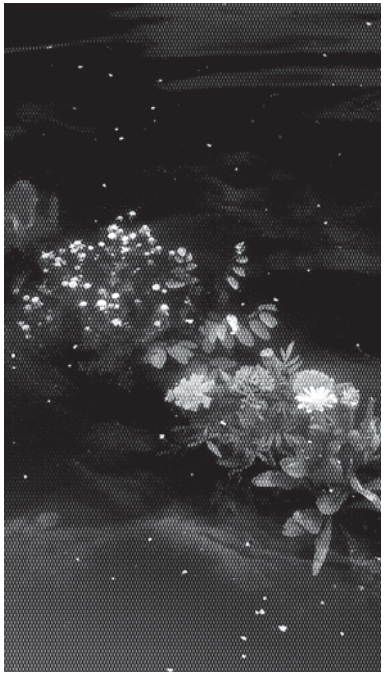
CLIMATE CARE READINGS
FLOATING ~~UNIVERSITY~~ 2019

CLIMATE CARE



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Täglich um 17.00 Uhr lassen wir das Workshop-Programm am Nachmittag mit einer Lesestunde und Pause ausklingen, bevor das Abendprogramm beginnt. Begleiten Sie Programmkünstler, Aktivisten und Schriftsteller bei der Durchführung von Lesungen von Texten, die für ihre eigene Forschung von Bedeutung sind.

Everyday at 17.00, the afternoon cycle of workshops is concluded with an hour of reading and pause before the evenings cycle begins on site. Join program artists, activists and writers as they lead reading sessions of texts from their own research.

Disclaimer

Dieser Leser begleitet das Klimaprogramm von Workshops und Veranstaltungen, das vom 1. bis 10. August 2019 auf dem Gelände der Floating ~~University~~ Berlin stattfindet. Der Leser besteht aus Texten, die von den Programmteilnehmern vorgeschlagen werden und die verschiedenen Themen, die im Rahmen des Programms untersucht werden hervorheben, und ist nur für den internen Gebrauch bestimmt. Alle Texte wurden online beschafft oder aus privaten Büchern gescannt und werden hier nur zum Zwecke des gemeinsamen Lesens vor Ort und des Lernens von ihnen präsentiert. Wir haben keine Erlaubnis, diese Texte zu verbreiten, soweit dieser Leser sie nicht in irgendeiner Form oder auf irgendeine Weise außerhalb der Lesungen reproduzieren, übertragen oder verteilen darf.

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READINGS

THURSDAY
01/08

Guided by: Gilly Karjevsky

TITLE: SHOULD TREES HAVE STANDING?
Author: Christopher D. Stone
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SHOULD TREES HAVE STANDING?

LAW, MORALITY, AND THE ENVIRONMENT

CHRISTOPHER D. STONE

THIRD EDITION

OXFORD
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INTRODUCTION
Trees at Thirty-Five

I. THE ROOTS OF *TREES*

It has been over thirty-five years since I wrote *Should Trees Have Standing?—Towards Legal Rights for Natural Objects*. It has since assumed a modest but apparently enduring place in contemporary environmental law and ethics, quite out of proportion to its actual impact on the courts. People have asked where I got the idea. I am not sure in what sense anyone ever "gets" any idea; and, at any rate I was later to be assured by readers—one should always be prepared to discover one's unoriginality—that the central notion had been floated about as far away as India[1] and as close to home as California.[2] The odd thing is that in this case I can assign a time, not much more than a moment, when the idea and I met up.

My thoughts were not even on the environment. I was teaching an introductory class in property law, and simply observing that societies, like human beings, progress through different stages of growth and sensitivity. In our progress through these stages, the law, in its way, participates, like art and literature in theirs. Our subject matter, the evolution of property law, was an illustration. Throughout history, there have been shifts in a cluster of related property variables, such as: what things, at various times were recognized as ownable (land, movables, ideas, other persons [slaves]); who was deemed capable of ownership (individuals, married women); the powers and privileges ownership conveyed (the right to destroy, the immunity from a warrantless search); and so on.[3] It was easy to see how each change shifted the locus and quality of power. But there also had to be an internal dimension, each advance in the law-legitimated concept of "ownership" fueling a change in consciousness, in the range and depth of feelings. For example, how did the innovation of the will—of the power to control our property after death—affect our sense of mortality, and thus of ourselves? Engrossing stuff (I thought). But we were approaching the end of the hour. I sensed that the students had already started to pack away their enthusiasm for the next venue. (I like to believe that every lecturer knows this feeling.) They needed to be lassoed back.

"So," I wondered aloud, reading their glazing skepticisms, "what would a radically different law-driven consciousness look like? . . . One in which Nature had rights," I supplied my own answer. "Yes, rivers, lakes, . . ." (warming to the idea) "trees . . . animals . . ." (I may have ventured "rocks"; I am not certain.) "How would such a posture *in law* affect a community's view *of itself*?"

This little thought experiment was greeted, quite sincerely, with uproar. At the end of the hour, none too soon, I stepped out into the hall and asked myself, "What did you just say in there? How could a tree have '*rights*'?" I had no idea.

The wish to answer my question was the starting point of *Should Trees Have Standing?* It launched as a vague, if heartfelt, conclusion tossed off in the heat of lecture. My initial motive was to restore my credibility. I set out to demonstrate that, whatever other criticisms might be leveled at the idea of Nature having legal rights, it was not incoherent.

But this was the hurdle: what were the criteria of an entity "having its own legal rights"? The question is complicated, because the law lends its mantle to protect all sorts of things, but not in a manner that would lead us to say that these things have rights. Under conventional law, if Jones lives next to a river, he has a property right to the flowing water in a condition suited for his domestic, or at least agricultural, use. If an upstream factory is polluting, Jones may well be able to sue the factory. Such a suit would protect the river indirectly. But no one would say the law was vindicating the river's rights. The rights would be Jones's. The suit would occur under conditions that Jones's interests in the river—its law-assured usefulness to him—were violated. Damages, if any, would go to Jones. If he were to win an injunction, he would have the liberty to negotiate it away—to release his claim against the factory for a price that was satisfactory to him (whatever the effect on the river's ecology).

So, then, what would be the criteria of a river having "its own" rights? One would have to imagine a legal system in which the rules (1) empower a suit to be brought against the factory owner in the name of the river (through a guardian or trustee); (2) hold the factory liable on the guardian's showing that, without justification, the factory changed the river from one state S to another state S* (for example, from oxygenated and teeming with fish to lifeless), irrespective of the economic consequences of the change on any human; and (3) the judgment would be for the benefit of the river (for example, if repairing the pollution—making the river "whole"—called for reoxygenating the river and restocking it with fish, the costs would be paid by the polluter into a fund for the river that its guardian would draw from).

I jotted down these three criteria on a yellow legal pad: (1) a suit in the object's own name (not some human's); (2) damages calculated by loss to a nonhuman entity (not limited to economic loss to humans); and (3) judgment applied for the benefit of the nonhuman entity. If the notion was ever to be more than a vague sentiment, I had to find some pending case in which this Nature-centered conception of rights might make a difference in the outcome. Could there be such?

I phoned my library reference desk, transmitted the criteria, and asked if they could come up with any litigation that fit this description. I did not expect a quick response. But within a half hour I got a call back: there was a case involving Mineral King in the California Sierra Nevada . . . Perhaps it might fit my needs?

II. SIERRA CLUB V. MORTON

The case the library had found, at the time entitled *Sierra Club v. Hickel*, had been recently decided by the Ninth Circuit Court of Appeals.[4] The U.S. Forest Service had granted a permit to Walt Disney Enterprises, Inc. to "develop" Mineral King Valley, a wilderness area in California's Sierra Nevada Mountains, by the construction of a $35 million complex of motels, restaurants, and recreational facilities. The Sierra Club, maintaining that the project would adversely affect the area's aesthetic and ecological balance, brought suit for an injunction. But the Ninth Circuit reversed. The key to the Ninth Circuit's opinion was this: not that the Forest Service had been right in granting the permit, but that the Sierra Club Legal Defense Fund had no "standing" to bring the question to the courts. After all, the Ninth Circuit reasoned, the Sierra Club itself

> does not allege that it is 'aggrieved' or that it is 'adversely affected' within the meaning of the rules of standing. Nor does the fact that no one else appears on the scene who is in fact aggrieved and is willing or desirous of taking up the cudgels create a right in appellee. The right to sue does not inure to one who does not possess it, simply because there is no one else willing and able to assert it.[5]

This, it was apparent at once, was the ready-made vehicle to bring to the Court's attention the theory that was taking shape in my mind. Perhaps the injury to the Sierra Club was tenuous, but the injury to Mineral King—the park itself—wasn't. If the courts could be persuaded to think about the park itself as a jural person—the way corporations are "persons"—the notion of Nature having rights would here make a significant operational difference—the difference between the case being heard and (the way things were then heading) being thrown out of court. In other words, if standing were the barrier, why not designate Mineral King, the wilderness area, as the plaintiff "adversely affected," let the Sierra Club be characterized as the attorney or guardian for the area, and get on with the merits? Indeed, that seemed a more straightforward way to get at the real issue, which was not what all that gouging of roadbeds would do to the club or its members, but what it would do to the valley. Why not come right out and say—and try to deal with—that?

It was October 1971. The Sierra Club's appeal had already been docketed for review by the U.S. Supreme Court under the name *Sierra Club v. Morton* (Morton being the name of the new Secretary of the Interior.). The case would be up for argument in November or December at the latest. I sat down with the editor-in-chief of the *Southern California Law Review*, and we made some quick estimates. The next issue of the *Review* to go to press would be a special symposium on law and technology, which was scheduled for publication in late March or early April. There was no hope, then, of getting an article out in time for the lawyers to work the idea into their briefs or oral arguments. Could something be

published in time for the Justices to see it before they had finished deliberating and writing their opinions? The chances that the case would still be undecided in April were only slim. But there was one hope. By coincidence, Justice William O. Douglas (who, if anyone on the Court, might be receptive to the notion of legal rights for natural objects) was scheduled to write the preface to the symposium issue. For this reason he would be supplied with a draft of all the manuscripts in December. Thus he would at least have this idea in his hands. If the case were long enough in the deciding, and if he found the theory convincing, he might even have the article available as a source of support.

We decided to try it. I pulled the thoughts together at a pace that, as such academic writings go, was almost breakneck, and the law review wedged it into a symposium in which it did not belong. The manuscripts for the symposium issue went to the printer in late December. Then began a long wait, all of us hoping that—at least in this case—the wheels of justice would turn slowly enough that the article could catch up with the briefs. It did.

The Supreme Court upheld the Ninth Circuit, a four Justice plurality affirming that "the 'injury in fact' test requires more than an injury to a cognizable interest. It requires that the party seeking review be himself among the injured."[6] But Justice Douglas opened his dissent with warm endorsement for the theory that had just then made its way into print:

> The critical question of 'standing' would be simplified and also put neatly in focus if we . . . allowed environmental issues to be litigated . . . in the name of the inanimate object about to be despoiled, defaced, or invaded . . . Contemporary public concern for protecting nature's ecological equilibrium should lead to the conferral of standing upon environmental objects to sue for their own preservation. See *Should Trees Have Standing?* . . . This suit would therefore be more properly labeled as Mineral King v. Morton.[7]

Justices Harold Blackmun and William J. Brennan favored a liberal construction of available precedent to uphold the Sierra Club on the pleadings it submitted; but in the alternative, they would have permitted the "imaginative expansion" of standing for which Douglas was willing to speak.[8]

III. EARLY REACTIONS

Boosted by Douglas's endorsement, the media got onto *Trees* overnight. It is not unusual for Justices to cite law review articles. But there was something, if not prophetic, at least amiably zany about a law professor who "speaks for the trees"—and gets a few Justices to listen. Writing in the *Journal of the American Bar Association*, one practicing lawyer took to verse for rejoinder:

> If Justice Douglas has his way—
> O come not that dreadful day—
> We'll be sued by lakes and hills
> Seeking a redress of ills.
> Great mountain peaks of name prestigious
> Will suddenly become litigious.
> Our brooks will babble in the courts,
> Seeking damages for torts.
> How can I rest beneath a tree
> If it may soon be suing me?
> Or enjoy the playful porpoise
> While it's seeking habeas corpus?
> Every beast within his paws
> Will clutch an order to show cause.
> The courts, besieged on every hand,
> Will crowd with suits by chunks of land.
> Ah! But vengeance will be sweet
> Since this must be a two-way street.
> I'll promptly sue my neighbor's tree
> for shedding all its leaves on me.[9]

The style—a reluctance to confront us natural object advocates head-on, prose to prose—spread. In disposing of a 1983 suit by a tree owner to recover from a negligent driver for injuries to the tree, the Oakland County Michigan Appeals Court affirmed dismissal with the following opinion in its entirety:

> We thought that we would never see
> A suit to compensate a tree.
> A suit whose claim in tort is prest
> Upon a mangled tree's behest;
> A tree whose battered trunk was prest
> Against a Chevy's crumpled chest;
> A tree that may forever bear
> A lasting need for tender care.
> Flora lovers though we three
> We must uphold the court's decree.[10]

On the tide of such interest, the *Trees* article was brought out in book form utterly without reedit[11]—essentially photocopied, in fact—and sold briskly.[12] Most reactions were favorable. The *Berkeley Monthly*, for one, took *Trees* as a sign of better times to come. Others were critical, either of my ideas, or of nearly unrecognizable mutations which the writers proceeded to connect, at their convenience, I thought, with my name. I might have expected to be considered a born again pantheist, but not, as one reviewer initiated, that my agenda was transparently communistic. (The gist, as I recall, was that if we could not own *things*—and, after all, what else was there?—the whole institution of ownership was done for.) My name and little chatty, uncritical versions of the idea began to

embellish the sort of journals that carry pictures. A revised mass-market paperback edition of the essay was issued by Avon Books, unsentineled by scholarly footnotes.[13]

I had not been an environmental lawyer, and the focus of my attentions soon settled back to other things. But the Nature-rights movement was rolling along and lawyers began to file suits in the name of nonhumans. Early named plaintiffs included a river (the Byram),[14] a marsh (No Bottom),[15] a brook (Brown),[16] a beach (Makena),[17] a national monument (Death Valley),[18] a town commons (Billerica),[19] a tree,[20] and an endangered Hawaiian bird (the Palila).[21]

But I am getting ahead of the story. I will return to the post-*Trees* developments in the epilogue.

1. SHOULD TREES HAVE STANDING?
Toward Legal Rights for Natural Objects

I. INTRODUCTION: THE UNTHINKABLE

In *The Descent of Man*, Charles Darwin observes that the history of moral development has been a continual extension in the objects of his "social instincts and sympathies." Originally, each man had regard only for himself and those of a very narrow circle about him; later, he came to regard more and more "not only the welfare, but the happiness of all his fellow-men"; then "his sympathies became more tender and widely diffused, extending to men of all races, to the imbecile, maimed, and other useless members of society, and finally to the lower animals. . . ."[1]

The history of the law suggests a parallel development. Perhaps there never was a pure Hobbesian state of nature, in which no "rights" existed except in the vacant sense of each man's "right to self-defense." But it is not unlikely that so far as the earliest "families" (including extended kinship groups and clans) were concerned, everyone outside the family was suspect, alien, rightless.[2] And even within the family, persons we presently regard as the natural holders of at least some rights had none. Take, for example, children. We know something of the early right-status of children from the widespread practice of infanticide—especially of the deformed and female.[3] (Senicide,[4] as among the North American Indians, was the corresponding rightlessness of the aged.[5]) Maine tells us that as late as the *patria potestas* of the Romans, the father had *jus vitae necisque*—the power of life and death—over his children. *A fortiori*, Maine writes, he had the power of "uncontrolled corporal chastisement; he can modify their personal condition at pleasure; he can give a wife to his son; he can give his daughter in marriage; he can divorce his children of either sex; he can transfer them to another family by adoption; and he can sell them." The child was less than a person: an object, a thing.[6]

The legal rights of children have long since been recognized in principle, and are still expanding in practice. Witness, *In re Gault*,[7] which guaranteed basic constitutional protections to juvenile defendants. We have been making persons of children although they were not, in law, always so. And we have done the same, albeit imperfectly some would say, with prisoners,[8] aliens, women (especially of the married variety), the insane,[9] African Americans, fetuses,[10] and Native Americans.

Nor is it only matter in human form that has come to be recognized as the possessor of rights. The world of the lawyer is peopled with inanimate right-holders: trusts, corporations, joint ventures, municipalities, Subchapter R

partnerships,[11] and nation-states, to mention just a few. Ships, still referred to by courts in the feminine gender, have long had an independent jural life, often with striking consequences.[12] We have become so accustomed to the idea of a corporation having "its" own rights, and being a "person" and "citizen" for so many statutory and constitutional purposes, that we forget how jarring the notion was to early jurists. "That invisible, intangible and artificial being, that mere legal entity" Chief Justice Marshall wrote of the corporation in *Bank of the United States v. Deveaux*[13]—could a suit be brought in its name? Ten years later, in the *Dartmouth College* case,[14] he was still refusing to let pass unnoticed the wonder of an entity "existing only in contemplation of law."[15] Yet, long before Marshall worried over the personifying of the modern corporation, the best medieval legal scholars had spent hundreds of years struggling with the notion of the legal nature of those great public "corporate bodies," the Church and the State. How could they exist in law, as entities transcending the living pope and king? It was clear how a king could bind himself—on his honor—by a treaty. But when the king died, what was it that was burdened with the obligations of, and claimed the rights under, the treaty his tangible hand had signed? The medieval mind saw (what we have lost our capacity to see)[16] how unthinkable it was, and worked out the most elaborate conceits and fallacies to serve as anthropomorphic flesh for the Universal Church and the Universal Empire.[17]

It is this note of the unthinkable that I want to dwell upon for a moment. Throughout legal history, each successive extension of rights to some new entity has been, theretofore, a bit unthinkable. We are inclined to suppose the rightlessness of rightless "things" to be a decree of Nature, not a legal convention acting in support of sonic status quo. It is thus that we defer considering the choices involved in all their moral, social, and economic dimensions. And so the U.S. Supreme Court could straight-facedly tell us in *Dred Scott* that African Americans had been denied the rights of citizenship "as a subordinate and inferior class of beings, who had been subjugated by the dominant race. . . ."[18]

In the nineteenth century, the highest court in California explained that the Chinese had not the right to testify against White men in criminal matters because they were a "race of people whom nature has marked as inferior, and who are incapable of progress or intellectual development beyond a certain point . . . between whom and ourselves nature has placed an impassable difference."[19] The popular conception of the Jew in the thirteenth century contributed to a law which treated them as "men *ferae naturae*, protected by a quasi forest law. Like the roe and the deer, they form an order apart."[20] Recall, too, that it was not so long ago that the fetus was "like the roe and the deer." In an early suit attempting to establish a wrongful death action on behalf of a negligently killed fetus (now widely accepted practice), Holmes, then on the Massachusetts Supreme Court, seems to have thought it simply inconceivable "that a man might owe a civil duty and incur a conditional prospective liability in tort to one

not yet in being."[21] The first woman in Wisconsin who thought she might have a right to practice law was told that she did not, in the following terms:

> The law of nature destines and qualifies the female sex for the bearing and nurture of the children of our race and for the custody of the homes of the world . . . [A]ll life-long callings of women, inconsistent with these radical and sacred duties of their sex, as is the profession of the law, are departures from the order of nature; and when voluntary, treason against it . . . The peculiar qualities of womanhood, its gentle graces, its quick sensibility, its tender susceptibility, its purity, its delicacy, its emotional impulses, its subordination of hard reason to sympathetic feeling, are surely not qualifications for forensic strife. Nature has tempered woman as little for the juridical conflicts of the court room, as for the physical conflicts of the battlefield. . . .[22]

The fact is, that each time there is a movement to confer rights onto some new "entity," the proposal is bound to sound odd or frightening or laughable.[23] This is partly because until the rightless thing receives its rights, we cannot see it as anything but a *thing* for the use of "us"—those who are holding rights at the time.[24] In this vein, what is striking about the Wisconsin case discussed earlier is that the court, for all its talk about women, so clearly was never able to see women as they are (and might become). All it could see was the popular "idealized" version of *an object it needed*. Such is the way the slave-holding South looked upon African Americans.[25] There is something of a seamless web involved: there will be resistance to giving the thing "rights" until it can be seen and valued for itself; yet, it is hard to see it and value it for itself until we can bring ourselves to give it "rights"—which is almost inevitably going to sound inconceivable to a large group of people.

The reason for this little discourse on the unthinkable, the reader must know by now, if only from the title of the paper. I am quite seriously proposing that we give legal rights to forests, oceans, rivers, and other so-called "natural objects" in the environment—indeed, to the natural environment as a whole.[26]

As strange as such a notion may sound, it is neither fanciful nor devoid of operational content. In fact, I do not think it would be a misdescription of certain developments in the law to say that we are already on the verge of assigning some such rights, although we have not faced up to what we are doing in those particular terms.[27] I argue here that we should do so now, and explore the implications such a notion would hold.

II. TOWARD RIGHTS FOR THE ENVIRONMENT

Now, to say that the natural environment should have rights is not to say anything as silly as that no one should be allowed to cut down a tree. We say

human beings have rights, but—at least as of the time of this writing—they can be executed.[28] Corporations have rights, but they cannot plead the Fifth Amendment.[29] *In re Gault* gave 15-year-olds certain rights in juvenile proceedings, but it did not give them the right to vote. Thus, to say that the environment should have rights is not to say that it should have every right we can imagine, or even the same body of rights as human beings have. Nor is it to say that everything in the environment should have the same rights as every other thing in the environment.

What the granting of rights does involve has two sides to it. The first involves what might be called the legal-operational aspects; the second, the psychic and socio-psychic aspects. I shall deal with these aspects in turn.

III. THE LEGAL-OPERATIONAL ASPECTS

(1) What It Means to Be a Holder of Legal Rights

There is, so far as I know, no generally accepted standard for how one ought to use the term "legal rights." Let me indicate how I shall be using it in this piece.

First and most obviously, if the term is to have any content at all, an entity cannot be said to hold a legal right unless and until *some public authoritative body* is prepared to give *some amount of review* to actions that are colorably inconsistent with that "right." For example, if a student can be expelled from a university and cannot get any public official, even a judge or administrative agent at the lowest level, either (1) to require the university to justify its actions (if only to the extent of filling out an affidavit alleging that the expulsion "was not wholly arbitrary and capricious"), or (2) to compel the university to accord the student some procedural safeguards (a hearing, right to counsel, right to have notice of charges), then the minimum requirements for saying that the student has a legal right to his education do not exist.[30]

But for a thing to be a *holder of legal rights*, something more is needed than that some authoritative body will review the actions and processes of those who threaten it. As I shall use the term, "holder of legal rights," each of three additional criteria must be satisfied. All three, one will observe, go toward making, a thing count judicially—to have a legally recognized worth and dignity in its own right, and not merely to serve as a means to benefit "us" (whoever the contemporary group of rights-holders may be). They are, first, that the thing can institute legal actions *at its behest*, second, that in determining the granting of legal relief, the court must take *injury to it* into account; and, third, that relief must run to the *benefit of it*.

To illustrate, even as between two societies that condone slavery there is a fundamental difference between S1, in which a master can (if he chooses), go to court and collect reduced chattel value damages from someone who has beaten his slave, and S2, in which the slave can institute the proceedings himself, for his

own recovery, damages being measured by, say, his pain and suffering. Notice that neither society is so structured as to leave wholly unprotected the slave's interests in not being beaten. But in S2 as opposed to S1 there are three operationally significant advantages that the slave has, and these make the slave in S2, albeit a slave, a holder of rights. Or, again, compare two societies, S1, in which prenatal injury to a live-born child gives a right of action against the tortfeasor at the mother's instance, for the mother's benefit, on the basis of the mother's mental anguish, and S2, which gives the child a suit in its own name (through a guardian ad litem) for its own recovery, for damages to it.

When I say, then, that at common law "natural objects" are not holders of legal rights, I am not simply remarking what we would all accept as obvious. I mean to emphasize three specific legal-operational advantages that the environment lacks, leaving it in the position of the slave and the fetus in S1, rather than the slave and fetus of S2.

(2) The Rightlessness of Natural Objects at Common Law

Consider, for example, the common law's posture toward the pollution of a stream. True, courts have always been able, in some circumstances, to issue orders that will stop the pollution—just as the legal system in S1 is so structured as incidentally to discourage beating slaves and being reckless around pregnant women. But the stream itself is fundamentally rightless, with implications that deserve careful reconsideration.

The first sense in which the stream is not a rights-holder has to do with standing. The stream itself has none. So far as the common law is concerned, there is in general no way to challenge the polluter's actions save at the behest of a lower riparian—another human being able to show an invasion of his rights. This conception of the riparian as the holder of the right to bring suit has more than theoretical interest. The lower riparians may simply not care about the pollution. They themselves may be polluting, and not wish to stir up legal waters. They may be economically dependent on their polluting neighbor.[31] And, of course, when they discount the value of winning by the costs of bringing suit and the chances of success, the action may not seem worth undertaking. Consider, for example, that while the polluter might be injuring one hundred downstream riparians of $100,000 a year *in the aggregate*, each riparian separately might be suffering injury only to the extent of $1000—possibly not enough for any one of them to want to press suit by himself, or even go to the trouble and cost of securing co-plaintiffs to make it worth everyone's while. This hesitance will be especially likely when the potential plaintiffs consider the burdens the law puts in their way:[32] proving, e.g., specific damages, the "unreasonableness" of defendant's use of the water, the fact that practicable means of abatement exist, and overcoming difficulties raised by issues such as joint causality, right to pollute by prescription, and so forth. Even in states which, like California, sought to overcome these difficulties by empowering the attorney general to sue for abatement

of pollution in limited instances, the power has been sparingly invoked and, when invoked, narrowly construed by the courts.[33]

The second sense in which the common law denies "rights" to natural objects has to do with the way in which the merits are decided in those cases in which someone is competent and willing to establish standing. At its more primitive levels, the system protected the "rights" of the property-owning human with minimal weighing of any values: "*Cujus est solum, ejus est usque ad coelum et ad infernos.*"[34] Today we have come more and more to make balances—but only such as will adjust the economic best interests of identifiable humans. For example, continuing with the case of streams, there are commentators who speak of a "general rule" that "a riparian owner is legally entitled to have the stream flow by his land with its quality unimpaired" and observe that "an upper owner has, prima facie, no right to pollute the water."[35] Such a doctrine, if strictly invoked, would protect the stream absolutely whenever a suit was brought; but obviously, to look around us, the law does not work that way. Almost everywhere there are doctrinal qualifications on riparian "rights" to an unpolluted stream.[36] Although these rules vary from jurisdiction to jurisdiction, and upon whether one is suing for an equitable injunction or for damages, what they all have in common is some sort of balancing. Whether under language of "reasonable use," "reasonable methods of use," "balance of convenience," or "the public interest doctrine,"[37] what the courts are balancing, with varying degrees of directness, are the economic hardships on the upper riparian (or dependent community) of abating the pollution vis-à-vis the economic hardships of continued pollution on the lower riparians. What does not weigh in the balance is the damage to the stream, its fish and turtles and lower life. So long as the natural environment itself is rightless, these are not matters for judicial cognizance. Thus, we find the highest court of Pennsylvania refusing to stop a coal company from discharging polluted mine water into a tributary of the Lackawanna River because a plaintiff's "grievance is for a mere personal inconvenience; and mere private personal inconveniences . . . must yield to the necessities of a great public industry, which although in the hands of a private corporation, subserves a great public interest."[38] The stream itself is lost sight of in "a quantitative compromise between two conflicting interests."[39]

The third way in which the common law makes natural objects rightless has to do with who is regarded as the beneficiary of a favorable judgment. Here, too, it makes a considerable difference that it is not the natural object that counts in its own right. To illustrate this point, let me begin by observing that it makes perfectly good sense to speak of, and ascertain, the legal damage to a natural object, if only in the sense of "making it whole" with respect to the most obvious factors.[40] The costs of making a forest whole, for example, would include the costs of reseeding, repairing watersheds, restocking wildlife—the sorts of costs the U.S. Forest Service undergoes after a fire. Making a polluted stream whole would include the costs of restocking with fish, waterfowl, and other animal and

vegetable life, dredging, washing out impurities, establishing natural and/or artificial aerating agents, and so forth. Now, what is important to note is that, under our present system, even if a plaintiff riparian wins a water pollution suit for damages, no money goes to the benefit of the stream itself to repair its damages.[41] This omission has the further effect that, at most, the law confronts a polluter with what it takes to make the plaintiff riparians whole; this may be far less than the damages to the stream,[42] but not so much as to force the polluter to desist. For example, it is easy to imagine a polluter whose activities damage a stream to the extent of $100,000 annually, although the aggregate damage to all the riparian plaintiffs who come into the suit is only $30,000. If $30,000 is less than the cost to the polluter of shutting down, or making the requisite technological changes, he might prefer to pay off the damages (i.e., the legally cognizable damages) and continue to pollute the stream. Similarly, even if the jurisdiction issues an injunction at the plaintiffs' behest (rather than to order payment of damages), there is nothing to stop the plaintiffs from "selling out" the stream, i.e., agreeing to dissolve or not enforce the injunction at some price (in the example described earlier, somewhere between plaintiffs' damages—$30,000—and defendant's next best economic alternative). Indeed, I take it this is exactly what Learned Hand had in mind in an opinion in which, after issuing an antipollution injunction, he suggests that the defendant "make its peace with the plaintiff as best it can."[43] What is meant is a peace between them, and not amongst them and the river.

I ought to make it clear at this point that the common law as it affects streams and rivers, which I have been using as an example so far, is not exactly the same as the law affecting other environmental objects. Indeed, one would be hard pressed to say that there was a "typical" environmental object, so far as its treatment at the hands of the law is concerned. There are some differences in the law applicable to all the various resources that are held in common: rivers, lakes, oceans, dunes, air, streams (surface and subterranean), beaches, and so forth.[44] And there is an even greater difference as between these traditional communal resources on one hand, and natural objects on traditionally private land, e.g., the pond on the farmer's field, or the stand of trees on the suburbanite's lawn.

On the other hand, although there be these differences which would make it fatuous to generalize about a law of the natural environment, most of these differences simply underscore the points made in the instance of rivers and streams. None of the natural objects, whether held in common or situated on private land, has any of the three criteria of a rights-holder. They have no standing in their own right; their unique damages do not count in determining outcome; and they are not the beneficiaries of awards. In such fashion, these objects have traditionally been regarded by the common law, and even by all but the most recent legislation, as objects for man to conquer and master and use—in such a way as the law once looked upon "man's" relationship to African Blacks. Even where special measures have been taken to conserve them, as by seasons on

game and limits on timber cutting, the dominant motive has been to conserve them for us—for the greatest good of the greatest number of human beings. Conservationists, so far as I am aware, are generally reluctant to maintain otherwise.[45] As the name implies, they want to conserve and guarantee our consumption and our enjoyment of these other living things. In their own right, natural objects have counted for little, in law as in popular movements.

As I mentioned at the outset, however, the rightlessness of the natural environment can and should change; it already shows signs of doing so.

(3) Toward Having Standing in Its Own Right

It is not inevitable, nor is it wise, that natural objects should have no rights to seek redress in their own behalf. It is no answer to say that streams and forests cannot have standing because streams and forests cannot speak. Corporations cannot speak, either; nor can states, estates, infants, incompetents, municipalities, or universities. Lawyers speak for them, as they customarily do for the ordinary citizen with legal problems. One ought, I think, to handle the legal problems of natural objects as one does the problems of legal incompetents—human beings who have become vegetative. If a human being shows signs of becoming senile and has affairs that he is de jure incompetent to manage, those concerned with his well being make such a showing to the court, and someone is designated by the court with the authority to manage the incompetent's affairs. The guardian[46] (or "conservator"[47] or "committee"[48]—the terminology varies) then represents the incompetent in his legal affairs. Courts make similar appointments when a corporation has become "incompetent": they appoint a trustee in bankruptcy or reorganization to oversee its affairs and speak for it in court when that becomes necessary.

On a parity of reasoning, we should have a system in which, when a friend of a natural object perceives it to be endangered, he can apply to a court for the creation of a guardianship.[49] Perhaps we already have the machinery to do so. California law, for example, defines an incompetent as "any person, whether insane or not, who by reason of old age, disease, weakness of mind, or other cause, is unable, unassisted, properly to manage and take care of himself or his property, and by reason thereof is likely to be deceived or imposed upon by artful or designing persons."[50] Of course, to urge a court that an endangered river is "a person" under this provision will call for lawyers as bold and imaginative as those who convinced the Supreme Court that a railroad corporation was a "person" under the Fourteenth Amendment, a constitutional provision theretofore generally thought of as designed to secure the rights of freed-men.[51] (When this article was first going to press, Professor John Byrn of Fordham petitioned the New York State Supreme Court to appoint him legal guardian for an unrelated fetus scheduled for abortion so as to enable him to bring a class action on behalf of all fetuses similarly situated in New York City's 18 municipal hospitals. Judge Holtzman granted the petition of guardianship.)[52] If such an argument

based on present statutes should fail, special environmental legislation could be enacted along traditional guardianship lines. Such provisions could provide for guardianship both in the instance of public natural objects and also, perhaps with slightly different standards, in the instance of natural objects on "private" land.[53]

The potential "friends" that such a statutory scheme requires are hardly lacking. The Sierra Club, the Environmental Defense Fund, Friends of the Earth, the Natural Resources Defense Counsel, and the Izaak Walton League are just some of the many groups which have manifested unflagging dedication to the environment and which are becoming increasingly capable of marshalling the requisite technical experts and lawyers. If, for example, the Environmental Defense Fund should have reason to believe that some company's strip mining operation might be irreparably destroying the ecological balance of large tracts of land, it could, under this procedure, apply to the court in which the lands were situated to be appointed guardian.[54] As guardian, it might be given rights of inspection (or visitation) to determine and bring to the court's attention a fuller finding on the land's condition. If there were indications that under the substantive law some redress might be available on the land's behalf, then the guardian would be entitled to raise the land's right in the land's name, i.e., without having to make the roundabout and often unavailing demonstration, discussed later, that the "rights" of the club's members were being invaded. Guardians would also be looked to for a host of other protective tasks, e.g., monitoring effluents (and/or monitoring the monitors), and representing their "wards" at legislative and administrative hearings on such matters as the setting of state water quality standards. Procedures exist, and can be strengthened, to move a court for the removal and substitution of guardians, for conflicts of interest or for other reasons,[55] as well as for the termination of the guardianship.[56]

In point of fact, there is a movement in the law toward giving the environment the benefits of standing, although not in a manner as satisfactory as the guardianship approach. What I am referring to is the marked liberalization of traditional standing requirements. As early as the 1960s, environmental action groups began to challenge federal government action. *Scenic Hudson Preservation Conference v. FPC*[57] is a good example. There, the Federal Power Commission had granted New York's Consolidated Edison a license to construct a hydroelectric project on the Hudson River at Storm King Mountain. The grant of license had been opposed by conservation interests on the grounds that the transmission lines would be unsightly, fish would be destroyed, and nature trails would be inundated. Two of these conservation groups, united under the name Scenic Hudson Preservation Conference, petitioned the Second Circuit to set aside the grant. Despite the claim that Scenic Hudson had no standing because it had not made the traditional claim "of any personal economic injury resulting from the Commission's actions,"[58] the petitions were heard, and the case sent back to the Commission. On the standing point, the court noted that Section 313(b)

of the Federal Power Act gave a right of instituting review to any party "aggrieved by an order issued by the Commission;"[59] it thereupon read "aggrieved by" as not limited to those alleging the traditional personal economic injury, but as broad enough to include "those who by their activities and conduct have exhibited a special interest in the aesthetic, conservational, and recreational aspects of power development."[60] A similar reasoning has swayed other circuits to allow proposed actions by the Federal Power Commission, the U.S. Department of Interior, and the U.S. Department of Health and Human Services to be challenged by environmental action groups on the basis of, e.g., recreational and esthetic interests of members, in lieu of direct economic injury.[61] Only the Ninth Circuit has balked, and one of these cases, involving the Sierra Club's attempt to challenge a Walt Disney development in the Sequoia National Forest, was at the original time of this writing awaiting decision by the U.S. Supreme Court.[62]

Even if the Supreme Court should reverse the Ninth Circuit in the Walt Disney–Sequoia National Forest matter, thereby encouraging the circuits to continue their trend toward liberalized standing in this area, there are significant reasons to press for the guardianship approach notwithstanding. For one thing, the cases of this sort have extended standing on the basis of interpretations of specific federal statutes—the Federal Power Commission Act,[63] the Administrative Procedure Act,[64] the Federal Insecticide, Fungicide and Rodenticide Act, and others. Such a basis supports environmental suits only where acts of federal agencies are involved; and even there, perhaps, only when there is some special statutory language, such as "aggrieved by" in the Federal Power Act, on which the action groups can rely.[65] Witness for example, *Bass Angler Sportsman Society v. United States Steel Corp.*[66] There, plaintiffs sued 175 corporate defendants located throughout Alabama, relying on 33 U.S.C. § 407 (1970), which provides:

> It shall not be lawful to throw, discharge, or deposit . . . any refuse matter . . . into any navigable water of the United States, or into any tributary of any navigable water from which the same shall float or be washed into such navigable water . . . [67]

Another section of the Act provides that one-half the fines shall be paid to the person or persons giving information which shall lead to a conviction.[68] Relying on this latter provision, the plaintiff designated his action a *qui tam* action[69] and sought to enforce the Act by injunction and fine. The District Court ruled that, in the absence of express language to the contrary, no one outside the U.S. Department of Justice had standing to sue under a criminal act and refused to reach the question of whether violations were occurring.[70]

Unlike the liberalized standing approach, the guardianship approach would secure an effective voice for the environment even where federal administrative action and public lands and waters were not involved. It would also allay one of the fears courts—such as the Ninth Circuit—have about the extended standing concept: if any ad hoc group can spring up overnight, invoke some "right" as

universally claimable as the esthetic and recreational interests of its members and thereby get into court, how can a flood of litigation be prevented?[71] If an ad hoc committee loses a suit brought *sub nom.* the Committee to Preserve our Trees, what happens when its very same members reorganize two years later and sue *sub nom.* the Massapequa Sylvan Protection League? Is the new group bound by res judicata? Class action law may be capable of ameliorating some of the more obvious problems. But even so, court economy might be better served designating the guardian de jure representative of the natural object, with rights of discretionary intervention by others, but with the understanding that the natural object is "bound" by an adverse judgment. The guardian concept, too, would provide the endangered natural object with what the trustee in bankruptcy provides the endangered corporation: a continuous supervision over a period of time, with a consequent deeper understanding of a broad range of the ward's problems, not just the problems present in one particular piece of litigation. It would thus assure the courts that the plaintiff has the expertise and genuine adversity in pressing a claim which are the prerequisites of a true "case or controversy."

The guardianship approach, however, is apt to raise two objections, neither of which seems to me to have much force. The first is that a committee or guardian could not judge the needs of the river or forest in its charge; indeed, the very concept of "needs," it might be said, could be used here only in the most metaphorical way. The second objection is that such a system would not be much different from what we now have: is not the Department of Interior already such a guardian for public lands, and do not most states have legislation empowering their attorneys general to seek relief—in a sort of *parens patriae* way—for such injuries as a guardian might concern himself with?

As for the first objection, natural objects can communicate their wants (needs) to us, and in ways that are not terribly ambiguous. I am sure I can judge with more certainty and meaningfulness whether and when my lawn wants (needs) water, than the Attorney General can judge whether and when the United States wants (needs) to take an appeal from an adverse judgment by a lower court. The lawn tells me that it wants water by a certain dryness of the blades and soil—immediately obvious to the touch—the appearance of bald spots, yellowing, and a lack of springiness after being walked on; how does "the United States" communicate to the Attorney General? For similar reasons, the guardian-attorney for a smog-endangered stand of pines could venture with more confidence that his client wants the smog stopped, than the directors of a corporation can assert that "the corporation" wants dividends declared. We make decisions on behalf of, and in the purported interest of, others every day; these "others" are often creatures whose wants are far less verifiable, and even far more metaphysical in conception, than the wants of rivers, trees, and land.[72]

As for the second objection, one can indeed find evidence that the Department of Interior was conceived as a sort of guardian of the public lands.[73] But there are

two points to keep in mind. First, insofar as the department already is an adequate guardian it is only with respect to the federal public lands as per Article IV, section 3 of the Constitution.[74] Its guardianship includes neither local public lands nor private lands. Second, to judge from the environmentalist literature and from the cases environmental action groups have been bringing, the department is itself one of the bogeys of the environmental movement. (One thinks of the uneasy peace between Native Americans and the Bureau of Indian Affairs.) Whether the various charges be right or wrong, one cannot help but observe that the department has been charged with several institutional goals (never an easy burden), and has been looked to for action by quite a variety of interest groups, only one of which is the environmentalists. In this context, a guardian outside the institution becomes especially valuable. Besides, what a person wants, fully to secure his rights, is the ability to retain independent counsel even when, and perhaps especially when, the government is acting "for him" in a beneficent way. I have no reason to doubt, for example, that the social security system is being managed "for me"; but I would not want to abdicate my right to challenge its actions as they affect me, should the need arise.[75] I would not ask more trust of national forests, vis-à-vis the Department of Interior. The same considerations apply in the instance of local agencies, such as regional water pollution boards, whose members' expertise in pollution matters is often all too credible.[76]

The objection regarding the availability of attorneys general as protectors of the environment within the existing structure is somewhat the same. Their statutory powers are limited and sometimes unclear. As political creatures, they must exercise the discretion they have with an eye toward advancing and reconciling a broad variety of important social goals, from preserving morality to increasing their jurisdiction's tax base. The present state of our environment, and the history of cautious application and development of environmental protection laws long on the books,[77] testifies that the burdens of any attorney general's broad responsibility have apparently not left much manpower for the protection of nature. (Cf. *Bass Anglers*, earlier.) No doubt, strengthening interest in the environment will increase the zest of public attorneys even where, as will often be the case, well-represented corporate polluters are the quarry. Indeed, the U.S. Attorney General has stepped up antipollution activity, and ought to be further encouraged in this direction.[78] The statutory powers of the attorneys general should be enlarged, and they should be armed with criminal penalties made at least commensurate with the likely economic benefits of violating the law.[79] On the other hand, one cannot ignore the fact that there is increased pressure on public law-enforcement offices to give more attention to a host of other problems, from crime "on the streets" (why don't we say "in the rivers"?) to consumerism and school busing. If the environment is not to get lost in the shuffle, we would do well, I think, to adopt the guardianship approach as an additional safeguard, conceptualizing major natural objects as holders of their own rights, raisable by the court-appointed guardian.

(4) Toward Recognition of Its Own Injuries

As far as adjudicating the merits of a controversy is concerned, there is also a good case to be made for taking into account harm to the environment—in its own right. As indicated earlier, the traditional way of deciding whether to issue injunctions in law suits affecting the environment, at least where communal property is involved, has been to strike some sort of balance regarding the economic hardships on *human beings*. Even Mr. Justice Douglas, our jurist most closely associated with conservation sympathies in his private life, showed reticence to acknowledge the importance of the environment directly, deciding the propriety of a new dam on the basis of, among other things, anticipated *lost profits* from fishing, some $12 million annually.[80] Although he voted to delay the project pending further findings, the reasoning seemed unnecessarily incomplete and compromising. Why should the environment be of importance only indirectly, as lost profits to someone else? Why not throw into the balance the cost *to the environment*?

The argument for "personifying" the environment, from the point of damage calculations, can best be demonstrated from the welfare economics position. Every well-working legal-economic system should be so structured as to confront each of us with the full costs that our activities are imposing on society.[81] Ideally, a paper mill, in deciding what to produce—and where, and by what methods—ought to be forced to take into account not only the lumber, acid, and labor that its production "takes" from other uses in the society, but also what costs alternative production plans will impose on society through pollution. The legal system, through the law of contracts and the criminal law, for example, makes the mill confront the costs of the first group of demands. When for example, the company's purchasing agent orders 1000 drums of acid from the Z Company, the Z Company can bind the mill to pay for them, and thereby reimburse the society for what the mill is removing from alternative uses.

Unfortunately, so far as the pollution costs are concerned, the allocative ideal begins to break down, because the traditional legal institutions have a more difficult time "catching" and confronting us with the full social costs of our activities. In the lakeside mill example, major riparian interests might bring an action, forcing a court to weigh their aggregate losses against the costs to the mill of installing the anti-pollution device. But many other interests—and I am speaking for the moment of recognized homocentric interests—are too fragmented and perhaps "too remote" causally to warrant securing representation and pressing for recovery: the people who own summer homes and motels, the man who sells fishing tackle and bait, the man who rents rowboats. There is no reason not to allow the lake to prove damages to them as the prima facie measure of damages to it. By doing so, we in effect make the natural object, through its guardian, a jural entity competent to gather up these fragmented and otherwise unrepresented damage claims, and press them before the court even where, for legal or practical reasons, they are not going to be pressed by traditional class action plaintiffs.[82]

Indeed, one way—the homocentric way—to view what I am proposing so far, is to view the guardian of the natural object as the guardian of unborn generations, as well as of the otherwise unrepresented, but distantly injured, contemporary humans.[83] By making the lake itself the focus of these damages, and "incorporating" it so to speak, the legal system can effectively take proof upon, and confront the mill with, a larger and more representative measure of the damages its pollution causes.

So far, I do not suppose that my economist friends (unremitting human chauvinists, every one of them!) will have any large quarrel in principle with the concept. Many will view it as a trompe l'oeil that comes down, at best, to effectuating the goals of the paragon class action, or the paragon water pollution control district. Where we are apt to part company is here—I propose going beyond gathering up the loose ends of what most people would presently recognize as economically valid damages. The guardian would urge before the court injuries not presently cognizable—the death of eagles and inedible crabs, the suffering of sea lions, the loss from the face of the earth of species of commercially valueless birds, the disappearance of a wilderness area. One might, of course, speak of the damages involved as "damages" to us humans, and indeed, the widespread growth of environmental groups shows that human beings do feel these losses. But they are not, at present, economically measurable losses: how can they have a monetary value for the guardian to prove in court?

The answer for me is simple. Wherever it carves out "property" rights, the legal system is engaged in the process of *creating* monetary worth. One's literary works would have minimal monetary value if anyone could copy them at will. Their economic value to the author is a product of the law of copyright; the person who copies a copyrighted book has to bear a cost to the copyright-holder because the law says he must. Similarly, it is through the law of torts that we have made a "right" of—and guaranteed an economically meaningful value to—privacy. (The value we place on gold—a yellow inanimate dirt—is not simply a function of supply and demand—wilderness areas are scarce and pretty, too—but results from the actions of the legal systems of the world, which have institutionalized that value; they have even done a remarkable job of stabilizing the price.) I am proposing we do the same with eagles and wilderness areas as we do with copyrighted works, patented inventions, and privacy: *make* the violation of rights in them to be a cost by declaring the "pirating" of them to be the invasion of a property interest.[84] If we do so, the net social costs the polluter would be confronted with would include not only the extended homocentric costs of his pollution (explained earlier) but also to the environment per se.

How, though, would these costs be calculated? When we protect an invention, we can at least speak of a fair market value for it, by reference to which damages can be computed. But the lost environmental "values" of which we are now speaking are by definition over and above those that the market is prepared to bid for: they are priceless.

One possible measure of damages, suggested earlier, would be the cost of making the environment whole, just as, when a man is injured in an automobile accident, we impose upon the responsible party the injured man's medical expenses. Comparable expenses to a polluted river would be the costs of dredging, restocking with fish, and so forth. It is on the basis of such costs as these, I assume, that we get the figure of $1 billion as the cost of saving Lake Erie.[85] As an ideal, I think this is a good guide applicable in many environmental situations. It is by no means free from difficulties, however.

One problem with computing damages on the basis of making the environment whole is that, if understood most literally, it is tantamount to asking for a "freeze" on environmental quality, even at the costs (and there will be costs) of preserving "useless" objects.[86] Such a "freeze" is not inconceivable to me as a general goal, especially considering that, even by the most immediately discernible homocentric interests, in so many areas we ought to be cleaning up and not merely preserving the environmental status quo. In fact, there have been movements in Congress to press for the total elimination of all river pollutants,[87] notwithstanding that such a decision would impose quite large direct and indirect costs on us all. Here one is inclined to recall the instructions of Judge Paul Hays, in remanding Consolidated Edison's Storm King application to the Federal Power Commission in *Scenic Hudson*:

> The Commission's renewed proceedings must include as a basic concern the preservation of natural beauty and of natural historic shrines, keeping in mind that, in our affluent society, the cost of a project is only one of several factors to be considered.[88]

Nevertheless, whatever the merits of such a goal in principle, there are many cases in which the social price tag of putting it into effect are going to seem too high to accept. Consider, for example, an oceanside nuclear generator that could produce low-cost electricity for a million homes at a savings of $1 a year per home and spare us the air pollution that comes from burning fossil fuels, but which through a slight heating effect threatened to kill off a rare species of temperature-sensitive sea urchin: suppose further that technological improvements adequate to reduce the temperature to present environmental quality would expend the entire $1 million in anticipated fuel savings. Are we prepared to tax ourselves $1 million a year on behalf of the sea urchins? In comparable problems under the present law of damages, we work out practicable compromises by abandoning restoration costs and calling upon fair market value. For example, if an automobile is so severely damaged that the cost of bringing the car to its original state by repair is greater than the fair market value, we would allow the responsible tortfeasor to pay the fair market value only. Or if a human being suffers the loss of an arm (as we might conceive of the ocean having irreparably lost the sea urchins), we can fall back on the capitalization of reduced earning power (and pain and suffering) to measure the damages. But what is the

fair market value of sea urchins? How can we capitalize their loss to the ocean, independent of any commercial value they may have to someone else?

One answer is that the problem can sometimes be sidestepped quite satisfactorily. In the sea urchin example, one compromise solution would be to impose on the nuclear generator the costs of making the ocean whole somewhere else, in some other way, e.g., reestablishing a sea urchin colony elsewhere, or making a somehow comparable contribution.[89] In debate over the laying of the trans-Alaskan pipeline the builders are apparently prepared to meet conservationists' objections halfway by reestablishing wildlife away from the pipeline, so far as is feasible.[90]

But even if damage calculations have to be made, one ought to recognize that the measurement of damages is rarely a simple report of economic facts about "the market," whether we are valuing the loss of a foot, a fetus, or a work of fine art. Decisions of this sort are always hard, but not impossible. We have increasingly taken (human) pain and suffering into account in reckoning damages, not because we think we can ascertain them as objective "facts" about the universe, but because, even in view of all the room for disagreement, we come up with a better society by making rude estimates of them than by ignoring them.[91] We can make such estimates in regard to environmental losses fully aware that what we are doing is making implicit normative judgments (as with pain and suffering)—laying down rules as to what the society is going to "value" rather than reporting market evaluations. In making such normative estimates decision-makers would not go wrong if they estimated on the "high side," putting the burden of trimming the figure down on the immediate human interests present. All burdens of proof should reflect common experience; our experience in environmental matters has been a continual discovery that our acts have caused more long-range damage than we were able to appreciate at the outset.

To what extent the decision-maker should factor in costs such as the pain and suffering of animals and other sentient natural objects, I cannot say; although I am prepared to do so in principle.[92] Given, in all events, the conjectural nature of the "estimates" and the roughness of the "balance of conveniences" procedure where that is involved, the practice would be of more interest from the sociopsychic point of view, discussed later, than from the legal-operational.

(5) Toward Being a Beneficiary in Its Own Right

As suggested earlier, one reason for making the environment itself the beneficiary of a judgment is to prevent it from being "sold out" in a negotiation among private litigants who agree not to enforce rights that have been established among themselves.[93] Protection from this will be advanced by making the natural object a party to an injunctive settlement. Even more importantly, we should make it a beneficiary of money awards. If in making the balance requisite to issuing an injunction, a court decides not to enjoin a lake polluter who is causing injury to the extent of $50,000 annually, then the owners and the lake ought both to be awarded damages. The natural object's portion could be put into a

trust fund to be administered by the object's guardian, as per the guardianship recommendation set forth earlier. So far as the damages are proved, as suggested in the previous section, by allowing the natural object to represent damages to others as prima facie evidence of damages to it, there will, of course, be problems of distribution. But even if the object is simply construed as representing a class of plaintiffs under the applicable civil rules,[94] there is often likely to be a sizeable amount of recovery attributable to members of the class who will not put in a claim for distribution (because their pro rata share would be so small, or because of their interest in the environment). Not only should damages go into these funds, but where criminal fines are applied (as against water polluters), it seems to me that the monies (less prosecutorial expenses, perhaps) ought sensibly to go to the fund raiser than to the general treasuries. Guardians' fees, including legal fees, would then come out of this fund. More importantly, the fund would be available to preserve the natural object as closely as possible to its condition at the time the environment was made a rights-holder.[95]

The idea of assessing damages as best we can and placing them in a trust fund is far more realistic than a hope that a total "freeze" can be put on the environmental status quo. Nature is a continuous theater in which things and species (eventually man) are destined to enter and exit.[96] In the meantime, coexistence of man and his environment means that *each* is going to have to compromise for the better of both. Some pollution of streams, for example, will probably be inevitable for some time. Instead of setting an unrealizable goal of enjoining absolutely the discharge of all such pollutants, the trust fund concept would (a) help assure that pollution would occur only in those instances where the social need for the pollutant's product (via his present method of production) was so high as to enable the polluter to cover all homocentric costs, plus some estimated costs to the environment per se, and (b) would be a corpus for preserving monies, if necessary, until the feasible technology was developed. Such a fund might even finance the requisite research and development.

(Incidentally, if "rights" are to be granted to the environment, then for many of the same reasons it might bear "liabilities" as well—as inanimate objects did anciently.[97] Rivers drown people, and flood over and destroy crops; forests burn, setting fire to contiguous communities. Where trust funds had been established, they could be available for the satisfaction of judgments against the environment, making it bear the costs of some of the harms it imposes on other right-holders. In effect, we would be narrowing the claim of acts of God. The ontological problem would be troublesome here, however: for, when the Nile overflows, is it the "responsibility" of the river? The mountains? The snow? The hydrologic cycle?)[98]

(6) Toward Rights in Substance

So far we have been looking at the characteristics of being a *holder of rights*, and exploring some of the implications that making the environment a holder of rights would entail. Natural objects would have standing in their own right,

through a guardian; damage to and through them would be ascertained and considered as an independent factor; and they would be the beneficiaries of legal awards. But these considerations only give us the skeleton of what a meaningful rights-holding would involve. To flesh out the "rights" of the environment demands that we provide it with a significant body of rights for it to invoke when it gets to court.

In this regard, the lawyer is constantly aware that a right is not, as the layman may think, some strange substance that one either has or has not. One's life, one's right to vote, one's property, can all be taken away. But those who would infringe on them must go through certain procedures to do so; these procedures are a measure of what we value as a society. Some of the most important questions of "right" thus turn into questions of degree: how much review, and of which sort, will which agencies of state accord it when we claim our "right" is being infringed?

We do not have an absolute right either to our lives or to our driver's licenses. But we have a greater right to our lives because, if even the state wants to deprive us of that "right," there are authoritative bodies that will demand that the state make a very strong showing before it does so, and it will have to justify its actions before a grand jury, petit jury (convincing them "beyond a reasonable doubt"), sentencing jury, and, most likely, levels of appellate courts. The carving out of students' "rights" to their education is being made up of this sort of procedural fabric. No one, I think, is maintaining that in no circumstances ought a student to be expelled from school. The battle for student "rights" involves shifting the answers to questions such as: before a student is expelled, does he have to be given a hearing; does he have to have prior notice of the hearing and notice of charges; may he bring counsel (need the state provide counsel if he cannot?); need there he a transcript; need the school carry the burden of proving the charges; may he confront witnesses; if he is expelled, can he get review by a civil court; if he can get such review, need the school show its actions were "reasonable," or merely "not unreasonable," and so forth?[99]

In this vein, to bring the environment into the society as a rights-holder would not stand it on a better footing than the rest of us mere mortals, who every day suffer injuries that are *damnum absque injuria*. What the environment must look for is that its interests be taken into account in subtler, more procedural ways.

The National Environmental Policy Act is a splendid example of this sort of rights-making through the elaboration of procedural safeguards. Among its many provisions, it establishes that every federal agency must:

> (c) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, detailed statements by the responsible official on
>
> (i) environmental impact of the proposal action,
>
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,

> (iii) alternatives to the proposed action,
>
> (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
>
> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.
>
> Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public as provided by section 552 of title 5, United States Code, and shall accompany the proposal through the existing agency review processes;
>
> (d) study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources;
>
> (e) recognize the worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's environment;
>
> (f) make available to States, counties, municipalities, institutions, and individuals, advice and information useful in restoring, maintaining, and enhancing the quality of the environment . . . [100]

These procedural protections have already begun paying off in the courts. For example, it was on the basis of the Federal Power Commission's failure to make adequate inquiry into "alternatives" (as per subsection (iii), in *Scenic Hudson*, and the Atomic Energy Commission's failure to make adequate findings, apparently as per subsections (i) and (ii), in connection with the Amchitka Island underground test explosion,[101] that federal courts delayed the implementation of environment-threatening schemes.

Although this sort of control (remanding a cause to an agency for further findings) may seem to the layman ineffectual, or only a stalling of the inevitable, the lawyer and the systems analyst know that these demands for further findings can make a difference. It may encourage the institution whose actions threaten the environment to really *think about* what it is doing, and that is neither an ineffectual nor a small feat. Indeed, I would extend the principle beyond federal agencies. Much of the environment is threatened not by them, but by private corporations. Surely the constitutional power would not be lacking to mandate that all private corporations whose actions may have significant adverse affect on

the environment make findings of the sort now mandated for federal agencies. Further, there should be requirements that these findings and reports be channeled to the board of directors; if the directors are not charged with the knowledge of what their corporation is doing to the environment, it will be all too easy for lower level management to prevent such reports from getting to a policymaking level. We might make it grounds for a guardian to enjoin a private corporation's actions if such procedures had not been carried out.

The rights of the environment could be enlarged by borrowing yet another page from the Environmental Policy Act and mandating comparable provisions for "private governments." The Act sets up within the executive office of the President a Council on Environmental Quality "to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs of the Nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment."[102] The Council is to become a focal point, within our biggest "corporation"—the State—to gather and evaluate environmental information which it is to pass on to our chief executive officer, the President. Rather than being ineffectual, this may be a highly sophisticated way to steer organizational behavior. Corporations—especially recidivist polluters and land despoilers—should have to establish comparable internal reorganization, e.g., to set up a vice president for ecological affairs. The author is not offering this suggestion as a cure-all, by any means. But I do not doubt that this sort of control over internal corporate organization would be an effective supplement to the traditional mechanisms of civil suits, licensing, administrative agencies, and fines.[103]

Similarly, courts, in making rulings that may affect the environment, should be compelled to make findings with respect to environmental harm—showing how they calculated it and how heavily it was weighed—even in matters outside the present Environmental Protection Act. This would have at least two important consequences. First, it would shift somewhat the focus of courtroom testimony and concern; second, the appellate courts, through their review and reversals for "insufficient findings," would give content to, and build up a body of, environmental rights, much as content and body has been given, over the years, to terms like "due process of law."

Beyond these procedural safeguards, would there be any rights of the environment that might be deemed "absolute," at least to the extent of, say, free speech? Here, the doctrine of irreparable injury comes to mind. There has long been equitable support for an attorney general's enjoining injury to communal property if he can prove it to be "irreparable." In other words, while repairable damage to the environment might be balanced and weighed, irreparable damage could be enjoined absolutely. There are several reasons why this doctrine has not been used effectively (witness Lake Erie).[104] Undoubtedly, political pressures (in the broadest sense) have had an influence. So, too, has the failure of all of us to understand just how delicate the environmental balance is; this failure has

made us unaware of how early "irreparable" injury might be occurring, and, if aware, unable to prove it in court. But most important, I think, is that the doctrine simply is not practical as a rule of universal application. For one thing, there are too many cases like the earlier sea urchin example, where the marginal costs of abating the damage seem too dearly to exceed the marginal benefits, even if the damage to the environment itself is liberally estimated. For another, there is a large problem in how one defines "irreparable." Certainly the great bulk of the environment in civilized parts of the world has been injured "irreparably" in the sense of "irreversible"; we are not likely to return it to its medieval quality. Despite the scientific right to the term, judgments concerning "irreparable injury" are going to have to subsume questions both of degree of damage and of value—of the damaged object. Thus, if we are going to revitalize the "irreparable damages" doctrine, and expect it to be taken seriously, we have to recognize that what will be said to constitute "irreparable damage" to the ionosphere, because of its importance to all life, or to the Grand Canyon, because of its uniqueness, is going to rest upon normative judgments that ought to be made explicit.

This suggests that some (relatively) absolute rights be defined for the environment by setting up a constitutional list of "preferred objects," just as some of our Justices feel there are "preferred rights" where humans are concerned.[105] Any threatened injury to these most jealously-to-be-protected objects should be reviewed with the highest level of scrutiny at all levels of government, including our "counter-majoritarian" branch, the court system. Their "constitutional rights" should be implemented, legislatively and administratively, by, e.g., the setting of environmental quality standards.

I do not doubt that other senses in which the environment might have rights will come to mind, and, as I explain more fully later, would be more apt to come to mind if only we should speak in terms of their having rights, albeit vaguely at first. "Rights" might well lie in unanticipated areas. It would seem, for example, that Chief Justice Earl Warren was only stating the obvious when he observed in *Reynolds v. Sims* that "Legislators represent people, not trees or acres." Yet, could not a case be made for a system of apportionment which *did* take into account the wildlife of an area?[106] It strikes me as a poor idea that Alaska should have no more congressmen than Rhode Island primarily *because there are in Alaska all those trees and acres, those waterfalls and forests.*[107] I am not saying anything as silly as that we ought to overrule *Baker v. Carr* and retreat from one man–one vote to a system of one man-or-tree–one vote. Nor am I even taking the position that we ought to count each acre, as we once counted each slave, as three-fifths of a man. But I am suggesting that there is nothing unthinkable about, and there might on balance even be a prevailing case to be made for, an electoral apportionment that made some systematic effort to allow for the representative "rights" of nonhuman life. And if a case can be made for that, which I offer here mainly for purpose of illustration, I suspect that a society that grew concerned enough about

the environment to make it a holder of rights would be able to find quite a number of "rights" to have waiting for it when it got to court.

(7) Do We Really Have to Put It That Way?

At this point, one might well ask whether much of what has been written could not have been expressed without introducing the notion of trees, rivers, and so forth "having rights." One could simply and straightforwardly say, for example, that (R1) the class of persons competent to challenge the pollution of rivers ought to be extended beyond that of persons who can show an immediate adverse economic impact on themselves, and that (R2), "judges, in weighing competing claims to a wilderness area, ought to think beyond the economic and even esthetic impact on man, and put into the balance a concern for the threatened environment as such." And it is true, indeed, that to say trees and rivers have "rights" is not in itself a stroke of any operational significance—no more that to say "people have rights." To solve any concrete case, one is always forced to more precise and particularized statements, in which the word "right" might just as well be dropped from the elocution.

But this is not the same as to suggest that introducing the notion of the "rights" of trees and rivers would accomplish nothing beyond the introduction of a set of particular rules like (R1) and (R2), earlier. I think it is quite misleading to say that "*A* has a right to . . ." can be fully explicated in terms of a certain set of specific legal rules, and the manner in which conclusions are drawn from them in a legal system. That is only part of the truth. Introducing the notion of something having a "right" (simply *speaking* that way), brings into the legal system a flexibility and open-endedness that no series of specifically stated legal rules like R*1*, R*2*, R*3* . . . R*n* can capture. Part of the reason is that "right" (and other so-called "legal terms" like "infant," "corporation," "reasonable time") have meaning—vague but forceful—in the ordinary language, and the force of these meanings, inevitably infused with our thought, becomes part of the context against which the "legal language" of our contemporary "legal rules" is interpreted.[108] Consider, for example, the "rules" that govern the question, on whom, and at what stages of litigation, is the burden of proof going to lie? Professor James E. Krier has demonstrated how terribly significant these decisions are in the trial of environmental cases, and yet, also, how much discretion judges have under them.[109] In the case of such vague rules, it is *context*—senses of direction, of value and purpose—that determines how the rules will be understood, every bit as much as their supposed "plain meaning." In a system which spoke of the environment "having legal rights," judges would, I suspect, be inclined to interpret rules such as those of burden of proof far more liberally from the point of the environment. There is, too, the fact that the vocabulary and expressions that are available to us influence and even steer our thought. Consider the effect that has had by introducing into the law terms like "motive," "intent," and "due process." These terms work a subtle shift into the rhetoric of explanation available

to judges; with them, new ways of thinking and new insights come to be explored and developed.[110] In such fashion, judges who could unabashedly refer to the "legal rights of the environment" would be encouraged to develop a viable body of law—in part simply through the availability and force of the expression. Besides, such a manner of speaking by courts would contribute to popular notions, and a society that spoke of the "legal rights of the environment" would be inclined to legislate more environment-protecting rules by formal enactment.

If my sense of these influences is correct, then a society in which it is stated, however vaguely, that "rivers have legal rights" would evolve a different legal system than one which did not employ that expression, even if the two of them had, at the start, the very same "legal rules" in other respects.

IV. THE PSYCHIC AND SOCIO-PSYCHIC ASPECTS

There are, as we have seen, a number of developments in the law that may reflect a shift from the view that nature exists *for humans*. These range from increasingly favorable procedural rulings for environmental action groups—as regards standing and burden of proof requirements, for example—to the enactment of comprehensive legislation such as the National Environmental Policy Act and the thoughtful Michigan Environmental Protection Act of 1970. Of such developments one may say, however, that it is not the environment per se that we are prepared to take into account, but that man's increased awareness of possible long-range effects on himself militate in the direction of stopping environmental harm in its incipiency. And this is part of the truth, of course. Even the far-reaching National Environmental Policy Act, in its preambulatory *Declaration of National Environmental Policy*, comes out both for "restoring and maintaining environmental quality *to the overall welfare and development of man*" as well as for creating and maintaining "conditions under which *man and nature can exist in productive harmony*."[111] Because the health and well-being of mankind depend upon the health of the environment, these goals will often be so mutually supportive that one can avoid deciding whether our rationale is to advance "us" or a new "us" that includes the environment. For example, consider the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) which insists that, e.g., pesticides, include a warning "adequate to prevent injury to living man and other vertebrate animals, vegetation, and useful invertebrate animals."[112] Such a provision undoubtedly reflects the sensible notion that the protection of humans is best accomplished by preventing dangerous accumulations in the food chain. Its enactment does not necessarily augur far-reaching changes in, nor even call into question, fundamental matters of consciousness.

But the time is already upon us when we may have to consider subordinating some human claims to those of the environment per se. Consider, for example,

the disputes over protecting wilderness areas from development that would make them accessible to greater numbers of people. I myself feel disingenuous rationalizing the environmental protectionist's position in terms of a utilitarian calculus, even one that takes future generations into account, and plays fast and loose with its definition of "good." Those who favor development have the stronger argument—they at least hold the protectionist to a standstill—from the point of advancing the greatest good of the greatest number of people. And the same is true regarding arguments to preserve useless species of animals, as in the sea urchin hypothetical. One *can* say that we never know what is going to prove useful at some future time. In order to protect ourselves, therefore, we ought to be conservative now in our treatment of nature. I agree. But when conservationists argue this way to the exclusion of other arguments, or find themselves speaking in terms of "recreational interests" so consistently as to play up to, and reinforce, homocentrist perspectives, there is something sad about the spectacle. One feels that the arguments lack even their proponents' convictions. I expect they want to say something less egotistic and more emphatic but the prevailing and sanctioned modes of explanation in our society are not quite ready for it. In this vein, there must have been abolitionists who put their case in terms of getting more work out of Blacks. W. Holdsworth says of the early English Jew that while he was "regarded as a species of res nullius . . . [H]e was valuable for his acquisitive capacity; and for that reason the crown took him under its protection."[113] (Even today, businessmen are put in the position of insisting that their decent but probably profitless acts will "help our company's reputation and be good for profits.")[114]

For my part, I would prefer a frank avowal that even making adjustments for esthetic improvements, what I am proposing is going to cost "us," i.e., reduce our standard of living as measured in terms of our present values.

Yet, this frankness breeds a frank response—one which I hear from my colleagues and which must occur to many a reader. Insofar as the proposal is not just an elaborate legal fiction, but really comes down in the last analysis to a compromise of *our* interests for *theirs*, why should we adopt it? "What is in it for 'us'?"

This is a question I am prepared to answer, but only after permitting myself some observations about how *odd* the question is. It asks for me to justify my position in the very anthropocentric hedonist terms that I am proposing we modify. One is inclined to respond by a counter: "couldn't you (as a White man) raise the same questions about compromising your preferred rights-status with African Americans?"; or "couldn't you (as a man) raise the same question about compromising your preferred rights-status with women?" Such counters, unfortunately, seem no more responsive than the question itself. (They have a nagging ring of "yours, too" about them.) What the exchange actually points up is a fundamental problem regarding the nature of philosophical argument. Recall that Socrates, whom we remember as an opponent of hedonistic thought,

confutes Thrasymachus by arguing that immorality makes one miserably unhappy! Immanuel Kant, whose moral philosophy was based upon the categorical imperative ("Woe to him who creeps through the serpent windings of Utilitarianism"[115]) finds himself justifying, e.g., promise keeping and truth telling, on the most prudential—one might almost say, commercial-grounds.[116] This "philosophic irony" (as Professor S.M. Engel calls it) may owe to there being something unique about ethical argument.[117] "Ethics cannot be put into words," L. Wittgenstein puts it; such matters "make themselves manifest."[118] On the other hand, perhaps the truth is that in any argument which aims at persuading a human being to action (on ethical or any other bases), "logic" is only an instrument for illuminating positions, at best, and in the last analysis it is psychological appeals to the listener's self-interest that hold sway, however "principled" the rhetoric may be.

With this reservation as to the peculiar task of the argument that follows, let me stress that the strongest case can be made from the perspective of human advantage for conferring rights on the environment. Scientists have been warning of the crises the earth and all humans on it face if we do not change our ways—radically—and these crises make the lost "recreational use" of rivers seem absolutely trivial. The earth's very atmosphere is threatened with frightening possibilities: absorption of sunlight, upon which the entire life cycle depends, may be diminished; the oceans may warm (increasing the "greenhouse effect" of the atmosphere), melting the polar ice caps, and destroying our great coastal cities; the portion of the atmosphere that shields us from dangerous radiation may be destroyed. Testifying before Congress, sea explorer Jacques Cousteau predicted that the oceans (to which we dreamily look to feed our booming populations) are headed toward their own death: "The cycle of life is intricately tied up with the cycle of water . . . the water system has to remain alive if we are to remain alive on earth."[119] We are depleting our energy and our food sources at a rate that takes little account of the needs even of humans now living.

These problems will not be solved easily: they very likely can be solved, if at all, only through a willingness to suspend the rate of increase in the standard of living (by present values) of the earth's "advanced" nations, and by stabilizing the total human population. For some of us this will involve forfeiting material comforts; for others it will involve abandoning the hope someday to obtain comforts long envied. For all of us it will involve giving up the right to have as many offspring as we might wish. Such a program is not impossible of realization, however. Many of our so-called "material comforts" are not only in excess of, but are probably in opposition to, basic biological needs. Further, the "costs" to the advanced nations is not as large as would appear from gross national product (GNP) figures. GNP reflects social gain (of a sort) without discounting for the social *cost* of that gain, e.g., the losses through depletion of resources, pollution, and so forth. As has well been shown, as societies become more and more "advanced," their real marginal gains become less and less for each additional

dollar of GNP.[120] Thus, to give up "human progress" would not be as costly as might appear on first blush.

Nonetheless, such far-reaching social changes are going to involve us in a serious reconsideration of our consciousness toward the environment. I say this knowing full well that there is something more than a trifle obscure in the claim: is popular consciousness a meaningful notion, to begin with? If so, what is our present consciousness regarding the environment? Has it been causally responsible for our material state of affairs? Ought we to shift our consciousness (and if so, to what exactly, and on what grounds)? How, if at all, would a shift in consciousness be translated into tangible institutional reform? Not one of these questions can be answered to everyone's satisfaction, certainly not to the author's.

It is commonly being said today, for example, that our present state of affairs—at least in the West—can be traced to the view that Nature is the dominion of Man, and that this attitude, in turn, derives from our religious traditions.

> Whatever the origins, the text is quite clear in Judaism, was absorbed all but unchanged into Christianity, and was inflated in Humanism to become the implicit attitude of Western man to Nature and the environment. Man is exclusively divine, all other creatures and things occupy lower and generally inconsequential stature; man is given dominion over all creatures and things; he is enjoined to subdue the earth . . . This environment was created by the man who believes that the cosmos is a pyramid erected to support man on its pinnacle, that reality exists only because man can perceive it, that God is made in the image of man, and that the world consists solely of a dialogue between men. Surely this is an infantilism which is unendurable. It is a residue from a past of inconsequence when a few puny men cried of their supremacy to an unhearing and uncaring world. One longs for a psychiatrist who can assure man that his deep seated cultural inferiority is no longer necessary or appropriate . . . It is not really necessary to destroy nature in order to gain God's favor or even his undivided attention.[121]

Surely this is forcibly put, but it is not entirely convincing as an explanation for how we got to where we are. For one thing, so far as intellectual influences are to be held responsible for our present state of affairs, one might as fairly turn on Darwin as the Bible. It was, after all, Darwin's views—in part through the prism of Herbert Spencer—that gave moral approbation to struggle, conquest, and domination; indeed, by emphasizing man's development as a product of chance happenings, Darwin also had the effect—intended or not—of reducing our awareness of the mutual interdependency of everything in Nature. And besides, as Professor Murphy points out, the spiritual beliefs of the Chinese and Native Americans "in the unity between man and nature had no greater effect than the contrary beliefs in Europe in producing a balance between man and his environment"; he claims that in China, *tao* notwithstanding, "ruthless

deforestation has been continuous."[122] I am under the impression, too, that notwithstanding the vaunted "harmony" between the American Plains Indians and Nature, once they had equipped themselves with rifles, their pursuit of the buffalo expanded to fill the technological potential.[123] The fact is that "consciousness" explanations pass too quickly over the less negative but simpler view of the situation: there are an increasing number of humans, with increasing wants, and there has been an increasing technology to satisfy them at "cost" to the rest of nature. Thus, we ought not to place too much hope that a changed environmental consciousness will in and of itself reverse present trends. Furthermore, societies have long since passed the point where a change in human consciousness on any matter will rescue us from our problems. More then ever before we are in the hands of institutions. These institutions are not "mere legal fictions" moreover: they have wills, minds, purposes, and inertias that are in very important ways their own, i.e., that can transcend and survive changes in the consciousness of the individual humans who supposedly comprise them, and whom they supposedly serve. (It is more and more the individual human being, with his consciousness, that is the legal fiction.)[124]

For these reasons, it is far too pat to suppose that a Western "environmental consciousness" is solely or even primarily responsible for our environmental crisis. On the other hand, it is not so extravagant to claim that it has dulled our resentment and our determination to respond. For this reason, whether we will be able to bring about the requisite institutional and population growth changes depends in part upon effecting a radical shift in our feelings about "our" place in the rest of Nature.

A radical new conception of man's relationship to the rest of nature would not only be a step toward solving the material planetary problems: there are strong reasons for such a changed consciousness from the point of making us far better humans. If we only stop for a moment and look at the underlying human qualities that our present attitudes toward property and nature draw upon and reinforce, we have to be struck by how stultifying of our own personal growth and satisfaction they can become when they take rein of us. G. Hegel, in "justifying" private property, unwittingly reflects the tone and quality of some of the needs that are played upon:

> A person has as his substantive end the right of putting his will into any and everything and thereby making it his, because it has no such end in itself and derives its destiny and soul from his will. This is the absolute right of appropriation which man has over all "things."[125]

What is it within us that gives us this need not just to satisfy basic biological wants, but to extend our wills over things, to objectify them, to make them ours, to manipulate them, to keep them at a psychic distance? Can it all be explained on "rational" bases? Should we not be suspect of such needs within us, cautious as to why we wish to gratify them? When I first read that passage of Hegel,

I immediately thought not only of the emotional contrast with Spinoza, but of the passage in Carson McCullers' *A Tree, A Rock, A Cloud*, in which an old derelict has collared a twelve-year-old boy in a streetcar cafe. The old man asks whether the boy knows "how love should be begun?"

> The old man leaned closer and whispered: "A tree. A rock. A cloud."
>
> . . . "The weather was like this in Portland," he said. "At the time my science was begun. I meditated and I started very cautious. I would pick up something from the street and take it home with me. I bought a goldfish and I concentrated on the goldfish and loved it. I graduated from one thing to another. Day by day I was getting this technique . . .
>
> "For six years now I have gone around by myself and built up my science. And now I am a master, Son. I can love anything. No longer do I have to think about it even. I see a street full of people and a beautiful light comes in me. I watch a bird in the sky. Or I meet a traveler on the road. Everything, Son. And anybody. All stranger and all loved! Do you realize what a science like mine can mean?"[126]

To be able to get away from the view that Nature is a collection of useful senseless objects is, as McCullers' "madman" suggests, deeply involved in the development of our abilities to love—or, if that is putting it too strongly, to be able to reach a heightened awareness of our own, and others', capacities in their mutual interplay. To do so, we have to give up some psychic investment in our sense of separateness and specialness in the universe. And this, in turn, is hard giving indeed, because it involves us in a flight backwards, into earlier stages of civilization and childhood in which we had to trust (and perhaps fear) our environment, for we had not then the power to master it. Yet, in doing so, we, as persons, gradually free ourselves of needs for supportive illusions. Is not this one of the triumphs for "us" of our giving legal rights to (or acknowledging the legal rights of) the Blacks and women?[127]

Changes in this sort of consciousness are already developing, for the betterment of the planet and us. There is now federal legislation which "establishes by law":[128]

> the humane ethic that animals should be accorded the basic creature comforts of adequate housing, ample food and water, reasonable handling, decent sanitation, sufficient ventilation, shelter from extremes of weather and temperature, and adequate veterinary care including the appropriate use of pain-killing drugs . . . [129]

The Vietnam War has contributed to this movement, as it has to others. A Los Angeles mother turned out a poster which read "War is not healthy for children and other living things."[130] It caught on tremendously—at first, I suspect, because it sounded like another clever protest against the war, i.e., another angle. But as

people say such things, and think about them, the possibilities of what they have stumbled upon become manifest. In its suit against the Secretary of Agriculture to cancel the registration of DDT, the Environmental Defense Fund alleged "biological injury to man and other living things."[131] Not long ago, the pollution of streams was thought of only as a problem of smelly, unsightly, unpotable water, i.e., to us. Now we are beginning to discover that pollution is a process that destroys wondrously subtle balances of life within the water, and also between the water and its banks. This heightened awareness enlarges our sense of the dangers to us. But it also enlarges our empathy. We are not only developing the scientific capacity, but we are cultivating the personal capacities *within us* to recognize more and more the ways in which nature—like the woman, the Black man, the Indian, and the alien—is like us (and we will also become more able realistically to define, confront, live with, and admire the ways in which we are all different).[132]

The time may be on hand when these sentiments, and the early stirrings of the law, can be coalesced into a radical new theory or myth—felt as well as intellectualized—of man's relationships to the rest of nature. I do not mean "myth" in a demeaning sense of the term, but in the sense in which, at different times in history, our social "facts" and relationships have been comprehended and integrated by reference to the "myths" that we are cosigners of a social contract, that the pope is God's agent, and that all men are created equal. Pantheism, Shintoism, and Taoism all have myths to offer. But they are all, each in its own fashion, quaint, primitive, and archaic. What is needed is a myth that can fit our growing body of knowledge of geophysics, biology and the cosmos. In this vein, I do not think it too remote that we may come to regard the earth, as some have suggested, as one organism, of which mankind is a functional part—the mind, perhaps: different from the rest of nature, but different as a man's brain is from his lungs.

> Ever since the first Geophysical Year, international scientific studies have shown irrefutably that the Earth as a whole is an organized system of most closely interrelated and indeed interdependent activities. It is, in the broadest sense of the term, an "organism." The so-called life-kingdoms and the many vegetable and animal species are dependent upon each other for survival in a balanced condition of planet-wide existence; and they depend on the environment, conditioned by oceanic and atmospheric currents, and even more by the protective action of the ionosphere and many other factors which have definite rhythms of operation. Mankind is part of this organic planetary whole; and there can be no truly new global society, and perhaps in the present state of affairs no society at all, as long as man will not recognize, accept and enjoy the fact that mankind has a definite function to perform within this planetary organism of which it is an active part.
>
> In order to give a constructive meaning to the activities of human societies all over the globe, these activities—physical and mental—should be understood

and given basic value with reference to the wholesome functioning of the entire Earth, and we may add of the entire solar system. This cannot be done (1) if man insists on considering himself an alien Soul compelled to incarnate on this sorrowful planet, and (2) if we can see in the planet, Earth, nothing but a mass of material substances moved by mechanical laws, and in "life" nothing but a chance combination of molecular aggregations.

. . . As I see it, the Earth is only one organized "field" of activities—and so is the *human person*—but these activities take place at various levels, in different "spheres" of being and realms of consciousness. The lithosphere is not the biosphere, and the latter not the . . . ionosphere. The Earth is not *only* a material mass. Consciousness is not only "human"; it exists at animal and vegetable levels, and most likely must lie latent, or operating in some form, in the molecule and the atom; and all these diverse and in a sense hierarchical modes of activity and consciousness should be seen integrated in and perhaps transcended by an all-encompassing and "cosmic" planetary Consciousness.

. . .

Mankind's function within the Earth-organism is to extract from the activities of all other operative systems within this organism the type of consciousness which we call "reflective" or "self"-consciousness—or, we may also say to *mentalize* and give meaning, value, and "name" to all that takes place anywhere within the Earth-field. . . .

This "mentalization" process operates through what we call culture. To each region of, and living condition in the total field of the Earth-organism a definite type of culture inherently corresponds. Each region is the "womb" out of which a specific type of human mentality and culture can and sooner or later will emerge. All these cultures—past, present and future—and their complex interrelationships and interactions are the collective builders of the Mind of humanity; and this means of the *conscious Mind of the Earth.*[133]

As radical as such a consciousness may sound today, all the dominant changes we see about us point in its direction. Consider just the impact of space travel, of worldwide mass media, of increasing scientific discoveries about the interrelatedness of all life processes. Is it any wonder that the term "spaceship earth" has so captured the popular imagination? The problems we have to confront are increasingly the worldwide crises of a global organism: not pollution of a stream, but pollution of the atmosphere and of the ocean. Increasingly, the death that occupies each human's imagination is not his own, but that of the entire life cycle of the planet earth, to which each of us is as but a cell to a body.

To shift from such a lofty fancy as the planetarization of consciousness to the operation of our municipal legal system is to come down to earth hard. Before the forces that are at work, our highest court is but a frail and feeble—a distinctly

human—institution. Yet, the Court may be at its best not in its work of handing down decrees, but at the very task that is called for: of summoning up from the human spirit the kindest and most generous and worthy ideas that abound there, giving them shape and reality and legitimacy.[134] Witness the school desegregation cases which, more importantly than to integrate the schools (assuming they did), awakened us to moral imperatives which, when made visible, could not be denied. And so here, too, in the case of the environment, the Supreme Court may find itself in a position to award "rights" in a way that will contribute to a change in popular consciousness. It would be a modest move, to be sure, but one in furtherance of a large goal: the future of the planet as we know it.

How far we are from such a state of affairs, where the law treats "environmental objects" as holders of legal rights, I cannot say. But there is certainly intriguing language in one of Justice Hugo Black's last dissents, regarding the Texas Department of Transportation's plan to run a six-lane expressway through a San Antonio park.[135] Complaining of the Court's refusal to stay the plan, Black observed that "after today's decision, the people of San Antonio and the birds and animals that make their home in the park will share their quiet retreat with an ugly, smelly stream of traffic . . . Trees, shrubs and flowers will be mown down."[136] Elsewhere he speaks of the "burial of public parks," of segments of a highway which "devour parkland," and of the park's heartland.[137] Was he, at the end of his great career, on the verge of saying—just saying—that "nature has 'rights' on its own account"? Would it be so hard to do?

NOTES

INTRODUCTION: *TREES* AT THIRTY-FIVE

1. Rod Macdonald, then Dean of Magill Law School, wrote to tell me I had missed *Mullick v. Mullick*, L.R. 52 Ind. App. 245 (Privy Council 1925) (family dispute in India regarding custody of an idol reversed with orders that, on retrial, counsel be appointed for the idol).

2. It turns out that the idea of a dog having "rights" had made an early appearance in two California cases, although neither case put the dog's standing in issue, and in both the court took the suggestion as an invitation to humor. One judge noted: "It may be that 'every dog has his day'; but if so, it is only a 'dog-day' and does not entitle him to claim the rights of persons." *People v. Fimbres*, 228 P. 19, 20 (1930). The other said of the claim: "though rather *dog*-matically asserted, we think no one of ordinary experience in the common, all-around affairs of this mundane sphere will hesitate to con-*cur*." *Ex parte Ackerman*, 6 Cal. App. 5, 13; 91 P. 429, 433 (1907) (emphasis by court).

3. Even in these observations I was quickly to learn that I was a late second. A law student at Chicago introduced me to Aldo Leopold's wonderful text, A SAND COUNTY ALMANAC, which traces out a comparable extension of ethics, beginning with "god-like Odysseus returning from the wars in Troy," to hang "all on one rope a dozen slave-girls of his household whom he suspected of misbehavior during his absence. This hanging involved no question of propriety. The girls were property. The disposal of property was then, as now, a matter of expediency, not of right and wrong." ALDO LEOPOLD, CHARLES W. SCHWARTZ, & ROBERT FINCH, A SAND COUNTY ALMANAC 201 (1989).

4. *Sierra Club v. Hickel*, 433 F.2d 24 (9th Cir. 1970), *aff'd sub nom. Sierra Club v. Morton*, 405 U.S. 727 (1972).

5. *Id.* at 32.

6. *Sierra Club v. Morton*, *id.* at 734–35.

7. *Id.* at 741–42 (Douglas, J., dissenting).

8. *Id.* at 757 (Blackmun, J., dissenting).

9. John M. Naff, Jr., *Reflections on the Dissent of Douglas, J., in* Sierra Club v. Morton, 58 A.B.A. J. 820 (1972).

10. *Fisher v. Lowe*, 333 N.W. 2d 67, 67 (Mich. Ct. App. 1983).

11. William Kaufmann, the first publisher of *Trees* (1st ed. 1974), arranged for a gracious foreword by the biologist Garret Hardin.

12. *LawScope Briefs: No Worse for the Verse*, 69 A.B.A.J. 436 (1983).

13. CHRISTOPHER D. STONE, SHOULD TREES HAVE STANDING? TOWARDS LEGAL RIGHTS FOR NATURAL OBJECTS (Avon Books 1975).

14. *Byram River v. Village of Port Chester*, 394 F. Supp. 618 (S.D.N.Y. 1975). This suit was brought in name of a river and other plaintiffs to enjoin pollution by a municipal sewage treatment plant, which was originally filed in the District of Connecticut but dismissed for lack of in personam jurisdiction. The suit was then transferred to S.D.N.Y., with no reservations expressed, however, regarding the river's designation as party plaintiff. Ultimately, a stipulation of settlement was approved, 6 E.L.R. 20467 (S.D.N.Y. Jan. 8, 1976) (defendant undertaking to conduct and monitor the project in environmentally protective manner).

15. *Sun Enterprises v. Train*, 394 F. Supp. 211 (S.D.N.Y. 1975), *aff'd*, 532 F.2d 280 (2d. Cir. 1976) (suit in the name of Brown Brook and No Bottom Marsh, among others, unsuccessfully challenging Environmental Protection Agency's issuance of sewage disposal permits).

16. *Ibid.*

17. Complaint, *Life of the Land, Inc. v. Bd. of Water Supply* (2d Cir. Hawaii) (filed Nov. 24, 1975) (complaint listing Makena Beach as one of several plaintiffs in action against Water Supply Board for failure to assess the environmental impact of the construction of water storage and transmission facilities and violation of state environmental policy).

18. Complaint, *Death Valley Nat'l Monument v. Dept. of the Interior* (N.D. Cal.) (filed Feb. 26, 1976) (complaint filed by environmental groups in name of national monument, and other plaintiffs, alleging failure to fulfill a trust obligation to protect the monument by permitting strip mining operations by private concerns within the Death Valley Monument in violation of the Wilderness Act of 1964 and the National Environmental Policy Act of 1969).

19. *Hookway, Whelan et al. v. United States Department of Transportation (D.C. Mass.)* (complaint to enjoin road realignment that would affect town common in violation of NEPA the action was not filed after press conference and threat of suit persuaded department to modify its plans).

20. *Ezer v. Fuchsloch*, 160 Cal. Rptr. 486 (Ct. App. 1979). Strictly speaking, the tree was not here a party plaintiff. The action was by landowners for injunctive relief against a neighbor based on a restriction recorded by their predecessors in interest providing that no shrub, tree, or other landscaping would obstruct any lot's view. The trial court granted a mandatory injunction requiring both defendants to trim their pine trees to afford their neighbors a view of the ocean. On appeal, the defendants argued that the trial court failed to consider the rights of the pine trees to exist untrimmed independent of the inter-human rights created by the restrictive covenant. Judge Jefferson ultimately rejected the argument, invoking a passage from *Trees* at 457–58 as consistent with the court's action: "to say that the environment should have rights is not to say that it should have every right we can imagine, or even the same body of rights that human beings have. Nor is it to say that everything in the environment should have the same rights as every other thing in the environment." *Id.* at 483.

21. *Palila v. Hawaii Dept. of Land & Natural Res.*, 471 F. Supp. 985 (D. Haw. 1979) (suit in name of endangered bird species and others, against state resources agency for allowing feral sheep and goats to endanger birds' critical habitat in which declaratory and injunctive relief was granted).

CHAPTER 1. SHOULD TREES HAVE STANDING?: TOWARD LEGAL RIGHTS FOR NATURAL OBJECTS

1. CHARLES DARWIN, THE DESCENT OF MAN 119, 120–21 (2d ed., 1874). *See also* R. WAELDER, PROGRESS AND REVOLUTION 39 *et seq.* (1967).

2. In THE DESCENT OF MAN Darwin expands, at 113–14:

> ". . . No tribe could hold together if murder, robbery, treachery, etc., were common; consequently such crimes within the limits of the tame tribe 'are branded with everlasting infamy'; but excite no such sentiment beyond these limits. . . . In a rude state of civilization the robbery of strangers is, indeed, generally considered as honorable."

See also Elman R. Service, *Forms of Kinship, in* MAN IN ADAPTATION 112 (Y. Cohen ed., 1968).

3. *See* DARWIN, *supra* at 113. *See also* E. WESTERMARCK, 1 THE ORIGIN AND DEVELOPMENT OF THE MORAL IDEAS 406–12 (1912). The practice of allowing sickly children to die has not been entirely abandoned, apparently, even at our most distinguished hospitals. *See Hospital Let Retarded Baby Die, Film Shows*, LOS ANGELES TIMES, Oct. 17, 1971, sec. A, at 9, col. 1.

4. There does not appear to be a word "gericide" or "geronticide" to designate the killing of the aged. "Senicide" is as close as the Oxford English Dictionary comes, although, as it indicates, the word is rare. 9 OXFORD ENGLISH DICTIONARY 454 (1933).

5. *See* DARWIN, *supra* note 1, at 386–93. WESTERMARCK, *supra* note 3, at 387–89, observes that where the killing of the aged and infirm is practiced, it is often supported by humanitarian justification; this, however, is a far cry from saying that the killing is requested by the victim as his right.

6. H. MAINE, ANCIENT LAW 153 (Pollock ed., 1930). Maine claimed that these powers of the father extended to all regions of private law, although not to the *jus publicum*, under which a son, notwithstanding his subjection in private life, might vote alongside his father. *Id.* at 152 WESTERMARCK, *supra* note 3, at 393–94, was skeptical that the arbitrary power of the father over the children extended as late as into early Roman law.

7. 387 U.S. 1 (1967).

8. *See Landman v. Royster*, 40 U.S.L.W. 2256 (E.D. Va., Oct. 30, 1971) (Eighth Amendment and Due Process clause of the Fourteenth Amendment require federal injunctive relief, including compelling the drafting of new prison rules, for Virginia prisoners against prison conduct prohibited by vague rules or no rules, without disciplinary proceedings embodying rudiments of procedural due process, and by various penalties that constitute cruel and unusual punishment). *See* note, *Courts, Corrections, and the Eighth Amendment: Encouraging Prison Reform by Releasing Inmates*, 44 S. CAL. L. REV. 1060 (1971).

9. *But see* THOMAS SZASZ, LAW, LIBERTY, AND PSYCHIATRY (1963).

10. The trend toward liberalized abortion can be seen either as a legislative tendency back in the direction of rightlessness for the fetus—or toward increasing rights of women. This tension is not unique in the law of course; it is simply support for W. Hohfeld's scheme that the "jural opposite" of someone's right is someone else's "no-right." W. HOHFELD, FUNDAMENTAL LEGAL CONCEPTIONS (1923).

Consider in this regard a New York case in which a settlor, S, established a trust on behalf of a number of named beneficiaries and "lives in being." Desiring to amend the deed of trust, the grantor took steps pursuant to statute to obtain "the written consent of all persons beneficially interested in [the] trust." At the time the grantor was pregnant and the trustee Chase Bank advised it would not recognize the proposed amendment because the child *en ventre sa mere* might be deemed a person beneficially interested in the trust. The court allowed the amendment to stand, holding that birth rather than conception is the controlling factor in ascertaining whether a person is beneficially interested in the trust which the grantor seeks to amend. *In re Peabody*, 5 N.Y.2d 541, 158 N.E.2d 841 (1959).

In 1970, the California Supreme Court refused to allow the deliberate killing of a fetus (in a nonabortion situation) to support a murder prosecution. The court ruled fetuses not to be denoted by the words "human being" within the statute defining murder. *Keeler v. Superior Court*, 2 Cal. 3d 619, 87 Cal. Rptr. 481, 470 P.2d 617 (1970).

Some jurisdictions have statutes defining a crime of "feticide"—deliberately causing the death of an unborn child. The absence of such a specific feticide provision in the California case was one basis for the ruling in *Keeler*. *See* 2 Cal. 3d at 613 n.16, 87 Cal. Rptr. at 489 n.16, 470 P.2. at 625 n.16.

11. INT. REV. CODE of 1954, § 1361 (repealed by Pub. L. No. 89-389, effective Jan 1, 1969).

12. *For example, see United States v. Cargo of the Brig Malek Adhel*, 43 U.S. (2 How.) 210 (1844). There, a ship had been seized and used by pirates. All this was done without the knowledge or consent of the owners of the ship. After the ship had been captured, the United States condemned and sold the "offending vessel." The owners objected. In denying release to the owners, Justice Joseph Story cited Chief Justice John Marshall from an earlier case: "This is not a proceeding against the owner; it is a proceeding against the vessel for an offense committed by the vessel, which is not the less an offense . . . because it was committed without the authority and against the will of the owner." 43 U.S. at 234, quoting from *United States v. Schooner Little Charles*, 26 F. Cas. 979 (No. 15,612) (C.C.D. Va. 1818).

13. 9 U.S. (5 Cranch) 61, 86 (1809).

14. *Trustees of Dartmouth College v. Woodward*, 17 U.S. (4 Wheat) 518 (1819).

15. *Id.* at 636.

16. Consider, for example, that the claim of the United States to the naval station at Guantanamo Bay, at $2000-a-year rental, is based upon a treaty signed in 1903 by Jose Montes, for the president of Cuba and a minister representing Theodore Roosevelt; it was subsequently ratified by two-thirds of a Senate no member of which is living today. *Lease [from Cuba] of Certain Areas for Naval or Coaling Stations*, July 2, 1903, T.S. No. 426; C. BEVANS, 6 TREATIES AND OTHER INTERNATIONAL AGREEMENTS OF THE UNITED STATES 1776–1949, at 1120 (U.S. Dep't of State Pub. 8549, 1971).

17. O. GIERKE, POLITICAL THEORIES OF THE MIDDLE AGE (Maitland transl., 1927), especially at 22–30. The reader may be tempted to suggest that the "corporate" examples in the text are distinguishable from environmental objects in that the former are comprised by and serve humans. On the contrary, I think that the more to learn about the sociology of the firm—and the realpoıitik of our society—the more we discover the ultimate reality of these institutions, and the increasingly legal fictiveness of the individual human being.

18. *Dred Scott v. Sanford*, 60 U.S. (19 How.) 396, 404–05 (1856). In *Bailey v. Poindexter's Ex'r*, 56 Va. (14 Gratt.) 132, 142–43 (1848) a provision in a will that testator's slaves could choose between emancipation and public sale was held void on the ground that slaves have no legal capacity to choose.

> "These decisions are legal conclusions flowing naturally and necessarily from the one clear, simple, fundamental idea of chattel slavery. That fundamental idea is, that, in the eye of the law, so far certainly as civil rights and relations are concerned, the slave is not a person, but a thing. The investiture of a chattel with civil rights or legal capacity is indeed a legal solecism and absurdity. The attribution of legal personality to a chattel slave—legal conscience, legal intellect, legal freedom, or liberty and power of free choice and action, and corresponding legal obligations growing out of such qualities, faculties and action—implies a palpable contradiction in terms."

19. *People v. Hall*, 4 Cal. 399, 405 (1854). The statute there under interpretation provided that "no Black or Mulatto person, or Indian shall be allowed to give evidence in favor of, or against a white man," but was silent as to Chinese. The "policy" analysis by which the court brings Chinese under "Black . . . or Indian" is a fascinating illustration of the relationship between a "policy" decision and a "just" decision, especially in light of the exchange between H. L. A. Hart, *Positivism and the Separation of Law and Morals*, 71 HARV. L. REV. 593 (1958) and Lon Fuller, *Positivism, and Fidelity to Law—A Reply to Professor Hart*, *id.* at 630.

20. Frank I. Schechter, *The Rightlessness of Medieval English Jewry*, 4 JEWISH Q. REV. 121, 135 (1914) quoting from M. BATESON, MEDIEVAL ENGLAND 139 (1904). Schechter also quotes Henry de Bracton to the effect that "a Jew cannot have anything of his own, because whatever he acquires he acquires not for himself but for the king . . ." *Id.* at 128.

21. *Dietrich v. Inhabitants of Northampton*, 138 Mass. 14, 16 (1884).

22. *In re Goddell*, 39 Wisc. 232, 245 (1875). The court continued with the following "clincher":

> "And when counsel was arguing for this lady that the word, person, in sec. 32. ch. 119 [respecting those qualified to practice law], necessarily includes females, her presence made it impossible to suggest to him as *reductio ad absurdum* of his position, that the same construction of the same word . . . would subject woman to prosecution for the paternity of a bastard, and . . . prosecution for rape."

Id. at 246.

The relationship between our attitudes toward woman, on the one hand, and, on the other, the more central concern of this article—land—is captured in an unguarded aside of our colleague, Curt Berger: ". . . after all, land, like woman, was meant to be possessed. . . ." LAND OWNERSHIP AND USE 139 (1968).

23. In one case, a group of prison inmates in Suffolk County tamed a mouse that they discovered, giving him the name Morris. Discovering Morris, a jailer flushed him down the toilet. The prisoners brought a proceeding against the warden, complaining, *inter alia*, that Morris was subjected to a discriminatory discharge and was otherwise unequally treated. The action was unsuccessful, on grounds that the inmates themselves were "guilty of imprisoning Morris without a charge, without a trial, and without bail," and that other mice at the prison were not treated more favorably. "As to the true victim the Court can only offer again the sympathy first proffered to his ancestors by Robert Burns . . ." The judge proceeded to quote from Burns' "To a Mouse." *Morabito v. Cyta*, 9 CRIM. L. REP. 2472 (N.Y. Sup. Ct. Suffolk Co. Aug. 26, 1971).

The whole matter seems humorous, of course. But what we need to know more of is the function of humor in the unfolding of a culture, and the ways in which it is involved with the social growing pains to which it is testimony. Why did people make jokes about the women's liberation movement? Is it not on account of—rather than in spite of—the underlying validity of the protests, and the uneasy awareness that recognition of them is inevitable? Arthur Koestler rightly begins his study of the human mind, ACT OF CREATION (1964), with an analysis of humor, entitled *The Logic of Laughter*. And cf. Sigmund Freud, *Jokes and the Unconscious*, 8 STANDARD EDITION OF THE COMPLETE PSYCHOLOGICAL WORKS OF SIGMUND FREUD (J. Strachey transl., 1905). (Query too: what is the relationship between the conferring of proper names, e.g., Morris, and the conferring of social and legal rights?)

24. Thus it was that the Founding Fathers could speak of the inalienable rights of all men, and yet maintain a society that was, by modern standards, without the most basic rights for African Americans, Native Americans, children, and women. There was no hypocrisy; emotionally, no one felt that these others were fully *people*.

25. "The second thought streaming from . . . the older South [is] the sincere and passionate belief that somewhere between men and cattle, God created a *tertium quid*, and called it a Negro—a clownish, simple creature, at times even lovable within its limitations, but straitly foreordained to walk within the Veil." W.E.B. DUBOIS, THE SOULS OF BLACK FOLK 89 (1924).

26. In this article I essentially limit myself to a discussion of nonanimal but natural objects. I trust that the reader will be able to discern where the analysis is appropriate to advancing our understanding of what would be involved in giving "rights" to other objects not presently endowed with rights—for example, not only animals (some of which already have rights in some senses) but also humanoids, computers, and so forth. Cf. The National Register for Historic Places, 16 U S.C. § 470 (1970), discussed in *Ely v. Velde*, 321 F. Supp. 1088 (E.D. Va. 1971).

As the reader will discover, there are large problems involved in defining the boundaries of the "natural object." For example, from time to time one will wish to speak of that portion of a river that runs through a recognized jurisdiction; at other times, one may be concerned with the entire river, or the hydrologic cycle—or the whole of nature. One's ontological choices will have a strong influence on the shape of the legal system, and the choices involved are not easy.

On the other hand, the problems of selecting an appropriate ontology are problems of all language—not merely of the language of legal concepts, but of ordinary language as well. Consider, for example, the concept of a "person" in legal or in everyday speech. Is each person a fixed bundle of relationships, persisting unaltered through time? Do our molecules and cells not change at every moment? Our hypostatizations always have a pragmatic quality to them. *See* D. HUME, *Of Personal Identity*, *in* TREATISE OF HUMAN NATURE bk. I, pt. IV, sec. VI, *in* THE PHILOSOPHICAL WORKS OF DAVID HUME 310–18, 324 (1854); T. MURTI, THE CENTRAL PHILOSOPHY OF BUDDHISM 70–73 (1955). In LOVES BODY 146–47 (1966) Norman O. Brown observes:

> "The existence of the 'let's pretend' boundary does not prevent the continuance of the real traffic across it. Projection and introjection, the process whereby the self as distinct from the other is constituted, is not past history, an event in childhood, but a present process of continuous creation. The dualism of self and external world is built up by a constant process of reciprocal exchange between the two. The self as a stable substance enduring through time, an identity, is maintained by constantly absorbing good parts (or people) from the outside world and expelling bad parts from the inner world. 'There is a continual "unconscious" wandering of other personalities into ourselves.'
>
> "Every person, then, is many persons; a multitude made into one person; a corporate body; incorporated, corporation. A 'corporation sole;' every man a parson-person. The unity of the person is as real, or unreal, as the unity of the corporation."

See generally, W. BISHIN & C. STONE, LAW, LANGUAGE, AND ETHICS Ch. 5 (1972).

In different legal systems at different times, there have been many shifts in the entity deemed "responsible" for harmful acts: an entire clan was held responsible for a crime before the notion of individual responsibility emerged; in some societies the offending hand, rather than an entire body, may be "responsible." Even today, we treat father and son as separate jural entities for some purposes, but as a single jural entity for others. I do not see why, in principle, the task of working out a legal ontology of natural objects (and "qualities," e.g., climatic warmth) should be any more unmanageable. Perhaps someday all mankind shall be, for some purposes, one jurally recognized "natural object."

27. The statement in text is not quite true, cf. Earl Finbar Murphy, *Has Nature Any Right to Life?* 22 HAST. L. J. 467 (1971). An Irish court, passing upon the validity of a testamentary trust to the benefits of someone's dogs observed in dictum that "'lives' means lives of human beings, not of animals or trees in California." *Kelly v. Dillon*, 1932 Ir. R. 255, 261. (The intended gift over on the death of the last surviving dog was held void for remoteness, the court refusing to "enter into the question of a dog's expectation of life," although prepared to observe that "in point of fact neighbor's [sic] dogs and cats are unpleasantly long-lived . . ." *Id.* at 260–61).

28. Four cases dealing with the constitutionality of the death penalty under the Eighth and Fourteenth Amendments are pending before the U.S. Supreme Court. *Branch v. Texas*, 447 S.W.2d 932 (Tex. 1969), *cert. granted*, 91 S. Ct. 2287 (1970), *Aikens v. California*, 70 Cal. 2d 369, 74 Cal. Rptr. 882, 450 P2d 238 (1969), *cert. granted*. 91 S. Ct. 2280 (1970); *Furman v. Georgia*, 225 Ga. 253, 167 S.E.2d 628 (1969), *cert. granted*. 91 S. Ct. 2282 (1970); *Jackson v. Georgia*, 225 Ga. 790, 171 S.E.2d 501 (1969), *cert. granted*, 91 S. Ct. 2287 (1970).

29. *See George Campbell Painting Corp. v. Reid*, 392 U.S. 286 (1968); *Oklahoma Press Pub. Co. v. Walling*, 327 U.S. 186 (1946); *Baltimore & O.R.R. v. ICC*, 221 U.S. 612 (1911); *Wilson v. United States*, 221 U.S. 361 (1911); *Hale v. Henkel*, 201 U.S. 43 (1906).

30. *See Dixon v. Alabama State Bd. of Educ.*, 294 F.2d 150 (5th Cir.), *cert. denied*, 368 U.S. 930 (1961).

31. *For example, see People ex rel. Ricks Water Co. v. Elk River Mill & Lumber Co.*, 107 Cal. 221, 40 Pac. 531 (1895) (refusing to enjoin pollution by an upper riparian at the instance of the attorney general on the grounds that the lower riparian owners, most of whom were dependent on the lumbering business of the polluting mill, did not complain).

32. The law in a suit for injunctive relief is commonly easier on the plaintiff than in a suit for damages. *See* J. GOULD, THE LAW OF WATERS § 206 (1883).

33. However, in 1970 California amended its Water Quality Act to make it easier for the attorney general to obtain relief, e.g., one must no longer allege irreparable injury in a suit for an injunction. CAL. WATER CODE § 13350(b) (West 1971).

34. To whomsoever the soil belongs, he owns also to the sky and to the depths. *See* W. BLACKSTONE, 2 COMMENTARIES 18.

At early common law, the owner of land could use all that was found under his land "at his free will and pleasure" without regard to any "inconvenience to his neighbour." *Acton v. Blundell*, 12 Meeson & Welsburg 324, 354, 152 Eng. Rep. 1223, 1235 (1843). "He [the landowner] may waste or despoil the land as he pleases . . ." R. MEGARRY & H. WADE, THE LAW OF REAL PROPERTY 725 (1971).

35. *See* note, *Statutory Treatment Industrial Stream Pollution*, 24 GEO. WASH. L. REV. 302, 306 (1955); H. FARNHAM, 2 LAW OF WATERS AND WATER RIGHTS § 461 (1904); GOULD, *supra* note 32, at § 204.

36. For example, courts have upheld a right to pollute by prescription, *Mississippi Mills Co. v. Smith*, 69 Miss. 299, 11 So. 26 (1882), and by easement, *Luama v. Bunker Hill & Sullivan Mining & Concentrating Co.*, 41 F.2d 358 (9th Cir. 1930).

37. *See Red River Roller Mills v. Wright*, 30 Minn. 249, 15 N.W. 167 (1883) (enjoyment of stream by riparian may be modified or abrogated by reasonable use of stream by others); *Townsend v. Bell*, 167 N.Y. 462, 60 N E. 757 (1901) (riparian owner not entitled to maintain action for pollution of stream by factory where he could not show use of water was unreasonable); *Smith v. Staso Milling Co.*, 18 F.2d 736 (2d Cir. 1927) (in suit for injunction, right on which injured lower riparian stands is a quantitative compromise between two conflicting interests); *Clifton Iron Co. v. Dye*, 87 Ala. 468, 6 So. 192 (1889) (in determining whether to grant injunction to lower riparian, court most weigh interest of public as against injury to one or the other party). *See also Montgomery Limestone Co. v. Bearder*, 256 Ala. 269, 54 So. 2d 571 (1951).

38. *Pennsylvania Coal Co. v. Sanderson*, 113 Pa. 126, 149, 6 A. 453, 459 (1886).

39. Hand, J. in *Smith v. Staso Milling Co.* 18 F.2d 736, 738 (2d Cir. 1927) (emphasis added). *See also Harrisonville v. Dickey Clay Co.*, 289 U.S. 33.1 (1933) (Brandeis, J.).

40. Measuring plaintiff's damages by "making him whole" has several limitations. These and the matter of measuring damages in this area generally are discussed more fully on 16–17 and *infra*.

41. Here, again, an analogy to corporation law might be profitable. Suppose that in the instance of negligent corporate management by the director, there was no institution of the stockholder derivative suit to force the directors to make *the corporation* whole; and the only actions provided for were direct actions by stockholders to collect for damages *to themselves qua* stockholders. Theoretically and practically, the damages might come out

differently in the two cases, and not merely because the creditor's losses are not aggregated in the stockholders' direct actions.

42. And even far less than the damages to all human economic interests derivatively through the stream; *see* 21–22 *infra*.

43. *Smith v. Staso*, 18 F.2d 736, 738 (2d Cir. 1927).

44. Some of these public properties are subject to the "public trust doctrine," which, while ill defined, might be developed in such fashion as to achieve fairly broad-ranging environmental protection. *See Gould v. Greylock Reservation Comm'n*, 350 Mass. 410, 215 N.E.2d 114 (1966), discussed in Joseph Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 69 MICH. L. REV. 471, 492–509 (1970).

45. By contrast, for example, with humane societies.

46. *See, e.g.*, CAL. PROB. CODE §§ 146–62 (West Supp. 1971).

47. CAL. PROB. CODE § 1751 (West Supp. 1971) provides for the appointment of a "conservator."

48. In New York State the Supreme Court and county courts outside New York City have jurisdiction to appoint a committee of the person and/or a committee of the property for a person "incompetent to manage himself or his affairs." N.Y. MENTAL HYGIENE LAW § 100 (McKinney 1971).

49. This is a situation at which the ontological problems discussed in the text become acute. One can conceive a situation in which a guardian would be appointed by a county court with respect to a stream, bring a suit against alleged polluters, and lose. Suppose now that a federal court were to appoint a guardian with respect to the large river system of which the stream were a part, and that the federally appointed guardian subsequently were to bring suit against the same defendants in state court, now on behalf of the river, rather than the stream. (Is it possible to bring a still subsequent suit, if the one above fails, on behalf of the entire hydrologic cycle, by a guardian appointed by an international court?)

While such problems are difficult, they are not impossible to solve. For one thing, pretrial hearings and rights of intervention can go far toward their amelioration. Further, courts have been dealing with the matter of potentially inconsistent judgments for years, as when one state appears on the verge of handing down a divorce decree inconsistent with the judgment of another state's courts. *Kempson v. Kempson*, 58 N.J. Eg. 94, 43 A. 97 (Ch. Ct 1899). Courts could, and of course would, retain such natural objects in the res nullius classification to help stave off the problem. Then, too, where several "objects" are interrelated (as is always the case), several guardians could all be involved, with procedures for removal to the appropriate court—probably that of the guardian of the most encompassing "ward" to be acutely threatened. And in some cases subsequent suit by the guardian of the more encompassing ward, not guilty of laches, might be appropriate. The problems are at least no more complex than the corresponding problems that the law has dealt with for years in the class action area.

50. CAL. PROB. CODE § 1460 (West Supp. 1971). THE N.Y. MENTAL HYGIENE LAW (McKinney 1971) provides for jurisdiction "over the custody of a person and his property if he is incompetent to manage himself or his affairs by reason of age, drunkenness, mental illness or other cause . . ."

51. *Santa Clara County v. Southern Pac. R.R.*, 118 U.S. 394 (1886). Justice Black would have denied corporations the rights of "persons" under the fourteenth amendment. *See Connecticut Gen. Life Ins. Co. v. Johnson*, 303 U.S. 77, 87 (1938) (Black, Dissenting): "Corporations have neither race nor color."

52. *In re Byrn*, LOS ANGELES TIMES, Dec. 5, 1971, sec. 1, at 16, col. 1. A preliminary injunction was subsequently granted, and defendant's cross-motion to vacate the guardianship was denied. Civ. 13113/71 (Sup. Ct. Queens Co., Jan. 4, 1972) (Smith, J.). Granting

a guardianship in these circumstances would seem to be a more radical advance in the law than granting a guardianship over communal natural objects like lakes. In the former case there is a traditionally recognized guardian for the object—the mother—and her decision has been in favor of aborting the fetus.

53. The laws regarding the various communal resources had to develop along their own lines, not only because so many different persons' "rights" to consumption and usage were continually and contemporaneously involved, but also because no one had to bear the costs of his consumption of public resources in the way in which the owner of resources on private land has to bear the costs of what he does. For example, if the landowner strips his land of trees, and puts nothing in their stead, he confronts the costs of what he has done in the form of reduced value of his land; but the river polluter's actions are costless, so far as he is concerned—except insofar as the legal system can somehow force him to internalize them. The result has been that the private landowner's power over natural objects on his land is far less restrained by law (as opposed to economics) than his power over the public resources that he can get his hands on. If this state of affairs is to be changed, the standard for interceding in the interests of natural objects on traditionally recognized "private" land might well parallel the rules that guide courts in the matter of people's children whose upbringing (or lack thereof) poses social threat. The courts can, for example, make a child "a dependent of the court" where the child's "home is an unfit place for him by reason of neglect, cruelty, or depravity of either of his parents . . ." CAL. WELF. & INST. CODE § 600(b) (West 1966). *See also id.* at § 601: any child "who from any cause is in danger of leading an idle, dissolute, lewd, or immoral life [may be adjudged] a ward of the court."

54. The present way of handling such problems on "private" property is to try to enact legislation of general application under the police power, *see Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393 (1922), rather than to institute civil litigation which, though a piecemeal process, can be tailored to individual situations.

55. CAL. PROB. CODE § 1580 (West Supp. 1971) lists specific causes for which a guardian may, after notice and a hearing, be removed.

Despite these protections, the problem of overseeing the guardian is particularly acute where, as here, there are no immediately identifiable human beneficiaries whose self-interests will encourage them to keep a close watch on the guardian. To ameliorate this problem, a page might well be borrowed from the law of ordinary charitable trusts, which are commonly placed under the supervision of the attorney general. *See* CAL. CORP. CODE §§ 9505, 10207 (West 1955).

56. *See* CAL. PROB. CODE §§ 1472,1590 (West 1956 and Supp. 1971).

57. 354 F.2d 608 (2d Cir. 1965), *cert. denied, Consolidated Edison Co. v. Scenic Hudson Preservation Conf.*, 384 U.S. 941 (1966).

58. 354 F.2d 608, 615 (2d Cir. 1965).

59. Act of Aug. 26, 1935, ch. 687, Title II, § 213, 49 Stat. 860 (codified in 16 U.S.C. § 8251(b) (1970).

60. 354 F.2d 608, 616 (2d Cir. 1165). The court might have felt that because the New York–Jersey Trail Conference, one of the two conservation groups that organized Scenic Hudson, had some 17 miles of trailways in the area of Storm King Mountain, it therefore had sufficient economic interest to establish standing: Judge Hays' opinion does not seem to so rely, however.

61. *Road Review League v. Boyd*, 270 F. Supp. 650 (S.D.N.Y. 1967). Plaintiffs who included the Town of Bedford and the Road Review League, a nonprofit association concerned with community problems, brought an action to review and set aside a determination of the Federal Highway Administrator concerning the alignment of an interstate highway. Plaintiffs claimed that the proposed road would have an adverse effect upon

local wildlife sanctuaries, pollute a local lake, and be inconsistent with local needs and planning. Plaintiffs relied upon the section of the Administrative Procedure Act, 5 U.S.C. § 702 (1970), which entitles persons "aggrieved by agency action within the meaning of a relevant statute" to obtain judicial review. The court held that plaintiffs had standing to obtain judicial review of proposed alignment of the road:

> I see no reason why the word "aggrieved" should have different meaning in the Administrative Procedure Act from the meaning given it under the Federal Power Act . . . The "relevant statute," *i.e.*, the Federal Highways Act, contains language which seems even stronger than that of the Federal Power Act, as far as local and conservation interests are concerned.

Id. at 661.

In *Citizens Comm. for the Hudson Valley v. Volpe*, 425 F.2d 97 (2d Cir. 1970), plaintiffs were held to have standing to challenge the construction of a dike and causeway adjacent to the Hudson Valley. The Sierra Club and the Village of Tarrytown based their challenge upon the provisions of the Rivers and Harbors Act of 1899. While the Rivers and Harbors Act does not provide for judicial review as does the Federal Power Act, the court stated that the plaintiffs were "aggrieved" under the Department of Transportation Act, the Hudson River Basin Compact Act, and a regulation under which the Corps of Engineers issued a permit, all of which contain broad provisions mentioning recreational and environmental resources and the need to preserve the same. Citing the *Road Review League* decision, the court held that as "aggrieved" parties under the Administrative Procedure Act, plaintiffs similarly had standing. Other decisions in which the court's grant of standing was based upon the Administrative Procedure Act include: *West Virginia Highlands Conservancy v. Island Creek Coal Co.*, 441 F.2d. 231 (4th Cir. 1971); *Environmental Defense Fund, Inc. v. Hardin*, 428 F.2d 1093 (D.C. Cir. 1970); *Allen v. Hickel*, 424 F.2d 944 (D.C. Cir. 1970); *Brooks v. Volpe*, 329 F. Supp. 118 (W.D. Wash. 1971); *Delaware v. Pennsylvania N.Y. Cent. Transp. Co.*, 323 F. Supp. 487 (D. Del. 1971); *Izaak Walton League of America v. St. Clair*, 313 F. Supp. 1312 (D. Minn. 1970); *Pennsylvania Environmental Council, Inc. v. Bartlett*, 115 F. Supp. 238 (M.D. Pa. 1970).

62. *Sierra Club v. Hickel*, 433 F.2d 24 (9th Cir. 1970), *cert. granted sub nom. Sierra Club v. Morton*, 401 U.S. 907 (1971). The Sierra Club, a nonprofit California corporation concerned with environmental protection, claimed that its interest in the conservation and sound management of natural parks would be adversely affected by an Interior permit allowing Walt Disney to construct the Mineral King Resort in Sequoia National Forest. The court held that because of the Sierra Club's failure to assert a direct legal interest, that organization lacked standing to sue. The court stated that the Sierra Club had claimed an interest only in the sense that the proposed course of action was displeasing to its members. The court purported to distinguish *Scenic Hudson* on the grounds that the plaintiff's claim of standing there was supported by the "aggrieved party" language of the Federal Power Act. (The outcome of the appeal to the U.S. Supreme Court is addressed in the introduction to this volume.)

63. 16 U.S.C. §§ 791 (a) *et seq.* (1970).

64. 5 U.S.C. §§ 551 *et seq.* (1970).

65. 7 U.S.C. § 135 *et seq.* (1970). Section 1351(d) affords a right of judicial review to anyone "adversely affected" by an order under the Act. *See Environmental Defense Fund, Inc. v. Hardin*, 428 F.2d 1093, 1096 (D.C. Cir. 1970).

66. 324 F. Supp. 412 (N.D., M.D. & S.D. Ala. 1970), *aff'd mem., sub nom. Bass Anglers Sportsman Soc'y of America, Inc. v. Koppers Co.*, 447 F.2d 1304 (5th Cir. 1971).

67. Section 13 of Rivers and Harbors Appropriation Act of 1899.

68. 33 U.S.C. § 411 (1970), reads:

> "Every person and every corporation that shall violate, or that shall knowingly aid, abet, authorize, or instigate a violation of the provisions of sections 407, 408, and 409 of the title shall . . . be punished by a fine . . . or by imprisonment . . . in the discretion of the court, one-half of said fine to be paid to the person or persons giving information which shall lead to conviction."

69. This is from the Latin, "who brings the action as well for the King as for himself," referring to an action brought by a citizen for the state as well as for himself.

70. "These sections create a criminal liability. No civil action lies to enforce it: criminal statutes can only be enforced by the government. A qui tam action lies only when expressly or implicitly authorized by statute, to enforce a penalty by civil action, not a criminal fine." 324 F. Supp. 412, 415–16 (N.D., M.D. & SD. Ala. 1970). Other *qui tam* actions brought by the Bass Angler Sportsman Society have been similarly unsuccessful. *See Bass Anglers Sportsman Society of America v. Scholze Tannery*, 329 F. Supp. 339 (E.D. Tenn. 1971); *Bass Anglers Sportsman's Society of America v. United States Plywood Champion Papers, Inc.*, 324 F. Supp. 302 (S.D. Tex. 1971).

71. Concern over an anticipated flood of litigation initiated by environmental organizations is evident in Judge Trask's opinion in *Alameda Conservation Ass'n v. California*, 437 F.2d 1087 (9th Cir.), *cert. denied, Leslie Salt Co v. Alameda Conservation Ass'n*, 402 U.S. 908 (1971), where a nonprofit corporation having as a primary purpose protection of the public's interest in San Francisco Bay was denied standing to seek an injunction prohibiting a land exchange that would allegedly destroy wildlife, fisheries, and the Bay's unique flushing characteristics:

> "Standing is not established by suit initiated by this association simply because it has as one of its purposes the protection of the 'public interest' in the waters of the San Francisco Bay. However well intentioned members may be, they may not by uniting create for themselves a super-administrative agency or a parens patriae official status with the capability of over-seeing and of challenging the action of the appointed and elected officials of the state government. Although recent decisions have considerably broadened the concept of standing, we do not find that they go this far.
>
> "Were it otherwise the various clubs, political, economic and social now or yet to be organized could wreak havoc with the administration of government, both federal and state. There are other forums where their voices and their views may be effectively presented, but to have standing to submit a 'case of controversy' to a federal court, something more must be shown."

417 F.2d at 1090.

72. Here, too, we are dogged by the ontological problem. It is easier to say that the smog-endangered stand of pines "wants" the smog stopped (assuming that to be a jurally significant entity) than it is to venture that the mountain, or the planet Earth, or the cosmos, is concerned about whether the pines stand or fall. The more encompassing the entity of concern, the less certain we can be in venturing judgments as to the "wants" of any particular substance, quality, or species within the universe. Does the cosmos care if we humans persist or not? "Heaven and earth . . . regard all things as insignificant, as though they were playthings made of straw." LAO-TZU, TAO THE KING 13 (D. Goddard transl., 1919).

73. *See Knight v. United States Land Ass'n*, 142 U.S. 161, 181 (1891).

74. Clause 2 gives Congress the power "to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States."

75. *See Flemming v. Nestor*, 363 U.S. 603 (1960).

76. *See* the Los Angeles Times editorial *Water: Public vs. Polluters* criticizing:

> ". . . the ridiculous built-in conflict of interests on Regional Water Quality Control Board. By law, five of the seven seats are given to spokesmen for industrial, governmental, agricultural or utility users. Only one representative of the public at large is authorized, along with a delegate from fish and game interests."

Feb. 12, 1969, Part II, at 8, cols. 1–2.

77. The Federal Refuse Act is over 70 years old. Refuse Act of 1899, 33 U.S.C. § 407 (1970).

78. *See* Hall, *Refuse Act of 1899 and the Permit Program*, 1 Nat'l Res. Defense Council Newsletter 1 (1971).

79. To be effective as a deterrent, the sanction ought to be high enough to bring about an internal reorganization of the corporate structure which minimizes the chances of future violations. Because the corporation is not necessarily a profit-maximizing "rationally economic man," there is no reason to believe that setting the fine as high as—but not higher than—anticipated profits from the violation of the law, will bring the illegal behavior to an end.

80. *Udall v. FPC*, 387 U.S. 424, 437 n.6 (1967). *See also* Holmes, J. in *New Jersey v. New York*, 283 U.S. 336, 342 (1931): "A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it."

81. To simplify the description, I am using here an ordinary language sense of causality, *i.e.* assuming that the pollution causes harm to the river. As Professor Ronald Coase has pointed out in *The Problem of Social Cost*, 3 J. Law & Econ. 1 (1960), a harm-causing can be viewed as a reciprocal problem, i.e., in the terms of the text, the mill wants to harm the river, and the river—if we assume it "wants" to maintain its present environment quality—"wants" to harm the mill. Coase rightly points out that at least in theory (if we had the data) we ought to be comparing the alternative social product of different social arrangements, and not simply imposing full costs on the party who would popularly be identified as the harm-causer.

82. I am assuming that one of the considerations that goes into a judgment of "remoteness" is a desire to discourage burdensome amounts of petty litigation. This is one of the reasons why a court would be inclined to say—to use the example in the text—that the man who sells fishing tackle and bait has not been "proximately" injured by the polluter. Using proximate cause in this manner, the courts can protect themselves from a flood of litigation. But once the guardian were in court anyway, this consideration would not obtain as strongly, and courts might be more inclined to allow proof on the damages to remotely injured humans (although the proof itself is an added burden of sorts).

83. *Cf.* Martin P. Golding, *Ethical Issues in Biological Engineering*, 15 U.C.L.A. L. Rev. 443, 451–63 (1968).

84. Of course, in the instance of copyright and patent protection, the creation of the "property right" can be more directly justified on homocentric grounds.

85. *See* Peter Schrag, *Life on a Dying Lake, in* The Politics of Neglect 167, at 173 (R. Meek & J. Straayer eds., 1971).

86. One ought to observe, too, that in terms of real effect on marginal welfare, the poor quite possibly will bear the brunt of the compromises. They may lack the wherewithal to get out to the countryside—and probably want an increase in material goods more acutely than those who now have riches.

87. On November 2, 1971, the Senate, by a vote of 86–0, passed and sent to the House the proposed Federal Water Pollution Control Act Amendments of 1971, 117 Cong. Rec. S17464 (daily ed., Nov. 2, 1971). Sections 101(a) and (a)(1) of the bill declare it to be "national policy that, consistent with the provisions of this Act (1) the discharge of pollutants into the navigable waters be eliminated by 1985." S2770, 92d Cong., 1st Sess., 117 Cong. Rec. S17464 (daily ed., Nov. 2, 1971).

88. 354 F.2d 608, 624 (2d Cir. 1965).

89. Again, there is a problem involving what we conceive to be the injured entity.

90. N.Y. Times, Jan. 14, 1971. § 1, col. 2, and at 74, col. 7.

91. Courts have not been reluctant to award damages for the destruction of heirlooms, literary manuscripts or other property having ascertainable market value. In *Willard v. Valley Gas Fuel Co.*, 171 Cal. 9 151 Pac. 286 (1915), it was held that the measure of damages for the negligent destruction of a rare old book written by one of plaintiff's ancestors was the amount which would compensate the owner for all detriment including sentimental loss proximately caused by such destruction. The court, at 171 Cal.15,151 Pac. 289, quoted approvingly from *Southern Express Co. v. Owens*, 146 Ala. 412, 426, 41 S. 752, 755 (1906):

> "Ordinarily, where property has a market value that can be shown, such value is the criterion by which actual damages for its destruction or loss may be fixed. But it may be that property destroyed or lost has no market value. In such state of the case, while it may be that no rule which will be absolutely certain to do justice between the parties can be laid down, it does not follow from this, nor is it the law, that the plaintiff must be turned out of court with normal damages merely. Where the article or thing is so unusual in its character that market value cannot be predicated of it, its value, or plaintiff's damages, must be ascertained in some other rational way and from such elements as are attainable."

Similarly, courts award damages in wrongful death actions despite the impossibility of precisely appraising the damages in such cases. In affirming a judgment in favor of the administrator of the estate of a child killed by defendant's automobile, the Oregon Supreme Court, in *Lane v. Hatfield*, 173 Or. 79, 88–89, 143 P.2d 230, 234 (1943), acknowledged the speculative nature of the measure of damages:

> "No one knows or can know when, if at all, a seven year old girl will attain her majority, for her marriage may take place before she has become twenty-one years of age . . . Moreover, there is much uncertainty with respect to the length of time anyone may live. A similar uncertainty veils the future of a minor's earning capacity or habit of saving. Illness or a non-fatal accident may reduce an otherwise valuable and lucrative life to a burden and liability.
>
> "The rule, that the measure of recovery by a personal representative for the wrongful death of his decedent is the value of the life of such decedent, if he had not come to such an untimely end, has been termed vague, uncertain and speculative if not, conjectural. It is, however, the best that judicial wisdom has been able to formulate."

92. It is not easy to dismiss the idea of "lower" life having consciousness and feeling pain, especially since it is so difficult to know what these terms mean even as applied to humans. *See* J. L. Austin, *Other Minds, in Logic and Language* 342 (S. Flew ed., 1965); Arthur Schopenhauer, *On the Will in Nature, in* Two Essays by Arthur Schopenhauer 193, 281–304 (1889). Some experiments on plant sensitivity—of varying degrees of extravagance in their claims—include George L. Lawrence, *Plants Have Feelings, Too . . .*, Organic Gardening & Farming 64 (April 1971 C. B. Woodlief, L. H. Royster, & B. K. Huang, *Effect of Random Noise on Plant Growth* 46 J. Acoustical Soc. Am. 481 (1969); Cleve Backster, *Evidence of a Primary Perception in Plant Life*, 10 Int'l J. Parapsychology 25 (1968).

93. *See* note 16 *supra* and note 21 *supra*.

94. *See* FED. R. CIV. P. 23 and note 13 *supra*.

95. This is an ideal, of course—like the ideal that no human being ought to interfere with any other human being. *See* Charles Dyke, *Freedom, Consent, and the Costs of Interaction*, and Christopher D. Stone, *Comment*, in IS LAW DEAD? 134–67 (E. Rostow ed., 1971). Some damages would inevitably be *damnum absque injuria*. *See* note 93 *supra*.

96. The inevitability of some form of evolution is not inconsistent with the establishment of a legal system that attempts to interfere with or ameliorate the process: is the same not true of the human law we now have against murder?

97. Oliver Wendell Holmes, *Early Forms of Liability*, *in* THE COMMON LAW (1881), discussed the liability of animals and inanimate objects in early Greek, early Roman, and some later law. Alfred's Laws (AD 871–901) provided, for example, that a tree by which a man was killed should "be given to the kindred, and let them have it off the land within 30 nights." *Id.* at 19. In Edward I's time, if a man fell from a tree the tree was deodand. *Id.* at 24. Perhaps the liability of nonhuman matter is, in the history of things, part of a paranoid, defensive phase in man's development; as humans become more abundant, both from the point of material wealth and internally, they may be willing to allow an advance to the stage where nonhuman matter has rights.

98. *See* note 6 *supra*. In the event that a person built his house near the edge of a river that flooded, would "assumption of the risk" be available on the river's behalf?

99. *See Dixon v. Alabama State Bd. of Educ.*, 294 F.2d 150 (5th Cir.), *cert. denied*, 368 U.S. 930 (1961); Comment, *Private Government on the Campus—Judicial Review of University* Expulsions, 72 YALE L. J. 1362 (1963).

100. National Environmental Policy Act, 92 U.S.C. § 4332 (1970).

101. *See Committee for Nuclear Responsibility Inc. v. Schlesinger*, 40 U.S.L.W. 3214 (Nov. 5, 1971) (Douglas, J. Dissent to denial of application for injunction in aid of jurisdiction).

102. 42 U.S.C. § 4342 (1970).

103. As an indication of what lower-level management is apt to do, *see* Barbara Ehrenreich & John Ehrenreich, *Conscience of a Steel Worker*, 213 THE NATION 268 (1971). One steel company's "major concession [toward obedience to the 1899 Refuse Act], was to order the workers to confine oil dumping to the night shift. 'During the day the Coast Guard patrols. But at night, the water's black, the oil's black; no one can tell.'" An effective corporation law would ensure that the internal information channels within a corporation were capable of forcing such matters to the attention of high-level officials. Even then, there is no guarantee that the law will be obeyed—but we may have improved the odds.

104. In the case of Lake Erie, in addition to the considerations that follow in the text, there were possibly additional factors such as that no one polluter's acts could be characterized as inflicting irreparable injury.

105. *See for example* Justice Stanley Reed's opinion for the Court in *Kovac v. Cooper*, 336 U.S. 77 (1949) (*but see* Mr. Justice Frankfurter's concurring opinion, 336 U.S. at 89–96), and *United States v. Carolene Products*, 304 U.S. 14.1, 152 n.4 (1938).

106. Note that in the discussion that follows I am referring to legislative apportionment, not voting proper.

107. In point of fact, there is no reason to suppose that an increase of congressmen from Alaska would be a benefit to the environment. The reality of the political situation might just as likely result in the election of additional congressmen with closer ties to oil companies and other developers.

108. *See* A. W. B. Simpson, *The Analysis of Legal Concepts*, 80 LAW Q. REV. 535 (1964).

109. James E. Krier, *Environmental Litigation and the Burden of Proof*, *in* LAW AND THE ENVIRONMENT 105 (M. Baldwin & J. Page eds., 1970). *See Texas East Trans. Corp. v. Wildlife Preserves*, 48 N.J. 261, 225 A.2d 130 (1966). There, where a corporation set up to maintain a wildlife preserve resisted condemnation for the construction of plaintiff's pipe line, the court ruled that ". . . the *quantum* of proof required of this defendant to show arbitrariness against it would not be as substantial as that to be assumed by the ordinary property owner, who devotes his land to conventional uses." 225 A.2d at 137.

110. *See* Stone, *Existential Humanism and the Law*, *in* EXISTENTIAL HUMANISTIC PSYCHOLOGY 151 (T. Greening ed., 1971).

111. National Environmental Policy Act, 42 U.S.C. § 5 4321–47 (1970).

112. U.S.C. §§ 135 et seq. (1970).

113. W. HOLDSWORTH, HISTORY OF ENGLISH LAW 45 (5th ed., 1931).

114. Note that it is in no small way the law that imposes this manner of speech on businessmen. *See Dodge v. Ford Motor Co.*, 204 Mich. 459, 499–505, 170 N.W. 668, 68283 (1919) (holding that Henry Ford, as dominant stockholder in Ford Motor Co., could not withhold dividends in the interests of operating the company "as a semi-eleemosynary institution and not as a business institution").

115. I. KANT, PHILOSOPHY OF LAW 195 (Hastie transl., 1887).

116. I. KANT, *The Metaphysics of* Morality, *in* THE PHILOSOPHY OF KANT § 1 at 230–31 (J. Watson transl., 1908).

117. S.M. Engel, *Reasons, Morals, and Philosophical Irony*, *in* LANGUAGE AND ILLUMINATION 60 (1996).

118. L. WITTGENSTEIN, TRACTATUS LOGICO-PHILOSOPHICUS §§ 6.421, 6.522 (D. Pears & B. McGuinness transl., 1961).

119. Jacques Cousteau, *The Oceans: No Time to Lose*, LOS A. TIMES, Oct. 24, 1971, § (opinion), at 1, col. 4.

120. *See* J. HARTE & R. SOCOLOW, PATIENT EARTH (1971).

121. Ian McHarg, *Values, Process, and Form*, *in* THE FITNESS OF MAN'S ENVIRONMENT 213–14 (1968).

122. Murphy, *supra* note 27, at 477.

123. On the other hand, the statement in text, and the previous one of Professor Murphy, may be a bit severe. One could as easily claim that Christianity has had no influence on overt human behavior in light of the killings that have been carried out by professed Christians, often in its name. Feng shui has, on all accounts I am familiar with, influenced the development of land in China. *See* Freedman, Geomancy, 1968 PROCEEDINGS OF THE ROYAL ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND 5; March, *An Appreciation of Chinese Geomancy*, 27 J. ASIAN STUDIES 253 (1968).

124. The legal system does the best it can to maintain the illusion of the reality of the individual human being. Consider, for example, how many constitutional cases, brought in the name of some handy individual, represent a power struggle between institutions—the NAACP and a school board, the Catholic Church and a school board, the ACLU and the Army, and so forth. Are the individual human plaintiffs the real moving causes of these cases—or an afterthought?

When we recognize that our problems are increasingly institutional, we would see that the solution, if there is one, must involve coming to grips with how the "corporate" (in the broadest sense) entity is directed, and we must alter our views of "property" in the fashion that is needed to regulate organizations successfully. For example, instead of ineffectual, after-the-fact criminal fines we should have more preventative in-plant inspections, notwithstanding the protests of "invasion of [corporate] privacy."

In-plant inspection of production facilities and records is presently allowed only in a narrow range of areas, e.g., in federal law, under the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 374 *et seq.* (1970), and provisions for meat inspection, 21 U.S.C. § 608 (1970). Similarly, under local building codes we do not wait for a building to collapse

before authoritative sources inquire into the materials and procedures that are being used in the construction; inspectors typically come on site to check the progress at every critical stage. A sensible preventive legal system calls for extending the ambit of industries covered by comparable "privacy invading" systems of inspection.

125. G. HEGEL, HEGEL'S PHILOSOPHY OF RIGHT 41 (T. Knox transl., 1945).

126. C. MCCULLERS, THE BALLAD OF THE SAD CAFÉ AND OTHER STORIES 150–51 (1958).

127. Consider what Schopenhauer was writing about women, about the time the Wisconsin Supreme Court was explaining why women were unfit to practice law, 4–5 *supra*:

> "You need only look at the way in which she as formed, to see that woman is not meant to undergo great labour, whether of the mind or of the body. She pays the debt of life not by what she does, but by what she suffers; by the pains of childbearing and care for the child, and by submission to her husband, to whom she should be a patient and cheering companion. The keenest sorrows and joys are not for her, nor is she called upon to display a great deal of strength. The current of her life should be more gentle, peaceful and trivial than man's without being essentially happier or unhappier.
>
> "Women are directly fitted for acting as the nurses and teachers of our early childhood by the fact that they are themselves childish, frivolous and short-sighted; in a word, they are big children all their life long—a kind of intermediate stage between the child and the full-grown man, which is man in the strict sense of the word . . .
>
> "However many disadvantages all this may involve, there is at least this to be said in its favor: that the woman lives more in the present than the man, and that, if the present is at all tolerable, she enjoys it more eagerly. This is the source of that cheerfulness which is peculiar to women, fitting her to amuse man in his hours of recreation, and, in case of need, to console him when he is borne down by the weight of his cares.
>
> ". . . [I]t will be found that the fundamental fault of the female character is that it has *no sense of justice*. This is mainly due to the fact already mentioned, that woman are defective in the powers of reasoning and deliberation; but it is also traceable to the position which Nature has assigned to them as the weaker sex. They are dependent, not upon strength, but upon craft; and hence their instinctive capacity for cunning, and their ineradicable tendency to say what is not true. . . . For as lions are provided with claws and teeth and elephants and boars with tusks, bulls with horns, and the cuttle fish with its cloud of inky fluid, so Nature has equipped woman, for her defense and protection, with the arts of dissimulation; and all the power which Nature has conferred upon man in the shape of physical strength and reason, has been bestowed upon women in this form. Hence, dissimulation is innate in woman, and almost as much a quality of the stupid as of the clever."

A. SCHOPENHAUER, *On Women*, in STUDIES IN PESSIMISM 105–10 (T.B. Saunders transl., 1893).

If a man should write such insensitive drivel today, we would suspect him of being morally and emotionally blind. Will the future judge us otherwise, for venting rather that examining the needs that impel us to treat the environment as a senseless object—to blast to pieces some small atoll to find out whether an atomic weapon works?

128. Of course, the phase one looks toward is a time in which such sentiments need not be prescribed by *law*.

129. The "Purpose of the Legislation" in H.R. Rep. No. 91-1651. 91st Cong., 2d Sess., to the "[Animal] Welfare Act of 1970," 3 U.S. CODE CONG. & ADMIN. NEWS 5103, 5104 (1970).

Some of the West Publishing Co. typesetters may not be quite ready for this yet; they printed out the title as "Annual Welfare Act of 1970."

130. *See* MCCALL'S, May 1971, at 44.

131. *Environmental Defense Fund, Inc. v. Hardin*, 428 F.2d 1093, 1096 (D.C. Cir. 1970). Plaintiffs would thus seem to have urged a broader than literal reading of the statute, 7 U.S.C. § 133(z) (2) (d) (1970), which refers to ". . . living man and other vertebrate animals, vegetation, and useful invertebrate animals." E.D.F. was joined as petitioners by the National Audubon Society, the Sierra Club, and the West Michigan Environmental Action Council, 428 F.2d at 1094–95 n.5.

132. In the case of the bestowal of rights on other humans, the action also helps the recipient to discover new personal depths and possibilities—new dignity—within him or her self. I do not want to make much of the possibility that this effect would be relevant in the case of bestowing rights on the environment. But I would not dismiss it out of hand, either. How, after all, do we judge that a person is, say, "flourishing with a new sense of pride and dignity?" What we mean by such statements, and the nature of the evidence upon which we rely in support of them, is quite complex. A tree treated in a "rightful" manner would respond in a manner that, when described, would sound much like the response of a person accorded "new dignity."

133. F.D. RUDHYAR, DIRECTIVES FOR NEW LIFE 21–23 (1971).

134. *See* Stone, note 111 *supra*.

135. *San Antonio Conservation Soc'y v. Texas Highway Dep't, cert. denied*, 400 U.S. 968 (1970) (Black, J. dissenting to denial of certiorari).

136. *Id.* at 969.

137. *Id.* at 971.

CHAPTER 2. DOES THE CLIMATE HAVE STANDING?

1. The author would like to thank his many colleagues for their comments, especially David Cruz and Dan Klerman, and, for research and editing assistance, Brian Rothschild and Grace Tse.

2. There are also complex and controversial provisions whereby each nation's "net" output of GHGs can be calculated by accounting for its "removal" of CO_2 from the atmosphere via its croplands and forests.

3. In *Palila v. Hawaii Dept. of Land & Natural Resources*, a suit was brought in the name of the Palila, an endangered bird species, and others, against the state resources agency for allowing feral sheep and goats to endanger the birds' critical habitat. 471 F. Supp. 985, 987 (D. Hawaii 1979). The district court granted declaratory and injunctive relief, without objection to the species as plaintiff. On appeal, Judge O'Scannlain wrote, "As an endangered species under the Endangered Species Act . . . the bird . . . has legal status and wings its way into federal court as a plaintiff in its own right." 852 F.2d 1106, 1107 (9th Cir. 1988).

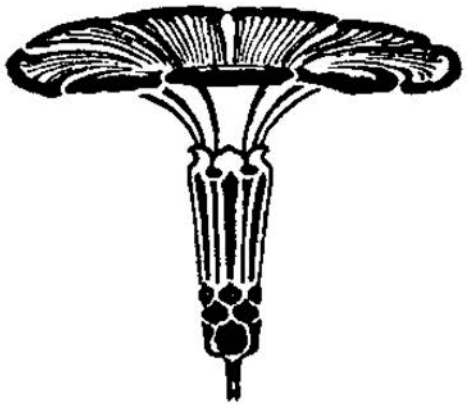
4. We shall see later, [51–53], that this is one reason why some climate change litigators are framing their complaints in the language of "human rights" violations: one's rights (think of the right to a jury trial or to vote) are not "trumped" by majority preferences.

5. *See Central Valley Chrysler-Jeep v.Witherspoon*, 456 F. Supp. 2d 1160, 1183 (E.D. Cal. 2006):

> "Nothing in the Supreme Court's foreign policy preemption jurisprudence forecloses the possibility of preemption of a generally applicable law that interferes with

TITLE: THE SECRETT LIFE OF PLANTS
Author: Peter Tompkins & Christopher Bird
Publisher: HarperCollins Publishers
Year: 1973
Pages: 16,17,18,24

THE SECRET LIFE OF PLANTS



Peter Tompkins

AND

Christopher Bird

HarperCollins *Publishers* India

to Backster from the amazing experiments in the energy fields around plants, trees, humans, and even cells, carried out at the Yale Medical School in the 1930s and 1940s by the late Professor Harold Saxton Burr, which are only just beginning to be recognized and understood.

With these considerations Backster temporarily abandoned his experiments with plants to explore the implications of his egg discoveries, which appeared to have profound implications for the origin-of-life research—and are the makings of another whole book.

CHAPTER 2

Plants Can Read Your Mind

While Backster was developing his experiments in the eastern United States, a heavy-set research chemist working with International Business Machines in Los Gatos, California, was challenged to give a course in "creativity" for IBM engineers and scientists. It was only after Marcel Vogel had taken on the job that he realized the enormity of it. "How does one define creativity?" he found himself asking. "What is a creative person?" To answer these questions, Vogel, who had studied for years to become a Franciscan priest, began writing an outline for twelve two-hour seminars which he hoped would represent an ultimate challenge to his students.

Vogel's own probings into the realm of creativity had started when he was a boy, curious to know what caused the light in fireflies and glowworms. Finding little on luminescence in the libraries, Vogel informed his mother that he would write a book on the subject. Ten years later *Luminescence in Liquids and Solids and Their Practical Application* was published by Vogel in collaboration with Chicago University's Dr. Peter Pringsheim. Two years after that, Vogel incorporated his own company, called Vogel Luminescence, in San Francisco, which became a leader in the field. Over a period of fifteen years Vogel's firm developed a variety of new products: the red color seen on television screens; fluorescent crayons; tags for insecticides; a "black light" inspection kit to determine, from their urine, the secret trackways of rodents in cellars, sewers, and slums; and the psychedelic colors popular in "new age" posters.

By the mid-1950s Vogel became bored with his day-to-day tasks of administering a company and sold it to go to work for IBM. There he was able to devote his full time to research, delving into magnetics, optic-electrical devices, and liquid crystal systems, developing and patenting inventions of crucial significance to the storage of information in computers, and winning awards which adorn the walls of his San Jose home.

The turning point in the creativity course which Vogel was asked to give at IBM came when one of his students gave him an *Argosy* magazine with an article on Backster's work entitled "Do Plants Have Emotions?" Vogel's first reaction was to throw the article into the wastebasket, convinced that Backster was just another charlatan unworthy of serious consideration. Yet something about the idea gnawed at his mind. A few days later, Vogel retrieved the article, and completely reversed his opinion.

The article, read aloud to his seminar students, aroused both derision and curiosity. Out of this ruckus came the unanimous decision to experiment with plants. That same evening, one student called Vogel to announce that the latest issue of *Popular Electronics* referred to Backster's work, and included a wiring diagram for an instrument called a "psychanalyser," which would pick up and amplify reactions from plants and could be built for less than twenty-five dollars.

man's emotions. They radiate energy forces that are beneficial to man. One can feel these forces! They feed into one's own force field, which in turn feeds back energy to the plant." The American Indians, say Vogel, were keenly aware of these faculties. When in need, they would go into the woods. With their arms extended, they would place their backs to a pine tree in order to replenish themselves with its power.

When Vogel began to demonstrate plants' sensitivity to "states of attention" different from the supposed awareness which most humans like to call consciousness, he discovered that the reaction of skeptics or hostile observers could produce strange effects on him. By paying attention to negative attitudes emanating from an audience, Vogel found he could isolate the individuals emitting them and counter their effect with a deep breath, learned in Yoga instruction. He would then switch his mind to another mental image just as if he were turning a dial to a different setting.

"The feeling of hostility, of negativity, in an audience," says Vogel, "is one of the main barriers to effective communication. To counteract this force is one of the most difficult tasks in public demonstration of these plant experiments. If one cannot do this, the plant and therefore the equipment will 'go dead' and there is no response until a positive tie can be reestablished.

"It seems," he says, "that I act as a filtering system which limits the response of a plant to the outside environment. I can turn it off or on so that people and plant become mutually responsive. By charging the plant with some energy within me, I can cause the plant to build up a sensitivity for this kind of work. It is extremely important that one understand that the plant's response is, in my opinion, not that of an intelligence in plant form, but that the plant becomes an extension of oneself. One can then interact with the bioelectric field of the plant, or through it, with the thought processes and emotions in a third person."

Vogel concluded that a Life Force, or Cosmic Energy, surrounding all living things is sharable among plants, animals, and humans. Through such sharing, a person and a plant become one. "This oneness is what makes possible a mutual sensitivity allowing plant and man not only to intercommunicate, but to record these communications via the plant on a recording chart."

FRIDAY
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Guided by: Teresa Dillon

TITLE: THE CLIMATE OF HISTORY: FOUR THESES
Author: Dipesh Chakrabarty
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The Climate of History: Four Theses

Dipesh Chakrabarty

The current planetary crisis of climate change or global warming elicits a variety of responses in individuals, groups, and governments, ranging from denial, disconnect, and indifference to a spirit of engagement and activism of varying kinds and degrees. These responses saturate our sense of the now. Alan Weisman's best-selling book *The World without Us* suggests a thought experiment as a way of experiencing our present: "Suppose that the worst has happened. Human extinction is a fait accompli. . . . Picture a world from which we all suddenly vanished. . . . Might we have left some faint, enduring mark on the universe? . . . Is it possible that, instead of heaving a huge biological sigh of relief, the world without us would miss us?"[1] I am drawn to Weisman's experiment as it tellingly demonstrates how the current crisis can precipitate a sense of the present that disconnects the future from the past by putting such a future beyond the grasp of historical sensibility. The discipline of history exists on the assumption that our past, present, and future are connected by a certain continuity of human experience. We normally envisage the future with the help of the same faculty that allows us to picture the past. Weisman's thought experiment illustrates the historicist paradox that inhabits contemporary moods of anxiety and concern about the finitude of humanity. To go along with Weisman's experiment, we have to insert ourselves into

This essay is dedicated to the memory of Greg Dening.

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1. Alan Weisman, *The World without Us* (New York, 2007), pp. 3–5.

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a future "without us" in order to be able to visualize it. Thus, our usual historical practices for visualizing times, past and future, times inaccessible to us personally—the exercise of historical understanding—are thrown into a deep contradiction and confusion. Weisman's experiment indicates how such confusion follows from our contemporary sense of the present insofar as that present gives rise to concerns about our future. Our historical sense of the present, in Weisman's version, has thus become deeply destructive of our general sense of history.

I will return to Weisman's experiment in the last part of this essay. There is much in the debate on climate change that should be of interest to those involved in contemporary discussions about history. For as the idea gains ground that the grave environmental risks of global warming have to do with excessive accumulation in the atmosphere of greenhouse gases produced mainly through the burning of fossil fuel and the industrialized use of animal stock by human beings, certain scientific propositions have come into circulation in the public domain that have profound, even transformative, implications for how we think about human history or about what the historian C. A. Bayly recently called "the birth of the modern world."[2] Indeed, what scientists have said about climate change challenges not only the ideas about the human that usually sustain the discipline of history but also the analytic strategies that postcolonial and postimperial historians have deployed in the last two decades in response to the postwar scenario of decolonization and globalization.

In what follows, I present some responses to the contemporary crisis from a historian's point of view. However, a word about my own relationship to the literature on climate change—and indeed to the crisis itself—may be in order. I am a practicing historian with a strong interest in the nature of history as a form of knowledge, and my relationship to the science of global warming is derived, at some remove, from what scientists and other informed writers have written for the education of the general public. Scientific studies of global warming are often said to have originated with the discoveries of the Swedish scientist Svante Arrhenius in the 1890s, but self-conscious discussions of global warming in the public realm

2. See C. A. Bayly, *The Birth of the Modern World, 1780–1914: Global Connections and Comparisons* (Malden, Mass., 2004).

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began in the late 1980s and early 1990s, the same period in which social scientists and humanists began to discuss globalization.[3] However, these discussions have so far run parallel to each other. While globalization, once recognized, was of immediate interest to humanists and social scientists, global warming, in spite of a good number of books published in the 1990s, did not become a public concern until the 2000s. The reasons are not far to seek. As early as 1988 James Hansen, the director of NASA's Goddard Institute of Space Studies, told a Senate committee about global warming and later remarked to a group of reporters on the same day, "It's time to stop waffling . . . and say that the greenhouse effect is here and is affecting our climate."[4] But governments, beholden to special interests and wary of political costs, would not listen. George H. W. Bush, then the president of the United States, famously quipped that he was going to fight the greenhouse effect with the "White House effect."[5] The situation changed in the 2000s when the warnings became dire, and the signs of the crisis—such as the drought in Australia, frequent cyclones and brush fires, crop failures in many parts of the world, the melting of Himalayan and other mountain glaciers and of the polar ice caps, and the increasing acidity of the seas and the damage to the food chain—became politically and economically inescapable. Added to this were growing concerns, voiced by many, about the rapid destruction of other species and about the global footprint of a human population poised to pass the nine billion mark by 2050.[6]

As the crisis gathered momentum in the last few years, I realized that all my readings in theories of globalization, Marxist analysis of capital, subaltern studies, and postcolonial criticism over the last twenty-five years, while enormously useful in studying globalization, had not really prepared me for making sense of this planetary conjuncture within which humanity finds itself today. The change of mood in globalization analysis may be seen by comparing Giovanni Arrighi's masterful history of world capitalism, *The Long Twentieth Century* (1994), with his more recent *Adam Smith*

3. The prehistory of the science of global warming going back to nineteenth-century European scientists like Joseph Fourier, Louis Agassiz, and Arrhenius is recounted in many popular publications. See, for example, the book by Bert Bolin, the chairman of the UN's Intergovernmental Panel on Climate Change (1988–1997), *A History of the Science and Politics of Climate Change: The Role of the Intergovernmental Panel on Climate Change* (Cambridge, 2007), pt. 1.

4. Quoted in Mark Bowen, *Censoring Science: Inside the Political Attack on Dr. James Hansen and the Truth of Global Warming* (New York, 2008), p. 1.

5. Quoted in ibid., p. 228. See also "Too Hot to Handle: Recent Efforts to Censor Jim Hansen," *Boston Globe*, 5 Feb. 2006, p. E1.

6. See, for example, Walter K. Dodds, *Humanity's Footprint: Momentum, Impact, and Our Global Environment* (New York, 2008), pp. 11–62.

in Beijing (2007), which, among other things, seeks to understand the implications of the economic rise of China. The first book, a long meditation on the chaos internal to capitalist economies, ends with the thought of capitalism burning up humanity "in the horrors (or glories) of the escalating violence that has accompanied the liquidation of the Cold War world order." It is clear that the heat that burns the world in Arrighi's narrative comes from the engine of capitalism and not from global warming. By the time Arrighi comes to write *Adam Smith in Beijing*, however, he is much more concerned with the question of ecological limits to capitalism. That theme provides the concluding note of the book, suggesting the distance that a critic such as Arrighi has traveled in the thirteen years that separate the publication of the two books.[7] If, indeed, globalization and global warming are born of overlapping processes, the question is, How do we bring them together in our understanding of the world?

Not being a scientist myself, I also make a fundamental assumption about the science of climate change. I assume the science to be right in its broad outlines. I thus assume that the views expressed particularly in the 2007 Fourth Assessment Report of the Intergovernmental Panel on Climate Change of the United Nations, in the *Stern Review,* and in the many books that have been published recently by scientists and scholars seeking to explain the science of global warming leave me with enough rational ground for accepting, unless the scientific consensus shifts in a major way, that there is a large measure of truth to anthropogenic theories of climate change.[8] For this position, I depend on observations such as the following one reported by Naomi Oreskes, a historian of science at the University of California, San Diego. Upon examining the abstracts of 928 papers on global warming published in specialized peer-reviewed scientific journals

7. Giovanni Arrighi, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (1994; London, 2006), p. 356; see Arrighi, *Adam Smith in Beijing: Lineages of the Twenty-First Century* (London, 2007), pp. 227–389.

8. An indication of the growing popularity of the topic is the number of books published in the last four years with the aim of educating the general reading public about the nature of the crisis. Here is a random list of some of the most recent titles that inform this essay: Mark Maslin, *Global Warming: A Very Short Introduction* (Oxford, 2004); Tim Flannery, *The Weather Makers: The History and Future Impact of Climate Change* (Melbourne, 2005); David Archer, *Global Warming: Understanding the Forecast* (Malden, Mass., 2007); *Global Warming,* ed. Kelly Knauer (New York, 2007); Mark Lynas, *Six Degrees: Our Future on a Hotter Planet* (Washington, D.C., 2008); William H. Calvin, *Global Fever: How to Treat Climate Change* (Chicago, 2008); James Hansen, "Climate Catastrophe," *New Scientist*, 28 July–3 Aug. 2007, pp. 30–34; Hansen et al., "Dangerous Human-Made Interference with Climate: A GISS ModelE Study," *Atmospheric Chemistry and Physics* 7, no. 9 (2007): 2287–2312; and Hansen et al., "Climate Change and Trace Gases," *Philosophical Transactions of the Royal Society*, 15 July 2007, pp. 1925–54. See also Nicholas Stern, *The Economics of Climate Change: The "Stern Review"* (Cambridge, 2007).

between 1993 and 2003, Oreskes found that not a single one sought to refute the "consensus" among scientists "over the reality of human-induced climate change." There is disagreement over the amount and direction of change. But "virtually all professional climate scientists," writes Oreskes, "agree on the reality of human-induced climate change, but debate continues on tempo and mode."[9] Indeed, in what I have read so far, I have not seen any reason yet for remaining a global-warming skeptic.

The scientific consensus around the proposition that the present crisis of climate change is man-made forms the basis of what I have to say here. In the interest of clarity and focus, I present my propositions in the form of four theses. The last three theses follow from the first one. I begin with the proposition that anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history and end by returning to the question I opened with: How does the crisis of climate change appeal to our sense of human universals while challenging at the same time our capacity for historical understanding?

Thesis 1: Anthropogenic Explanations of Climate Change Spell the Collapse of the Age-old Humanist Distinction between Natural History and Human History

Philosophers and students of history have often displayed a conscious tendency to separate human history—or the story of human affairs, as R. G. Collingwood put it—from natural history, sometimes proceeding even to deny that nature could ever have history quite in the same way humans have it. This practice itself has a long and rich past of which, for reasons of space and personal limitations, I can only provide a very provisional, thumbnail, and somewhat arbitrary sketch.[10]

We could begin with the old Viconian-Hobbesian idea that we, humans, could have proper knowledge of only civil and political institutions because we made them, while nature remains God's work and ultimately inscrutable to man. "The true is identical with the created: *verum ipsum factum*" is how Croce summarized Vico's famous dictum.[11] Vico scholars have sometimes protested that Vico did not make such a drastic separation

9. Naomi Oreskes, "The Scientific Consensus on Climate Change: How Do We Know We're Not Wrong?" in *Climate Change: What It Means for Us, Our Children, and Our Grandchildren,* ed. Joseph F. C. Dimento and Pamela Doughman (Cambridge, Mass., 2007), pp. 73, 74.

10. A long history of this distinction is traced in Paolo Rossi, *The Dark Abyss of Time: The History of the Earth and the History of Nations from Hooke to Vico,* trans. Lydia G. Cochrane (1979; Chicago, 1984).

11. Benedetto Croce, *The Philosophy of Giambattista Vico*, trans. R. G. Collingwood (1913;

between the natural and the human sciences as Croce and others read into his writings, but even they admit that such a reading is widespread.[12]

This Viconian understanding was to become a part of the historian's common sense in the nineteenth and twentieth centuries. It made its way into Marx's famous utterance that "men make their own history, but they do not make it just as they please" and into the title of the Marxist archaeologist V. Gordon Childe's well-known book, *Man Makes Himself*.[13] Croce seems to have been a major source of this distinction in the second half of the twentieth century through his influence on "the lonely Oxford historicist" Collingwood who, in turn, deeply influenced E. H. Carr's 1961 book, *What Is History?* which is still perhaps one of the best-selling books on the historian's craft.[14] Croce's thoughts, one could say, unbeknown to his legatees and with unforeseeable modifications, have triumphed in our understanding of history in the postcolonial age. Behind Croce and his adaptations of Hegel and hidden in Croce's creative misreading of his predecessors stands the more distant and foundational figure of Vico.[15] The connections here, again, are many and complex. Suffice it to say for now that Croce's 1911 book, *La filosofia di Giambattista Vico,* dedicated, significantly, to Wilhelm Windelband, was translated into English in 1913 by none other than Collingwood, who was an admirer, if not a follower, of the Italian master.

However, Collingwood's own argument for separating natural history from human ones developed its own inflections, while running, one might say, still on broadly Viconian lines as interpreted by Croce. Nature, Collingwood remarked, has no "inside." "In the case of nature, this distinction between the outside and the inside of an event does not arise. The events of

New Brunswick, N.J., 2002), p. 5. Carlo Ginzburg has alerted me to problems with Collingwood's translation.

12. See the discussion in Perez Zagorin, "Vico's Theory of Knowledge: A Critique," *Philosophical Quarterly* 34 (Jan. 1984): 15–30.

13. Karl Marx, "The Eighteenth Brumaire of Louis Bonaparte," in Marx and Frederick Engels, *Selected Works*, trans. pub., 3 vols. (Moscow, 1969), 1:398. See V. Gordon Childe, *Man Makes Himself* (London, 1941). Indeed, Althusser's revolt in the 1960s against humanism in Marx was in part a jihad against the remnants of Vico in the savant's texts; see Étienne Balibar, personal communication to author, 1 Dec. 2007. I am grateful to Ian Bedford for drawing my attention to complexities in Marx's connections to Vico.

14. David Roberts describes Collingwood as "the lonely Oxford historicist. . . , in important respects a follower of Croce's" (David D. Roberts, *Benedetto Croce and the Uses of Historicism* [Berkeley, 1987], p. 325).

15. On Croce's misreading of Vico, see the discussion in general in Cecilia Miller, *Giambattista Vico: Imagination and Historical Knowledge* (Basingstoke, 1993), and James C. Morrison, "Vico's Principle of *Verum* is *Factum* and the Problem of Historicism," *Journal of the History of Ideas* 39 (Oct.–Dec. 1978): 579–95.

nature are mere events, not the acts of agents whose thought the scientist endeavours to trace." Hence, "all history properly so called is the history of human affairs." The historian's job is "to think himself into [an] action, to discern the thought of its agent." A distinction, therefore, has "to be made between historical and non-historical human actions. . . . So far as man's conduct is determined by what may be called his animal nature, his impulses and appetites, it is non-historical; the process of those activities is a natural process." Thus, says Collingwood, "the historian is not interested in the fact that men eat and sleep and make love and thus satisfy their natural appetites; but he is interested in the social customs which they create by their thought as a framework within which these appetites find satisfaction in ways sanctioned by convention and morality." Only the history of the social construction of the body, not the history of the body as such, can be studied. By splitting the human into the natural and the social or cultural, Collingwood saw no need to bring the two together.[16]

In discussing Croce's 1893 essay "History Subsumed under the Concept of Art," Collingwood wrote, "Croce, by denying [the German idea] that history was a science at all, cut himself at one blow loose from naturalism, and set his face towards an idea of history as something radically different from nature."[17] David Roberts gives a fuller account of the more mature position in Croce. Croce drew on the writings of Ernst Mach and Henri Poincaré to argue that "the concepts of the natural sciences are human constructs elaborated for human purposes." "When we peer into nature," he said, "we find only ourselves." We do not "understand ourselves best as part of the natural world." So, as Roberts puts it, "Croce proclaimed that there is no world but the human world, then took over the central doctrine of Vico that we can know the human world because we have made it." For Croce, then, all material objects were subsumed into human thought. No rocks, for example, existed in themselves. Croce's idealism, Roberts explains, "does not mean that rocks, for example, 'don't exist' without human beings to think them. Apart from human concern and language, they neither exist nor do not exist, since 'exist' is a human concept that has meaning only within a context of human concerns and purposes."[18] Both Croce and Collingwood would thus enfold human history and nature, to the extent that the latter could be said to have history, into purposive human action. What exists beyond that does not "exist" because it does not exist for humans in any meaningful sense.

16. Collingwood, *The Idea of History* (1946; New York, 1976), pp. 214, 212, 213, 216.
17. Ibid., p. 193.
18. Roberts, *Benedetto Croce and the Uses of Historicism*, pp. 59, 60, 62.

In the twentieth century, however, other arguments, more sociological or materialist, have existed alongside the Viconian one. They too have continued to justify the separation of human from natural history. One influential though perhaps infamous example would be the booklet on the Marxist philosophy of history that Stalin published in 1938, *Dialectical and Historical Materialism*. This is how Stalin put the problem:

> Geographical environment is unquestionably one of the constant and indispensable conditions of development of society and, of course, . . . [it] accelerates or retards its development. But its influence is not the *determining* influence, inasmuch as the changes and development of society proceed at an incomparably faster rate than the changes and development of geographical environment. In the space of 3000 years three different social systems have been successfully superseded in Europe: the primitive communal system, the slave system and the feudal system. . . . Yet during this period geographical conditions in Europe have either not changed at all, or have changed so slightly that geography takes no note of them. And that is quite natural. Changes in geographical environment of any importance require millions of years, whereas a few hundred or a couple of thousand years are enough for even very important changes in the system of human society.[19]

For all its dogmatic and formulaic tone, Stalin's passage captures an assumption perhaps common to historians of the mid-twentieth century: man's environment did change but changed so slowly as to make the history of man's relation to his environment almost timeless and thus not a subject of historiography at all. Even when Fernand Braudel rebelled against the state of the discipline of history as he found it in the late 1930s and proclaimed his rebellion later in 1949 through his great book *The Mediterranean*, it was clear that he rebelled mainly against historians who treated the environment simply as a silent and passive backdrop to their historical narratives, something dealt with in the introductory chapter but forgotten thereafter, as if, as Braudel put it, "the flowers did not come back every spring, the flocks of sheep migrate every year, or the ships sail on a real sea that changes with the seasons." In composing *The Mediterranean*, Braudel wanted to write a history in which the seasons—"a history of constant repetition, ever-recurring cycles"—and other recurrences in

19. Joseph Stalin, *Dialectical and Historical Materialism* (1938), www.marxists.org/reference/archive/stalin/works/1938/09.htm

nature played an active role in molding human actions.[20] The environment, in that sense, had an agentive presence in Braudel's pages, but the idea that nature was mainly repetitive had a long and ancient history in European thought, as Gadamer showed in his discussion of Johann Gustav Droysen.[21] Braudel's position was no doubt a great advance over the kind of nature-as-a-backdrop argument that Stalin developed. But it shared a fundamental assumption, too, with the stance adopted by Stalin: the history of "man's relationship to the environment" was so slow as to be "almost timeless."[22] In today's climatologists' terms, we could say that Stalin and Braudel and others who thought thus did not have available to them the idea, now widespread in the literature on global warming, that the climate, and hence the overall environment, can sometimes reach a tipping point at which this slow and apparently timeless backdrop for human actions transforms itself with a speed that can only spell disaster for human beings.

If Braudel, to some degree, made a breach in the binary of natural/human history, one could say that the rise of environmental history in the late twentieth century made the breach wider. It could even be argued that environmental historians have sometimes indeed progressed towards producing what could be called natural histories of man. But there is a very important difference between the understanding of the human being that these histories have been based on and the agency of the human now being proposed by scientists writing on climate change. Simply put, environmental history, where it was not straightforwardly cultural, social, or economic history, looked upon human beings as biological agents. Alfred Crosby, Jr., whose book *The Columbian Exchange* did much to pioneer the "new" environmental histories in the early 1970s, put the point thus in his original preface: "Man is a biological entity before he is a Roman Catholic or a capitalist or anything else."[23] The recent book by Daniel Lord Smail, *On Deep History and the Brain*, is adventurous in attempting to connect knowledge gained from evolutionary and neurosciences with human his-

20. Fernand Braudel, "Preface to the First Edition," *The Mediterranean and the Mediterranean World in the Age of Philip II*, trans. Siân Reynolds, 2 vols. (1949; London, 1972), 1:20. See also Peter Burke, *The French Historical Revolution: The "Annales" School, 1929–89* (Stanford, Calif., 1990), pp. 32–64.

21. See Hans-Georg Gadamer, *Truth and Method*, 2d ed., trans. Joel Weinsheimer and Donald G. Marshall (1975, 1979; London, 1988), pp. 214–18. See also Bonnie G. Smith, "Gender and the Practices of Scientific History: The Seminar and Archival Research in the Nineteenth Century," *American Historical Review* 100 (Oct. 1995): 1150–76.

22. Braudel, "Preface to the First Edition," p. 20.

23. Alfred W. Crosby, Jr., *The Columbian Exchange: Biological and Cultural Consequences of 1492* (1972; London, 2003), p. xxv.

tories. Smail's book pursues possible connections between biology and culture—between the history of the human brain and cultural history, in particular—while being always sensitive to the limits of biological reasoning. But it is the history of human biology and not any recent theses about the newly acquired geological agency of humans that concerns Smail.[24]

Scholars writing on the current climate-change crisis are indeed saying something significantly different from what environmental historians have said so far. In unwittingly destroying the artificial but time-honored distinction between natural and human histories, climate scientists posit that the human being has become something much larger than the simple biological agent that he or she always has been. Humans now wield a geological force. As Oreskes puts it: "To deny that global warming is real is precisely to deny that humans have become geological agents, changing the most basic physical processes of the earth."

> For centuries, [she continues,] scientists thought that earth processes were so large and powerful that nothing we could do could change them. This was a basic tenet of geological science: that human chronologies were insignificant compared with the vastness of geological time; that human activities were insignificant compared with the force of geological processes. And once they were. But no more. There are now so many of us cutting down so many trees and burning so many billions of tons of fossil fuels that we have indeed become geological agents. We have changed the chemistry of our atmosphere, causing sea level to rise, ice to melt, and climate to change. There is no reason to think otherwise.[25]

Biological agents, geological agents—two different names with very different consequences. Environmental history, to go by Crosby's masterful survey of the origins and the state of the field in 1995, has much to do with biology and geography but hardly ever imagined human impact on the planet on a geological scale. It was still a vision of man "as a prisoner of climate," as Crosby put it quoting Braudel, and not of man as the maker of it.[26] To call human beings geological agents is to scale up our imagination of the human. Humans are biological agents, both collectively and as individuals. They have always been so. There was no point in human history when humans were not biological agents. But we can become geological agents only historically and collectively, that is, when we have reached

24. See Daniel Lord Smail, *On Deep History and the Brain* (Berkeley, 2008), pp. 74–189.
25. Oreskes, "The Scientific Consensus," p. 93.
26. Crosby Jr., "The Past and Present of Environmental History," *American Historical Review* 100 (Oct. 1995): 1185.

numbers and invented technologies that are on a scale large enough to have an impact on the planet itself. To call ourselves geological agents is to attribute to us a force on the same scale as that released at other times when there has been a mass extinction of species. We seem to be currently going through that kind of a period. The current "rate in the loss of species diversity," specialists argue, "is similar in intensity to the event around 65 million years ago which wiped out the dinosaurs."[27] Our footprint was not always that large. Humans began to acquire this agency only since the Industrial Revolution, but the process really picked up in the second half of the twentieth century. Humans have become geological agents very recently in human history. In that sense, we can say that it is only very recently that the distinction between human and natural histories—much of which had been preserved even in environmental histories that saw the two entities in interaction—has begun to collapse. For it is no longer a question simply of man having an interactive relation with nature. This humans have always had, or at least that is how man has been imagined in a large part of what is generally called the Western tradition.[28] Now it is being claimed that humans are a force of nature in the geological sense. A fundamental assumption of Western (and now universal) political thought has come undone in this crisis.[29]

Thesis 2: The Idea of the Anthropocene, the New Geological Epoch When Humans Exist as a Geological Force, Severely Qualifies Humanist Histories of Modernity/Globalization

How to combine human cultural and historical diversity with human freedom has formed one of the key underlying questions of human histories written of the period from 1750 to the years of present-day globalization. Diversity, as Gadamer pointed out with reference to Leopold von Ranke, was itself a figure of freedom in the historian's imagination of the

27. Will Steffen, director of the Centre for Resource and Environmental Studies at the Australian National University, quoted in "Humans Creating New 'Geological Age,'" *The Australian*, 31 Mar. 2008, www.theaustralian.news.com.au/story/0,,23458148-5006787,00.html. Steffen's reference was the Millennium Ecosystem Assessment Report of 2005. See also Neil Shubin, "The Disappearance of Species," *Bulletin of the American Academy of Arts and Sciences* 61 (Spring 2008): 17–19.
28. Bill McKibben's argument about the "end of nature" implied the end of nature as "a separate realm that had always served to make us feel smaller" (Bill McKibben, *The End of Nature* [1989; New York, 2006], p. xxii).
29. Bruno Latour's *Politics of Nature: How to Bring the Sciences into Democracy*, trans. Catherine Porter (1999; Cambridge, Mass., 2004), written before the intensification of the debate on global warming, calls into question the entire tradition of organizing the idea of politics around the assumption of a separate realm of nature and points to the problems that this assumption poses for contemporary questions of democracy.

historical process.[30] *Freedom* has, of course, meant different things at different times, ranging from ideas of human and citizens' rights to those of decolonization and self-rule. Freedom, one could say, is a blanket category for diverse imaginations of human autonomy and sovereignty. Looking at the works of Kant, Hegel, or Marx; nineteenth-century ideas of progress and class struggle; the struggle against slavery; the Russian and Chinese revolutions; the resistance to Nazism and Fascism; the decolonization movements of the 1950s and 1960s and the revolutions in Cuba and Vietnam; the evolution and explosion of the rights discourse; the fight for civil rights for African Americans, indigenous peoples, Indian *Dalits,* and other minorities; down to the kind of arguments that, say, Amartya Sen put forward in his book *Development as Freedom*, one could say that freedom has been the most important motif of written accounts of human history of these two hundred and fifty years. Of course, as I have already noted, freedom has not always carried the same meaning for everyone. Francis Fukuyama's understanding of freedom would be significantly different from that of Sen. But this semantic capaciousness of the word only speaks to its rhetorical power.

In no discussion of freedom in the period since the Enlightenment was there ever any awareness of the geological agency that human beings were acquiring at the same time as and through processes closely linked to their acquisition of freedom. Philosophers of freedom were mainly, and understandably, concerned with how humans would escape the injustice, oppression, inequality, or even uniformity foisted on them by other humans or human-made systems. Geological time and the chronology of human histories remained unrelated. This distance between the two calendars, as we have seen, is what climate scientists now claim has collapsed. The period I have mentioned, from 1750 to now, is also the time when human beings switched from wood and other renewable fuels to large-scale use of fossil fuel—first coal and then oil and gas. The mansion of modern freedoms stands on an ever-expanding base of fossil-fuel use. Most of our freedoms so far have been energy-intensive. The period of human history usually associated with what we today think of as the institutions of civilization—the beginnings of agriculture, the founding of cities, the rise of the religions we know, the invention of writing—began about ten thousand years ago, as the planet moved from one geological period, the last ice age or the Pleistocene, to the more recent and warmer Holocene. The Holocene is the period we are supposed to be in; but the possibility of

30. Gadamer, *Truth and Method*, p. 206: The historian "knows that everything could have been different, and every acting individual could have acted differently."

anthropogenic climate change has raised the question of its termination. Now that humans—thanks to our numbers, the burning of fossil fuel, and other related activities—have become a geological agent on the planet, some scientists have proposed that we recognize the beginning of a new geological era, one in which humans act as a main determinant of the environment of the planet. The name they have coined for this new geological age is Anthropocene. The proposal was first made by the Nobel-winning chemist Paul J. Crutzen and his collaborator, a marine science specialist, Eugene F. Stoermer. In a short statement published in 2000, they said, "Considering . . . [the] major and still growing impacts of human activities on earth and atmosphere, and at all, including global, scales, it seems to us more than appropriate to emphasize the central role of mankind in geology and ecology by proposing to use the term 'anthropocene' for the current geological epoch."[31] Crutzen elaborated on the proposal in a short piece published in *Nature* in 2002:

> For the past three centuries, the effects of humans on the global environment have escalated. Because of these anthropogenic emissions of carbon dioxide, global climate may depart significantly from natural behaviour for many millennia to come. It seems appropriate to assign the term "Anthropocene" to the present, . . . human-dominated, geological epoch, supplementing the Holocene—the warm period of the past 10–12 millennia. The Anthropocene could be said to have started in the latter part of the eighteenth century, when analyses of air trapped in polar ice showed the beginning of growing global concentrations of carbon dioxide and methane. This date also happens to coincide with James Watt's design of the steam engine in 1784.[32]

It is, of course, true that Crutzen's saying so does not make the Anthropocene an officially accepted geologic period. As Mike Davis comments, "in geology, as in biology or history, periodization is a complex, controversial art," involving, always, vigorous debates and contestation.[33] The name Holocene for "the post-glacial geological epoch of the past ten to twelve thousand years" ("A," p. 17), for example, gained no immediate acceptance when proposed—apparently by Sir Charles Lyell—in 1833. The International Geological Congress officially adopted the name at their meeting in

31. Paul J. Crutzen and Eugene F. Stoermer, "The Anthropocene," *IGBP [International Geosphere-Biosphere Programme] Newsletter* 41 (2000): 17; hereafter abbreviated "A."

32. Crutzen, "Geology of Mankind," *Nature,* 3 Jan. 2002, p. 23.

33. Mike Davis, "Living on the Ice Shelf: Humanity's Meltdown," 26 June 2008, tomdispatch.com/post/174949; hereafter abbreviated "LIS." I am grateful to Lauren Berlant for bringing this essay to my attention.

Bologna after about fifty years in 1885 (see "A," p. 17). The same goes for Anthropocene. Scientists have engaged Crutzen and his colleagues on the question of when exactly the Anthropocene may have begun. But the February 2008 newsletter of the Geological Society of America, *GSA Today*, opens with a statement signed by the members of the Stratigraphy Commission of the Geological Society of London accepting Crutzen's definition and dating of the Anthropocene.[34] Adopting a "conservative" approach, they conclude: "Sufficient evidence has emerged of stratigraphically significant change (both elapsed and imminent) for recognition of the Anthropocene—currently a vivid yet informal metaphor of global environmental change—as a new geological epoch to be considered for formalization by international discussion."[35] There is increasing evidence that the term is gradually winning acceptance among social scientists as well.[36]

So, has the period from 1750 to now been one of freedom or that of the Anthropocene? Is the Anthropocene a critique of the narratives of freedom? Is the geological agency of humans the price we pay for the pursuit of freedom? In some ways, yes. As Edward O. Wilson said in his *The Future of Life*: "Humanity has so far played the role of planetary killer, concerned only with its own short-term survival. We have cut much of the heart out of biodiversity. . . . If Emi, the Sumatran rhino could speak, she might tell us that the twenty-first century is thus far no exception."[37] But the relation between Enlightenment themes of freedom and the collapsing of human and geological chronologies seems more complicated and contradictory than a simple binary would allow. It is true that human beings have tumbled into being a geological agent through our own decisions. The Anthropocene, one might say, has been an unintended consequence of human choices. But it is also clear that for humans any thought of the way out of our current predicament cannot but refer to the idea of deploying reason in global, collective life. As Wilson put it: "We know more about the problem now. . . . We know what to do" (*FL*, p. 102). Or, to quote Crutzen and Stoermer again:

> Mankind will remain a major geological force for many millennia, maybe millions of years, to come. To develop a world-wide accepted strategy leading to sustainability of ecosystems against human-induced stresses will be one of the great future tasks of mankind, requiring intensive research efforts and wise application of knowledge thus acquired. . . . An exciting, but also difficult and daunting task lies ahead of the global research and engineering community to guide mankind towards global, sustainable, environmental management. ["A," p. 18]

Logically, then, in the era of the Anthropocene, we need the Enlightenment (that is, reason) even more than in the past. There is one consideration though that qualifies this optimism about the role of reason and that has to do with the most common shape that freedom takes in human societies: politics. Politics has never been based on reason alone. And politics in the age of the masses and in a world already complicated by sharp inequalities between and inside nations is something no one can control. "Sheer demographic momentum," writes Davis, "will increase the world's urban population by 3 billion people over the next 40 years (90% of them in poor cities), and no one—absolutely no one [including, one might say, scholars on the Left]—has a clue how a planet of slums, with growing food and energy crises, will accommodate their biological survival, much less their inevitable aspirations to basic happiness and dignity" ("LIS").

It is not surprising then that the crisis of climate change should produce anxieties precisely around futures that we cannot visualize. Scientists' hope that reason will guide us out of the present predicament is reminiscent of the social opposition between the myth of Science and the actual politics of the sciences that Bruno Latour discusses in his *Politics of Nature*.[38] Bereft of any sense of politics, Wilson can only articulate his sense of practicality as a philosopher's hope mixed with anxiety: "Perhaps we will act in time" (*FL*, p. 102). Yet the very science of global warming produces of necessity political imperatives. Tim Flannery's book, for instance, raises the dark prospects of an "Orwellian nightmare" in a chapter entitled "2084: The Carbon Dictatorship?"[39] Mark Maslin concludes his book with some gloomy thoughts: "It is unlikely that global politics will solve global warming. Technofixes are dangerous or cause problems as bad as the ones they are

34. See William F. Ruddiman, "The Anthropogenic Greenhouse Era Began Thousands of Years Ago," *Climatic Change* 61, no. 3 (2003): 261–93; Crutzen and Steffen, "How Long Have We Been in the Anthropocene Era?" *Climatic Change* 61, no. 3 (2003): 251–57; and Jan Zalasiewicz et al., "Are We Now Living in the Anthropocene?" *GSA Today* 18 (Feb. 2008): 4–8. I am grateful to Neptune Srimal for this reference.

35. Zalasiewicz et al., "Are We Now Living in the Anthropocene?" p. 7. Davis described the London Society as "the world's oldest association of Earth scientists, founded in 1807" ("LIS").

36. See, for instance, Libby Robin and Steffen, "History for the Anthropocene," *History Compass* 5, no. 5 (2007): 1694–1719, and Jeffrey D. Sachs, "The Anthropocene," *Common Wealth: Economics for a Crowded Planet* (New York, 2008), pp. 57–82. Thanks to Debjani Ganguly for drawing my attention to the essay by Robin and Steffen, and to Robin for sharing it with me.

37. Edward O. Wilson, *The Future of Life* (New York, 2002), p. 102; hereafter abbreviated *FL*.

38. See Latour, *Politics of Nature*.

39. Flannery, *The Weather Makers*, p. xiv.

aimed at fixing. . . . [Global warming] requires nations and regions to plan for the next 50 years, something that most societies are unable to do because of the very short-term nature of politics." His recommendation, "we must prepare for the worst and adapt," coupled with Davis's observations about the coming "planet of slums" places the question of human freedom under the cloud of the Anthropocene.[40]

Thesis 3: The Geological Hypothesis Regarding the Anthropocene Requires Us to Put Global Histories of Capital in Conversation with the Species History of Humans

Analytic frameworks engaging questions of freedom by way of critiques of capitalist globalization have *not*, in any way, become obsolete in the age of climate change. If anything, as Davis shows, climate change may well end up accentuating all the inequities of the capitalist world order if the interests of the poor and vulnerable are neglected (see "LIS"). Capitalist globalization exists; so should its critiques. But these critiques do not give us an adequate hold on human history once we accept that the crisis of climate change is here with us and may exist as part of this planet for much longer than capitalism or long after capitalism has undergone many more historic mutations. The problematic of globalization allows us to read climate change only as a crisis of capitalist management. While there is no denying that climate change has profoundly to do with the history of capital, a critique that is only a critique of capital is not sufficient for addressing questions relating to human history once the crisis of climate change has been acknowledged and the Anthropocene has begun to loom on the horizon of our present. The geologic now of the Anthropocene has become entangled with the now of human history.

Scholars who study human beings in relation to the crisis of climate change and other ecological problems emerging on a world scale make a distinction between the recorded history of human beings and their deep history. Recorded history refers, very broadly, to the ten thousand years that have passed since the invention of agriculture but more usually to the last four thousand years or so for which written records exist. Historians of modernity and "early modernity" usually move in the archives of the last four hundred years. The history of humans that goes beyond these years of written records constitutes what other students of human pasts—not professional historians—call deep history. As Wilson, one of the main pro-

40. Maslin, *Global Warming*, p. 147. For a discussion of how fossil fuels created both the possibilities for and the limits of democracy in the twentieth century, see Timothy Mitchell, "Carbon Democracy," forthcoming in *Economy and Society*. I am grateful to Mitchell for letting me cite this unpublished paper.

ponents of this distinction, writes: "Human behavior is seen as the product not just of recorded history, ten thousand years recent, but of deep history, the combined genetic and cultural changes that created humanity over hundreds of [thousands of] years."[41] It, of course, goes to the credit of Smail that he has attempted to explain to professional historians the intellectual appeal of deep history.[42]

Without such knowledge of the deep history of humanity it would be difficult to arrive at a secular understanding of why climate change constitutes a crisis for humans. Geologists and climate scientists may explain why the current phase of global warming—as distinct from the warming of the planet that has happened before—is anthropogenic in nature, but the ensuing crisis for humans is not understandable unless one works out the consequences of that warming. The consequences make sense only if we think of humans as a form of life and look on human history as part of the history of life on this planet. For, ultimately, what the warming of the planet threatens is not the geological planet itself but the very conditions, both biological and geological, on which the survival of human life as developed in the Holocene period depends.

The word that scholars such as Wilson or Crutzen use to designate life in the human form—and in other living forms—is *species*. They speak of the human being as a species and find that category useful in thinking about the nature of the current crisis. It is a word that will never occur in any standard history or political-economic analysis of globalization by scholars on the Left, for the analysis of globalization refers, for good reasons, only to the recent and recorded history of humans. Species thinking, on the other hand, is connected to the enterprise of deep history. Further, Wilson and Crutzen actually find such thinking essential to visualizing human well-being. As Wilson writes: "We need this longer view . . . not only to understand our species but more firmly to secure its future" (*SN*, p. x). The task of placing, historically, the crisis of climate change thus requires us to bring together intellectual formations that are somewhat in tension with each other: the planetary and the global; deep and recorded histories; species thinking and critiques of capital.

In saying this, I work somewhat against the grain of historians' thinking on globalization and world history. In a landmark essay published in 1995 and entitled "World History in a Global Age," Michael Geyer and Charles Bright wrote, "At the end of the twentieth century, we encounter, not a

41. Wilson, *In Search of Nature* (Washington, D.C., 1996), pp. ix–x; hereafter abbreviated *SN*.

42. See Smail, *On Deep History and the Brain*.

universalizing and single modernity but an integrated world of multiple and multiplying modernities." "As far as world history is concerned," they said, "there is no universalizing spirit. . . . There are, instead, many very specific, very material and pragmatic practices that await critical reflection and historical study." Yet, thanks to global connections forged by trade, empires, and capitalism, "we confront a startling new condition: humanity, which has been the subject of world history for many centuries and civilizations, has now come into the purview of all human beings. This humanity is extremely polarized into rich and poor."[43] This humanity, Geyer and Bright imply in the spirit of the philosophies of difference, is not one. It does not, they write, "form a single homogenous civilization." "Neither is this humanity any longer a mere species or a natural condition. For the first time," they say, with some existentialist flourish, "we as human beings collectively constitute ourselves and, hence, are responsible for ourselves" ("WH," p. 1059). Clearly, the scientists who advocate the idea of the Anthropocene are saying something quite the contrary. They argue that because humans constitute a particular kind of species they can, in the process of dominating other species, acquire the status of a geologic force. Humans, in other words, have become a natural condition, at least today. How do we create a conversation between these two positions?

It is understandable that the biological-sounding talk of species should worry historians. They feel concerned about their finely honed sense of contingency and freedom in human affairs having to cede ground to a more deterministic view of the world. Besides, there are always, as Smail recognizes, dangerous historical examples of the political use of biology.[44] The idea of species, it is feared, in addition, may introduce a powerful degree of essentialism in our understanding of humans. I will return to the question of contingency later in this section, but, on the issue of essentialism, Smail helpfully points out why species cannot be thought of in essentialist terms:

> Species, according to Darwin, are not fixed entities with natural essences imbued in them by the Creator. . . . Natural selection does not homogenize the individuals of a species. . . . Given this state of affairs, the search for a normal . . . nature and body type [of any particular species] is futile. And so it goes for the equally futile quest to identify

43. Michael Geyer and Charles Bright, "World History in a Global Age," *American Historical Review* 100 (Oct. 1995): 1058–59; hereafter abbreviated "WH."

44. See Smail, *On Deep History and the Brain*, p. 124.

> "human nature." Here, as in so many areas, biology and cultural studies are fundamentally congruent.[45]

It is clear that different academic disciplines position their practitioners differently with regard to the question of how to view the human being. All disciplines have to create their objects of study. If medicine or biology reduces the human to a certain specific understanding of him or her, humanist historians often do not realize that the protagonists of their stories—persons—are reductions, too. Absent personhood, there is no human subject of history. That is why Derrida earned the wrath of Foucault by pointing out that any desire to enable or allow madness *itself* to speak in a history of madness would be "the *maddest* aspect" of the project.[46] An object of critical importance to humanists of all traditions, personhood is nevertheless no less of a reduction of or an abstraction from the embodied and whole human being than, say, the human skeleton discussed in an anatomy class.

The crisis of climate change calls on academics to rise above their disciplinary prejudices, for it is a crisis of many dimensions. In that context, it is interesting to observe the role that the category of species has begun to play among scholars, including economists, who have already gone further than historians in investigating and explaining the nature of this crisis. The economist Jeffrey Sachs's book, *Common Wealth*, meant for the educated but lay public, uses the idea of species as central to its argument and devotes a whole chapter to the Anthropocene.[47] In fact, the scholar from whom Sachs solicited a foreword for his book was none other than Edward Wilson. The concept of species plays a quasi-Hegelian role in Wilson's foreword in the same way as the multitude or the masses in Marxist writings. If Marxists of various hues have at different times thought that the good of humanity lay in the prospect of the oppressed or the multitude realizing their own global unity through a process of coming into self-consciousness, Wilson pins his hope on the unity possible through our collective self-recognition as a species: "Humanity has consumed or transformed enough of Earth's irreplaceable resources to be in better shape than ever before. We are smart enough and now, one hopes, well informed enough to achieve self-understanding as a unified species. . . . We will be wise to look on ourselves as a species."[48]

45. Ibid. pp. 124–25.

46. Jacques Derrida, "Cogito and the History of Madness," *Writing and Difference*, trans. Alan Bass (Chicago, 1978), p. 34.

47. See Sachs, *Common Wealth*, pp. 57–82.

48. Wilson, foreword to Sachs, *Common Wealth*, p. xii. Students of Marx may be reminded here of the use of the category "species being" by the young Marx.

Yet doubts linger about the use of the idea of species in the context of climate change, and it would be good to deal with one that can easily arise among critics on the Left. One could object, for instance, that all the anthropogenic factors contributing to global warming—the burning of fossil fuel, industrialization of animal stock, the clearing of tropical and other forests, and so on—are after all part of a larger story: the unfolding of capitalism in the West and the imperial or quasi-imperial domination by the West of the rest of the world. It is from that recent history of the West that the elite of China, Japan, India, Russia, and Brazil have drawn inspiration in attempting to develop their own trajectories toward superpower politics and global domination through capitalist economic, technological, and military might. If this is broadly true, then does not the talk of species or mankind simply serve to hide the reality of capitalist production and the logic of imperial—formal, informal, or machinic in a Deleuzian sense—domination that it fosters? Why should one include the poor of the world—whose carbon footprint is small anyway—by use of such all-inclusive terms as *species* or *mankind* when the blame for the current crisis should be squarely laid at the door of the rich nations in the first place and of the richer classes in the poorer ones?

We need to stay with this question a little longer; otherwise the difference between the present historiography of globalization and the historiography demanded by anthropogenic theories of climate change will not be clear to us. Though some scientists would want to date the Anthropocene from the time agriculture was invented, my readings mostly suggest that our falling into the Anthropocene was neither an ancient nor an inevitable happening. Human civilization surely did not begin on condition that, one day in his history, man would have to shift from wood to coal and from coal to petroleum and gas. That there was much historical contingency in the transition from wood to coal as the main source of energy has been demonstrated powerfully by Kenneth Pomeranz in his pathbreaking book *The Great Divergence*.[49] Coincidences and historical accidents similarly litter the stories of the "discovery" of oil, of the oil tycoons, and of the automobile industry as they do any other histories.[50] Capitalist societies themselves have not remained the same since the beginning of capitalism.[51]

49. See Kenneth Pomeranz, *The Great Divergence: Europe, China, and the Making of the Modern World Economy* (Princeton, N.J., 2000).

50. See Mitchell, "Carbon Democracy." See also Edwin Black, *Internal Combustion: How Corporations and Governments Addicted the World to Oil and Derailed the Alternatives* (New York, 2006).

51. Arrighi's *The Long Twentieth Century* is a good guide to these fluctuations in the fortunes of capitalism.

Human population, too, has dramatically increased since the Second World War. India alone is now more than three times more populous than at independence in 1947. Clearly, nobody is in a position to claim that there is something inherent to the human species that has pushed us finally into the Anthropocene. We have stumbled into it. The way to it was no doubt through industrial civilization. (I do not make a distinction here between the capitalist and socialist societies we have had so far, for there was never any principled difference in their use of fossil fuel.)

If the industrial way of life was what got us into this crisis, then the question is, Why think in terms of species, surely a category that belongs to a much longer history? Why could not the narrative of capitalism—and hence its critique—be sufficient as a framework for interrogating the history of climate change and understanding its consequences? It seems true that the crisis of climate change has been necessitated by the high-energy-consuming models of society that capitalist industrialization has created and promoted, but the current crisis has brought into view certain other conditions for the existence of life in the human form that have no intrinsic connection to the logics of capitalist, nationalist, or socialist identities. They are connected rather to the history of life on this planet, the way different life-forms connect to one another, and the way the mass extinction of one species could spell danger for another. Without such a history of life, the crisis of climate change has no human "meaning." For, as I have said before, it is not a crisis for the inorganic planet in any meaningful sense.

In other words, the industrial way of life has acted much like the rabbit hole in Alice's story; we have slid into a state of things that forces on us a recognition of some of the parametric (that is, boundary) conditions for the existence of institutions central to our idea of modernity and the meanings we derive from them. Let me explain. Take the case of the agricultural revolution, so called, of ten thousand years ago. It was not just an expression of human inventiveness. It was made possible by certain changes in the amount of carbon dioxide in the atmosphere, a certain stability of the climate, and a degree of warming of the planet that followed the end of the Ice Age (the Pleistocene era)—things over which human beings had no control. "There can be little doubt," writes one of the editors of *Humans at the End of the Ice Age*, "that the basic phenomenon—the waning of the Ice Age—was the result of the Milankovich phenomena: the orbital and tilt relationships between the Earth and the Sun."[52] The temperature of the planet stabilized within a zone that allowed grass to grow. Barley and wheat

52. Lawrence Guy Straus, "The World at the End of the Last Ice Age," in *Humans at the*

are among the oldest of such grasses. Without this lucky "long summer" or what one climate scientist has called an "extraordinary" "fluke" of nature in the history of the planet, our industrial-agricultural way of life would not have been possible.[53] In other words, whatever our socioeconomic and technological choices, whatever the rights we wish to celebrate as our freedom, we cannot afford to destabilize conditions (such as the temperature zone in which the planet exists) that work like boundary parameters of human existence. These parameters are independent of capitalism or socialism. They have been stable for much longer than the histories of these institutions and have allowed human beings to become the dominant species on earth. Unfortunately, we have now ourselves become a geological agent disturbing these parametric conditions needed for our own existence.

This is not to deny the historical role that the richer and mainly Western nations of the world have played in emitting greenhouse gases. To speak of species thinking is not to resist the politics of "common but differentiated responsibility" that China, India, and other developing countries seem keen to pursue when it comes to reducing greenhouse gas emissions.[54] Whether we blame climate change on those who are retrospectively guilty—that is, blame the West for their past performance—or those who are prospectively guilty (China has just surpassed the United States as the largest emitter of carbon dioxide, though not on a per capita basis) is a question that is tied no doubt to the histories of capitalism and modernization.[55] But scientists' discovery of the fact that human beings have in the process become a geological agent points to a shared catastrophe that we have all fallen into. Here is how Crutzen and Stoermer describe that catastrophe:

> The expansion of mankind . . . has been astounding. . . . During the past 3 centuries human population increased tenfold to 6000 million, accompanied e.g. by a growth in cattle population to 1400 million (about one cow per average size family). . . . In a few generations mankind is exhausting the fossil fuels that were generated over several hundred million years. The release of SO_2 . . . to the atmosphere by coal and oil burning, is at least two times larger than the sum of all natural emissions . . . ; more than half of all accessible fresh water is used by mankind; human activity has increased the species extinction rate by thousand to ten thousand fold in the tropical rain forests. . . . Furthermore, mankind releases many toxic substances in the environment. . . . The effects documented include modification of the geochemical cycle in large freshwater systems and occur in systems remote from primary sources. ["A," p. 17]

End of the Ice Age: The Archaeology of the Pleistocene–Holocene Transition, ed. Lawrence Guy Straus et al. (New York, 1996), p. 5.

53. Flannery, *Weather Makers*, pp. 63, 64.

54. Ashish Kothari, "The Reality of Climate Injustice," *The Hindu*, 18 Nov. 2007, www.hinduonnet.com/thehindu/mag/2007/11/18/stories/2007111850020100.htm

55. I have borrowed the idea of "retrospective" and "prospective" guilt from a discussion led at the Franke Institute for the Humanities by Peter Singer during the Chicago Humanities Festival, November 2007.

Explaining this catastrophe calls for a conversation between disciplines and between recorded and deep histories of human beings in the same way that the agricultural revolution of ten thousand years ago could not be explained except through a convergence of three disciplines: geology, archaeology, and history.[56]

Scientists such as Wilson or Crutzen may be politically naïve in not recognizing that reason may not be all that guides us in our effective collective choices—in other words, we may collectively end up making some unreasonable choices—but I find it interesting and symptomatic that they speak the language of the Enlightenment. They are not necessarily anticapitalist scholars, and yet clearly they are not for business-as-usual capitalism either. They see knowledge and reason providing humans not only a way out of this present crisis but a way of keeping us out of harm's way in the future. Wilson, for example, speaks of devising a "wiser use of resources" in a manner that sounds distinctly Kantian (*SN*, p. 199). But the knowledge in question is the knowledge of humans as a species, a species dependent on other species for its own existence, a part of the general history of life. Changing the climate, increasingly not only the average temperature of the planet but also the acidity and the level of the oceans, and destroying the food chain are actions that cannot be in the interest of our lives. These parametric conditions hold irrespective of our political choices. It is therefore impossible to understand global warming as a crisis without engaging the propositions put forward by these scientists. At the same time, the story of capital, the contingent history of our falling into the Anthropocene, cannot be denied by recourse to the idea of species, for the Anthropocene would not have been possible, even as a theory, without the history of industrialization. How do we hold the two together as we think the history of the world since the Enlightenment? How do we relate to a universal history of life—to universal thought, that is—while retaining what is of

56. See Colin Tudge, *Neanderthals, Bandits, and Farmers: How Agriculture Really Began* (New Haven, Conn., 1999), pp. 35–36.

obvious value in our postcolonial suspicion of the universal? The crisis of climate change calls for thinking simultaneously on both registers, to mix together the immiscible chronologies of capital and species history. This combination, however, stretches, in quite fundamental ways, the very idea of historical understanding.

Thesis 4: The Cross-Hatching of Species History and the History of Capital Is a Process of Probing the Limits of Historical Understanding

Historical understanding, one could say following the Diltheyan tradition, entails critical thinking that makes an appeal to some generic ideas about human experience. As Gadamer pointed out, Dilthey saw "the individual's private world of experience as the starting point for an expansion that, in a living transposition, fills out the narrowness and fortuitousness of his private experience with the infinity of what is available by re-experiencing the historical world." "*Historical consciousness,*" in this tradition, is thus "*a mode of self-knowledge*" garnered through critical reflections on one's own and others' (historical actors') experiences.[57] Humanist histories of capitalism will always admit of something called the experience of capitalism. E. P. Thompson's brilliant attempt to reconstruct working-class experience of capitalist labor, for instance, does not make sense without that assumption.[58] Humanist histories are histories that produce meaning through an appeal to our capacity not only to reconstruct but, as Collingwood would have said, to reenact in our own minds the experience of the past.

When Wilson then recommends in the interest of our collective future that we achieve self-understanding as a species, the statement does not correspond to any historical way of understanding and connecting pasts with futures through the assumption of there being an element of continuity to human experience. (See Gadamer's point mentioned above.) Who is the we? We humans never experience ourselves as a species. We can only intellectually comprehend or infer the existence of the human species but never experience it as such. There could be no phenomenology of us as a species. Even if we were to emotionally identify with a word like *mankind,* we would not know what being a species is, for, in species history, humans are only an instance of the concept species as indeed would be any other life form. But one never experiences being a concept.

57. Gadamer, *Truth and Method*, pp. 232, 234. See also Michael Ermarth, *Wilhelm Dilthey: The Critique of Historical Reason* (Chicago, 1978), pp. 310–22.
58. See E. P. Thompson, *The Making of the English Working Class* (Harmondsworth, 1963).

The discussion about the crisis of climate change can thus produce affect and knowledge about collective human pasts and futures that work at the limits of historical understanding. We experience specific effects of the crisis but not the whole phenomenon. Do we then say, with Geyer and Bright, that "humanity no longer comes into being through 'thought'" ("WH," p. 1060) or say with Foucault that "the human being no longer has any history"?[59] Geyer and Bright go on to write in a Foucaultian spirit: "Its [world history's] task is to make transparent the lineaments of power, underpinned by information, that compress humanity into a single humankind" ("WH," p. 1060).

This critique that sees humanity as an effect of power is, of course, valuable for all the hermeneutics of suspicion that it has taught postcolonial scholarship. It is an effective critical tool in dealing with national and global formations of domination. But I do not find it adequate in dealing with the crisis of global warming. First, inchoate figures of us all and other imaginings of humanity invariably haunt our sense of the current crisis. How else would one understand the title of Weisman's book, *The World without Us,* or the appeal of his brilliant though impossible attempt to depict the experience of New York after we are gone![60] Second, the wall between human and natural history has been breached. We may not experience ourselves as a geological agent, but we appear to have become one at the level of the species. And without that knowledge that defies historical understanding there is no making sense of the current crisis that affects us all. Climate change, refracted through global capital, will no doubt accentuate the logic of inequality that runs through the rule of capital; some people will no doubt gain temporarily at the expense of others. But the whole crisis cannot be reduced to a story of capitalism. Unlike in the crises of capitalism, there are no lifeboats here for the rich and the privileged (witness the drought in Australia or recent fires in the wealthy neighborhoods of California). The anxiety global warming gives rise to is reminiscent of the days when many feared a global nuclear war. But there is a very important difference. A nuclear war would have been a conscious decision on the part of the powers that be. Climate change is an unintended consequence of human actions and shows, only through scientific analysis, the effects of our actions as a species. Species may indeed be the name of a placeholder for an emergent, new universal history of humans that flashes up in the moment of the danger that is climate change. But we can never

59. Michel Foucault, *The Order of Things: An Archaeology of Human Knowledge*, trans. pub. (1966; New York, 1973), p. 368.
60. See Weisman, *The World without Us*, pp. 25–28.

understand this universal. It is not a Hegelian universal arising dialectically out of the movement of history, or a universal of capital brought forth by the present crisis. Geyer and Bright are right to reject those two varieties of the universal. Yet climate change poses for us a question of a human collectivity, an us, pointing to a figure of the universal that escapes our capacity to experience the world. It is more like a universal that arises from a shared sense of a catastrophe. It calls for a global approach to politics without the myth of a global identity, for, unlike a Hegelian universal, it cannot subsume particularities. We may provisionally call it a "negative universal history."[61]

61. I am grateful to Antonio Y. Vasquez-Arroyo for sharing with me his unpublished paper "Universal History Disavowed: On Critical Theory and Postcolonialism," where he has tried to develop this concept of negative universal history on the basis of his reading of Theodor Adorno and Walter Benjamin.

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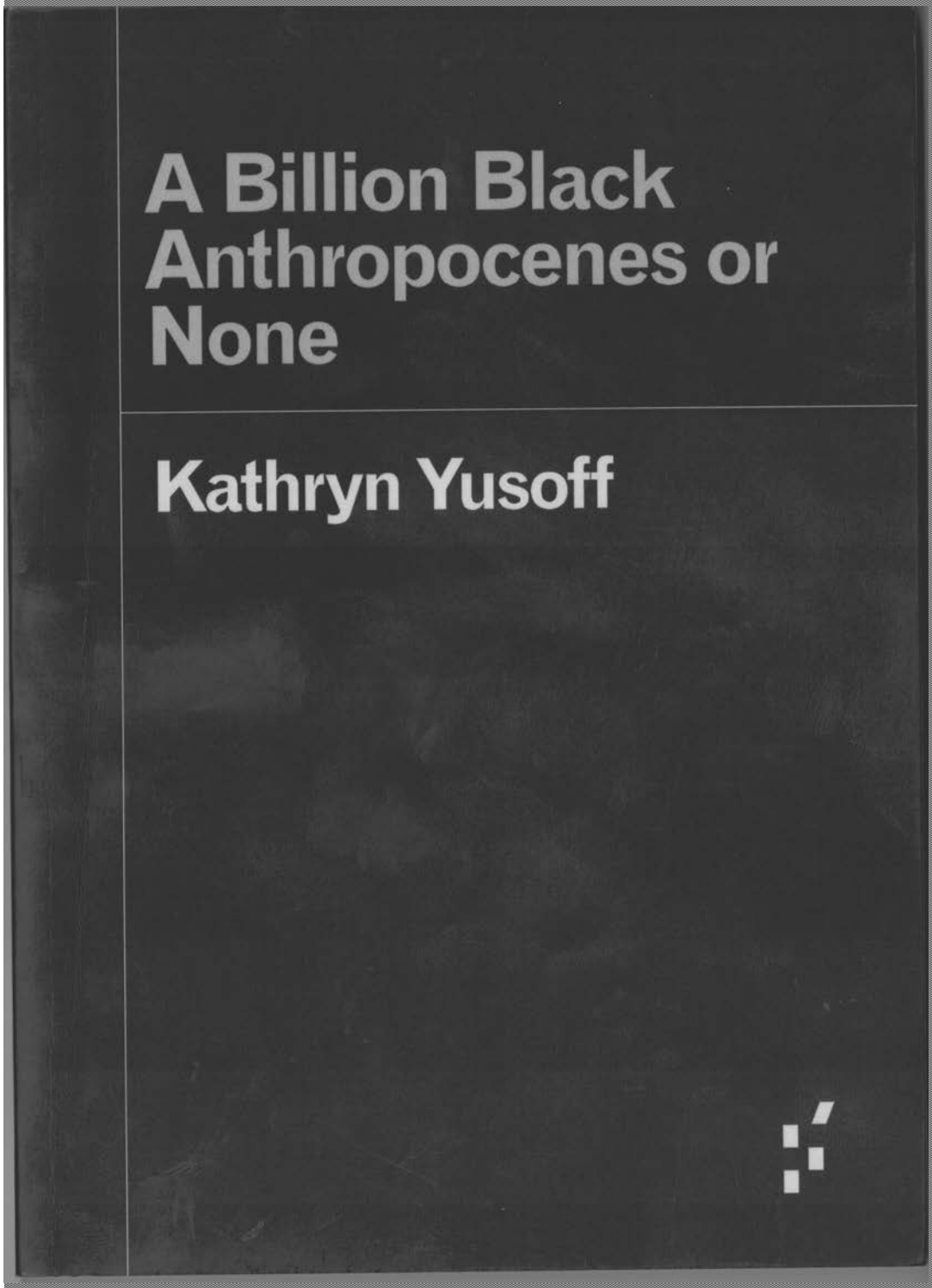

A Billion Black Anthropocenes or None

Kathryn Yusoff

University of Minnesota Press
MINNEAPOLIS

Insurgent Geology: A Billion Black Anthropocenes Now

> If, thus, we allow that an aesthetics is an art of conceiving, imagining, acting, the other of thought is the aesthetics implemented by me and by you to join the dynamics to which we are to contribute. This is the part fallen to me in an aesthetics of chaos.
>
> —ÉDOUARD GLISSANT, *Poetics of Relation*

> Counting her own theory, the theory of nothing, she had opened up the world. In every city in the Old World are Marie Ursule's New World wanderers real and chimeric. . . . They wander as if they have no century, as if they can bound time . . . compasses whose directions tilt, skid off known maps. . . . They are bony with hope, muscular with grief possession.
>
> —DIONNE BRAND, *A Map to the Door of No Return: Notes to Belonging*

Black Geophysics and the "Unthought" Geoaesthetics of the Earth

Inspired by the work of black feminist scholars—Dionne Brand's poetry about "coming out a woman crushing stones," Sylvia Wynter's ideas from "Black Metamorphosis" on the "senses as theoreticians," and Tina Campt's "quiet aesthetics"—this chapter plots the course of a black geophysics crafted in the indices of fungibility and fugitivity, an aesthetics made in the provisional ground of slavery and its continuing afterlives (Hartman 1997).

matter that would make a person into a thing, defying the weight of her flesh arranged in the matter of anti-Blackness.

Hartman urges an attentiveness to how Blackness is made captive. Any recourse to the release of that captivity in descriptive moments of transgression that are held up as agency should be treated with caution in the "tragic continuities between slavery and freedom." Imagining and representing scenes of "freedom" within slavery, a kind of hopeful overcoming, negates the way in which freedom and its conceptual apparatus were built on that subjection, with slavery very much in mind. That is, humanity was never for the whole of humanity, and freedom was only for some and a systemic regulation (and literal reproduction) of slavery for others. There is no recuperation of the captive or the captured in terms of agency within these positions and their legacy in the afterlife of slavery, because there is never the possibility of consent Hartman argues. The Black Anthropocenes or None is thus already a priori null and void. Drawing attention to a billion Black Anthropocenes is not a vehicle of visibility to see the dark underbelly of modernity with greater clarity, because it is already erased and caught in the process of erasure. So "Blackness" and "Slave" could be added to the ledger of Lewis and Maslin's diagram of New World exchange as the *sub-* or *sur*text of racial difference and extraction, but that would do nothing to ameliorate that this was not an exchange by any conception of the imagination, only an "X" that marks the absence of that possibility. Slavery and genocide are the *ur*text to discussions of species and geology, their empirical bedrock and epistemic anchor. Another way to say this is that escape from captivity is only possible within the indices of that grammar of captivity and its interstitial moments, never as idealized outside of it. The deformation of inhuman subjectivity is made from within that matter, and so is its refusal and aesthetics of resistance. That is, to paraphrase Campt (2017, 59), to reread refusal not necessarily as "an inextricable expression of agential intention" but as a muscular refashioning, "bony with hope." The destabilization of the inhuman as a category of chattel into an atmospheric, environmental sense and geophysical "tense" (Campt 2017) repositions the "event" in a different idea of time, space, and matter, an affective environment made through altered categories of description or aesthetics of the inhuman.

The colonial inscription that overwrites the inhuman as property and properties and its parallel geologies of displacement are aptly articulated by Brand (1997) in *Land,* written in the rifts of this geologic reason. She says, "Written as wilderness, wood, nickel, water, coal, rock, prairie, erased as Athabasca, Algonquin, Salish, Inuit . . . hooded in Buxton fugitive, Preston Black Loyalist, railroaded to gold mountain, swimming to *Komagata Maru*. . . . Are we still moving? Each body submerged in its awful history. When will we arrive?" (77). The places of Athabasca, Algonquin, Salish, Inuit, become "wilderness," nickel, coal, prairie, commodities to be extracted. The Buxton community of black Canadians in Ontario, descendants of freed and fugitive slaves who escaped via the Underground Railroad; the "gold mountain" on the continental divide of British Columbia and Alberta, where Chinese migrants mined for gold; the black Loyalists in Preston and their waves of relocation by the British; maroons from Jamaica deported to Nova Scotia, granted less land in surveys for sharecropping than whites; the *Komagata Maru,* which brought British subjects from Punjab, British India, to Canada, and who were refused entry by the racist Canadian exclusion laws; the waves and waves of nonarrival and the uncertainty that can never reassuringly assert "you are Here" to confirm your place in the universe: this "unbearable archaeology" (Brand 1997, 73) of the geologic codes of dispossession time-travel to arrive in the racist impulse of the white cop who stops three friends in a snowstorm on the way to Buxton. These material histories sediment and arrive in the now as a continued challenge to presence in the context of erasure. They arrive as a geophysics of sense.

In *Listening to Images,* Campt develops an idea of "tense" as an affectual force of politics, enacting a movement toward a different theoretical possibility through the destabilization of the mode of

encounter, listening rather than seeing the quiet soundings, blurring the authority of the visual code. She reorganizes the aesthetic sense of engagement away from the dominant reading of images as visual to attenuate both attention and a mode of reading resistance through tense (of the poise and noise of black bodies). Campt's (2017, 16) work on photography's quiet registers of meaning identifies an undercurrent in which we might read "possibilities obliquely . . . the tiny, often miniscule chinks and crevices of what appears to be the inescapable web of capture" in the "terms and tenses of grammar," undercurrents that travel through more surface-led summations. She argues that the future can be conceived in terms of acts and political movements, but "I believe we must not only look but also listen for it in other, less likely places . . . in some of the least celebrated, often most disposable archives" (16). That is, decentering Eurocentric logics is not just a theoretical exercise of decolonization but a realignment of sense through affective infrastructures, an affective mattering in the discourse of materiality and its worlds. Campt says,

> Futurity is, for me, not a question of "hope"—though it is certainly inescapably intertwines with the idea of aspiration. To me it is crucial to think about futurity through a notion of "tense." What is the "tense" of a black feminist future? It is a tense of anteriority, a tense relationship to an idea of possibility that is neither innocent nor naïve. Nor is it necessarily heroic or intentional. It is often humble and strategic, subtle and discriminating. It is devious and exacting. It's not always loud and demanding. It is frequently quiet and opportunistic, dogged and disruptive. (17)

Campt's understanding of new arrangements of sense that are counterintuitive to the directional flow of readings that take place within the intellectual framework of Western liberalism enacts an axiological redirection of sense into new theoretical possibilities (affectual possibilities within the tight spaces of the quotidian rather than on their outsides). Reiterating Wynter's call to take the senses as theoreticians, this unsettles sense and settles it into new formations that have a political charge precisely because they have

a subterranean force that travels underneath and through colonial technologies of space and time. The printmaker's gentle craft is to not subject the woman out the women to the gravitational field, to give her, or rather let her claim, another geophysics of being that does not subject her to an "inevitable" geo-logics of her designated material and symbolic position (a position that she has already claimed for herself in her leap). White Geology offers a geophysics of anti-Blackness, but the black woman held in countergravity expands the dimensions of geologic force through a different tense of possibility and relation to the earth. Rather than being framed in the "vexed genealogy of freedom" that forged the liberal imagination through "entanglements of bondage and liberty" (Hartman 1997, 115), she is partaking of a different gravitational opening, in Césaire's ([1972] 2000, 42) words, "made to the measure of the world."

In the lexicon of geology that takes possession of people and places, delimiting the organization of existence, the refusal of such captivity makes a commons in the measure and pitch of the world, not the exclusive universality of the humanist subject. I think of all the forced stoniness[2] that I have read in this past year through the literatures of slavery and its afterlives, the brittle broken rocks and bones forced together in mines, in the cut of cane on the plantation, the stoniness of bodies held against the imagination of a black life as an empty sign of property that positioned them as a receptacle for white desire and violence (per Hartman), the endurance of a stony patience that doesn't forget love. Rather, this rock poetry finds that love is in the oceanic of the earth. As Brand (1997, 46) imagines slaves on factory ships, whose crank of the neck and

2. Wynter (n.d., 128) describes how, in colonizers' descriptions of slave crucifixion, slaves appeared to them as little affected by their sadistic torture, "behaving all the time with a degree of hardened insolence, and brutal insensibility," suggesting an inability on the colonizers' part to perceive the sensibility of black pain or to understand the courage marshaled against it.

tip of the boat reveal for a moment the horizon, "they moving toward their own bone . . . 'so thank god for the ocean and the sky all implicated, all unconcerned,' they must have said, 'or there'd be nothing to love.'" Lilting, in the shit of the hold and the tip of the waves, "stripped in their life, naked as seaweed, they would have sat and sunk but no, the sky was a doorway, a famine and a jacket." A refusal to be delimited is found in the matter of the world and a home in its maroonage; "they wander as if they have no century, as if they can bound time . . . compasses whose directions tilt, skid off known maps" (46).

Refusal might be understood in terms of the friendship of the "No" that Maurice Blanchot ([1971] 1997, 111–12) locates in the resistance to torture or oppression (perhaps influenced by his own experience in front of a firing squad)—a refusal that affirms the break or the rupture from an unacceptable logic and reason:

> What we refuse is not without value or importance. This is precisely why refusal is necessary. There is a kind of reason that we will no longer accept, there is an appearance of wisdom that horrifies us, there is an offer of agreement and compromise that we will not hear. A rupture has occurred. We have been to this frankness that does not tolerate complicity any longer. When we refuse, we refuse with a movement free from contempt and exaltation, one that is as far as possible anonymous, for the power of refusal is accomplished neither by us nor in our name, but from a very poor beginning that belongs first of all to those who cannot speak . . . refusal is never easy, that we must learn how to refuse and to maintain intact this power of refusal, by the rigor of thinking and modesty of expression that each one of our affirmations must evidence from now on.

Tilting the axis of engagement within a geological optic and intimacy, the inhuman can be claimed as a different kind of resource than in its propertied colonial form—a gravitational force so extravagant, it defies gravity.

Forging a new language of geology must provide a lexicon with which to take apart the Anthropocene, a poetry to refashion a new epoch, a new geology that attends to the racialization of matter (see Silva 2017). Turning to critical black aesthetics is not an attempt to reformulate the Anthropocene into a different scene through black ontologies, ontologies without territories, but to locate more precisely how the praxis of that aesthetic, forged as it was within the context of inhuman intimacies that are inherently antiblack (constituted by the material geographies of colonialism, slavery, and diaspora), locates an insurgent geology. The origins of the Anthropocene continue to erasure and dissimulate violent histories of encounter, dispossession, and death in the geographical imagination. This geologic prehistory has everything to do with the Anthropocene as a condition of the present; it is the material history that constitutes the present in all its geotraumas and thus should be embraced, reworked, and reconstituted in terms of agency *for* the present, *for the end of this world* and the possibility of others, because the world is already turning to face the storm, writing its weather for the geology next time. We are all, after all, involved in geology, from the cosmic mineralogical constitution of our bodies to the practices and aesthetics that fuel our consumption and ongoing extraction. Our desire is constituted in the underground, shaped in the mine and the dark seams of forgotten formations that one day we will become, that we are already becoming. But our relation to the underground is different.

Inside the language of inhuman proximities, the ghosts of geology rise, naming storms, tornados, leaves, and rivers as experience. Césaire (quoted in Brand 2001, 58) writes,

> I should discover once again the secret of great
> Communication and great combustions . . .
>
> I have words vast enough to
> contain you and you, earth, tense drunken earth . . .

TITLE: SLOW VIOLENCE
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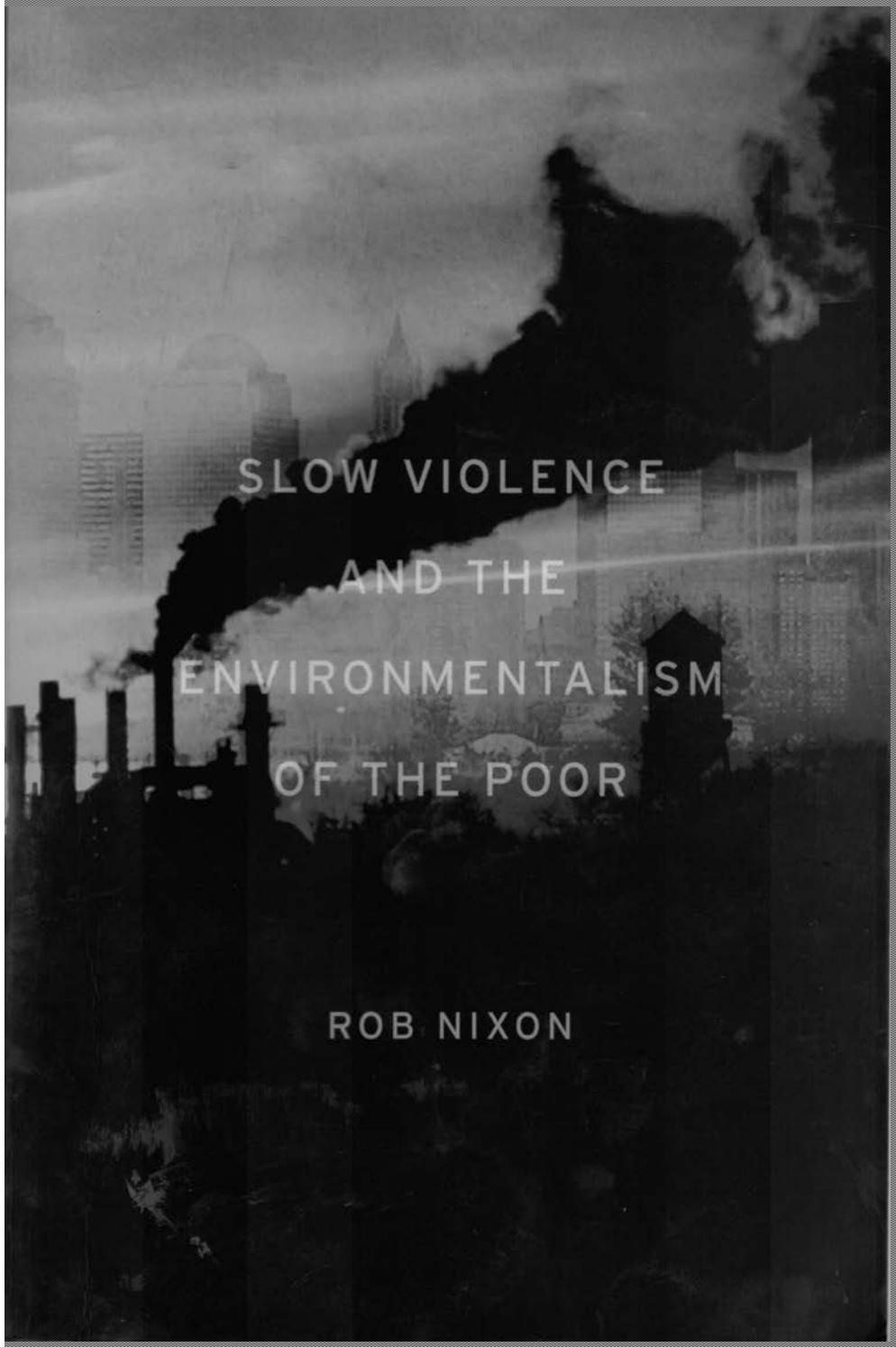

Introduction

> I think of globalization like a light which shines brighter and brighter on a few people and the rest are in darkness, wiped out. They simply can't be seen. Once you get used to not seeing something, then, slowly, it's no longer possible to see it.
>
> —Arundhati Roy

> I think the economic logic behind dumping a load of toxic waste in the lowest-wage country is impeccable and we should face up to that. . . . I've always thought that countries in Africa are vastly under polluted; their air quality is probably vastly inefficiently low compared to Los Angeles. . . . Just between you and me, shouldn't the World Bank be encouraging more migration of the dirty industries to the Least Developed Countries?
>
> —Lawrence Summers, confidential World Bank memo, December 12, 1991

When Lawrence Summers, then president of the World Bank, advocated that the bank develop a scheme to export rich nation garbage, toxic waste, and heavily polluting industries to Africa, he did so in the calm voice of global managerial reasoning.[1] Such a scheme, Summers elaborated, would help correct an inefficient global imbalance in toxicity. Underlying his plan is an overlooked but crucial subsidiary benefit that he

outlined: offloading rich-nation toxins onto the world's poorest continent would help ease the growing pressure from rich-nation environmentalists who were campaigning against garbage dumps and industrial effluent that they condemned as health threats and found aesthetically offensive. Summers thus rationalized his poison-redistribution ethic as offering a double gain: it would benefit the United States and Europe economically, while helping appease the rising discontent of rich-nation environmentalists. Summers' arguments assumed a direct link between aesthetically unsightly waste and Africa as an out-of-sight continent, a place remote from green activists' terrain of concern. In Summers' win-win scenario for the global North, the African recipients of his plan were triply discounted: discounted as political agents, discounted as long-term casualties of what I call in this book "slow violence," and discounted as cultures possessing environmental practices and concerns of their own. I begin with Summers' extraordinary proposal because it captures the strategic and representational challenges posed by slow violence as it impacts the environments—and the environmentalism—of the poor.

Three primary concerns animate this book, chief among them my conviction that we urgently need to rethink—politically, imaginatively, and theoretically—what I call "slow violence." By slow violence I mean a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all. Violence is customarily conceived as an event or action that is immediate in time, explosive and spectacular in space, and as erupting into instant sensational visibility. We need, I believe, to engage a different kind of violence, a violence that is neither spectacular nor instantaneous, but rather incremental and accretive, its calamitous repercussions playing out across a range of temporal scales. In so doing, we also need to engage the representational, narrative, and strategic challenges posed by the relative invisibility of slow violence. Climate change, the thawing cryosphere, toxic drift, biomagnification, deforestation, the radioactive aftermaths of wars, acidifying oceans, and a host of other slowly unfolding environmental catastrophes present formidable representational obstacles that can hinder our efforts to mobilize and act decisively. The long dyings—the staggered and staggeringly discounted casualties, both human and ecological that result from war's toxic aftermaths or

climate change—are underrepresented in strategic planning as well as in human memory.

Had Summers advocated invading Africa with weapons of mass destruction, his proposal would have fallen under conventional definitions of violence and been perceived as a military or even an imperial invasion. Advocating invading countries with mass forms of slow-motion toxicity, however, requires rethinking our accepted assumptions of violence to include slow violence. Such a rethinking requires that we complicate conventional assumptions about violence as a highly visible act that is newsworthy because it is event focused, time bound, and body bound. We need to account for how the temporal dispersion of slow violence affects the way we perceive and respond to a variety of social afflictions—from domestic abuse to posttraumatic stress and, in particular, environmental calamities. A major challenge is representational: how to devise arresting stories, images, and symbols adequate to the pervasive but elusive violence of delayed effects. Crucially, slow violence is often not just attritional but also exponential, operating as a major threat multiplier; it can fuel long-term, proliferating conflicts in situations where the conditions for sustaining life become increasingly but gradually degraded.

Politically and emotionally, different kinds of disaster possess unequal heft. Falling bodies, burning towers, exploding heads, avalanches, volcanoes, and tsunamis have a visceral, eye-catching and page-turning power that tales of slow violence, unfolding over years, decades, even centuries, cannot match. Stories of toxic buildup, massing greenhouse gases, and accelerated species loss due to ravaged habitats are all cataclysmic, but they are scientifically convoluted cataclysms in which casualties are postponed, often for generations. In an age when the media venerate the spectacular, when public policy is shaped primarily around perceived immediate need, a central question is strategic and representational: how can we convert into image and narrative the disasters that are slow moving and long in the making, disasters that are anonymous and that star nobody, disasters that are attritional and of indifferent interest to the sensation-driven technologies of our image-world? How can we turn the long emergencies of slow violence into stories dramatic enough to rouse public sentiment and warrant political intervention, these emergencies whose repercussions have given rise to some of the most critical challenges of our time?

This book's second, related focus concerns the environmentalism of the poor, for it is those people lacking resources who are the principal casualties of slow violence. Their unseen poverty is compounded by the invisibility of the slow violence that permeates so many of their lives. Our media bias toward spectacular violence exacerbates the vulnerability of ecosystems treated as disposable by turbo-capitalism while simultaneously exacerbating the vulnerability of those whom Kevin Bales, in another context, has called "disposable people."[2] It is against such conjoined ecological and human disposability that we have witnessed a resurgent environmentalism of the poor, particularly (though not exclusively) across the so-called global South. So a central issue that emerges is strategic: if the neoliberal era has intensified assaults on resources, it has also intensified resistance, whether through isolated site-specific struggles or through activism that has reached across national boundaries in an effort to build translocal alliances.

"The poor" is a compendious category subject to almost infinite local variation as well as to fracture along fault lines of ethnicity, gender, race, class, region, religion, and generation. Confronted with the militarization of both commerce and development, impoverished communities are often assailed by coercion and bribery that test their cohesive resilience. How much control will, say, a poor hardwood forest community have over the mix of subsistence and market strategies it deploys in attempts at adaptive survival? How will that community negotiate competing definitions of its own poverty and long-term wealth when the guns, the bulldozers, and the moneymen arrive? Such communities typically have to patch together threadbare improvised alliances against vastly superior military, corporate, and media forces. As such, impoverished resource rebels can seldom afford to be single-issue activists: their green commitments are seamed through with other economic and cultural causes as they experience environmental threat not as a planetary abstraction but as a set of inhabited risks, some imminent, others obscurely long term.

The status of environmental activism among the poor in the global South has shifted significantly in recent years. Where green or environmental discourses were once frequently regarded with skepticism as neocolonial, Western impositions inimical to the resource priorities of the poor in the global South, such attitudes have been tempered by the gathering visibility and credibility of environmental justice movements that have pushed

back against an antihuman environmentalism that too often sought (under the banner of universalism) to impose green agendas dominated by rich nations and Western NGOs. Among those who inhabit the frontlines of the global resource wars, suspicions that environmentalism is another guise of what Andrew Ross calls "planetary management" have not, of course, been wholly allayed.[3] But those suspicions have eased somewhat as the spectrum of what counts as environmentalism has broadened. Western activists are now more prone to recognize, engage, and learn from resource insurrections among the global poor that might previously have been discounted as not properly environmental.[4] Indeed, I believe that the fate of environmentalism—and more decisively, the character of the biosphere itself—will be shaped significantly in decades to come by the tension between what Ramachandra Guha and Joan Martinez-Alier have called "full-stomach" and "empty-belly" environmentalism.[5]

The challenge of visibility that links slow violence to the environmentalism of the poor connects directly to this book's third circulating concern—the complex, often vexed figure of the environmental writer-activist. In the chapters that follow I address not just literary but more broadly rhetorical and visual challenges posed by slow violence; however, I place particular emphasis on combative writers who have deployed their imaginative agility and worldly ardor to help amplify the media-marginalized causes of the environmentally dispossessed. I have sought to stress those places where writers and social movements, often in complicated tandem, have strategized against attritional disasters that afflict embattled communities. The writers I engage are geographically wide ranging—from various parts of the African continent, from the Middle East, India, the Caribbean, the United States, and Britain—and work across a variety of forms. Figures like Wangari Maathai, Arundhati Roy, Indra Sinha, Ken Saro-Wiwa, Abdulrahman Munif, Njabulo Ndebele, Nadine Gordimer, Jamaica Kincaid, Rachel Carson, and June Jordan are alive to the inhabited impact of corrosive transnational forces, including petro-imperialism, the megadam industry, outsourced toxicity, neocolonial tourism, antihuman conservation practices, corporate and environmental deregulation, and the militarization of commerce, forces that disproportionately jeopardize the livelihoods, prospects, and memory banks of the global poor. Among the writers I consider, some have testified in relative isolation, some have helped instigate movements

for environmental justice, and yet others, in aligning themselves with preexisting movements, have given imaginative definition to the issues at stake while enhancing the public visibility of the cause.

Relations between movements and writers are often fraught and frictional, not least because such movements themselves are susceptible to fracture from both external and internal pressures.[6] That said, the writers I consider are enraged by injustices they wish to see redressed, injustices they believe they can help expose, silences they can help dismantle through testimonial protest, rhetorical inventiveness, and counterhistories in the face of formidable odds. Most are restless, versatile writers ready to pit their energies against what Edward Said called "the normalized quiet of unseen power."[7] This normalized quiet is of particular pertinence to the hushed havoc and injurious invisibility that trail slow violence.

Slow Violence

In this book, I have sought to address our inattention to calamities that are slow and long lasting, calamities that patiently dispense their devastation while remaining outside our flickering attention spans—and outside the purview of a spectacle-driven corporate media. The insidious workings of slow violence derive largely from the unequal attention given to spectacular and unspectacular time. In an age that venerates instant spectacle, slow violence is deficient in the recognizable special effects that fill movie theaters and boost ratings on TV. Chemical and radiological violence, for example, is driven inward, somatized into cellular dramas of mutation that—particularly in the bodies of the poor—remain largely unobserved, undiagnosed, and untreated. From a narrative perspective, such invisible, mutagenic theater is slow paced and open ended, eluding the tidy closure, the containment, imposed by the visual orthodoxies of victory and defeat.

Let me ground this point by referring, in conjunction, to Rachel Carson's *Silent Spring* and Frantz Fanon's *The Wretched of the Earth*. In 1962 *Silent Spring* jolted a broad international public into an awareness of the protracted, cryptic, and indiscriminate casualties inflicted by dichlorodiphenyltrichloroethane (DDT). Yet, just one year earlier, Fanon, in the opening pages of *Wretched of the Earth*, had comfortably invoked DDT as an affirmative metaphor for anticolonial violence: he called for a DDT-filled spray gun to be

wielded as a weapon against the "parasites" spread by the colonials' Christian church.[8] Fanon's drama of decolonization is, of course, studded with the overt weaponry whereby subjugation is maintained ("by dint of a great array of bayonets and cannons") or overthrown ("by the searing bullets and bloodstained knives") after "a murderous and decisive struggle between the two protagonists."[9] Yet his temporal vision of violence—and of what Aimé Césaire called "the rendezvous of victory"—was uncomplicated by the concerns that an as-yet inchoate environmental justice movement (catalyzed in part by *Silent Spring*) would raise about lopsided risks that permeate the land long term, blurring the clean lines between defeat and victory, between colonial dispossession and official national self-determination.[10] We can certainly read Fanon, in his concern with land as property and as fount of native dignity, retrospectively with an environmental eye. But our theories of violence today must be informed by a science unavailable to Fanon, a science that addresses environmentally embedded violence that is often difficult to source, oppose, and once set in motion, to reverse.

Attritional catastrophes that overspill clear boundaries in time and space are marked above all by displacements—temporal, geographical, rhetorical, and technological displacements that simplify violence and underestimate, in advance and in retrospect, the human and environmental costs. Such displacements smooth the way for amnesia, as places are rendered irretrievable to those who once inhabited them, places that ordinarily pass unmourned in the corporate media. Places like the Marshall Islands, subjected between 1948 and 1958 to sixty-seven American atmospheric nuclear "tests," the largest of them equal in force to 1,000 Hiroshima-sized bombs. In 1956 the Atomic Energy Commission declared the Marshall Islands "by far the most contaminated place in the world," a condition that would compromise independence in the long term, despite the islands' formal ascent in 1979 into the ranks of self-governing nations.[11] The island republic was still in part governed by an irradiated past: well into the 1980s its history of nuclear colonialism, long forgotten by the colonizers, was still delivering into the world "jellyfish babies"—headless, eyeless, limbless human infants who would live for just a few hours.[12]

If, as Said notes, struggles over geography are never reducible to armed struggle but have a profound symbolic and narrative component as well, and if, as Michael Watts insists, we must attend to the "violent geographies

of fast capitalism," we need to supplement both these injunctions with a deeper understanding of the slow violence of delayed effects that structures so many of our most consequential forgettings.[13] Violence, above all environmental violence, needs to be seen—and deeply considered—as a contest not only over space, or bodies, or labor, or resources, but also over time. We need to bear in mind Faulkner's dictum that "the past is never dead. It's not even past." His words resonate with particular force across landscapes permeated by slow violence, landscapes of temporal overspill that elude rhetorical cleanup operations with their sanitary beginnings and endings.[14]

Kwame Anthony Appiah famously asked, "Is the 'Post-' in 'Postcolonial' the 'Post-' in 'Postmodern'?" As environmentalists we might ask similarly searching questions of the "post" in postindustrial, post–Cold War, and postconflict.[15] For if the past of slow violence is never past, so too the post is never fully post: industrial particulates and effluents live on in the environmental elements we inhabit and in our very bodies, which epidemiologically and ecologically are never our simple contemporaries.[16] Something similar applies to so-called postconflict societies whose leaders may annually commemorate, as marked on the calendar, the official cessation of hostilities, while ongoing intergenerational slow violence (inflicted by, say, unexploded landmines or carcinogens from an arms dump) may continue hostilities by other means.

Ours is an age of onrushing turbo-capitalism, wherein the present feels more abbreviated than it used to—at least for the world's privileged classes who live surrounded by technological time-savers that often compound the sensation of not having enough time. Consequently, one of the most pressing challenges of our age is how to adjust our rapidly eroding attention spans to the slow erosions of environmental justice. If, under neoliberalism, the gulf between enclaved rich and outcast poor has become ever more pronounced, ours is also an era of enclaved time wherein for many speed has become a self-justifying, propulsive ethic that renders "uneventful" violence (to those who live remote from its attritional lethality) a weak claimant on our time. The attosecond pace of our age, with its restless technologies of infinite promise and infinite disappointment, prompts us to keep flicking and clicking distractedly in an insatiable—and often insensate—quest for quicker sensation.

The oxymoronic notion of slow violence poses a number of challenges: scientific, legal, political, and representational. In the long arc between the

emergence of slow violence and its delayed effects, both the causes and the memory of catastrophe readily fade from view as the casualties incurred typically pass untallied and unremembered. Such discounting in turn makes it far more difficult to secure effective legal measures for prevention, restitution, and redress. Casualties from slow violence are, moreover, out of sync not only with our narrative and media expectations but also with the swift seasons of electoral change. Politicians routinely adopt a "last in, first out" stance toward environmental issues, admitting them when times are flush, dumping them as soon as times get tight. Because preventative or remedial environmental legislation typically targets slow violence, it cannot deliver dependable electoral cycle results, even though those results may ultimately be life saving. Relative to bankable pocketbook actions—there'll be a tax rebate check in the mail next August—environmental payouts seem to lurk on a distant horizon. Many politicians—and indeed many voters—routinely treat environmental action as critical yet not urgent. And so generation after generation of two- or four-year cycle politicians add to the pileup of deferrable actions deferred. With rare exceptions, in the domain of slow violence "yes, but not now, not yet" becomes the modus operandi.

How can leaders be goaded to avert catastrophe when the political rewards of their actions will not accrue to them but will be reaped on someone else's watch decades, even centuries, from now? How can environmental activists and storytellers work to counter the potent political, corporate, and even scientific forces invested in immediate self-interest, procrastination, and dissembling? We see such dissembling at work, for instance, in the afterword to Michael Crichton's 2004 environmental conspiracy novel, *State of Fear*, wherein he argued that we needed twenty more years of data gathering on climate change before any policy decisions could be ventured.[17] Although the National Academy of Sciences had assured former president George W. Bush that humans were indeed causing the earth to warm, Bush shopped around for views that accorded with his own skepticism and found them in a private meeting with Crichton, whom he described as "an expert scientist."

To address the challenges of slow violence is to confront the dilemma Rachel Carson faced almost half a century ago as she sought to dramatize what she eloquently called "death by indirection."[18] Carson's subjects were biomagnification and toxic drift, forms of oblique, slow-acting violence that,

like climate change, pose formidable imaginative difficulties for writers and activists alike. In struggling to give shape to amorphous menace, both Carson and reviewers of *Silent Spring* resorted to a narrative vocabulary: one reviewer portrayed the book as exposing "the new, unplotted and mysterious dangers we insist upon creating all around us,"[19] while Carson herself wrote of "a shadow that is no less ominous because it is formless and obscure."[20] To confront slow violence requires, then, that we plot and give figurative shape to formless threats whose fatal repercussions are dispersed across space and time. The representational challenges are acute, requiring creative ways of drawing public attention to catastrophic acts that are low in instant spectacle but high in long-term effects. To intervene representationally entails devising iconic symbols that embody amorphous calamities as well as narrative forms that infuse those symbols with dramatic urgency.

Slow Violence and Structural Violence

Seven years after Rachel Carson turned our attention to the lethal mechanisms of "death by indirection," Johan Galtung, the influential Norwegian mathematician and sociologist, coined the term "indirect or structural violence."[21] Galtung's theory of structural violence is pertinent here because some of his concerns overlap with the concerns that animate this book, while others help throw into relief the rather different features I have sought to highlight by introducing the term "slow violence." Structural violence, for Galtung, stands in opposition to the more familiar personal violence that dominates our conceptions of what counts as violence per se.[22] Galtung was concerned, as I am, with widening the field of what constitutes violence. He sought to foreground the vast structures that can give rise to acts of personal violence and constitute forms of violence in and of themselves. Such structural violence may range from the unequal morbidity that results from a commodified health care system, to racism itself. What I share with Galtung's line of thought is a concern with social justice, hidden agency, and certain forms of violence that are imperceptible.

In these terms, for example, we can recognize that the structural violence embodied by a neoliberal order of austerity measures, structural adjustment, rampant deregulation, corporate megamergers, and a widening gulf between rich and poor is a form of covert violence in its own right

that is often a catalyst for more recognizably overt violence. For an expressly environmental example of structural violence, one might cite Wangari Maathai's insistence that the systemic burdens of national debt to the IMF and World Bank borne by many so-called developing nations constitute a major impediment to environmental sustainability.[23] So, too, feminist earth scientist Jill Schneiderman, one of our finest thinkers about environmental time, has written about the way in which environmental degradation may "masquerade as inevitable."[24]

For all the continuing pertinence of the theory of structural violence and for all the modifications the theory has undergone, the notion bears the impress of its genesis during the high era of structuralist thinking that tended toward a static determinism. We see this, for example, in Galtung's insistence that "structural violence is silent, it does not show—its is essentially static, it *is* the tranquil waters."[25] In contrast to the static connotations of structural violence, I have sought, through the notion of slow violence, to foreground questions of time, movement, and change, however gradual. The explicitly temporal emphasis of slow violence allows us to keep front and center the representational challenges and imaginative dilemmas posed not just by imperceptible violence but by imperceptible change whereby violence is decoupled from its original causes by the workings of time. Time becomes an actor in complicated ways, not least because the temporal templates of our spectacle-driven, 24/7 media life have shifted massively since Galtung first advanced his theory of structural violence some forty years ago. To talk about slow violence, then, is to engage directly with our contemporary politics of speed.

Simply put, structural violence is a theory that entails rethinking different notions of causation and agency with respect to violent effects. Slow violence, by contrast, might well include forms of structural violence, but has a wider descriptive range in calling attention, not simply to questions of agency, but to broader, more complex descriptive categories of violence enacted slowly over time. The shift in the relationship between human agency and time is most dramatically evident in our enhanced understanding of the accelerated changes occurring at two scalar extremes—in the life-sustaining circuits of planetary biophysics and in the wired brain's neural circuitry. The idea of structural violence predated both sophisticated contemporary ice-core sampling methods and the emergence of cyber

technology. My concept of slow violence thus seeks to respond both to recent, radical changes in our geological perception and our changing technological experiences of time.

Let me address the geological aspect first. In 2000, Paul Crutzen, the Nobel Prize–winning atmospheric chemist, introduced the term "the Anthropocene Age" (which he dated to James Watt's invention of the steam engine). Through the notion of "the Anthropocene Age," Crutzen sought to theorize an unprecedented epochal effect: the massive impact by the human species, from the industrial era onward, on our planet's life systems, an impact that, as his term suggests, is geomorphic, equal in force and in long-term implications to a major geological event.[26] Crutzen's attempt to capture the epochal scale of human activity's impact on the planet was followed by Will Steffen's elaboration, in conjunction with Crutzen and John McNeill, of what they dubbed the Great Acceleration, a second stage of the Anthropocene Age that they dated to the mid-twentieth century. Writing in 2007, Steffen et al. noted how "nearly three-quarters of the anthropogenically driven rise in CO_2 concentration has occurred since 1950 (from about 310 to 380 ppm), and about half of the total rise (48 ppm) has occurred in just the last 30 years."[27] The Australian environmental historian Libby Robin has put the case succinctly: "We have recently entered a new geological epoch, the Anthropocene. There is now considerable evidence that humanity has altered the biophysical systems of Earth, not just the carbon cycle . . . but also the nitrogen cycle and ultimately the atmosphere and climate of the whole globe."[28] What, then, are the consequences for our experience of time of this newfound recognition that we have inadvertently, through our unprecedented biophysical species power, inaugurated an Anthropocene Age and are now engaged in (and subject to) the hurtling changes of the Great Acceleration?

Over the past two decades, this high-speed planetary modification has been accompanied (at least for those increasing billions who have access to the Internet) by rapid modifications to the human cortex. It is difficult, but necessary, to consider simultaneously a geologically-paced plasticity, however relatively rapid, and the plasticity of brain circuits reprogrammed by a digital world that threatens to "info-whelm" us into a state of perpetual distraction. If an awareness of the Great Acceleration is (to put it mildly) unevenly distributed, the experience of accelerated connectivity (and the paradoxical disconnects that can accompany it) is increasingly widespread.

In an age of degraded attention spans it becomes doubly difficult yet increasingly urgent that we focus on the toll exacted, over time, by the slow violence of ecological degradation. We live, writes Cory Doctorow, in an era when the electronic screen has become an "ecosystem of interruption technologies."[29] Or as former Microsoft executive Linda Stone puts it, we now live in an age of "continuous partial attention."[30] Fast is faster than it used to be, and story units have become concomitantly shorter. In this cultural milieu of digitally speeded up time, and foreshortened narrative, the intergenerational aftermath becomes a harder sell. So to render slow violence visible entails, among other things, redefining speed: we see such efforts in talk of accelerated species loss, rapid climate change, and in attempts to recast "glacial"—once a dead metaphor for "slow"—as a rousing, iconic image of unacceptably fast loss.

Efforts to make forms of slow violence more urgently visible suffered a setback in the United States in the aftermath of 9/11, which reinforced a spectacular, immediately sensational, and instantly hyper-visible image of what constitutes a violent threat. The fiery spectacle of the collapsing towers was burned into the national psyche as *the* definitive image of violence, setting back by years attempts to rally public sentiment against climate change, a threat that is incremental, exponential, and far less sensationally visible. Condoleezza Rice's strategic fantasy of a mushroom cloud looming over America if the United States failed to invade Iraq gave further visual definition to cataclysmic violence as something explosive and instantaneous, a recognizably cinematic, immediately sensational, pyrotechnic event.

The representational bias against slow violence has, furthermore, a critically dangerous impact on what counts as a casualty in the first place. Casualties of slow violence—human and environmental—are the casualties most likely not to be seen, not to be counted. Casualties of slow violence become light-weight, disposable casualties, with dire consequences for the ways wars are remembered, which in turn has dire consequences for the projected casualties from future wars. We can observe this bias at work in the way wars, whose lethal repercussions spread across space and time, are tidily bookended in the historical record. Thus, for instance, a 2003 *New York Times* editorial on Vietnam declared that "during our dozen years there, the U.S. killed and helped kill at least 1.5 million people."[31] But that simple phrase "during our dozen years there" shrinks the toll, foreshortening the ongoing

slow-motion slaughter: hundreds of thousands survived the official war years, only to slowly lose their lives later to Agent Orange. In a 2002 study, the environmental scientist Arnold Schecter recorded dioxin levels in the bloodstreams of Bien Hoa residents at 135 times the levels of Hanoi's inhabitants, who lived far north of the spraying.[32] The afflicted include thousands of children born decades after the war's end. More than thirty years after the last spray run, Agent Orange continues to wreak havoc as, through biomagnification, dioxins build up in the fatty tissues of pivotal foods such as duck and fish and pass from the natural world into the cooking pot and from there to ensuing human generations. An Institute of Medicine committee has by now linked seventeen medical conditions to Agent Orange; indeed, as recently as 2009 it uncovered fresh evidence that exposure to the chemical increases the likelihood of developing Parkinson's disease and ischemic heart disease.[33] Under such circumstances, wherein long-term risks continue to emerge, to bookend a war's casualties with the phrase "during our dozen years there" is misleading: that small, seemingly innocent phrase is a powerful reminder of how our rhetorical conventions for bracketing violence routinely ignore ongoing, belated casualties.

Slow Violence and Strategies of Representation: Writer-Activism

How do we bring home—and bring emotionally to life—threats that take time to wreak their havoc, threats that never materialize in one spectacular, explosive, cinematic scene? *Apprehension* is a critical word here, a crossover term that draws together the domains of perception, emotion, and action. To engage slow violence is to confront layered predicaments of apprehension: to apprehend—to arrest, or at least mitigate—often imperceptible threats requires rendering them apprehensible to the senses through the work of scientific and imaginative testimony. An influential lineage of environmental thought gives primacy to immediate sensory apprehension, to sight above all, as foundational for any environmental ethics of place. George Perkins Marsh, the mid-nineteenth-century environmental pioneer, argued in *Man and Nature* that "the power most important to cultivate, and, at the same time, hardest to acquire, is that of seeing what is before him."[34] Aldo Leopold similarly insisted that "we can be ethical only toward what we can see."[35] But

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DIAGØNALS ØF EMPTINESS

We scour the boulevard, scavengers in search of discarded toys, tech and consumer electronics. The French regulations that deal with the detritus of life seem to be working well in Nevers, as there is little to find on the streets. The NØ SCHOOL trip to the local recycling complex further reveals such etiquettes. Built in the mid-2000s the site is owned by the city but runs as a commercial enterprise that sorts recycled material and burns its leftover waste. We learn the plant is the last such site in France, in which recycled material is manually sorted. The majority of those working on the factory floor are recent immigrants to France. Others, due to difficult life circumstances, seek routes out of adversity. Supporting employee integration and transformation, the company provides French language classes. Our 'tour guide' proudly shares how staff only stay a few months as both parties benefit from short-term interdependencies, workers quickly move on to become truck drivers, hairdressers and office clerks. Socially minded enterprise pitched as the efficiency of recycling and reuse, extends beyond binary material categories. Humanity's capacity for survival, re-introduced into a waste chain that ends with the production of a toxic dust. Graded into various levels, the corrupted particles return to the land, as base layers for the construction industry. As we stand, amid compacted piles of paper, plastic and tin, Tsing (2017) concept of salvage accumulation becomes acutely present. Defined as the generative means through which capital harvests value from the fringes, the realities of such transactions are executed via human and material fallout. The actualities of circular economies, performed before our eyes.

Further dérives reveal that there are no repair shops in Nevers centre. Even the ubiquitous string of mobile phone restoration stores are missing. Ghost signs on buildings provide evidence of past trade, faded etched echoes of another time. Thierry, my host, and his neighbour Cyrille, explain the death of rural city centres across France. In part the result of 1960s planning, where out of town shopping centres began to replace century old urban hubs. Today, some 21% of Nevers's commercial units are empty. Building on this line, Thierry and Cyrille, introduce the notion of the French Empty Diagonal, Diagonale du Vide.

The origins of Diagonale du Vide are not specifically known but the term has broadly been used to describe a diagonal band or line, which depending on what map you read stretches from the south-west to north-east; or south-east to the north-east. We joke that whatever way you cut it, Nevers, given its central position, is not lucky. Characterised by low population density, coupled with limited socio-economic conditions, the diagonal is somewhat rooted in the French geographer, Jean-François Gravier's book 'Paris and the French Desert', in which he traces the compounded effects of the centralisation of power in Paris from French kings, to political and industrial revolutions, to then contemporary context. Written in 1947, Gravier's post war view of the 'the French desert' captured not only the public imagination, but has over the last six decades held some weight; with other countries, scholars and practitioners adopting the term "desertification" to refer to rural depopulation and exodus combined with the breakdown of community through lack of employment opportunities, changes in agricultural practices and, in some cases, the ruin

of land and soil. Critics of such discourses of desertification have noted how they fail to take into account the complexities, activities and imaginaries of the relations that remain; others point to the pejorative and alarmist tone of such terms, advocating instead a more neutral position.

While the decrease of rural populations in France can be traced back to the beginnings of the 20thcentury, since 1968 Nevers has experienced a steady decline in population, with the surrounding regions' density being described in terms of 'absolute and regular decline', 'absolute but irregular decline' and 'permanent slowdown'. Over the decades multiple initiatives have been introduced as a means to revitalise such areas. The most recent led by the Caisse des Dépôts is a national 24-month regeneration programme, in which Nevers has been selected as one of a number of small cities (defined as having populations between 15,000-100,000), which will gain support to address city centre vacancy and decay. Current plans focus on creating pathways through the centre, so that streets with less visibility become more active. Other initiatives look towards increasing visitor flow via means of cultural activities and new forms of 'nature' related tourism. The city has also introduced taxes on properties empty for longer than two years and currently fashions 'fake' shop fronts, which are deployed as masks to cover up the void, creating in turn illusions of activity.

It is against this background that we speak towards setting up "a unique international summer school, aimed at students, artists, designers, makers, hackers, activists and educators who wish to further their skills and engage in critical research around the social and environmental impacts of information and communication technologies", that NØ SCHOOL unfolds. Accompanying this call out are themes relating to E-Waste, discard, repair, maintenance, recyclism, obsoletism, dead and zombie media. As the school days progress, working at the local node becomes a direct method of intervention that is activated across the schools, hardware, networking and publishing studios. To name but a few projects, participants begin to create local network hotspots, hack the small adverts section in the daily news paper, collect found objects and flora from the streets, create city based wifi-treasure huts, boil beetroot to make print dye, and build their own speakers and printers from discarded parts. Emphasis is placed on generating new directions from the inputs and materials that are found in the immediate surrounds.

As participants and teachers, consciously or not, in the process of such engagements, we are becoming active agents, entangled now in the conditions that relate to Nevers history and contemporary condition. Inextricably interlinked, our presence in this quiet city produces a direct effect on local ecologies–restaurants, bars, galleries, the empty spaces we take over, the footprints we make on the river beach, the bats we rescue. From this standpoint, choices begin to emerge as to what level of engagement is played out. Programmes presented at NØ SCHOOL, which already critically place 'the local' at the heart of their work, include WoeLabs, Repair Acts and Restart. Within these projects, parameters are set out via neighbourhood parties, square miles and kilometres. Native patches through which the geo-politics of global flows are explicitly grounded through material inquiries. Contained within these parameters we can also identify Gambiarra logics of action and reaction, process of direct, critical making and disinovation at play. Connecting these programmes and lines of making, doing and playing are techniques such as hard- and software hacking, circuit bending, reverse engineering, glitch, mods and self-builds. These meta-processes connect our collective sensibilities, articulated as a means through which to think-with-and-think-together-through-materials-and-limitations. Limitations are necessary to place emphasis on here, as one could argue it could distinguish NØ SCHOOL's potential to contribute to "critical research around the social and environmental impacts of information and communication technologies". This logic of limitation not only opened our school conversations as the parameters of human capacities, raw materials and computation were explored, but also became evident in the artistic work presented within the programme.

Broadly speaking, if we sit back and reflect on two-weeks of NØ SCHOOL, our sensitivity and sensibility of thinking-with-and-thinking-together-through-materials-and-limitations were rooted to a particular site, in this case Nevers and explored along dimensions of location, time and space. This rooting, itself holds much potential to become a critical, radical act. Contextualised in this manner, NØ SCHOOL is a learning experiment that holds the possibility to enact what cybernetic theorist, Donna Haraway (2016) would consider as the earthbound, which translates in this context to an approach to making that is situated within local conditions, and stays with the trouble of what is presented in this condition. As the first NØ SCHOOL comes to a close, such intentionality develops, while attempting to also retain a caring, playful, fun and open approach. Naturally this requires further stretch and fine-tuning. For now, we can say, we have begun the process, and that the pathways of intent that pre-seeded and flourished here over the last few days, will hopefully continue, far, far beyond it's NØ-Nah-Nevers school 'walls'.

TERESA DILLON, JULY 11TH 2019
AT NØ SCHOOL NEVERS

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TITLE: THE FORCE MAJEURE
Author: Harrison Studio
Year: 2007

The Force Majeure
From 2007 to the Present and Beyond

Reflecting on the Laws of the Conservation of Energy and Exploitation in Ecosystems

Matter/energy can be transformed from one form to another.
Matter/energy can be neither created nor destroyed.
When matter/energy is transformed from one form to another,
there is a net loss of available energy to perform work.
This loss is called entropy.
A system that has been so transformed and has lost energy
moves towards higher local entropy.
A system that maintains its ability to take useful energy into itself
and dissipate unuseful energy
tends to be a healthy, low-entropy system.
If a forest in a watershed is clear-cut
all the useful energies in the forest
are transformed and dispersed.
The energies within topsoil
supporting a multiplicity of lives
as a consequence of erosion, in part are dispersed.
The entropy of the watershed has been increased
by the dispersal of these energies.
The energies so dispersed cannot be retrieved.
What then, watershed, what then.

We as artists have come to understand that entropy is a special case for how energy is defined. When we say entropy is raised in a system we mean the system has lost the energy to maintain itself in its former state in other words it has become more uniform, with less usable energy. When we say the energy has been dispersed the cut wood from the watershed for instance becomes the work of the lumberyard and is no longer available to do the work of the forest. The dictionary defines entropy "the degradation of the matter and energy … to an ultimate state of inert uniformity." In nature, mostly, the dispersal of energy from one system is put to use by another nearby. Hence with the free energy sources being the sun and the available waste of others, nature can and does grow. The difference between how nature works and human industry works is that nature uses the waste it creates and industry in the main does not. Above all nature does not charge a profit. These thoughts inform much of what we later write.

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SATURDAY
03/08

Guided by: Elise Hunchuck

TITLE: BLOOD, SEA
Author: Italo Calvino
Publisher: In: TEXTURES OF THE ANTHROPOCENE: GRAIN, VAPOR, RAY (MIT Press)
Year: 2015

Textures of the Anthropocene
Grain Vapor Ray

Edited by Katrin Klingan, Ashkan Sepahvand,
Christoph Rosol, Bernd M. Scherer

Haus der Kulturen der Welt, Berlin
The MIT Press, Cambridge, MA and London, England

Italo Calvino
Blood, Sea

The conditions that obtained when life had not yet emerged from the oceans have not subsequently changed a great deal for the cells of the human body, bathed by the primordial wave which continues to flow in the arteries. Our blood in fact has a chemical composition analogous to that of the sea of our origins, from which the first living cells and the first multicellular beings derived the oxygen and the other elements necessary to life. With the evolution of more complex organisms, the problem of maintaining a maximum number of cells in contact with the liquid environment could not be solved simply by the expansion of the exterior surface: those organisms endowed with hollow structures, into which the sea water could flow, found themselves at an advantage. But it was only with the ramification of these cavities into a system of blood circulation that distribution of oxygen was guaranteed to the complex of cells, thus making terrestrial life possible. The sea where living creatures were at one time immersed is now enclosed within their bodies.

Basically not much has changed: I swim, I continue swimming in the same warm sea,—*Qfwfq said*,—or rather, the inside isn't changed, what was formerly the outside, where I used to swim under the sun, and where I now swim in darkness, is inside; what's changed is the outside, the present outside, which was the inside before, that's changed all right; however, it doesn't matter very much. I say it doesn't matter very much and you promptly reply: What do you mean, the outside doesn't matter much? What I mean is that if you look at it more closely, from the point of view of the old outside, that is from the present inside, what is

the present outside? It's simply where it's dry, where there is no flux or reflux, and as far as mattering goes, of course, that matters too, inasmuch as it's the outside, since it's been on the outside, since that outside has been outside, and people believe it's more deserving of consideration than the inside. When all is said and done, however, even when it was inside it mattered, though in a more restricted range or so it seemed then. This is what I mean: less deserving of consideration. Well, let's start talking right now about the others, those who are not I, our neighbor: we know our neighbor exists because he's outside, agreed? Outside like the present outside. But before, when the outside was what we swam in, the very dense and very warm ocean, even then there were the others, slippery things, in that old outside, which is like the present inside, and so it is now when I've changed places and given the wheel to Signor Cècere, at the Codogno service station, and in front, next to him, Jenny Fumagalli has taken the passenger's seat, and I've moved in back with Zylphia: the outside, what is the outside? A dry environment, lacking in meaning, a bit crammed (there are four of us in a Volkswagen), where all is indifferent and interchangeable, Jenny Fumagalli, Codogno, Signor Cècere, the service station, and as far as Zylphia is concerned, at the moment when I placed my hand on her knee, at perhaps 15 kilometers from Casalpusterlengo, or else she was the one who started touching me, I don't remember, since outside events tend to be confused, what I felt, I mean the sensation that came from outside, was really a weak business compared to what went through my blood and to what I have felt ever since then, since the time when we were swimming together in the same torrid, blazing ocean, Zylphia and I. The underwater depths were red like the color we see now only inside our eyelids, and the sun's rays penetrated to brighten them in flashes or else in sprays.

We undulated with no sense of direction, drawn by an obscure current so light that it seemed downright impalpable and yet strong enough to drag us up in very high waves and down in their troughs. Zylphia would plunge headlong beneath me in a violet, almost black whirlpool, then soar over me rising toward the more scarlet stripes that ran beneath the luminous vault. We felt all this through the layers of our former surface dilated to maintain the most extended possible contact with that nourishing sea, because at every up and down of the waves there was stuff that passed from outside of us to our inside, all sustenance of every sort, even iron, healthful stuff, in short, and in fact I've never been so well as I was then. Or, to be more precise: I was well since in dilating my surface I increased the possibilities of contact between me and this outside of me that was so precious, but as the zones of my body soaked in marine solution were extended, my volume also increased at the same time, and a more and more voluminous zone within me became unreachable by the element outside, it became arid, dull, and the weight of this dry and torpid thickness I carried within me was the only shadow on my happiness, our happiness, Zylphia's and mine, because the more she splendidly took up space in the sea, the more the inert and opaque thickness grew in her too, unlaved and unlavable, lost to the vital flux, not reached by the messages I transmitted to her through the vibration of the waves. So perhaps I could say I'm better off now than I was then, now that the layers of our former surface, then stretched on the outside, have been turned inside out like a glove, now that all the outside has been turned inward and has entered and pervaded us through filiform ramifications, yes, I could really say this, were it not for the fact that the dull arid zone has been projected outward, has expanded to the extent of the distance between my tweed suit and the fleeting

landscape of the Lodi plain, and it surrounds me, swollen with undesired presences such as Signor Cècere's, with all the thickness that Signor Cècere, formerly, would have enclosed within himself—in his foolish manner of dilating uniformly like a ball—now unfolded before me in a surface unsuitably irregular and detailed, especially in his pudgy neck dotted with pimples, taut in his halfstarched collar at this moment when he is saying: "Oh, you two on the back seat!" and he has slightly shifted the rear-view mirror and has certainly glimpsed what our hands are doing, mine and Zylphia's, our diminutive outside hands, our diminutively sensitive hands that pursue the memory of ourselves swimming, or rather our swimming memory, or rather the presence of what in me and Zylphia continues swimming or being swum, together, as then.

This is a distinction I might bring up to give a clearer idea of before and now: before, we swam, and now we are swum. But on sober reflection I prefer not to go into this, because in reality even when the sea was outside I swam in it the same way I do now, without any intervention of my will, that is to say I was swum even then, no more nor less than now, there was a current that enfolded me and carried me this way and that, a gentle and soft fluid, in which Zylphia and I wallowed, turning on ourselves, hovering over abysses of ruby-colored transparence, hiding among turquoise-colored filaments that wriggled up from the depths; but these sensations of movement—wait and I'll explain it to you—were due only to what? They were due to a kind of general pulsation, no, I don't want to confuse things with the way they are now, because since we've been keeping the sea closed inside us it's natural that in moving it should make this piston effect, but in those days you certainly couldn't have talked about pistons, because you would have had to imagine a

piston without walls, a combustion chamber of infinite volume as the sea appeared infinite to us, or rather the ocean, in which we were immersed, whereas now everything is pulsation and beating and rumble and crackling, inside the arteries and outside, the sea within the arteries that accelerates its course as soon as I feel Zylphia's hand seeking mine, or rather, as soon as I feel the acceleration in the course of Zylphia's arteries as she feels my hand seeking hers (the two flows which are still the same flow of a same sea and which are joined beyond the contact of the thirsty fingertips); and also outside, the opaque thirsty outside that seeks dully to imitate the beat and rumble and crackling of inside, and vibrates in the accelerator under Signor Cècere's foot, and all the line of cars stopped at the exit from the superhighway tries to repeat the pulsing of the ocean now buried inside us, of the red ocean that was once without shores, under the sun.

It is a false sense of movement that this now-motionless line of cars transmits, crackling; then it moves and it's as if it were still, the movement is false, it merely repeats signs and white stripes and roadbeds; and the whole journey has been nothing but false movement in the immobility and indifference of everything that is outside. Only the sea moved and moves, outside or inside, only in that movement did Zylphia and I become aware of each other's presence, even if then we didn't so much as graze each other, even if I was undulating in this direction and she in that, but the sea had only to quicken its rhythm and I became aware of Zylphia's presence, her presence which was different, for example, from Signor Cècere, who was however also around even then and I could sense him as I felt an acceleration of the same sort as that other one but with a negative charge, that is the acceleration of the sea (and now of the blood) with regard to Zylphia was (is) like swimming toward each other, or else like

swimming and chasing each other in play, while the acceleration (of the sea and now of the blood) with regard to Signor Cècere was (is) like a swimming away to avoid him, or else like swimming toward him to make him go away, all of this involving no change in the relationship of our respective distances.

Now it is Signor Cècere who accelerates (the words used are the same but the meanings change) and passes an Alfa Romeo in a curve, and it is with regard to Zylphia that he accelerates, to distract her with a risky maneuver, a false risky maneuver, from the swimming that unites her and me: false, I say, as a maneuver, not as a risk because the risk may well be real, that is to our inside which in a crash could spurt outside; whereas the maneuver in itself changes nothing at all, the distances between Alfa, curve, Volkswagen can assume different values and relationships but nothing essential happens, as nothing essential happens in Zylphia, who doesn't care a bit about Signor Cècere's driving, at most it is Jenny Fumagalli who exults: "My, isn't this car fast?" and her exultation, in the presumption that Signor Cècere's bold driving is for her benefit, is doubly unjustified, first because her inside transmits nothing to her that justifies exultation, and secondly because she is mistaken about Signor Cècere's intentions as he in turn is mistaken, believing he is achieving God knows what with his showing off, just as she, Jenny Fumagalli, was mistaken before about my intentions, when I was at the wheel and she at my side, and there in back next to Zylphia Signor Cècere, too, was mistaken, both concentrating—he and Jenny—on the reverse arrangement of dry layers of surface, unaware—dilated into balls as they were—that the only real things that happen are those that happen in the swimming of our immersed parts; and so this silly business of passing Alfas meaning nothing, like a passing of fixed, immobile, nailed-down objects which continues

to be superimposed on the story of our free and real swimming, continues to seek meaning by interfering with it, in the only silly way it knows, risk of blood, a false return to a sea of blood which would no longer be blood or sea.

Stefan Helmreich
Blood, Waves

The narrator of Italo Calvino's "Blood, Sea," Qfwfq, is a volume of blood—possibly a cell, a drop, the quantity encapsulated in a single human body, or maybe all blood everywhere, ever.[1] Qfwfq's biography stretches back to a time "when life had not emerged from the oceans," and Qfwfq spends the span of the narrative doing two things: remembering a past of flowing freely within a salty sea, and making sense of a present-day circumstance in which Qfwfq finds itself swirling through the veins of a passenger in a Volkswagen automobile, an automobile that is speeding along a snaky road in northern Italy. Calvino's story pulls the reader into a tale of primal and ongoing communion between the substances of blood and seawater, tracking what Calvino, in an italicized scene-setting, names as the "primordial wave" traveling from Earth's oceanic past into today's human bloodstreams, a portion of which, at the end of "Blood, Sea," splashes onto the metal of Qfwfq's Volkswagen car after it swerves to avoid an oncoming Jaguar, and crashes.

Religious studies scholar Gil Anidjar has dissected Calvino's "Blood, Sea" for the way it veers around the politics of blood. Far from unifying all things—let alone all humanity—blood has historically been called into service to create differences and inequalities: by bloodlines, races, sexes, sexualities, health chances, and more.[2] From Patristic Christian fears of menstrual blood, to Iberian Catholic notions of the purity of blood lineage, to those one-drop rules and blood quanta policing African American and Native American identities, to the semiotics of sexuality that suffuse HIV-infected plasma, to cross-species experiments in xenotransfusion, the flow of blood

1 In other Calvino stories, Qfwfq has been a subatomic entity, the first mollusk, and a dinosaur—all pockets of consciousness at turning points in the unfolding of the universe.
2 Gil Anidjar, "The Blood of Freedom," in Annalisa Oboe and Shaul Bassi (eds.), *Experiences of Freedom in Postcolonial Literatures and Cultures*. London: Routledge, 2011, pp. 122–31.

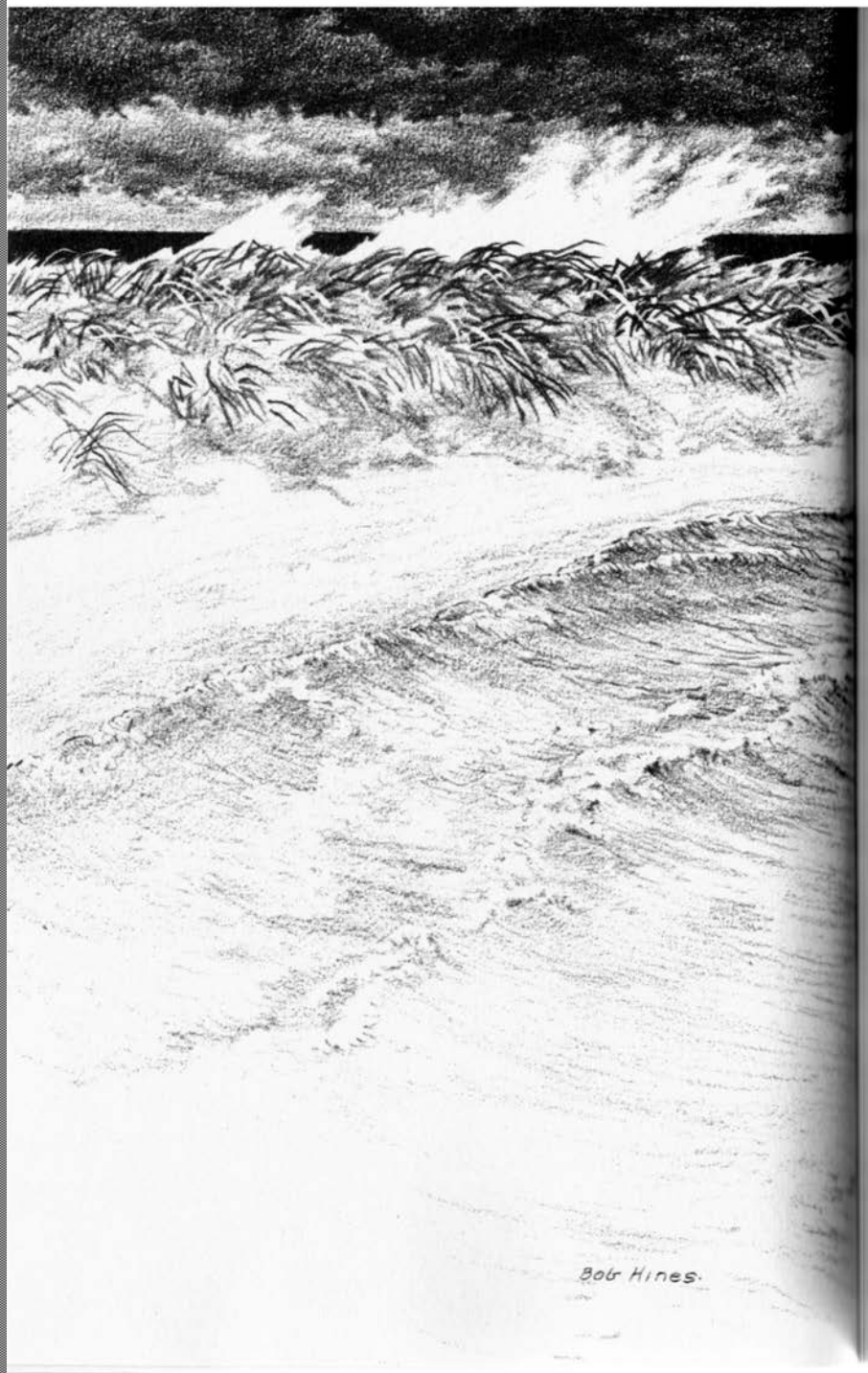
TITLE: THE EDGE OF THE SEA
Author: Rachel Carson
Publisher: Houghton Miffin Co.
Year: 1998

The Edge of the Sea

Rachel Carson

with illustrations by Bob Hines
and a new introduction by Sue Hubbell

A MARINER BOOK
Houghton Mifflin Company
BOSTON NEW YORK



The Marginal World

THE EDGE of the sea is a strange and beautiful place. All through the long history of Earth it has been an area of unrest where waves have broken heavily against the land, where the tides have pressed forward over the continents, receded, and then returned. For no two successive days is the shore line precisely the same. Not only do the tides advance and retreat in their eternal rhythms, but the level of the sea itself is never at rest. It rises or falls as the glaciers melt or grow, as the floor of the deep ocean basins shifts under its increasing load of sediments, or as the earth's crust along the continental margins warps up or down in adjustment to strain and tension. Today a little more land may belong to the sea, tomorrow a little less. Always the edge of the sea remains an elusive and indefinable boundary.

The shore has a dual nature, changing with the swing of the tides, belonging now to the land, now to the sea. On the ebb tide it knows the harsh extremes of the land world, being exposed to heat and cold, to wind, to rain and drying sun. On the flood tide it is a water world, returning briefly to the relative stability of the open sea.

Only the most hardy and adaptable can survive in a region so mutable, yet the area between the tide lines is crowded with plants and animals. In this difficult world of the shore, life displays its enormous toughness and vitality by occupying almost every conceivable niche. Visibly, it carpets the intertidal rocks; or half hidden, it descends into fissures and crevices, or

hides under boulders, or lurks in the wet gloom of sea caves. Invisibly, where the casual observer would say there is no life, it lies deep in the sand, in burrows and tubes and passageways. It tunnels into solid rock and bores into peat and clay. It encrusts weeds or drifting spars or the hard, chitinous shell of a lobster. It exists minutely, as the film of bacteria that spreads over a rock surface or a wharf piling; as spheres of protozoa, small as pinpricks, sparkling at the surface of the sea; and as Lilliputian beings swimming through dark pools that lie between the grains of sand.

The shore is an ancient world, for as long as there has been an earth and sea there has been this place of the meeting of land and water. Yet it is a world that keeps alive the sense of continuing creation and of the relentless drive of life. Each time that I enter it, I gain some new awareness of its beauty and its deeper meanings, sensing that intricate fabric of life by which one creature is linked with another, and each with its surroundings.

In my thoughts of the shore, one place stands apart for its revelation of exquisite beauty. It is a pool hidden within a cave that one can visit only rarely and briefly when the lowest of the year's low tides fall below it, and perhaps from that very fact it acquires some of its special beauty. Choosing such a tide, I hoped for a glimpse of the pool. The ebb was to fall early in the morning. I knew that if the wind held from the northwest and no interfering swell ran in from a distant storm the level of the sea should drop below the entrance to the pool. There had been sudden ominous showers in the night, with rain like handfuls of gravel flung on the roof. When I looked out into the early morning the sky was full of a gray dawn light but the sun had not yet risen. Water and air were pallid. Across the bay the moon was a luminous disc in the western sky, suspended above the dim line of distant shore—the full August moon, drawing the tide to the low, low levels of the threshold of the alien

sea world. As I watched, a gull flew by, above the spruces. Its breast was rosy with the light of the unrisen sun. The day was, after all, to be fair.

Later, as I stood above the tide near the entrance to the pool, the promise of that rosy light was sustained. From the base of the steep wall of rock on which I stood, a moss-covered ledge jutted seaward into deep water. In the surge at the rim of the ledge the dark fronds of oarweeds swayed, smooth and gleaming as leather. The projecting ledge was the path to the small hidden cave and its pool. Occasionally a swell, stronger than the rest, rolled smoothly over the rim and broke in foam against the cliff. But the intervals between such swells were long enough to admit me to the ledge and long enough for a glimpse of that fairy pool, so seldom and so briefly exposed.

And so I knelt on the wet carpet of sea moss and looked back into the dark cavern that held the pool in a shallow basin. The floor of the cave was only a few inches below the roof, and a mirror had been created in which all that grew on the ceiling was reflected in the still water below.

Under water that was clear as glass the pool was carpeted with green sponge. Gray patches of sea squirts glistened on the ceiling and colonies of soft coral were a pale apricot color. In the moment when I looked into the cave a little elfin starfish hung down, suspended by the merest thread, perhaps by only a single tube foot. It reached down to touch its own reflection, so perfectly delineated that there might have been, not one starfish, but two. The beauty of the reflected images and of the limpid pool itself was the poignant beauty of things that are ephemeral, existing only until the sea should return to fill the little cave.

Whenever I go down into this magical zone of the low water of the spring tides, I look for the most delicately beautiful of all the shore's inhabitants—flowers that are not plant but animal, blooming on the threshold of the deeper sea. In that fairy cave

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I was not disappointed. Hanging from its roof were the pendent flowers of the hydroid Tubularia, pale pink, fringed and delicate as the wind flower. Here were creatures so exquisitely fashioned that they seemed unreal, their beauty too fragile to exist in a world of crushing force. Yet every detail was functionally useful, every stalk and hydranth and petal-like tentacle fashioned for dealing with the realities of existence. I knew that they were merely waiting, in that moment of the tide's ebbing, for the return of the sea. Then in the rush of water, in the surge of surf and the pressure of the incoming tide, the delicate flower heads would stir with life. They would sway on their slender stalks, and their long tentacles would sweep the returning water, finding in it all that they needed for life.

And so in that enchanted place on the threshold of the sea the realities that possessed my mind were far from those of the land world I had left an hour before. In a different way the same sense of remoteness and of a world apart came to me in a twilight hour on a great beach on the coast of Georgia. I had come down after sunset and walked far out over sands that lay wet and gleaming, to the very edge of the retreating sea. Looking back across that immense flat, crossed by winding, water-filled gullies and here and there holding shallow pools left by the tide, I was filled with awareness that this intertidal area, although abandoned briefly and rhythmically by the sea, is always reclaimed by the rising tide. There at the edge of low water the beach with its reminders of the land seemed far away. The only sounds were those of the wind and the sea and the birds. There was one sound of wind moving over water, and another of water sliding over the sand and tumbling down the faces of its own wave forms. The flats were astir with birds, and the voice of the willet rang insistently. One of them stood at the edge of the water and gave its loud, urgent cry; an answer came from far up the beach and the two birds flew to join each other.

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The flats took on a mysterious quality as dusk approached and the last evening light was reflected from the scattered pools and creeks. Then birds became only dark shadows, with no color discernible. Sanderlings scurried across the beach like little ghosts, and here and there the darker forms of the willets stood out. Often I could come very close to them before they would start up in alarm—the sanderlings running, the willets flying up, crying. Black skimmers flew along the ocean's edge silhouetted against the dull, metallic gleam, or they went flitting above the sand like large, dimly seen moths. Sometimes they "skimmed" the winding creeks of tidal water, where little spreading surface ripples marked the presence of small fish.

The shore at night is a different world, in which the very darkness that hides the distractions of daylight brings into sharper focus the elemental realities. Once, exploring the night beach, I surprised a small ghost crab in the searching beam of my torch. He was lying in a pit he had dug just above the surf, as though watching the sea and waiting. The blackness of the night possessed water, air, and beach. It was the darkness of an older world, before Man. There was no sound but the all-enveloping, primeval sounds of wind blowing over water and sand, and of waves crashing on the beach. There was no other visible life—just one small crab near the sea. I have seen hundreds of ghost crabs in other settings, but suddenly I was filled with the odd sensation that for the first time I knew the creature in its own world—that I understood, as never before, the essence of its being. In that moment time was suspended; the world to which I belonged did not exist and I might have been an onlooker from outer space. The little crab alone with the sea became a symbol that stood for life itself—for the delicate, destructible, yet incredibly vital force that somehow holds its place amid the harsh realities of the inorganic world.

The sense of creation comes with memories of a southern coast, where the sea and the mangroves, working together, are

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building a wilderness of thousands of small islands off the southwestern coast of Florida, separated from each other by a tortuous pattern of bays, lagoons, and narrow waterways. I remember a winter day when the sky was blue and drenched with sunlight; though there was no wind one was conscious of flowing air like cold clear crystal. I had landed on the surf-washed tip of one of those islands, and then worked my way around to the sheltered bay side. There I found the tide far out, exposing the broad mud flat of a cove bordered by the mangroves with their twisted branches, their glossy leaves, and their long prop roots reaching down, grasping and holding the mud, building the land out a little more, then again a little more.

The mud flats were strewn with the shells of that small, exquisitely colored mollusk, the rose tellin, looking like scattered petals of pink roses. There must have been a colony nearby, living buried just under the surface of the mud. At first the only creature visible was a small heron in gray and rusty plumage—a reddish egret that waded across the flat with the stealthy, hesitant movements of its kind. But other land creatures had been there, for a line of fresh tracks wound in and out among the mangrove roots, marking the path of a raccoon feeding on the oysters that gripped the supporting roots with projections from their shells. Soon I found the tracks of a shore bird, probably a sanderling, and followed them a little; then they turned toward the water and were lost, for the tide had erased them and made them as though they had never been.

Looking out over the cove I felt a strong sense of the interchangeability of land and sea in this marginal world of the shore, and of the links between the life of the two. There was also an awareness of the past and of the continuing flow of time, obliterating much that had gone before, as the sea had that morning washed away the tracks of the bird.

The sequence and meaning of the drift of time were quietly summarized in the existence of hundreds of small snails—the

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mangrove periwinkles—browsing on the branches and roots of the trees. Once their ancestors had been sea dwellers, bound to the salt waters by every tie of their life processes. Little by little over the thousands and millions of years the ties had been broken, the snails had adjusted themselves to life out of water, and now today they were living many feet above the tide to which they only occasionally returned. And perhaps, who could say how many ages hence, there would be in their descendants not even this gesture of remembrance for the sea.

The spiral shells of other snails—these quite minute—left winding tracks on the mud as they moved about in search of food. They were horn shells, and when I saw them I had a nostalgic moment when I wished I might see what Audubon saw, a century and more ago. For such little horn shells were the food of the flamingo, once so numerous on this coast, and when I half closed my eyes I could almost imagine a flock of these magnificent flame birds feeding in that cove, filling it with their color. It was a mere yesterday in the life of the earth that they were there; in nature, time and space are relative matters, perhaps most truly perceived subjectively in occasional flashes of insight, sparked by such a magical hour and place.

There is a common thread that links these scenes and memories —the spectacle of life in all its varied manifestations as it has appeared, evolved, and sometimes died out. Underlying the beauty of the spectacle there is meaning and significance. It is the elusiveness of that meaning that haunts us, that sends us again and again into the natural world where the key to the riddle is hidden. It sends us back to the edge of the sea, where the drama of life played its first scene on earth and perhaps even its prelude; where the forces of evolution are at work today, as they have been since the appearance of what we know as life; and where the spectacle of living creatures faced by the cosmic realities of their world is crystal clear.

TITLE: THE LAND AND WATER AND AIR THAT WE ARE: SOME THOUGHTS ON COP21
Author: Heather Davis
Publisher: SFAQ
Year: 2016

THE LAND AND WATER AND AIR THAT WE ARE: SOME THOUGHTS ON COP 21

Heather Davis

March 15, 2016

Every time we breathe, we pull the world into our bodies: water vapor and oxygen and carbon and particulate matter and aerosols. We become the outside through our breath, our food, and our porous skin. We are composed of what surrounds us. We have come into existence with and because of so many others, from carbon to microbes to dogs. And all these creatures and rocks and air molecules and water all exist together, with each other, for each other. To be a human means to be the land and water and air of our surroundings. We are the outside. We are our environment. We are losing, with the increase in aromatic hydrocarbons and methane and carbon, the animals and plants and air and water that compose us. In this time of loss, we need to imagine.

The COP 21 agreement in Paris was, it is said, a victory. An agreement was reached. A political process succeeded. I do not want to diminish these things. They are important. But what went mostly unreported in the barrage of media coverage and the political rhetoric after Paris was the predicted effects on the air and the water and the land that is us. This air and this water and this land will not exist in the temperatures that we are headed towards, even if every one of those signatory states keeps to the agreement. Humans, in the entire history of our species, have never lived in such a warm climate. These temperatures are biologically unprecedented. And, if all goes well, if every country keeps to their nonbinding agreements, we will experience temperatures well above the agreed upon “safe” level of 2 degree Celsius warming by 2100. “As early as the third page of the draft agreement is the acknowledgment that its CO2 target won’t keep the global temperate rise below 2 deg C, the level that was once set as the critical safe limit,”[2] write the signatories of an open letter signed by scientists around the globe. Michael Gerrard, a climate change lawyer and the Chair of Columbia University’s Earth Institute, anticipates that the Paris agreement will leave us in a world about 3.5C (6.3F) warmer by the end of the century.[3]

When the low-lying island nations say that a rise of global temperature of 2 degrees Celsius amounts to genocide, they are right. The New York State legislature estimates that there is a 10 percent chance that the oceans will be six feet higher than they are today by 2100. This means that these nations would be completely submerged. It is possible that the people of these islands might be able to leave their homes. They might find refuge elsewhere. But they will not be the same. Literally. They will not be able to breathe in the air and the salt and the water of their island. Their bodies will not be composed of the same molecules, their organs and receptors and sense of self, will all begin to change. It is possible that these epigenetic changes, changes induced by the environment that affect the genomic expression in the body, may be passed on to their descendants. Whole ways of life, of communities and ways of being human, both biologically and culturally, will be transformed.

The failure of our political leaders to properly come to terms with climate change and take the radical and necessary actions to drastically reduce fossil fuel emissions means cultural genocide, not just for the people of low-lying islands, but for South Florida and sub-Saharan Africa and the Arctic—where temperatures are rising faster than anywhere else on Earth. Not only does this mean that vast geographical regions will be completely unrecognizable, but also the multiple entangled relationships between the plants, animals and people who inhabit them. It means the end of multiple cultures, cultures that have grown out of and in response to specific environments.

The world will not end in 2100: the end point at which our political imaginations seem to fail and our data seems to evaporate. Temperatures—due to multiple feedback loops built into atmospheric systems—will continue to rise after 2100. So when we speak of a global rise of temperature by 2 degrees Celsius, we are only speaking of the lifetimes of those living now, or those just about to be born. The generations that come after will live in an even hotter world. But worlds will end in 2100 if we do not take more drastic action. We must radically change our way of life to prioritize relations over commerce, and locality over universality. The worlds that have been built through the collaboration of people and land and air and water and animals and microbes cannot be disentangled. As useful as it is to employ abstractions and argue about numbers and statistics, safe levels of carbon, and what it will take to "maintain our way of life," we are actually gambling with so many worlds.[4]

And it is naïve to think that the carbon will simply obey our desires. Or, to believe that political will and negotiation are enough to stop runaway global warming coupled with desertification, ocean acidification, and the largest mass extinction event since the end of the dinosaurs. We cannot trade or numerize or rationalize or render abstract the worlds we are birthed from and are indebted to. The environment is not like the economy. We cannot simply print more air or revalue species stocks. We are so immersed in economic logic, the logic of trade and abstraction, that we forget our relations. We are now breathing in the remains of those dinosaurs that haunt our imaginations, foreshadowing the fate of countless species. As Thom van Dooren has written so beautifully, the loss of a species is the loss of thousands of years of accumulated knowledge. He states, "it is clear that this thing we call a 'species' is an incredible achievement . . . We often do not appreciate—and perhaps we cannot fully grasp—the immensity of this intergenerational work: the skill, commitment, cooperation, and hard work, alongside serendipity, that are required in each generation to carry the species through."[5] The development of a species is also the development of certain kinds of imaginaries, of spaces of imagination. In the midst of this destruction, holding onto to creativity seems vital.

Artistic work is one small space for re-imagining the world through loss, beyond loss, and into a future radically different from the present that we now occupy. As David Garneau says, "What art does do—and what is difficult to measure—is that it changes our individual and collective imaginaries by particles, and these new pictures of the world can influence our behavior."[6] One of these particles is offered by Amy Balkin's work Public Smog (2004-2012). The piece proposes listing the atmosphere as a UNESCO World Heritage Site. As such, the atmosphere

would have to be protected with the same degree of stringency that a public building, monument or park would be. Balkin calls attention to the fact that the atmosphere is being re-shaped by advanced petrocapitalism under the auspices of "humanity," and acknowledges that the atmosphere is indeed the legacy of some humans. The piece also simultaneously asserts the ways in which the atmosphere should be regarded as a commons, a commons we all rely upon, and one that needs to be maintained within specific parameters in order for human existence to continue. Or, as Eyal Weizman has recently suggested, we need to decolonize the atmosphere.[7]

This process of decolonization might not be what we expect. As Kim TallBear recently stated, some of what might look like devastation to white bourgeois settler-colonial eyes, might actually be revitalization.[8] At a recent talk at the University of Alberta, TallBear described a devastating flood in her hometown on the Minnesota, South Dakota border that caused so much damage, the farmland had to be abandoned. This meant that the wetlands returned, accompanied by birds and other wildlife. It wasn't until this moment of return that she fully comprehended the damage of European agriculture on that land.[9] In the force and upheaval of the changes to come, there might be more possibilities like this for emergent ecologies within what Anna Tsing has described as "blasted landscapes."

It is not just a matter of "fixing" the climate problem, no matter how justifiably tempting this way of thinking may be. It is a matter of reimagining and recreating our relationship with the components of ourselves that are not of ourselves. We must learn to be responsive to land, to water, and to air. Even if our efforts fail, there may be something to be learned by this living with. Living with responsibility. Living with others. Living and composing with the land and water and air, regardless of how it all turns out. There might be something beautiful to be learned, and to be imagined, during our precious time on earth. As the RAQS Media Collective, a group of politically-engaged interdisciplinary artists from India, have said so eloquently,

"Without a recalibration of the senses, at the level of our global species-being, without at least half a conversation to understand, and then attenuate and nuance our desires and needs, we cannot conceive of another mode of production, another set of social relations, another ethic of husbandry between ourselves and the earth.

That is why we send pictures from deserts and write words on water, that is why we make earthworks that stand on the landscape of the mind. That is why we listen to the whispers of an eccentric planet. So that it can listen to us in turn, and keep wanting us, and our children, and their children, around.

The world is all, that is the case."[10]

Originally published 15 March 2016 at http://sfaq.us/2016/03/the-land-and-water-and-air-that-we-are-some-thoughts-on-cop-21/

TITLE: AN ATLAS OF THE DIFFICULT WORLD: POEMS 1988-1991
Author: Adrienne Rich
Publisher: W.W. Norton & Co
Year: 1991

II

Here is a map of our country:
here is the Sea of Indifference, glazed with salt
This is the haunted river flowing from brow to groin
we dare not taste its water
This is the desert where missiles are planted like corms
This is the breadbasket of foreclosed farms
This is the birthplace of the rockabilly boy
This is the cemetery of the poor
who died for democracy This is a battlefield
from a nineteenth-century war the shrine is famous
This is the sea-town of myth and story when the fishing fleets
went bankrupt here is where the jobs were on the pier
processing frozen fishsticks hourly wages and no shares
These are other battlefields Centralia Detroit
here are the forests primeval the copper the silver lodes
These are the suburbs of acquiescence silence rising fumelike
from the streets
This is the capital of money and dolor whose spires
flare up through air inversions whose bridges are crumbling
whose children are drifting blind alleys pent
between coiled rolls of razor wire
I promised to show you a map you say but this is a mural
then yes let it be these are small distinctions
where do we see it from is the question

SUNDAY
04/08

Guided by: Members of XR Berlin

TITLE: THIS IS NOT A DRILL
Author: Extinction Rebellion
Publisher: Penguin Books
Year: 2019
Pages: 1-13 / 65-68

THIS IS NOT A DRILL

AN extinction rebellion HANDBOOK

DECLARATION OF REBELLION

We hold the following to be true:

This is our darkest hour.

Humanity finds itself embroiled in an event unprecedented in its history, one which, unless immediately addressed, will catapult us further into the destruction of all we hold dear: this nation, its peoples, our ecosystems and the future of generations to come.

The science is clear: we are in the sixth mass extinction event and we will face catastrophe if we do not act swiftly and robustly.

Biodiversity is being annihilated around the world. Our seas are poisoned, acidic and rising. Flooding and desertification will render vast tracts of land uninhabitable and lead to mass migration.

Our air is so toxic the United Kingdom is breaking the law. It harms the unborn while causing tens of thousands to die. The breakdown of our climate has begun. There will be more wildfires, unpredictable super-storms, increasing famine and untold drought as food supplies and fresh water disappear.

The ecological crises that are impacting upon this nation – and on this planet and its wildlife – can no longer be ignored, denied or go unanswered by any beings of sound rational mind, ethical conscience, moral concern or spiritual belief.

In accordance with these values, the virtues of truth and

the weight of scientific evidence, we declare it our duty to act on behalf of the security and well-being of our children, our communities and the future of the planet itself.

We, in alignment with our consciences and our reasoning, declare ourselves in rebellion against our government and the corrupted, inept institutions that threaten our future.

The wilful complicity displayed by our government has shattered meaningful democracy and cast aside the common interest in favour of short-term gain and private profit.

When government and the law fail to provide any assurance of adequate protection of and security for its people's well-being and the nation's future, it becomes the right of citizens to seek redress in order to restore dutiful democracy and to secure the solutions needed to avert catastrophe and protect the future. It becomes not only our right but our sacred duty to rebel.

We hereby declare the bonds of the social contract to be null and void; the government has rendered them invalid by its continuing failure to act appropriately. We call upon every principled and peaceful citizen to rise with us.

We demand to be heard, to apply informed solutions to these ecological crises and to create a national assembly by which to initiate those solutions needed to change our present cataclysmic course.

We refuse to bequeath a dying planet to future generations by failing to act now.

We act in peace, with ferocious love of these lands in our hearts.

We act on behalf of life.

FOREWORD

VANDANA SHIVA
Academic

The signs are loud and clear. From the Earth. From science. From women. From children. From indigenous communities. From our daily lives.

The life on this planet, and our own future, is under severe threat.

We are living through the sixth mass extinction, driven by the limitless greed of the 1 per cent, their blindness to the ecological limits the Earth sets and the limits set by social justice and human rights. We forget that we are one humanity on one planet. There is no planet B. This is where we will live, or go extinct as a species, with the millions that have been driven to extinction by the violence and carelessness of the brute force misleadingly called the economy.

'Economy', like 'ecology', is derived from *oikos* – our home, the Earth. An economy that destroys our home is no longer an economy. It is a war against the planet, the people and our future.

The Hopi people of North America describe the phenomenon of destroying everything that sustains a society as *Powaqqatsi* – 'an entity, a way of life, that consumes the life forces of beings in order to further its own life'.

The *Powaqqatsi* phenomenon of the Hopi is clearly in evidence today. We are dealing with a destructive force that is taking out life forces wherever it can. If the corporations have

their way, our fragile web of life will be poisoned and broken, species will be driven to extinction, people will lose all their freedoms to their seed, to their food, to their knowledge and decisions, and all social relations will be ruptured and broken.

Life, society and democracy are under threat. We refuse to allow this future to unfold. We love the Earth; we embrace humanity. We celebrate our biological and cultural diversity and we will defend the rights of the Earth, and the rights of all its citizens, including the last child, with our fearless love and compassionate courage.

To make peace among people we need to make peace with the Earth. To defend the human rights of people we need to recognize the rights of Mother Earth. We need to live through our creativity and her generosity to reduce our ecological footprint while expanding our planetary consciousness of being an Earth family, with one common home.

The extermination of biological diversity and of indigenous cultures that know how to live in peace with Mother Earth is part of one extinction, one interconnected war against life. Ecocide and genocide are one indivisible process, and they began with the idea of the colonization of the Earth as the 'civilizing mission' of a 'superior race'.

In his fifth annual message to Congress on 3 December 1833, US President Andrew Jackson said:

> *That those tribes cannot exist surrounded by our settlements and in continual contact with our citizens is certain. They have neither the intelligence, the industry, the moral habits, nor the desire of improvement which are essential to any favorable change in their condition. Established in the midst of another and a superior race, and without appreciating the causes of their inferiority or seeking to control them, they must necessarily yield to the force of circumstances and ere long disappear.*

And the tribes did disappear. In 1492 the estimated population of indigenous people in the continent north of Mesoamerica was 18 million. By 1890 the Native American population had dropped to 228,000.

Gandhi wrote in his book on freedom, *Hind Swaraj, or Indian Home Rule*, 'This [attacking] civilization is such that one has only to be patient and it will be self-destroyed.' However, in the process of this civilization's self-destruction, it is destroying the planet and our lives. It is destroying our future.

Therefore, it is a moral imperative to rebel against a system that is driving extinction, exterminating species and cultures. To not cooperate has become a moral imperative – a survival imperative. The non-cooperation must begin with the refusal to accept that a system based on ecocide and genocide qualifies to be a 'civilization'. There are better ways to live, to produce and to consume. Extinction Rebellion begins with the liberation of our minds from colonizing categories. We are diverse but equal – not 'superior' or 'inferior'. The extermination of life in its diversity cannot be justified by declaring other species and other cultures 'inferior creatures of God'.

The Earth is for all beings, today and tomorrow.

I call Extinction Rebellion '*Satyagraha* for Life'. *Satyagraha*, for Gandhi, was non-cooperation based on the force of truth.

Today's struggle for truth is that extinction and extermination are not inevitable. They are crimes against the Earth and against humanity. And we can stop this crime by refusing to participate in and cooperate with this project of ecocide and genocide.

Together, as diverse species and diverse cultures, we have the creative power to stop extinction through non-cooperation

at every level, beginning with each of us, expanding the rebellion into 'ever-widening, never-ascending circles' of interconnected life and freedom.

This is the call of Earth Democracy. This is our highest duty as Earth citizens.

INTRODUCTION: THE STORY SO FAR

SAM KNIGHTS
Extinction Rebellion

This book is about a rebellion. A rebellion that is happening now.

Although perhaps, by the time these words are published, the rebellion will be over. Perhaps the rebellion will have died, suddenly or without warning. Perhaps it will have simply vanished, consigned to a long history of failed revolutions and fruitless campaigns. Perhaps it will have been successful. Perhaps you will now all be deep in the process of constructing a new kind of world. A world in which all human beings are created equal, and no person, or party, or corporation sits in dominion over their fellow human beings or – indeed – the Earth.

It is impossible to overestimate the significance of where we are now. The journey here has been long and arduous. It has been fought for by thousands of scientists, academics and activists all across the world. It has been hard, and punishing, and sometimes very lonely.

Extinction Rebellion began in a small English town. It began with fifteen people who had studied and researched the way to achieve radical social change.

Together, these fifteen people decided to embark upon a long campaign of civil disobedience, a campaign that would transform the way in which we talk about the climate and ecological emergency and force governments all over the world to act. We started touring the country, visiting communities,

villages, towns and cities. We gave talks, took action, and slowly began to build a movement. The talks we gave were clear, straightforward and led by science. We walked people through the facts and then, at the end of the presentation, provided a necessary and rational response: mass civil disobedience.

So, on 31 October 2018, we declared ourselves to be in open rebellion against the UK government. Since then, in such a short space of time, hundreds of Extinction Rebellion groups have been established in countries across the globe. The movement is now active in every single continent except Antarctica. Hundreds of thousands of people have signed up to block roads, shut down bridges and – if need be – to get arrested.

In April 2019 we began our first phase of International Rebellion. In Pakistan, we marched through the capital. In the US, we glued ourselves to a bank. In the Netherlands, we occupied The Hague. In Austria, we blocked roads. In Chile, we lay down in the middle of a street. In Ghana, we blew whistles to sound the climate alarm.

In the UK, meanwhile, we shut down five iconic locations in central London: Oxford Circus, Marble Arch, Waterloo Bridge, Piccadilly Circus and Parliament Square. We stayed there for ten days, delivering a rolling programme of speeches, discussions and public assemblies. We closed down fossil-fuel companies, blocked the roads around the Treasury and glued ourselves to the London Stock Exchange. We attempted to cause as much economic disruption as we possibly could.

By the end of the fortnight over a thousand people had been arrested.

The protests had cost the city tens of millions of pounds and completely confounded an already stretched police force. We were quickly invited to meet senior politicians from all the major parties, including the Secretary of State for Environment, Food, and Rural Affairs in the very heart of government.

The next day, the UK became the first country to declare a state of climate and ecological emergency.

We have already seen a huge shift in public opinion. More and more people are joining this movement as they realize that the climate crisis – and the associated crises of capitalism and colonialism that caused it – will not be solved by gradual reform and rotten compromise. This is a crisis that requires radical system change on a scale never seen before.

Extinction Rebellion is a decentralized mass movement of concerned citizens. It is open to anyone who takes action in a non-violent way, actively mitigating for power and standing by the action that we have taken. We work to transform our society into one that is compassionate, inclusive, sustainable, equitable and connected; where creativity is prioritized and where the diversity of our gifts is recognized, celebrated and encouraged to flourish.

We believe that government has failed to understand the severity of this crisis. We believe that we must now take radical action to reduce the very worst effects of climate breakdown and, in doing so, reform and extend our broken democracy. We therefore have three key demands:

1/ the government must tell the truth by declaring a climate and ecological emergency, working with other institutions to communicate the urgency for change
2/ the government must act now to halt biodiversity loss and reduce greenhouse-gas emissions to net zero by 2025
3/ The government must create and be led by the decisions of a Citizens' Assembly on climate and ecological justice

These demands have been adapted by different international groups in accordance with our decentralized system

of governance. The tactics we use in the United Kingdom or the United States are not always an effective or safe strategy in other countries, especially those under repressive regimes or dictatorships.

The majority world needs no lectures from us. They have been on the front line of this struggle for centuries and we do not presume to tell them how to stage a rebellion. We act in solidarity with them and their struggle, and we bow to their experience and their wisdom. After all, this is a movement led by indigenous communities and those in the majority world. It is led by women and children and people of colour. It is led by the people most affected by this crisis – the people who are being displaced now, the people who are dying now, the people who have been trying to warn us for years.

We acknowledge that Extinction Rebellion is just one articulation of a feeling that is being felt all across the world. We see ourselves as one branch of a much wider, stronger, wiser movement.

The future will not look like the present. We know that for certain. The rebellion will not happen under any one banner or any one slogan. The future is going to be humble. Because, if this is going to work, then we will all have to work together. After all, we are facing an unprecedented global emergency and our governments have completely failed to protect us. To survive, it's going to take everything we've got. And everyone we know.

The challenge we now face is extremely daunting. Because the problem, unfortunately, is not just the climate. The problem is ecology. The problem is the environment. The problem is biodiversity. The problem is capitalism. The problem is colonialism. The problem is power. The problem is inequality. The problem is greed, and corruption, and money, and this tired, broken system.

The problem is our complete and utter failure to imagine any meaningful alternative.

Perhaps this book will go some way to changing that. We need to rewild the world. That much is obvious. But first we need to rewild the imagination. We must all learn how to dream again, and we have to learn that together. To break down the old ways of thinking and to move beyond our current conception of what is and what is not possible.

This book is supposed to be a handbook. A book that you will keep by you, that will help you, inform you, empower you to act. A book that will compel you to join the rebellion in whatever way that means to you.

The first section of the book is about telling the truth; it will spell out the severity of the situation and describe, in painstaking detail, the effects of climate breakdown. It will tell you the facts and it will not hold back. It presents dispatches from the front lines of climate change and attempts to diagnose decades of denial. It considers the psychological damage of the climate crisis and the role of love, grief and courage in finding a way out of the wreckage. The second section is about action; it will give you practical instructions for what to do now and how to react. It will give you the tools to be an activist and gesture towards what happens next.

We know that, for some, this book will be very hard to read. You may end up feeling sad, or empty, or guilty, or angry, or frightened, or numb. But, ultimately, this is a book about love. About the love we should have for humanity, and the love we should have for the planet.

About the love we are currently lacking. And the love that we desperately need.

With love and peace. Rebel for life.

PART ONE

TELL THE TRUTH

IN TIMES OF UNIVERSAL DECEIT, TELLING THE TRUTH IS A REVOLUTIONARY ACT

— George Orwell

9/ CLIMATE SORROW

SUSIE ORBACH

It is a curious paradox. The more we are connected at a national and global scale, the less we seem to be able to take on the calamities that are brought to our screens. Flooding in the UK, the Arctic ice melts, the tsunami in Indonesia, the poisoning of water in Canada.

Five years ago, a flood in lower Manhattan knocked out the electricity, devastated New Jersey beaches. The activities of New York City residents ceased. Elevators didn't work. The food shops had no lighting or fridges. Hospitals were on back-up generators. My daughter sent photos of lower Manhattan as a river. With the water receding, the city returned to normal and, with it, for many, the awareness of what should have been the wake-up call receded, too.

How can we explain this curiosity, the fact of climate change being in our face and yet our capacity for denial? We know there are nefarious political players involved in disputing the evidence – evidence they know is incontrovertible for it has often come from their own reports, such as those from Exxon Mobil in the 1970s. Such players change the language to soften what we hear and dump a surfeit of words and advertisements arguing that climate change is not proven. They aim to destabilize the certainties we know. They are always there to provide 'balance': either in the form of outright denial (and in the guise of how they are cleaning things up), or, more dishonest still,

they contest the idea that fracking, deforestation and pipelines are polluting.

As these voices generate ever more distortions, we inadvertently accommodate them in some way. There are mechanisms inside of ourselves that allow us to cut off from what we know even as we separate our rubbish, take our shopping bags to market, watch our screens aghast, and endeavour to limit our footprint.

I've been puzzling this much as I puzzle over other forms of denial. We participate in activities that are often against our self-interest. We are seduced into thinking that uncomfortable things will go away or that 'science' will solve the problems. But it's not accurate and the urgency upon us means we need to engage with our own denial.

How can we do this? What is required of us psychologically to engage with rather than cut off from this knowledge? How can we envision what is happening when it isn't right in front of us? It's difficult to imagine one's own death. How much more impossible to imagine that human activities might mean extinction?

Among North Americans polled at the end of last year by the Yale Program on Climate Change, 73 per cent said they believed it and 69 per cent said they were worried. This is an eight-point increase since March 2018, so consciousness is changing. But the politics aren't. They are going backwards and the capacity to hold on to what we know and want seems slippery. We know and we don't know.

To come into knowing is to come into sorrow. A sorrow that arrives as a thud, deadening and fearful.

Sorrow is hard to bear. With sorrow comes grief and loss. Not easy feelings. Nor is guilt, nor fury, nor despair.

Climate sorrow, if I can call it that, opens up into wretched states of mind and heart. We can find it unbearable. Without

even meaning to repress or split off our feelings, we do so. I am doing so now as I write. Staying with such feelings can be bruising and can make us feel helpless and despairing. It is hard, very hard, to stay with, and yet there is value in this if we can create contexts for doing so.

The feminist movement taught us that speaking with one another allows truths to enter in and be held together. In creating spaces to talk, we transformed our isolation and, although we have not focused our energy on issues of extinction, we need to do so now. We need to take that practice, to create spaces in which we can share how difficult this hurt is and how to deal with our despair and rage.

Facing feelings is not a substitute for political action, nor is it a distraction from action. Feelings are an important feature of political activity. Acknowledging our feelings – to ourselves, to one another – makes us more robust. We need to mourn *and* organize. It should not be one or the other.

We know from conventional political struggles that the less we understand emotionally, the more our potential victories will lead us to missteps and a weakening of our legitimate concerns. When setbacks and external manipulations occur, which they inevitably will, there can be a pull to manage difficult feelings by collapsing into sectarianism. We can find ourselves projecting our frustrations, fury and disappointments at the slowness of change on to those we mostly agree with rather than those responsible for endangering social justice and planetary conservation. We need to work in broad coalitions where differences can be tolerated rather than fracture effective political interventions. This doesn't mean weakening our positions or not having sound leadership. Leadership is critical, and we need a leadership that finds ways to encompass the range of progressive activities while speaking to people's emotional upset as well as their hopes.

Climate emergency is too important for us to go into the splits that can haunt progressive struggles. We have superb political analysis. What's missing is how to hold the feelings we fall into denying. If we look at how moved and concerned children are when they hear about endangered bears, we see a tap root for political action. That tap root should be part of the toolkit for activists. We need to accept our own feelings of grief and fear and we need to provoke conversations that touch the hearts of others. In doing so we will build a movement that can handle the horrors we are facing, without the secondary issue of internal denial. We will be more, not less, robust. More, not less, effective. More, not less, compelling.

IF YOU FEEL THAT THE STATE HAS BREACHED THE SOCIAL CONTRACT, RIP OUT THIS PAGE AND JOIN EXTINCTION REBELLION

THE SOCIAL CONTRACT

An agreement on: [INSERT DATE]

BETWEEN *1/ The State*
AND *2/ You, the Citizen*

This is a Social Contract between **You, the Citizen**, and **The State.** It binds you. It binds The State. As long as we both keep up our ends of the deal.

PREAMBLE

There are billions of us now. We need, somehow, to live together. Let's cut the grand words and legalese and speak plainly about our duties towards each other. It's too important for anyone to misunderstand.

DURATION OF THE CONTRACT

This will last forever, or until one or both sides breaks the terms.

THE STATE AGREES:

1/ I am **The State.** I agree to look after you. That's the whole point of me.

2/ I agree to protect you. I'll make laws so that everyone knows the rules. I'll need courts, a police force and army to enforce the rules. But I'll only use them for that purpose.

3/ I'll make sure the laws apply to everyone – even to me and the people who work for me. That's called the rule of law.

4/ I'm going to defend your human rights. So you have freedom from threats of violence, torture, slavery, unnecessary imprisonment; even death – if I can prevent it. And you'll have freedom to live your best life, in privacy, with your family, in a home, in health and welfare, choosing your religion, saying what you want to and protesting when you must. You get all these rights whoever you are - I'm not going to change them depending on what group you're from.

5/ There's no point having rights if you can't breathe. So I'm going to make sure you have clean air and uncontaminated water. I'll stop your home being flooded if I can avoid it. I'll make sure the temperature stays at a safe level. And if things get really bad, I'll take urgent action. After all, I exist to look after you.

YOU, THE CITIZEN, AGREES:

6/ You are the citizen. You don't get **1/** to **5/** for free. You have responsibilities too. The main one is to follow the laws which **The State** sets for you and your fellow citizens. As long as they are understandable and fair.

7/ **The State** needs resources for all the stuff it gives you. So you'll chip in with a bit of what you earn – that's tax.

8/ You have a responsibility towards your fellow citizens. **The State** can't do everything for you. So if something is going wrong, are going to have to stand up and be counted.

That's it. In summary – The State will hold up its end if You, The Citizen hold up yours.

SIGNATURES

The State

You, The Citizen

.....

IF YOU FEEL THAT THE STATE HAS BREACHED THE SOCIAL CONTRACT, RIP OUT THIS PAGE AND JOIN EXTINCTION REBELLION

TITLE: U.N ENVIRONMENTAL SABBATH PROGRAM
Author: Elizabeth Roberts and Elias Amidon
Publisher: HarperSanFrancisco
Year: 1991

“We have forgotten who we are.”

We have forgotten who we are

We have alienated ourselves from the unfolding of the cosmos
We have become estranged from the movements of the earth
We have turned our backs on the cycles of life.

We have forgotten who we are.

We have sought only our own security
We have exploited simply for our own ends
We have distorted our knowledge
We have abused our power

We have forgotten who we are.

Now the land is barren
And the waters are poisoned
And the air is polluted.

We have forgotten who we are.

Now the forests are dying
And the creatures are disappearing
And humans are despairing.

We have forgotten who we are.

We ask forgiveness
We ask for the gift of remembering
We ask for the strength to change

We have forgotten who we are.

MONDAY
05/08

Guided by: Laboratory for Aesthetics and Ecology

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Chapter 6

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 metaphysical 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.

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— David Suzuki[1]

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

— Environmental Literacy Council[2]

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 McMenamin[3]

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 Kandel[4]

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

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other "webs of physical intimacy and fluid exchange."[6] In this act of ingestion, we come into contact with all of our companion species[7] 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

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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.

feminism | leaks

We ourselves are sea, sands, corals, seaweeds, beaches, tides, swimmers, children, waves . . . seas and mothers.

— Hélène Cixous and Catherine Clément[10]

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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-ha[11]

In me everything is already flowing.

— Luce Irigaray[12]

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 feminine*, 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

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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 metaphores 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

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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 reprosexual and nonreprosexual) 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

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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 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.*
>
> — Wikipedia[22]

> *"Viscosity retains an emphasis on resistance to changing form.*
>
> — Nancy Tuana[23]

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?

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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

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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 Braidotti[27]

The problem was that we did not know whom we meant when we said "we."

— Adrienne Rich[28]

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 nonhuman 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?

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"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 whale-shark 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

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aqueous understanding of our *interbeing* 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-Sandilands[33]

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

— Pheng Cheah[34]

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]

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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 in-between. 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 Alaimo[37]

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

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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

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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] 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 Braidotti[42]

Watershed pollution, a theory of embodiment, amniotic becomings, disaster, environmental colonialism, how to write, global capital, nutrition, philosophy, birth, rain, animal ethics,

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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

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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.

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[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.

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[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).

[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.

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[27] Rosi Braidotti, *Transpositions: On Nomadic Ethics* (London: Polity, 2006), p. 119. This refrain is a motto for Braidotti's posthumanist 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.

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[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").

TITLE: THE WEATHER
Author: Lisa Robertson
Publisher: Vancouver New Star Books
Year: 2001
Pages: 18-25

the weather

LISA ROBERTSON

vancouver
new star books
2001

We think of the design and construction of these weather descriptions as important decorative work. What shall our new ornaments be? How should we adorn mortality now? This is a serious political question. Sincerity's eroticism is different from wit's. The narcotic and the cosmetic each distribute a space. They sculpt what rhythmed peace could be. Within that chiaroscuro we need to gently augment the fraught happinesses of our temporary commons by insisting on utopian delusion as a passage – like a wet pergola or a triumphal arch against blue. The days ever and again are godlets swagging our bliss and ignorance and adjustments in economy. We would, with ultra-enriched and devoted femininity, decorate for them. The day is our house. Words are fleshy ducts. Description decorates. As for us, we like a touch of kitsch in each room to juice up or pinken the clean lines of the possible. This is the decor that receives futurity as its own ludic production; this weather is the vestibule to something fountaining newly and crucially and yet indiscernibly beyond. Perhaps here we shall be other than the administrators of poverty.

Consider that we need to drink deeply from convention under faithfully lighthearted circumstances in order to integrate the weather, boredom utopic, with waking life. By 'integrate' we mean: to arc into a space without surface as if it were an inhabitable, flickering event. And by 'convention' we refer to our improprietous infiltration of the long citations of grooming, intimacy, and prognostication. Like flags or vanes, we signify an incommensurability. No elegance is self-sufficient. No-one is old enough to die or to love. The weather is a stretchy, elaborate, delicate trapeze, an abstract and intact conveyance to the genuine future which is also now. Mount its silky rope in ancient makeup and polished muscle to know the idea of tempo as real.

But the history of the atmosphere is recklessly slow. Recall the peculiar feeling of lassitude before a storm. This is what makes 1 am, 4 am, 5:15 am: Dear Reader – a lady speaking to humans from the motion of her own mind is always multiple. Enough of the least. We want to be believed.

THE OFFICE FOR SOFT ARCHITECTURE | VANCOUVER | APRIL 2001

tuesday

Days heap upon us. All plain. All clouds except a narrow opening at the top of the sky. All cloudy except a narrow opening at the bottom of the sky with others smaller. All cloudy except a narrow opening at the bottom of the sky. All cloudy except a narrow opening at the top of the sky. All cloudy. All cloudy. All cloudy. Except one large opening with others smaller. And once in the clouds. Days heap upon us. Where is our anger. And the shades darker than the plain part and darker at the top than the bottom. But darker at bottom than top. Days heap upon us. Where is Ti-Grace. But darker at the bottom than the top. Days heap upon us. Where is Christine. Broken on the word culture. But darker at the bottom than the top. Days heap upon us. Where is Valerie. Pulling the hard air into her lung. The life crumbles open. But darker at the bottom than the top. Days heap upon us. Where is Patty. Unlearning each thing. Red sky crumbles open. This is

the only way to expand the heart. But darker at the top than the bottom. Days heap upon us. Where is Shulamith. Abolishing the word love. The radical wing crumbles open. The scorn is not anticipated. We have given our surface. Darker at the top than the bottom. Except one large opening with others smaller. Except one large opening with others smaller. Gradually. Days heap upon us. Where is Patricia. In the dream of obedience and authority. The genitalia crumble open. It is only ever a flickering. We never worshipped grief. It has been stuccoed over. Half cloud half plain. Half cloud half plain. Half plain. One in the plain part and one in the clouds. Days heap upon us. Where is Jane. Looking for food. Hunger crumbles open. All this is built on her loveliness. We have fallen into a category. Love subsidized our descent. Streaky clouds at the bottom of the sky. Days heap upon us. Where is Mary. In the extreme brevity of

the history of parity. Rage crumbles open. It felt like dense fog. What is fact is not necessarily human. Memory anticipitates. Authority flows into us like a gel. We cross the border to confront the ideal. Streaky cloudy at the top of the sky. Days heap upon us. Where is Grace. Spent in sadness. The underground crumbles open. There is no transgression possible. We publicly mobilize the horror of our emotion. It is a phalanx. The clouds darker than the plain or blue part and darker at the top than the bottom. Days heap upon us. Where is Gloria. Pushing down laughter. Utopia crumbles open. It is an emotion similar to animals sporting. We won't plagarize shame. Like this we solve herself. The clouds darker than the plain part and darker at the top than the bottom. The clouds darker than the plain part and darker at the top than the bottom. The clouds lighter than the plain part and darker at the top than the bottom. The clouds lighter than the plain part

and darker at the bottom than top. The clouds lighter than the plain part and darker at the top than the bottom. The lights of the clouds lighter and the darks darker than the plain part and darker at the top than the bottom. The same as the last but darker at the bottom than the top. The same as the last but darker at the bottom than the top. Days heap upon us. Where is Violette. Walking without flinching. Doubt crumbles open. It is not a value but a disappearance. We come upon the city in our body. The same as the last. The same as the last. The same as the last. The tint once over in the plain part, and twice in the clouds. Days heap upon us. Where is Emily. Out in all weather. Dignity crumbles open. There is not even a utopia. We would have to mention all the possible causes of her death. The tint once over the openings and twice in the clouds. Days heap upon us. Where is Olympe. Going without rest. The polis crumbles open. This is no different

than slow war. The tint twice in the openings and once in the clouds. Days heap upon us. Where is Michelle. Homesick for anger. Midnight crumbles open. The tint twice in the openings. The tint twice over. Days heap upon us. Where is Bernadine. At description. The tint twice over. Days heap upon us. Where is Kathleen. The tint twice. The clouds darker than the plain part and darker at the top than the bottom. The clouds lighter than the plain part and darker at the top than the bottom. The lights of the clouds lighter. The others smaller. The same as the last. The same as the last. The tint twice in the openings and once in the clouds. Days heap upon us. The tint twice over. Days heap upon us. With others smaller. With others smaller.

My purpose here is to advance into
the sense of the weather, the lesson of
the weather. Forever I'm the age 37
to calm my mind. I'm writing sentences here
of an unborrowed kind. The sky is
mauve lucite. The light lies intact and
folded. You can anticipate the wind.
A slight cloud drifts contrary to the
planet. Everything I'm writing about
begins as the robin as the song
sparrow begins is description
animals are description sparkling
scrapping in loose shrieks teenagers also
utopia is memory the broken
bits running motors leaves remarkably
simple and heart shaped and practical
as leaves the gentlest flavour of them is

description and islands of written
stuff love operas and suicides vast
itineraries of error, memory
grey silk sky with pigeons circling
description because memory can't
love as the orange lights of description
beneath the birds which appear to be strings
of memory in speaking of this small
thing, repeatedly to speak of some small
proximity and in what ways the tough
days pass into languor smoke trees brightgrey
clouds moving in Heaven, streets with
clouds or dripping mist, the mist touching the
golden age of untranslatability, no
distinction: just the fear of isolation
from objects and from the clouds, breathing
arguments I wish to touch as
if the touch were emblem of the scene of novelty.
'Tis not my purpose to retrace the under-
thirst, then the severance. I'll finger
sincerity, by exemplum relate
a portrait of my luck.

TITLE: ICE
Author: Anna Kavan
Publisher: Penguin Books
Year: 2017
Pages: 48-51

FIVE

My window overlooked an empty landscape where nothing ever moved. No houses were visible, only the debris of the collapsed wall, a bleak stretch of snow, the fjord, the fir forest, the mountains. No colour, only monotonous shades of grey from black to the ultimate dead white of the snow. The water lifeless in its dead calm, the ranks of black trees marching everywhere in uniform gloom. Suddenly there was a movement, a shout of red and blue in that silent grey monotone. I seized my overcoat, struggled into it as I rushed to the door; changed my mind and went back to the window, which was stuck fast. I managed to heave it up, stepped out on to piles of rubble, then pulled it shut behind me with the tips of my fingers. Slithering on the frozen grass, I ran down the slope; it was the quickest way; and I had eluded the woman of the house, whom I suspected of keeping watch on my movements. There was no one on the narrow path skirting the fjord, but the person I was chasing could not be far off. The path plunged into the forest. At once it got colder and darker under the trees, which grew close together, their black branches meeting in dense entanglements overhead, intertwining with the undergrowth lower down. Twenty invisible people could have been near me, but I saw the ghostly grey coat flicker among the firs, and occasionally caught a glimpse of its checked lining.

The wearer's head was uncovered : her bright hair shimmered like silver fire, an *ignis fatuus* glimmering in the forest. She hurried on as fast as she could, anxious to get out of the trees. She was nervous in the forest, which always seemed full of menace. The crowding trees unnerved her, transformed themselves into black walls, shutting her in. It was late, after sunset; she had come too far and must hurry back. She looked about for the fjord, failed to see it, lost her bearings, and at once became really frightened, terrified of being overtaken by night in the dark forest. Fear was the climate she lived in; if she had ever known kindness it would have been different. The trees seemed to obstruct her with deliberate malice. All her life she had thought of herself as a foredoomed victim, and now the forest had become the malign force that would destroy her. In desperation she tried to run, but a hidden root tripped her, she almost fell. Branches caught in her hair, tugged her back, lashed out viciously when they were disentangled. The silver hairs torn from her head glittered among black needles; they were the clues her pursuers would follow, leading them to their victim. She escaped from the forest at length only to see the fjord waiting for her. An evil effluence rose from the water, something primitive, savage, demanding victims, hungry for a human victim.

For a second she stood still, appalled by the absolute silence and loneliness all around. A new ferocity pervaded the landscape now that night was approaching. She saw the massed armies of forest trees encamped on all sides, the mountain wall above bristling with trees like guns. Below, the fjord was an impossible icy volcano erupting the baleful fire of the swallowed sun.

In the deepening dusk every horror could be expected. She was afraid to look, tried not to see the spectral shapes rising from the water, but felt them come gliding towards her and

fled in panic. One overtook her, wound her in soft, clammy, adhesive bands like ectoplasm. Wildly choking a scream, she fought herself free, raced on blindly, frantic and gasping. Her brain was locked in nightmare, she did not think. The last light fading, she stumbled against unseen rocks, bruising knees and elbows. Thorns lacerated her hands, scratched her face. Her flying leaps shattered the thin ice at the fjord's edge and she was deluged in freezing water. Each breath was painful, a sharp knife repeatedly stabbing her chest. She dared not stop or slacken speed for an instant, terrified by the loud thud of pursuing steps close behind her, not recognizing her own agonized heartbeats. Suddenly she slipped on the edge of a snowdrift, could not stop herself, fell face down in a deep snow-grave. There was snow in her mouth, she was done for, finished, she would never get up again, could not run any further. Cruelly straining muscles relentlessly forced her up, she had to struggle on, pulled by the irresistible magnet of doom. Systematic bullying when she was most vulnerable had distorted the structure of her personality, made a victim of her, to be destroyed, either by things or by human beings, people or fjords and forests; it made no difference, in any case she could not escape. The irreparable damage inflicted had long ago rendered her fate inevitable.

A pitch black mass of rock loomed ahead, a hill, a mountain, an unlighted fortress, buttressed by regiments of black firs. Her weak hands were shaking too much to manipulate a door, but the waiting forces of doom dragged her inside.

Stretched out on her bed, she could feel the hostile, alien, freezing dark pressed to the wall like the ear of a listening enemy. In the utter silence and solitude, she lay watching the mirror, waiting for her fate to arrive. It would not be long now. She knew that something fearful was going to happen in the sound-proof room, where nobody could or would come to

her rescue. The room was antagonistic as it always had been. She was aware of the walls refusing protection, of the frigid hostility in the air. There was nothing she could do, no one to whom she could appeal. Abandoned, helpless, she could only wait for the end.

A woman came in without knocking and stood in the doorway, handsome, forbidding, dressed all in black, tall and menacing as a tree, followed by other indistinct shapes, which kept to the shadows behind her. The girl at once recognized her executioner, whose enmity she had always felt without understanding it, too innocent or too preoccupied with her own dream world to guess the obvious cause. Now, cold bright pitiless eyes swam in the glassy depths of the mirror, darted towards their victim. *Her* eyes were widely dilated and black with dread, two deep pits of terror, of intuitive nightmare foreknowledge. Then a sense of fatality overcame her; she experienced a regression, became a submissive, terrorized child, cowed by persistent ill-treatment. Intimidated, obedient to the woman's commanding voice, she got up and with faltering steps left the platform, her white face blank as paper. When her arms were seized she cried out, struggled feebly. A hand was clamped over her mouth. Several figures towered above her. She was gripped from all sides, roughly handled, hustled out of the room, her hands tied behind her back.

Under the trees it got darker and darker, I kept losing sight of the path. In the end I lost it entirely and came out at a different place. I was close to the wall. It was impressive, intact, no break in it anywhere; I saw the black shapes of sentries posted along the top. Two of them were approaching each other and would cross quite near me. I stood still in the shadow of the black trees where I should not be seen. Their steps were loud, the hard frost magnified every sound. They met, stamped their feet, exchanged passwords, separated again.

51

TITLE: THE DROWNED WORLD
Author: J. G. Ballard
Publisher: Berkley
Year: 1962

CHAPTER 1

On the Beach at the Ritz

Soon it would be too hot. Looking out from the hotel balcony shortly after eight o'clock, Kerans watched the sun rise behind the dense groves of giant gymnosperms crowding over the roofs of the abandoned department stores four hundred yards away on the east side of the lagoon. Even through the

massive olive-green fronds the relentless power of the sun was plainly tangible. The blunt refracted rays drummed against his bare chest and shoulders, drawing out the first sweat, and he put on a pair of heavy sunglasses to protect his eyes. The solar disc was no longer a well-defined sphere, but a wide expanding ellipse that fanned out across the eastern horizon like a colossal fire-ball, its reflection turning the dead leaden surface of the lagoon into a brilliant copper shield. By noon, less than four hours away, the water would seem to burn.

Usually Kerans woke at five, and reached the biological testing station in time to do at least four or five hours' work before the heat became intolerable, but this morning he found himself reluctant to leave the cool, air-curtained haven of the hotel suite. He had spent a couple of hours over breakfast alone, and then completed a sixpage entry in his diary, deliberately delaying his departure until Colonel Riggs passed the hotel in his patrol boat, knowing that by then it would be too late to go to the station. The Colonel was always eager for an hour of conversation, particularly when sustained by a few rounds of aperitif, and it would be at least eleven-thirty before he left, his thoughts solely upon lunch at the base.

For some reason, however, Riggs had been delayed. Presumably he was carrying out a longer sweep than usual of the

adjacent lagoons, or perhaps was waiting for Kerans to arrive at the testing station. For a moment Kerans wondered whether to try to reach him on the radio transmitter installed by the signals unit in the lounge, but the console was buried under a pile of books, its battery flat. The corporal in charge of the radio station at the base had protested to Riggs when his cheerful morning round-up of old pop songs and local news--an attack by two iguanas on the helicopter the previous night, the latest temperature and humidity readings-- had been cut off abruptly half-way through the first instalment. But Riggs recognised Kerans' unconscious attempt to sever his links with the base--the careful haphazardness of the pyramid of books hiding the set contrasted too obviously with Kerans' otherwise meticulous neatness--and tolerantly accepted his need to isolate himself.

Leaning on the balcony rail, the slack water ten storeys below reflecting his thin angular shoulders and gaunt profile, Kerans watched one of the countless thermal storms rip through a dump of huge horse-tails lining the creek which led out of the lagoon. Trapped by the surrounding buildings and the inversion layers a hundred feet above the water, pockets of air would heat rapidly, then explode upwards like escaping balloons, leaving behind them a sudden detonating vacuum. For a few seconds the

steam clouds hanging over the creek dispersed, and a vicious miniature tornado lashed across the 60-feet-high plants, toppling them like matchsticks. Then, as abruptly, the storm vanished and the great columnar trunks subsided among one another in the water like sluggish alligators.

Rationalising, Kerans told himself that he had been wise to remain in the hotel--the storms were erupting more and more frequently as the temperature rose--but he knew that his real motive was his acceptance that little now remained to be done. The biological mapping had become a pointless game, the new flora following exactly the emergent lines anticipated twenty years earlier, and he was sure that no-one at Camp Byrd in Northern Greenland bothered to file his reports, let alone read them.

In fact, old Dr. Bodkin, Kerans' assistant at the station, had slyly prepared what purported to be an eyewitness description by one of Colonel Riggs' sergeants of a large sail-backed lizard with a gigantic dorsal fin which had been seen cruising across one of the lagoons, in all respects indistinguishable from the Pelycosaur, an early Pennsylvanian reptile. Had the report been taken at its face value--heralding the momentous return of the age of the great reptiles--an army of ecologists would have descended on them immediately, backed by a tactical atomic

weapons unit and orders to proceed south at a steady twenty knots. But apart from the routine acknowledgement signal nothing had been heard. Perhaps the specialists at Camp Byrd were too tired even to laugh.

At the end of the month Colonel Riggs and his small holding unit would complete their survey of the city (had it once been Berlin, Paris or London?, Kerans asked himself) and set off northward, towing the testing station with them. Kerans found it difficult to believe that he would ever leave the penthouse suite where he had lived for the past six months. The Ritz's reputation, he gladly agreed, was richly deserved--the bathroom, for example, with its black marble basins and gold-plated taps and mirrors, was like the side-chapel of a cathedral. In a curious way it satisfied him to think that he was the last guest who would stay at the hotel, identifying what he realised was a concluding phase of his own life--the northward odyssey through the drowned cities in the south, soon to end with their return to Camp Byrd and its bracing disciplines--and this farewell sunset of the hotel's long splendid history.

He had commandeered the Ritz the day after their arrival, eager to exchange his cramped cabin among the laborat-

ory benches at the testing station for the huge, high-ceilinged state-rooms of the deserted hotel. Already he accepted the lavish brocaded furniture and the bronze art nouveau statuary in the corridor niches as a natural background to his existence, savouring the subtle atmosphere of melancholy that surrounded these last vestiges of a level of civilisation now virtually vanished forever. Too many of the other buildings around the lagoon had long since slipped and slid away below the silt, revealing their gimcrack origins, and the Ritz now stood in splendid isolation on the west shore, even the rich blue moulds sprouting from the carpets in the dark corridors adding to its 19th century dignity.

The suite had originally been designed for a Milanese financier, and was lavishly furnished and engineered. The heat curtains were still perfectly sealed, although the first six storeys of the hotel were below water level and the load walls were beginning to crack, and the 250-amp air-conditioning unit had worked without a halt. Although it had been unoccupied for ten years little dust had collected over the mantelpieces and gilt end-tables, and the triptych of photo graphic portraits on the crocodile-skin desk--financier, financier and sleek well-fed family, financier and even sleeker fifty-storey office block--revealed scarcely a blemish. Luckily for Kerans his predecessor had left in a hurry, and the cupboards and wardrobes were packed with

treasure, ivory-handled squash rackets and handprinted dressing gowns, the cocktail bar stocked with an ample supply of what were now vintage whiskeys and brandies.

A giant Anopheles mosquito, the size of a dragon-fly, spat through the air past his face, then dived down towards the floating jetty where Kerans' catamaran was moored. The sun was still hidden behind the vegetation on the eastern side of the lagoon, but the mounting heat was bringing the huge vicious insects out of their lairs all over the moss-covered surface of the hotel. Kerans was reluctant to leave the balcony and retreat behind the wiremesh enclosure. In the early morning light a strange mournful beauty hung over the lagoon; the sombre green-black fronds of the gymnosperms, intruders from the Triassic past, and the half-submerged white-faced buildings of the 20th century still reflected together in the dark mirror of the water, the two interlocking worlds apparently suspended at some junction in time, the illusion momentarily broken when a giant water spider cleft the oily surface a hundred yards away.

In the distance, somewhere beyond the drowned bulk of a large Gothic building half a mile to the south, a diesel engine coughed and surged. Kerans left the balcony, closing the wire

door behind him, and went into the bathroom to shave. Water had long ceased to flow through the taps, but Kerans maintained a reservoir in the plunge bath, carefully purified in a home-made still on the roof and piped in through the window.

Although he was only forty, Kerans' beard had been turned white by the radio-fluorine in the water, but his bleached crew-cut hair and deep amber tan made him appear at least ten years younger. A chronic lack of appetite, and the new malarias, had shrunk the dry leathery skin under his cheekbones, emphasising the ascetic cast of his face. As he shaved he examined his features critically, feeling the narrowing planes with his fingers, kneading the altered musculature which was slowly transforming its contours and revealing a personality that had remained latent during his previous adult life. Despite his introspective manner, he now seemed more relaxed and equable than he could remember, his cool blue eyes surveying himself with ironic detachment. The slightly self-conscious absorption in his own world, with its private rituals and observances, had passed. If he kept himself aloof from Riggs and his men this was simply a matter of convenience rather than of misanthropy.

On the way out he picked a monographed cream silk shirt from the stack left in the wardrobe by the financier, and slipped into a pair of neatly pressed slacks with a Zurich label.

TITLE: MONDAY
Author: Lisa Robertson
Publisher: Poetry Foundation
Year: 2001

POETRY FOUNDATION

Monday

BY LISA ROBERTSON

First all belief is paradise. So pliable a medium. A time not very long. A transparency caused. A conveyance of rupture. A subtle transport. Scant and rare. Deep in the opulent morning, blissful regions, hard and slender. Scarce and scant. Quotidian and temperate. Begin afresh in the realms of the atmosphere, that encompasses the solid earth, the terraqueous globe that soars and sings, elevated and flimsy. Bright and hot. Flesh and hue. Our skies are inventions, durations, discoveries, quotas, forgeries, fine and grand. Fine and grand. Fresh and bright. Heavenly and bright. The day pours out space, a light red roominess, bright and fresh. Bright and oft. Bright and fresh. Sparkling and wet. Clamour and tint. We range the spacious fields, a battlement trick and fast. Bright and silver. Ribbons and failings. To and fro. Fine and grand. The sky is complicated and flawed and we're up there in it, floating near the apricot frill, the bias swoop, near the sullen bloated part that dissolves to silver the next instant bronze but nothing that meaningful, a breach of greeny-blue, a syllable, we're all across the swathe of fleece laid out, the fraying rope, the copper beech behind the aluminum catalpa that has saved the entire spring for this flight, the tops of these a part of the sky, the light wind flipping up the white undersides of leaves, heaven afresh, the brushed part behind, the tumbling. So to the heavenly rustling. Just stiff with ambition we range the spacious trees in earnest desire sure and dear. Brisk and west. Streaky and massed. Changing and appearing. First and last. This was made from Europe, formed from Europe, rant and roar. Fine and grand. Fresh and bright. Crested and turbid. Silver and bright. This was spoken as it came to us, to celebrate and tint, distinct and designed. Sure and dear. Fully designed. Dear afresh. So free to the showing. What we praise we believe, we fully believe. Very fine. Belief thin and pure and clear to the title. Very beautiful. Belief lovely and elegant and fair for the footing. Very brisk. Belief lively and quick and strong by the bursting. Very bright. Belief clear and witty and famous in impulse. Very stormy. Belief violent and open and raging from privation. Very fine. Belief intransigent after pursuit. Very hot. Belief lustful and eager and curious before beauty.Very bright. Belief intending afresh. So calmly and clearly. Just stiff with leaf sure and dear and appearing and last. With lust clear and scarce and appearing and last and afresh.

Lisa Robertson, "Monday" from *the weather*. Copyright © 2001 by Lisa Robertson. Reprinted by permission of New Star Books.

TITLE: WEATHERING
Author: Astrida Neimanis & Jennifer Mae Hamilton
Publisher: Feminist Review
Year: 2018
Pages: 80-84

Astrida Neimanis and Jennifer Mae Hamilton

Pine Avenue is a small side street in the Sydney suburb of Earlwood. It terminates abruptly at the Cooks River, a tidal estuary that defines the contours of Sydney's inner south-west and reifies colonial exploration. While engineered from asphalt, Pine Avenue is also shaped by waters both slow and spectacular: every King Tide, the road floods with brackish water seeping up from underground; during storm surges, an excess of storm water from neighbouring areas can cause the Cooks to breach its banks, pouring itself out onto Pine. Due to the creep of the tide or the inundation of storm water, city-planning regulations dictate that any house constructed on Pine Avenue must match the elevation of the runway at Kingsford Smith Airport, some two kilometres to the east. In this, the tiny thoroughfare becomes a repetition of that larger thoroughfare—one that gives Sydney access to globalisation, mobility and myriad fossil-fuelled desires, and one that, like the microcosm of Pine Avenue, is also built on stolen indigenous land and engineered to mute the whims of the water (Figure 1).

Those living on Pine Avenue are especially exposed to the rising sea levels and stronger storm surges of climate change, but each of these Pine Avenue bodies also weathers climate change differently. While the inhabitants of some houses attempt to fortify properties by investing in higher foundations and subfloor ventilation systems, neighbours with homes built before the elevation regulations weather the rising damp. Cyclists and drivers avoid wheeling through the 'nuisance' floodwaters lest the Cooks' brackish excess prematurely corrode their vehicles, while other animals face different navigational challenges: turtles displaced by tides will have to plot a course through new mangroves and bitumen roads, while bats seek out the toxic waters to avoid death during heatwaves. Weeds and other non-humans persevere through tides and floods, despite (and sometimes because of) the ubiquity of pollution in the river—even though weed spraying by local government keeps trying to engineer their existence. If we were to follow the Cooks back in time, we would find that the Bedigal people were likely weathering in the area well after the British seized Port Jackson; middens and cave paintings mark this history of life with tide, bank, storm, shellfish. Today, few Bedigal live on Country. A settler invasion gives way to skyrocketing property prices to continue a history of dispossession. Nonetheless, many aboriginal people displaced from rural locations still live with and care for this river, sometimes in solidarity with local school groups, families and organisations seeking to help communities around Pine Avenue and the Cooks weather differently.

Weathering, then, is a particular way of understanding how bodies, places and the weather are all inter-implicated in our climate-changing world. Weathering describes socially, culturally, politically and materially differentiated bodies in relation to the materiality of place, across a

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Figure 1 King Tide on Pine Ave, 13 January 2017
Source: Photograph by Jennifer Mae Hamilton

thickness of historical, geological and climatological time. As that part of speech known as a gerund (an *-ing* word that functions as a noun), weathering also names a practice or a tactic: to weather means to pay attention to how bodies and places respond to weather-worlds which they are also making; to weather responsively means to consider how we might weather differently—better—and act in ways that can move towards such change. Importantly, as suggested by its provenance in an essay by Neimanis and Walker (2014) in the feminist philosophy journal *Hypatia*, weathering as a concept learns from a feminist politics of difference and intersectionality: not all bodies weather the same; weathering is a situated phenomenon embedded in social and political worlds.

This understanding of weathering also asks that we expand how we understand 'the weather'. Weather is pervasive in ways that makes distinctions between the meteorological and the social rather leaky, not unlike the much-critiqued nature/culture divide. While climate change certainly affects us all, challenges related to sea level rise, food insecurity, and increasing naturalcultural disasters always cut along gendered, raced, classed and colonial lines, in well-documented ways.[1] This mix of sociopolitical inheritances and structures intra-acting with more-than-human conditions is what critical race scholar Christina Sharpe (2016, p. 104) calls 'the total climate'; weather is the totality of our environments—naturalcultural, all the way down. As Sharpe argues, in the wake of slavery (which persists in various mutated forms to this day), black bodies must continue surviving, or *weathering*, the total climate that

[1]Many works on environment and climate justice substantiate this claim. Two texts that focus specifically on Hurricane Katrina, for example, include Bullard and Wright's Race, Place and Environmental Justice after Hurricane Katrina (2009), and David and Enarson's co-edited The Women of Katrina: How Gender, Race and Class Matter in an American Disaster (2012). See also Gunaratnam and Clark (2012) on the question of race and vulnerability to climate change in the context of critical race studies in 'Pre-race post-race: climate change and planetary humanism'.

is anti-blackness. Again, weathering here is neither metaphor nor analogy (anti-blackness is not only *like* bad weather and surviving it is not only *like* surviving bad weather); in a climate-changing world, climatological phenomena are themselves imbricated in these embodied lifeworlds. In the face of the greatest climatic transformation that human bodies have ever known, weathering means learning to live with the changing conditions of rainfall, drought, heat, thaw and storm *as never separable from* the 'total climate' of social, political and cultural existence of bodies. This includes anti-blackness, but also, we suggest, coloniality, misogyny and the resourcing and thingafication of other bodies—poor, queer, non-human, disabled.

Moreover, as Sharpe reminds us, weathers gather. Over time, new weathers emerge. Weather is not ahistorical, but nor is it facilely 'made'; it is rather wrought from a specific set of conditions. This makes weather both predictable and changeable: bodies that weather also respond. So, when Sharpe (*ibid.*, p. 106) insists that black bodies 'produce out of the weather their own ecologies' as a means of resisting (while being incapable of completely escaping) the total climate, we draw a direct connection to Anishinaabe scholar Gerald Vizenor's (2009) concept of survivance—Indigenous persistence and resistance—as a kin concept for weathering. As Vizenor (*ibid.*, p. 85) describes it, 'survivance creates a sense of native presence and actuality over absence, nihility and victimry'.

Survivance, like Sharpe's (2016) conception of being 'in the wake', has its own vital history. It is therefore not ours to wrench from its context, but it can teach us about the importance of articulating a mode of being that can acknowledge injustice, damage done, and the impossibility of the neo-liberal imperative, while also seeing the need for bodies and places to persevere. Weathermarked, new ecologies are built. Weathering in the face of violent structures cannot be romanticised, nor can it provide an alibi for colonialism and white supremacy. At the same time, the remarkable persistence of these labours must be acknowledged. Weathering reminds white settler colonial bodies that learning to weather better cannot be about fortifying our own havens; weathering better requires interrupting our existing patterns of weathermaking, broadly construed.

Weathering on Pine Avenue may appear utterly banal alongside the total climate of contemporary forms of slavery or coloniality that Sharpe and Vizenor describe. Yet, Sharpe's explication of what counts as 'total climate' makes us more attentive to the subtle structures of power that also shape Pine Avenue and the bodies that belong there: an ideology of private property that too often trumps community and solidarity; a pervasive speciesism that prioritises the well-being of humans and their objects over more-than-human flourishing; and a settler colonial violent displacement that is so normalised that it has literally become part of the air we breathe—in Sydney, settler colonialism is the total climate. In other words, to consider how 'climate' affects life on Pine Avenue again demands an understanding of weather as more-than-meteorological.[2]

Given this attention to structural violence, what we call weathering might evoke different concepts by others—for example, in their critique of 'resilience' as a key concept in the 'Living lexicon for

[2]In a short piece for the journal *Environmental Humanities*, Mike Hulme (2015, pp. 176, 177) expands the term 'climate' to include more direct thinking about the weather, because just as the weather has a complex role in sociocultural life, so too does climate. While we agree, we seek an even more capacious, naturalcultural understanding of both weather and climate.

environmental humanities',[3] Vardy and Smith (2017) suggest the word 'vulnerability'. We agree with Vardy and Smith's rejection of a totalising discourse of resilience as a form of biopolitics. We also recognise how 'vulnerability' can be helpful in challenging, for example, the idea that Pine Avenue might be made 'resilient' (in a neo-liberal sense) through more engineering so that the business of living might continue as usual.[4] Indeed, vulnerability can situate people and places in a more capacious relationship with the encroaching tide, and can recognise an inevitable need to find ways of living in relation to weather and climate change. To speak only of vulnerability, however, does not enable the related discussion of the vexed historical, social, embodied and proprietorial relationships that hold the street's residents *in situ*; it does not account for stubborn attachment to place or the bodily and economic barriers to movement (or to coming home). *To ask a poor person, or woman, or refugee to be 'vulnerable' is as troubling as it is to demand self-determined 'resilience'.*

Weathering, however, insists that the need for a particular kind of relation with the more-than-human–environment must also stake a claim for a different kind of sociality and (interhuman) politics. Weathering is thus between the neo-liberal heroics of resilience and the victim politics of vulnerability; with its specific feminist, antiracist and decolonial intersectional attentiveness, it also recommits to the need for an analysis of structural and systemic violence as essential to thinking through life in a changing climate. Weathering enables us to talk about the ethics of exposure, necessarily in relation to the political economies of place. It recognises the need for shelter while remaining critically attentive to the politics of shelter, always textured by gender, race, class, accessibility, species and other embodied markers. Demonstrating responsibility to place, history, difference, justice and more-than-human earth others, weathering is a critical response concept and practice for our time.

author biographies

Astrida Neimanis writes mostly about bodies, water and weather, in an intersectional feminist mode. Her most recent monograph is *Bodies of Water: Posthuman Feminist Phenomenology* (London and New York: Bloomsbury Academic, 2017). She is also Associate Editor of the journal *Environmental Humanities*, and scientific director of the 'Deep Waters' cluster of The Seed Box: Environmental Humanities Collaboratory based in Linköping University, Sweden (www.theseedbox.se/research-clusters/deep-time-deep-earthdeep-waters/deep-waters/). Currently, Astrida is Senior Lecturer in the Department of Gender and Cultural Studies at the University of Sydney, on Gadigal land, in Australia.

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Together, Jennifer and Astrida initiated the COMPOSTING Feminisms and the Environmental Humanities (compostingfeminisms.wordpress.com) reading and research group in 2015, and are founding members of The Weathering Collective (weatheringstation.net), with Tessa Zettel, Rebecca Giggs and Kate Wright. Since 2015, they have also jointly hosted the *Feminist, Queer and Anticolonial Propositions for Hacking the Anthropocene!* (hackingthenanthropocene.wordpress.com) event series, which is now being rearticulated as a living book, in collaboration with Susan Reid and Sigi Jottkandt.

[3] Emily O'Gorman and Kate Wright, eds., 'Living lexicon for the environmental humanities', http://environmentalhumanities.org/lexicon/ [last accessed 19 January 2018].

[4] Multiple studies explore how resilience rhetoric works to maintain dominant and unequal power relations across gender, race and class lines. See Bracke's 'Bouncing back: vulnerability and resistance in times of resilience' (2016) and Robin James' *Resilience and Melancholy: Pop Music, Feminism, Neoliberalism* (2015). For a specific uptake of the sociological and ecological in resilience discourse see Ashley Dawson's *Extreme Cities* (2017).

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TITLE: IN THE WAKE - ON BLACKNESS AND BEING
Author: Christina Sharpe
Publisher: Duke University Press
Year: 2016
Pages: 102-134

FOUR

The Weather

> Weather: The condition of the atmosphere (at a given place and time) with respect to heat or cold, quantity of sunshine, presence or absence of rain, hail, snow, thunder, fog, etc., violence or gentleness of the winds. Also, the condition of the atmosphere regarded as subject to vicissitudes. *fig.* and in figurative context; *spec.* (*lit.*), applied to an intellectual climate, state of mind, etc. *Naut.* Of a ship, to make good, bad, etc. weather of it: to behave well or ill in a storm. Weather is described by variable conditions such as temperature, humidity, wind velocity, precipitation, and barometric pressure.
>
> —OED *Online*

In all kinds of weather, the ships came and went from Saint Louis, Bristol, Rhode Island, New York, from Senegambia and offshore Atlantic, from West Central Africa and St. Helena, from Southeast Africa and Indian Ocean islands, from the Bight of Benin, from the Bight of Biafra, from Liverpool and Lisbon, from Bahia, Havana, Marseilles, Amsterdam, Port Antonio, Kingston, Rio de Janeiro, and London. The ships set out one in the wake of another. Five hundred years of voyages of theft, pillage, and bondage. Some of the ships made only one trip; others made multiple trips under the same and different names, under the same and different owners, and under the same and different flags, under the same and different insurers. The ships kept going and coming, over thirty-five thousand recorded voyages. I find their names in the TransAtlantic Slave Trade Voyages Database: *Antelope*,

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Formiga, The Good Jesus, Diligente, Black Joke, Bonfirm, Mercúrio, The Phillis, Alligator, Voador, Tibério, The Amistad, Africa, Africain, Africaine, African Gally, Africano Constitucional, Africano Oriental, African Queen, Legítimo Africano, Vigilante Africano, Agreeable, Agreement, Aleluia da Ressurreição e Almas, the names went on and on.[1]

There were rebellions on board many of those slave ships. Other ships were intercepted or claimed at sea or in port by one jurisdiction or another. One such ship was the *Antelope*, about which it was recorded that the "original goal"—delivering the 259 surviving abducted Africans on board, 64 percent of whom were children, to the port where they would be sold—was "thwarted"; "reason human agency."[2] From Morrison's *Beloved* I draw a connection between Sethe's mother and her shipmates who made that Middle Passage crossing and that ship the *Antelope*. The figure of the *Antelope* first appears in *Beloved* through the dance that, from a distance, Sethe sees her mother and her mother's shipmates dance. As the figure appears here, I read it as it stands in for the Middle Passage and more, for other suspensions of Black being between life and death and resistance to those violent suspensions. The antelope as African cosmology and slave ship haunts the novel and repeats in the description of the fetus that Sethe is carrying as she breaks for something like freedom across the Ohio River away from the Kentucky plantation called Sweet Home. After Schoolteacher attempts to make that (left side human; right side animal) ledger flesh, Sethe breaks for supposedly free soil, carrying with her memories of another flight for freedom. "She waited for the little antelope to protest, and why she thought of an antelope Sethe could not imagine since she had never seen one. She guessed it must have been an invention held on to from before Sweet Home, when she was very young. Of that place where she was born (Carolina maybe? or was it Louisiana?) she remembered only song and dance" (Morrison 1987, 30). The text continues, "Oh but when they sang. And oh but when they danced and sometimes they danced the antelope. The men as well as the ma'ams, one of whom was certainly her own. They shifted shapes and became something other. Some unchained, demanding other whose feet knew her pulse better than she did. Just like this one in her stomach" (Morrison 1987, 31). The *Antelope* and those other ships and what occurred before them, on them, and in their wake repeat in Morrison's text and they are Weather. They haunt

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as Sethe gives birth to Denver in a "wrecked and wretched boat" on which she hopes to cross the Ohio River.

In *Beloved*, the weather comes, breaks, changes quickly; it "let[s] loss," it is remarked upon and forgotten; it is. In my text, the weather is the totality of our environments; the weather is the total climate; and that climate is antiblack. And while the air of freedom might linger around the ship, it does not reach into the hold, or attend the bodies in the hold. Recall Margaret Garner, on whom Morrison's Sethe is based. Margaret Garner, who first breathes Ohio's "air of freedom" when she is seven years old[3] and who, twelve years later, on the evening of January 27, 1856, escapes from Kentucky and heads back to Ohio. She has with her her four children, her husband Robert, and his parents, Mary and Simon. Of course, six years after the passage of the Fugitive Slave Act that "free air" of a "free state" is denied to those in the hold who would take their freedom; slavery is enforced as the law of the entire United States. Its atmospheric density increased; slavery undeniably became the total environment.

> *By and by all trace is gone, and what is forgotten is not only the footprints but the water too and what is down there. The rest is weather. . . . Just weather.* (Morrison 1987, 275)

Remember that Margaret Garner is recaptured, and in her attempt to deny ownership to those who would claim her and her children as property, she succeeds in killing her daughter Mary. After which she is recaptured, held, tried, and put on the *Henry Lewis*, that ship that will return her slavery, this time to New Orleans, a place from which almost no enslaved people managed to escape. Margaret Garner marked for that ship, stowed on it with her husband and her baby daughter, Cilla.

As the *Henry Lewis* set out on its trip to Gaines' Landing in Arkansas, it collided with the boat the *Edward Howard*. Margaret and Cilla Garner were thrown or jumped overboard. Twenty-five people died in that accident, and the Garners' infant daughter Cilla was among them. Cilla was the nursing daughter whom Garner had tried unsuccessfully to kill in order to prevent her re-abduction into slavery. When *The Liberator* and the *Cincinnati Daily Commercial* covered this, they did not report on the weather, or on the speed of the boats or on the traffic on the sometimes-crowded river. The papers reported that there was a col-

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lision and that it caused Cilla's death. The papers reported "Margaret Garner's expression of joy" on learning that the journey by ship had succeeded in killing Cilla where she had not. Another one of her children would be spared the hell of slavery (Reinhardt 2010). The papers reported that "a black man, the cook on the Lewis, sprang into the river and saved Margaret whom it was said displayed frantic joy when told that her child was drowned, and said she would never reach alive Gaines' Landing in Arkansas, the point to which she was shipped—thus indicating her intention to drown herself. . . . Another report is, that, as soon as she had an opportunity, she threw her child into the river and jumped after it. . . . It is only certain that she was in the river with her child and that it was drowned" (Reinhardt 2010, 134). The only certainties are the river, that weather (antiblackness as total climate), and that Cilla, "it" as the newspapers mis/name her, was drowned. (That oceanic ungendering repeats.)

In the wake, the river, the weather, and the drowning are death, disaster, and possibility. They are some of the impossible possibilities faced by those Black people who appear in the door and dwell in the wake. Here is Edwidge Danticat (1996b) on this: "The past is full of examples when our foremothers and forefathers showed such deep trust in the sea that they would jump off slave ships and let the waves embrace them. They too believed that the sea was the beginning and the end of all things, the road to freedom and their entrance to Guinin."

It is some of these impossible possibilities that, in *Beloved*, Sethe wants to keep from her daughter Denver. She wants to keep Denver from standing in the place where it was and is and will be; she wants to keep her from being overtaken by the past that is not past. Sethe wants to protect Denver from memory and from more than memory, from the experience, made material, of people and places that now circulate, like weather. What Sethe describes is the afterlife of slavery, and it is a "thought picture" that is out there "waiting for you." As Sethe tells Denver, memories reanimate the places and spaces of slavery post nominative emancipation. Rememory is Sethe's word for it, and it is out there, waiting for you: "What I remember," she says, "is a picture floating around out there outside my head" (Morrison 1987, 36). What Sethe remembers, rememories, and encounters in the now is the weather of being in the wake. It is weather, and even if the country, every country, any country, tries to forget and even if "every tree and grass blade of

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[the place] dies," it is the atmosphere: slave law transformed into lynch law, into Jim and Jane Crow, and other administrative logics that remember the brutal conditions of enslavement after the event of slavery has supposedly come to an end (Morrison 1987, 36).

In the United States, slavery is imagined as a singular event even as it changed over time and even as its duration expands into supposed emancipation and beyond. But slavery was not singular; it was, rather, a singularity—a weather event or phenomenon likely to occur around a particular time, or date, or set of circumstances. Emancipation did not make free Black life free; it continues to hold us in that singularity. The brutality was not singular; it was the singularity of antiblackness.

> *Singularity: a point or region of infinite mass density at which space and time are infinitely distorted by gravitational forces and which is held to be the final state of matter falling into a black hole.* (Merriam-Webster Online)

In what I am calling the weather, antiblackness is pervasive *as* climate. The weather necessitates changeability and improvisation; it is the atmospheric condition of time and place; it produces new ecologies. *Ecology: the branch of biology that deals with the relations of organisms to one another and to their physical surroundings; the political movement that seeks to protect the environment, especially from pollution*. We read in *Beloved* one ecology of the ship that continues into the present: "In the beginning the women are away from the men and the men are away from the women storms rock us and mix the men into the women and the women into the men" (Morrison 1987, 211). The weather trans*forms Black being. But the shipped, the held, and those in the wake also produce out of the weather their own ecologies. When the only certainty is the weather that produces a pervasive climate of antiblackness, what must we know in order to move through these environments in which the push is always toward Black death?

An example of knowledge to survive such lived and produced ecologies comes to us via Dionne Brand's "Ruttier for the Marooned in the Diaspora." "The oral ruttier," she writes, "is a long poem containing navigational instructions which sailors learned by heart and recited from memory." The "Ruttier" (historical and present) "contained the

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routes and tides, the stars and maybe the taste and flavour of the waters, the coolness, the saltiness; all for finding one's way at sea" (Brand 2001, 212). Coming at the end of *A Map to the Door of No Return*, Brand's "Ruttier" has taken note of the weather, and this poem appears as a way-making tool, a gift of knowledge that, and how, Black life is lived in the wake. The inhabitants of Diaspora are

> marooned, tenantless, deserted. Desolation castaway, abandoned in the world. They was, is, wandered, wanders as spirits who dead cut, banished, seclude, refuse, shut the door, derelict, relinquished, apart. More words she has left them. Cast behind. . . . All unavailable to themselves, open to the world, cut in air. . . . And it doesn't matter where in the world, this spirit is no citizen, no national, no one who is christened, no sex, this spirit is washed of all its lading, bag and baggage, jhaji bundle, georgie bindle, lock stock, knapsack, and barrel, and only holds its own weight which is nothing, which is memoryless and tough with remembrances, heavy with lightness, aching with grins. (Brand 2001, 213)

A long poem for those of us in the wake of those ships, Brand's "Ruttier" does not contain conventional navigational instructions to country and safe landing (could it? those of us in the wake cannot use such conventional means); it does contain what present/future migrants might meet, refuse, and remake on and in their journeys. The "Ruttier" takes as ground that first plunge into unbelonging, reframes as gift that absence of country. I read the "Ruttier," then, as a way-making tool and a refusal of nation, country, citizenship; it is a barometer, a reading of and a response to those atmospheric pressures and the predictably unpredictable changes in climates that, nonetheless, remain antiblack.

The boats set out in all kinds of weather from Zliten and Tripoli and other points along the coast of Libya. These boats have no names, though they might come to be called *Left-to-Die*. Those Africans from other countries who had been living and working in Libya set out, now, because of the war, the ongoing destruction of Libya, and all that has occurred since. The atmosphere radically changed, specifically in relation to "Black Africans," and so they boarded those "wrecked and wretched boats."

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> "The Libyans who got me to Italy are not human," he said. "They speak with the gun not with words. . . . They pushed eight Nigerians into the sea." . . . And they pushed my friend into the sea. They all drowned.[4]
>
> Teenagers arriving in the Italian port of Lampedusa told workers from Save the Children how migrants from sub-Saharan African countries were often kept below the deck, deprived of water and sunlight. . . . The weather was really bad. Some people were afraid. They didn't want to go, but there was no way back. (Dearden 2015)

The boats set out one after another.

And when the migrants reach the shore they are often returned to the hold in the form of the camp, the *Lager*, the detention center, and so on, and they may be returned to the ship. Cast behind, set adrift, once again.

Aspiration

> We were the offspring of lovers convicts the poor and had been
> brought to this forest by the Factory Committee
> from we born
> or. in some cases. from infancy. Many of us were mad
> some were idiots and a few suffered from enhystamines hys
> -terias vitamin deficiencies & allergies that behave like liars
> tubers & blood pressure/diseases . result of the vicious in
> -ternal breeding of our impenitential ancestors.
> —Kamau Brathwaite, The Black Angel/DS (2): Dream Stories

> We revolt simply because . . . we can no longer breathe.
> —Frantz Fanon, *Toward the African Revolution*

Again, when NourbeSe Philip asks in the Notanda to *Zong!* "What is the word for bringing bodies back from water? From a 'liquid grave'?" (Philip 2008, 202), the word she arrives at is *exaqua*. And so we ask yet again: What would it mean to stay safe and to defend the dead—our "impenitential ancestors"; those who are actually dead and those whom the state refuses to grant life; those whom the state persists in choking the life out of? I've been thinking a lot about aspiration. Not in the conventional sense. Or at least not in the sense that may most readily come

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to mind in which aspiration is tied to *opportunity*—that connection to the door of no return and the ship and the shipping is never far away—and tied to class movement. Tied as well, in the United States to some articulation of that deadly *occlusion* that is continually reanimated and called the American Dream. (This American Dream stands counterpoised to the dream of and in Brathwaite's *Dream Stories* and "Dream Haiti." To dream Haiti is an entirely different enterprise all together. It is to enter and inhabit the dream and reality of revolution.) I've been thinking about what it takes, in the midst of the singularity, the virulent antiblackness everywhere and always remotivated, to keep breath in the Black body. What ruttier, internalized, is necessary now to do what I am calling wake work as aspiration, that keeping breath in the Black body? I've been thinking aspiration in the complementary senses of the word: the withdrawal of fluid from the body *and* the taking in of foreign matter (usually fluid) into the lungs with the respiratory current, *and* as *audible breath* that accompanies or comprises a speech sound. Aspiration here, doubles, trebles in the same way that with the addition of an exclamation point, Philip transforms and breaks *Zong* from a proper name into *Zong!* That exclamation point breaks the word into song/moan/chant/shout/breath.

It is to the breath that I want to turn now. To the necessity of breath, to breathing space, to the breathtaking spaces in the wake in which we live; and to the ways we respond, "with wonder and admiration, you are still alive, like hydrogen, like oxygen" (Brand 2015). As Philip says, the pause in the poem, the breath, "is totally subversive in the face of the kind of broad-brush brutalizing where people just get reduced to Negro man, Negro woman, and ditto, ditto, ditto. You pay attention to one, and it is such an amazing act—and one that spills over to all the other dittos—paying attention and taking care with just the one. Because that's all we can do is care one by one by one. And that's why it was so important for me to name these lost souls in the footnotes to the early poems" (Saunders 2008a, 78). Breathlessness and the archive: the archives of breathlessness. The details accumulate in *Zong!* and for us, what might it mean to attend to these archives? What might we discover in them?

In 1982, Los Angeles police chief Daryl Gates "provoked an outcry from civil rights advocates when he said that blacks might be more likely to die from choke holds because their arteries do not open as fast as arteries do on 'normal people.'"[5] Nine years later, but only seven

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months after the March 3, 1991, beating-almost-to-death of Rodney King in which we marveled that he was still alive ("*like hydrogen, like oxygen*"), "some Police Department tactical experts now see the videotape of officers striking Mr. King 56 times as an opportunity to convince the public the choke hold is actually safer and a more humane way to subdue suspects."[6] In New York City, though police chokeholds were banned for over two decades, "the Civilian Complaint Review Board has seen 1,128 chokehold cases over the last five-and-a-half years, and complaints about the practice 'persist and appear to be increasing.'"[7]

"I can't breathe." On July 17, 2014, Eric Garner was on the street in Staten Island when he was approached and stopped by an NYPD officer "on suspicion of selling loose, untaxed cigarettes." Mr. Garner is (and I am reading/hearing echoes of Margaret Garner in all of this) approached by the NYPD, and he responds to the stop by saying, "For what? Every time you see me you want to mess with me. I'm tired of it. This stops today. What are you bothering me for. . . . I didn't do nothing. . . . I'm just standing here. I did not sell nothing. Because every time you see me, you want to stop me, you harass me. . . . I'm minding my business, officer. I'm minding my business; please just leave me alone. I told you the last time, please just leave me alone."[8] Then two other officers approach Mr. Garner and he repeats his pleas not to be touched: "Don't touch me, don't touch me, please." And then the first officer, Pantaleo, puts Mr. Garner in a chokehold and takes him down to the ground. Eleven times during this assault Mr. Garner says, "I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe, I can't breathe" until he stops breathing. And though paramedics have arrived on the scene, they give him no assistance. No aspiration. The city medical examiner ruled Mr. Garner's death a homicide, and despite audio and visual evidence, the NYPD maintains its claim that the cause of this murder (for which they will find no one, save Mr. Garner, responsible) was *not* a chokehold, and once again, Mr. Garner's murderer was not indicted. The list of nonindictments in the wake of state murders of Black people continues to grow: Michael Brown, John Crawford, Aiyana Stanley-Jones, Sandra Bland, Jonathan Ferrell, Miriam Carey, Tamir Rice, Rekia Boyd, *. Again, Black being appears in the space of the asterisked human as the insurance for, as that which underwrites, white circulation as the human. Always, Black

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being seems lodged between cargo and being. *Wake: in the line of recoil of (a gun). Wake: the track left on the water's surface by a ship. Wake: the watching of relatives and friends beside the body of the dead person.*

It was soon after Eric Garner's murder on July 17, 2014, that the jury in the trial of Ted Wafer returned a verdict of guilty in the case of his murder of nineteen-year-old Renisha McBride.[9] The previous July had seen the all-(non Black)woman jury return a verdict of not guilty for George Zimmerman, the murderer of seventeen-year-old Trayvon Martin.[10] The verdict in the Wafer trial brought, perhaps, a little breathing room before the next onslaught, the next intake of air, the held breath. In the weather of the wake, one cannot trust, support, or condone the state's application of something they call justice, but one can only hold one's breath for so long. "'*We revolt simply because, for a variety of reasons, we can no longer breathe*'" (Fanon [1970] 1994, 50).

Day after day the stories arrive. Fifty people suffocated in the hold of a ship;[11] three people suffocated in prison over the course of a weekend in the United States. To explicate Fanon, it is not the specifics of any one event or set of events that are endlessly repeatable and repeated, but the totality of the environments in which we struggle; the machines in which we live; what I am calling the weather.

In an interview in the *Atlantic* about *Breathing Race into the Machine*, her book on racial science and the invention and use of the spirometer, the instrument that measures lung capacity, Lundy Braun says,

> In 1864, the year before the Civil War ended, a massive study was launched to quantify the bodies of Union soldiers. One key finding in what would become a 613-page report was that soldiers classified as "White" had a higher lung capacity than those labeled "Full Blacks" or "Mulattoes." The study relied on the spirometer—a medical instrument that measures lung capacity. This device was previously used by plantation physicians to show that black slaves had weaker lungs than white citizens. The Civil War study seemed to validate this view. As early as Thomas Jefferson's *Notes on the State of Virginia*, in which he remarked on the dysfunction of the "pulmonary apparatus" of blacks, lungs were used as a marker of difference, a sign that black bodies were fit for the field and little else. (Forced labor was seen as a way to "vitalize the blood" of flawed black physiology. By this logic, slavery is what kept black bodies alive.) (Braun and Shaban 2014)

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Daryl Gates and contemporary policing practices are the inheritors of the history of the spirometer that produced Black bodies as defective and monstrous.

There is, too, a connection between the lungs and the weather: the supposedly transformative properties of breathing free air—that which throws off the mantle of slavery—and the transformative properties of being "free" to breathe fresh air. These discourses run through freedom narratives habitually. But who has access to freedom? Who can breathe free? Those narratives do not ameliorate this lack; this lack is the atmosphere of antiblackness. Recall, too, that captive Africans were brought out of the hold, weather permitting, to put fresh air in their lungs and to be exercised. (Of course, this was about their value as cargo and not about the health of the captive Africans for themselves. This is being, property, for the other.) Weather monitoring was a major part of plantation management. Awareness of the ecological systems was necessary for the growth and cultivation of certain crops (growing seasons, yield, etc.) and for the life expectancy (or lack of) of the captive laboring population. We read, "Planters consistently recorded the weather in their work logs as part of the revolution in plantation accounting techniques" (Roberts 2013, 195). Weather determined local practices of working enslaved people, and those practices differed from plantation to plantation and from region to region. Some slave owners believed in working enslaved people harder in the rain, while under the same conditions other slave owners assigned the enslaved "lighter" tasks. Overall, though, enslaved people had very little respite from work even when plantation managers believed that work in the rain produced a miasma or "bad air." One Jamaican planter reports "not a single day of work lost to weather over the course of two years" (Roberts 2013, 196). Regardless of the particular practices, relentless hard labor in the rain, in the sun, in damp and in dry, cutting cane, laying dung, hoeing, and weeding, all had deleterious and often deadly effects on the lungs and bodies of the enslaved.

Slavery, then, simultaneously exhausted the lungs and bodies of the enslaved even as it was imagined and operationalized as that which kept breath in and vitalized the Black body. We, now, are living in the wake of such pseudoscience, living the time when our labor is no longer necessary but our flesh, our bodies, are still the stuff out of which "democracy" is produced. Back to Fanon ([1970]1994, 50), who wrote

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in *Toward the African Revolution*, "There is not occupation of territory, on the one hand, and independence of persons on the other. It is the country as a whole, its history, its daily pulsation that are contested, disfigured . . . under these conditions; the individual's breathing is an observed breathing. It is a combat breathing."

What is the word for keeping and putting breath back in the body? What is the word for how we must approach the archives of slavery (to "tell the story that cannot be told") and the histories and presents of violent extraction *in* slavery *and* incarceration; the calamities and catastrophes that sometimes answer to the names of occupation, colonialism, imperialism, tourism, militarism, or humanitarian aid and intervention? What are the words and forms for the ways we must continue to think and imagine laterally, across a series of relations in the hold, in multiple Black everydays of the wake? The word that I arrived at for such imagining and for keeping and putting breath back in the Black body in hostile weather is *aspiration* (and aspiration is violent and life-saving). Two additional forms of wake work as a praxis for imagining, arrive in the registers of Black annotation and Black redaction.

Black Annotation, Black Redaction

> Annotate: To add notes to, furnish with notes (a literary work or author).
> An annotation is metadata (e.g. a comment, explanation, presentational markup) attached to text, image, or other data. Often annotations refer to a specific part of the original data.
> —*OED Online*

> Redaction: a: The action of bringing or putting into a definite form; (now) *spec.* the working or drafting of source material into a distinct, esp. written, form. Usu. with *into*, (occas.) *to*.
> b: The action or process of revising or editing text, esp. in preparation for publication; (also) an act of editorial revision.
> Obs. The action of driving back; resistance, reaction.
> —*OED Online*

I point to these practices of Black annotation and Black redaction as more examples of wake work. The orthographies of the wake require new modes of writing, new modes of making-sensible. Redaction comes to us most familiarly through those blacked-out "sensitive

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4.1 Steve McQueen, *End Credits*, 2012. Sequence of digitally scanned files, sound, continuous projection. Installation at the Art Institute, Chicago, 2013. Courtesy of the artist; Marian Goodman Gallery and Thomas Dane Gallery, London

lines" in certain government documents that contain information we are not allowed to read. Steve McQueen's film *End Credits* (2012) consists of six hours of images and voiceover of the redacted FBI files of Paul Robeson. As I watched and listened, it again became clear to me that so much of Black intramural life and social and political work is redacted, made invisible to the present and future, subtended by plantation logics, detached optics, and brutal architectures.

There is, in the Black diaspora (and I include the Continent here because of colonial histories and presents and trans*migration) a long history of Black life, of Black lives being annotated and redacted. There is, as well, continuous resistance to and disruption of those violent annotations and redactions. A 2015 conference on Black portraiture has the subtitle *Imaging the Body and Re-Staging Histories*. Each time I read that word *imaging* I read it doubly. That is, I read the word as *imaging*, "to make a representation of the external form of," and also as *imagining*, "to form a mental image or concept of; to suppose or assume; the ability to form mental images of things that either are not physi-

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cally present or have never been conceived or created by others."[12] If we understand portraiture to be both the "art of creating portraits" (image and text) and "graphic and detailed description," how might we understand a variety of forms of contemporary Black public image-making in and as refusals to accede to the optics, the disciplines, and the deathly demands of the antiblack worlds in which we live, work, and struggle to make visible (to ourselves, if not to others) all kinds of Black pasts, presents, and possible futures? Much of the work of Black imaging and the work that those images do out in the world has been about such imaginings of the fullness of Black life. In *Cutting a Figure: Fashioning Black Portraiture*, Richard Powell (2008, xv) writes that "a significant segment of black portraiture stands apart from the rest of the genre, and not only because of the historical and social realities of racism. Rather, the difference often lies in the artistic contract between the portrayer and portrayed; conscious or unconscious negotiations that invest black subjects with social capital." While Powell speaks here of Black artists and subjects' negotiated and reciprocal imaginings, I want to think about those portraits outside of our own imaging and imagining in which, to borrow from Huey Copeland (2013), we seem "bound to appear." There is a long history and present of resistance to, disruption and refashioning of images of blackness and Black people. There is a long history and present of imaging and imagining blackness and Black selves otherwise, in excess of the containment of the long and brutal history of the violent annotations of Black being: what Spillers, for example, called the hieroglyphics of the flesh; a history that is "the crisis of referentiality, the fictions of personhood, and the gap or incommensurability between the proper name and the form of existence that it signifies" (Hartman 2014). I am thinking here, ushering here, into the gap, Black annotation together with Black redaction, not as opposites, but as trans*verse *and* coextensive ways to imagine otherwise.

Put another way, I want to think annotation in relation to the dysgraphia and the orthography of the wake; in relation to those photographs of Black people in distress that appear so regularly in our lives, whether the image of that suffering Black person comes from quotidian or extraordinary disasters, the photos of them often hit in the register of abandonment. The photographs do this even, or even especially, when they purport to "humanize" Black people—that is, they purport

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to make *manifest* "humanity" that we already know to be present.[13] To be clear, just as I am not interested in rescuing the term *girl* (see "The Ship"), I am not interested in rescuing Black being(s) for the category of the "Human," misunderstood as "Man," or for the languages of development. Both of those languages and the material conditions that they re/produce continue to produce our fast and slow deaths. I am interested in ways of seeing and imagining responses to the terror visited on Black life and the ways we inhabit it, are inhabited by it, and refuse it. I am interested in the ways we live in and despite that terror. By considering that relationship between imaging and imagining in the registers of Black annotation and Black redaction, I want to think about what these images call forth. And I want to think through what they call on us to do, think, feel in the wake of slavery—which is to say, in an ongoing present of subjection and resistance.

Annotation appears like that asterisk, which is itself an annotation mark, that marks the trans*formation into ontological blackness. As photographs of Black people circulate as portraits in a variety of publics, they are often accompanied by some sort of note or other metadata, whether that notation is in the photograph itself or as a response to a dehumaning photograph, in order that the image might travel with supplemental information that marks injury and, then, more than injury. We know that, as far as images of Black people are concerned, in their circulation they often don't, in fact, do the imaging work that we expect of them. There are too many examples of this to name: from the videotaped beating of Rodney King in 1991, to the murder of Oscar Grant, to the brutal murders of twenty-one trans women in the United States as of November 2015, to all of the circulating images of and in the aftermath of Hurricane Katrina and the 2010 earthquake in Haiti, to the ongoing deaths in transatlantic, trans-Mediterranean, and transcontinental crossings extending across the Black global diaspora. This is true even though and when we find images of Black suffering in various publics framed in and as calls to action or calls to feel with and for. Most often these images function as a hail to the non Black person in the Althusserian sense. That is, these images work to confirm the status, location, and already held opinions within dominant ideology about those exhibitions of spectacular Black bodies whose meanings then remain unchanged. We have been reminded by Hartman and many others that the repetition of the visual, discursive, state, and other quo-

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tidian and extraordinary cruel and unusual violences enacted on Black people does not lead to a cessation of violence, nor does it, across or within communities, lead primarily to sympathy or something like empathy. Such repetitions often work to solidify and make continuous the colonial project of violence. With that knowledge in mind, what kinds of ethical viewing and reading practices must we employ, *now*, in the face of these onslaughts? What might practices of Black annotation and Black redaction offer?

What follows are three examples of what I am calling Black visual/textual annotation and redaction. Redaction and annotation toward seeing and reading otherwise; toward reading and seeing something in excess of what is caught in the frame; toward seeing something beyond a visuality that is, as Nicholas Mirzoeff (2011) argues, subtended by the logics of the administered plantation. In "Home," Toni Morrison (1998, 7) writes that she has consistently tried "to carve away the accretions of deceit, blindness, ignorance, paralysis, and sheer malevolence embedded in raced language so that other kinds of perception were not only available but were inevitable." I am imagining that the work of Black annotation and Black redaction is to enact the movement to that inevitable—a counter to abandonment, another effort to try to look, to try to really see.[14]

I return, again, to the photograph of the little girl with the word *Ship* affixed to her forehead (figure 2.5). This little girl was at the beginning of this work, and she occupies its center. Shortly after that catastrophic earthquake hit Haiti on January 12, 2010, I entered the archive of photographs that had emerged from it. It wasn't the first time I had cautiously entered this archive, but on this occasion I was stopped by that photograph of a young Black girl, ten years old at most. A third of the image is blurry. But on the right-hand side one can still make out grass and dirt, something black that she is lying on, and, in the background, other things (a figure? a bundle of clothing? a cigarette? something else?).

The girl's face is clear; it's what's in focus. She is alive. Her eyes are open. She is lying on what looks like a black stretcher; her head is on a cold pack, and you can make out that there is writing on that cold pack and some of the words, like *instructions for use and disposal*. You can also read the words *roll up* and *dispose* and *registered trademark*. There's some debris on the stretcher. There are two uncovered wounds over the girl's right eye and another smaller one under it. A piece of paper

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is stuck to her bottom lip. She is wearing what seems to be a print cotton hospital gown. She is looking straight ahead of her, or directly at, or past, the photographer's camera. She looks to be in shock. Her big black eyes, with their lush eyelashes, look glazed. Her look reaches out to me. Affixed to her forehead is that piece of transparent tape with the word *Ship* written on it. What is the look in her eyes? What do I do with it? The first annotation was that word *Ship*. What can one see beyond that word that threatens to block out everything else?

When I stumbled upon that image of this girl child with the word *Ship* taped to her forehead, it was the look in her eyes that stopped me. Then with its coming into focus that word *Ship* threatened to obliterate everything and anything else I could see. What was it doing there, I wondered? But I returned again and again to that photo and to her face to ask myself about the look in her eyes. What was I being called to by and with her look at me and mine at her? Over the course of the years since I first found that image of this girl, I returned to it repeatedly to try to account for what I saw or thought I might see. Where is she looking? Who and what is she looking at or looking for? Who can look back? Does she know that there is a piece of tape on her forehead? Does she know what that piece of tape says? She must be afraid. Does she know that she is already linked to a ship and that she is destined for yet another one? Her eyes look back at me, like Delia's eyes, like Drana's.[15]

In a move that is counter to the way photographic redaction usually works—where the eyes are covered and the rest of the face remains visible—here I include only Delia's and Drana's eyes. I performed my own redaction of Agassiz's ethnographic images in order to focus in on their eyes. I redact the images to focus their individual and collective looks out and past the white people who claimed power over them and the instrument by which they are being further subjected in ways they could never have imagined or anticipated. I want to see *their* looks out and past and across time. Delia and Drana. In my look at them, I register in their eyes an "I" and a "we" that is and are holding something in, holding on, and held, still. Delia and Drana sitting there (still) and then standing there (still), and clothed and unclothed (still) and protected only by eyelashes (still).[16] I am reminded here, of the anagrammatical life of the word *still* for the enslaved and for all Black people in slavery's wake. Over the course of a paragraph in *Beloved* Morrison elaborates what *still* means for the heavily pregnant Sethe, who at this point in her

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4.2 Joseph T. Zealy, Delia, country born of African parents, daughter, Renty. Congo. Delia's eyes. Detail. Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM# 35–5-1/053040 (digital file# 60742034 DETAIL)

4.3 Joseph T. Zealy, Drana, country born, daughter of Jack, Guinea, plantation of B. F. Taylor Esq. Drana's eyes. Detail. Courtesy of the Peabody Museum of Archaeology and Ethnology, Harvard University, PM #35–5-1/053041 (digital file# 60742035 DETAIL)

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pregnancy "was walking on two feet meant for standing still . . . still, near a kettle; still at the churn; still, at the tub and ironing board" (Morrison 1987, 29–30). I am reminded here of *still* as it repeats in Brand's *Verso* 55 (2015), marked as it is there, with wonder at our survival and the residence time of the wake: "We felt pity for them, and affection and love; they felt happy for us, we were still alive. Yes, we are still alive we said. And we had returned to thank them. You are still alive, they said. Yes we are still alive. They looked at us like violet; like violet teas they drank us. We said here we are. They said, you are still alive. We said, yes, yes we are still alive." Delia and Drana, marked, still, because of the daguerreotype's long exposure time, which required that one hold still for long periods of time, and because they were of the ship yet not immediately off the ship like their fathers identified as Renty (Congo) and Jack (Guinea). The little girl who survives the 2010 Haitian earthquake is also a descendant of the ship and she is marked still, and once again, for its hold. I looked again at that photo and I marked her youth, the diagonal scar that cuts across the bridge of her nose and into her eyebrow, those extravagant eyelashes that curl back to the lid, the uncovered wounds, that bit of paper on her lip, and a leaf on the gown and in her hair. *"standing here in eyelashes, in/. . ./the brittle gnawed life we live,/I am held, and held."*

I marked the violence of the quake that deposited that little girl there, injured, in this archive, and the violence in the name of care of the placement of that taped word on her forehead, and then I kept looking because that could not be all there was to see or say. *I had to take care*. (A different kind of care and a different optic than the ones employed in the wake of the *Zorgue*, that ship called Care.) I was looking for more than the violence of the slave ship, the migrant and refugee ship, the container ship, and the medical ship. I saw that leaf in her hair, and with it I performed my own annotation that might open this image out into a life, however precarious, that was always there.[17] *That leaf is stuck in her still neat braids*. And I think: *Somebody braided her hair before that earthquake hit*.

The Little Girl Who Wrote "Hi"

She comes to us from the front pages of the *New York Times*, a December 10, 2014, article titled "Schools' Discipline for Girls Differs by Race and Hue" and with the caption "Mikia Hutchings, 12, whose writing on

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a wall at school led to a juvenile criminal case, and her lawyer, Michael J. Tafelski, waiting for a meeting held last month by a Georgia state committee studying school discipline."[18] Writing is discovered on a school gym bathroom wall. Two middle school students are accused of vandalism: Mikia Hutchings, who is Black, and her (unnamed in the article) white girlfriend. When Mikia's family is alerted to the charges against her, they find it hard to believe she was involved in defacing school and personal property. Then they report to the authorities that they cannot afford to pay the hundred-dollar "restitution" fee to the school and to the student whose sneakers were damaged. "While both students were suspended from school for a few days, Mikia had to face a school disciplinary hearing and, a few weeks later, a visit by a uniformed officer from the local Sheriff's Department, who served her grandmother with papers accusing Mikia of a trespassing misdemeanor and, potentially, a felony" (Vega 2014). Because her family is unable to pay the money, Mikia will be made to pay a much larger price. "As part of an agreement with the state to have the charges dismissed in juvenile court, Mikia admitted to the allegations of criminal trespassing. Mikia, who is African-American, spent her summer on probation, under a 7 p.m. curfew, and had to complete 16 hours of community service in addition to writing an apology letter to a student whose sneakers were defaced in the incident. *Her friend, who is white, was let go after her parents paid restitution*" (Vega 2014).

The article is sympathetic to Mikia. It tries to bring her into focus, and yet she disappears in description. The introductory paragraph reads: "To hear Mikia Hutchings speak, one must lean in close, as her voice barely rises above a whisper. In report cards, her teachers describe her as 'very focused,' someone who follows the rules and stays on task. So it was a surprise for her grandmother when Mikia, 12, and a friend got into trouble for writing graffiti on the walls of a gym bathroom at Dutchtown Middle School in Henry County last year" (Vega 2014).

See and hear Mikia Hutchings. She is a child, a young Black girl, just twelve years old and slight. In the photograph she appears, captured, her lower back resting against a wall as she leans forward, beside a classroom door. She is wearing a gray-and-black horizontal-striped shirt, black stretch pants, black boots with white turned-over cuffs, and a light blue insulated jacket with a hood and a white collar, trim, and

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4.4 Mikia Hutchings, twelve, and her lawyer, Michael Tafelski, wait for a disciplinary hearing at the Henry County Board of Education building in McDonough, Georgia, November 18, 2014. Hutchings and a white friend faced very different disciplinary actions for the same minor incident of vandalism, part of what some see as bias in a state where black girls are five times more likely to be suspended from school than white ones. © Kevin Liles/The New York Times/Redux

white cuffs that echo the white cuffs on the boots. She looks down and to the side, and the fingers of her left hand hold one finger of her right hand. (She holds herself, holds onto herself.) What is the look on her face? As she appears here, she is physically overwhelmed by her white male legal representative, by the charges against her and all of the authority that has been summoned and is determined to discipline her. This authority, the police, the courts, the school, and so on, would put her in cuffs; they have been summoned to transform this girl into a felon. As it abuts the modifier Black, "girl" here, again, appears as the anagrammatical. "'When a darker-skinned African-American female acts up, there's a certain concern about their boyish aggressiveness,' Dr. Hannon said, 'that they don't know their place as a female, as a woman'" (Vega 2014). Mikia Hutchings is held, and in that holding once again "girl" is thrown into question.

If we annotate and redact that first paragraph of the *New York Times* article, we might find Mikia's point of view. Through redaction we

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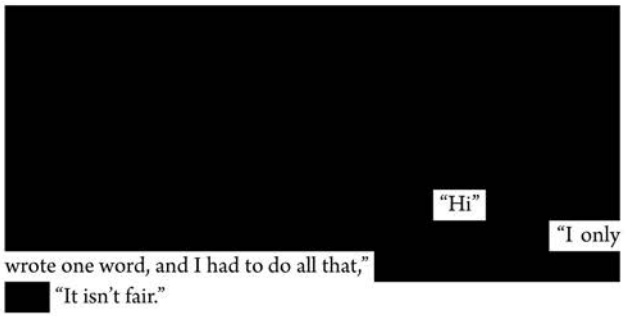
might hear what she has to say in her own defense in the midst of the ways she is made to appear only to be made to disappear. Put another way, with our own Black annotations and Black redactions, we might locate a counter to the force of the state (care as force; "the provision of what is necessary for the health, welfare, maintenance, and protection of someone or something") that has landed her on the front page of the *New York Times*. With this analytic we might begin to see and hear Mikia, whose sole offense was writing the word "Hi" on the wall while a young, Black girl child without financial resources.



That I am arguing for Mikia to come into sight should not be mistaken as an argument for representation or representational politics.

Rather, Black annotation and Black redaction are ways to make Black life visible, if only momentarily, through the optic of the door. Black annotation and redaction meet the Black anagrammatical and the failure of words and concepts to hold in and on Black flesh. Think, now, of the annotations and redactions of the second autopsies ordered by the families of the murdered and commissioned in the wake of so many murders. The second autopsy performed on Michael Brown was requested by his family and their legal team in order to show injury. In other words, that second autopsy was ordered to show the harm done to Michael Brown, who was shot at least six times, including two times in the head. As with Lamont Adams, the bullet wounds to Michael Brown's hand suggested that he was in the posture of surrender. By securing that second autopsy, his family tried to disrupt the dysgraphia that wrote a version of events that was riven with antiblackness. It was not enough to see Michael Brown's body uncovered in the street for

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hours on a hot August day, his mother and stepfather prevented from going to his side. It was not enough to see his mother's distress, to see and hear her scream and fall into the arms of family members. It was not enough to see his distraught stepfather on the side of the road with a makeshift sign declaring: "The police just murdered my son." Not enough. And so his family added their own annotations; they tried to come up with his body's harms as seen through their eyes in order to contest that body that was drawn by antiblackness (figure 4.5). And, of course, even then, it is not enough. It cannot be enough. They cannot recuperate his body. The constant production of Black death *is* and *as* necessary returns us to the singularity. But just as the weather is always ripe for Black death, the singularity also produces Black resistances and refusals.

Black redaction and Black annotation are ways of imagining otherwise. I turn here to Julie Dash's *Daughters of the Dust* (1992). *Daughters* was produced over the course of ten years, and it emanated from the politics and aesthetics that began with Dash's work as part of the LA Rebellion, along with other filmmakers, like Charles Burnett and Haile Gerima. When it was released in 1992, *Daughters* became the first film by an African American woman to get cinematic distribution in the United States. It found an immediate audience with Black women, and at the same time it came to be seen by many other viewing audiences as a foreign film because it did not deal in the familiar.

It was Dash and cinematographer Arthur Jafa's aim to unmake colonial optics that occupy and reproduce the retinal detachment that, then, reproduces the hold as location and destination. That that is their aim is clear from the first shot of the film, which takes place on a boat. In that opening scene we are introduced to Viola Peazant; Mr. Snead, the photographer she has hired to document the migration of her family; her long-gone cousin Yellow Mary; and Yellow Mary's lover Trula. Mr. Snead shows Yellow Mary and Trula the kaleidoscope he has brought with him. He explains the word's etymology as "*Kalos* . . . Beautiful. *Eidos* . . . Form. *Skopein* . . . [to see]" (Dash 1992, 82). As he speaks, Yellow Mary looks at Trula through the kaleidoscope, and Viola explains to Mr. Snead that the slave trade, the importation of "fresh Africans," continued "back off these islands" for many years after it was banned (Dash 1992, 84). This scene establishes for the audience its entrance into a complex visual scene as it interrogates established knowledges:

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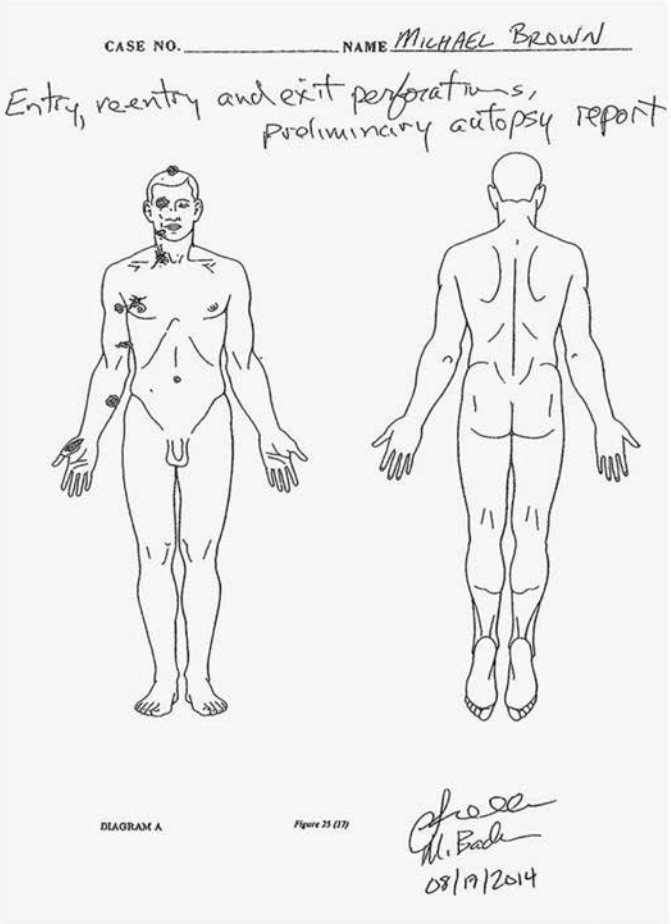

4.5 Preliminary autopsy report delineating wounds on Michael Brown's body. Courtesy of Dr. Michael M. Baden

the time when slavery ended, what the archives don't record. The photographer with his optical equipment, the conversations they have on the boat, and the deliberate way the characters look at and away from each other prepare the audience for something formally beautiful and something that challenges their assumed viewing habits. The slowing down of some of the shots from twenty-four to sixteen frames per second is also a reconfiguration of ways of seeing, and in those instances when the film slows down, an additional space is created for the audience to enter into the scene. Dash (1992, 16, 25) says that she "was told over and over again that there was no market for the film. The distributors talked about the spectacular look of the film and the images and story being so different and thought-provoking, yet the consistent response was that there was 'no market' for this type of film."

With those additional spaces and with her visual and aesthetic choices for marking slavery's long time, Dash engages in some of her own Black redactions. By which I mean, her redaction is her decision to show the traces of slavery as the indigo blue that remains on the hands of the formerly enslaved people who labored and died over the poisonous indigo pits on the Sea Islands off of the coast of South Carolina. Though Dash was well aware that the indigo stains would no longer be visible forty years after the end of legal chattel slavery, she chose this image as the trace of slavery rather than whip-scarred backs, brands, or other more familiar marks that are all too visible in, for example, Steve McQueen's *Twelve Years a Slave* (2013). For Dash, the indigo is what endures as trace, and this trace positions viewers differently in relation to the fact that the afterlives of slavery are long and that the life span of the enslaved people who labored over the pits was very short. "From fifty to sixty hands work in the indigo factory; and such is the effect of the indigo upon the lungs of the laborers, that they never live over seven years. Every one that runs away, and is caught, is put in the indigo fields, which are hedged all around, so that they cannot escape again."[19]

Twelve Years a Slave is a film that McQueen has said "is about love" and that his work here, "is about keeping the tension." He continues, "I love the idea of just being in real time, being present, being there. I'm a filmmaker, so I always think: 'When is the breaking point? When is long enough?'"[20] If we think *Daughters* alongside *Twelve Years*, we might ask where and when is the breaking point in the latter film, or for that matter in most contemporary films in the West, in their rep-

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resentations of Black suffering (of the wake, the hold, the weather, the ship). Where is the breaking point, the breath, the pause, where the circulation, production, and reception of images of Black suffering and, importantly, the pleasure in them are concerned? The long time/ the long shot, the residence time of Black life always on the verge of and in death, goes on. As it appears in *Twelve Years a Slave* (whether in the vicious extended beating of Patsey or in the four-minute-long take of Northrup's hanging), it enters the everyday as continuous and gratuitous. Not so in *Daughters of the Dust* and its visualization of Black life in the decades after slavery's end, as one family is about to migrate from the South to the North of the United States.

Not so in Mauritanian filmmaker Abderrahmane Sissako's gorgeous film *Timbuktu* (2014), which tells a story of life lived in the immanence and imminence of death and in the midst of great violent change. *Timbuktu* makes tangible the ways life is lived in the wake and under the pressure of tremendous change. In Sissako's film the year is 2012 and the pressure is Ansar Dine's takeover of Timbuktu, Mali. They banned music; they made women cover their faces, heads, and hands; they forbade play; and they introduced strict Islamic law. Sissako visualizes life in the midst of those impositions that drastically change the lives of the people in Timbuktu. There is a group of young boys who—in the moments that they are not being watched by the men and boys with guns, some of those boys not much older than themselves—play a full and beautifully imagined and executed football match without a football because football has been banned. There is a young woman who has been caught and found guilty of the crime of making music together in a room with three friends, another woman and two men. She is sentenced to forty lashes. In the midst of this vicious public beating her weeping breaks into song. (From *Zong* [which again means "song"] to Philip's *Zong!*) This is, again, the time of the oral ruttier, and those songs help us find our way; they are our internalized maps in the long time of our displacement. *"We sing for death, we sing for birth. That's what we do. We sing."*

There is another woman who appears several times in Sissako's *Timbuktu*. Each time she appears in the film she is moving unmolested through the town and she is wearing a fantastic dress made of brightly colored strips of cloth that trail into a long indigo train. This woman refuses to cover her head or hands or face; she holds up traffic, she

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strolls past the men and boys with guns, she refuses to cower before them; she laughs at their commands, these men who have descended on and taken over Timbuktu, the enforcers of Islamic law who smoke in secret and have long conversations with each other about music and professional football. Of the women in the city she is not alone in her refusal; every woman in *Timbuktu* resists, but this woman alone faces no reprisal.

There is a stunning moment in the film when this fantastically dressed woman appears on screen and speaks. We learn that her name is Zabou, and when she speaks Haiti erupts into Sissako's *Timbuktu*. Zabou speaks and her words return us to Brathwaite's *Dream Haiti* and its collapse of time and space.[21] Her words return us to the dream and promise and centrality of Haiti in diaspora imaginings.

What Zabou says is this: "It was on the twelfth of January 2010 and 4:53 p.m. exactly, the same time as Miami. At 4:53 p.m., Port-au-Prince time, the earth quaked and I found myself here, at exactly 9:53 p.m." Zabou asks one of the men, drawn to Timbuktu from all over the continent, for confirmation of this. But the man replies that she was in Timbuktu long before that earthquake hit. To which Zabou retorts: "What is time?" She continues: "Time doesn't matter. The earthquake is my body, the cracks, it's me! Cracked open from head to toe and vice versa, my arms, my back and my face, cracked. What is time? I am cracked. Sweetpea, you and I are alike. We're both cracked. Cracked everywhere" (figures 4.6–4.8).

Time. In *Beloved*, time "never worked the way Sixo thought." In *Beloved*, Sethe has trouble believing in it because "some things go. Pass on. Some things just stay" (Morrison 1987, 21, 35). Time appears here as cracked. Time is cracked like Zabou's body, like Zabou's life, and not only her life. She tells the young man with a gun (who appears to have been a dancer in his former life) that he, too, is cracked. Zabou doesn't believe in time, at least not linear time. She lives in trans*Atlantic time, in an oceanic time that does not pass, a time in which the past and present verge. "Time doesn't matter," Zabou says again, and I hear in her speaking the longue durée, the residence time, of the wake.

Zabou moves through Sissako's film, trailing that long indigo train, blue like the sea, a V like a wave; like a wake; it is a crack that follows her, a crack that precedes her. Sissako has opened a seam in Timbuktu and inserted Haiti; Sissako has opened a seam in Timbuktu, and from

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4.6–4.8 Film stills. *Timbuktu*. © 2014 Les films du Worso — Dune Vision — Arches Films — ARTE France Cinéma — Orange Studio. With the courtesy of LE PACTE

it Haiti has emerged. Zabou's blue train, like the indigo on the hands of the formerly enslaved in *Daughters of the Dust*, like the violet teas and the violet chemistry of Brand's *Verso 55*, like water, like the ruptures of the transatlantic and trans-Arab slave trades, appears and opens the film into and out of all of the violences and more, as so many aftershocks, as so many wakes. The work that *Daughters* and *Timbuktu* perform is wake work.

And in Zabou's speech I hear a connection to what Beverly Bell describes in *Fault Lines: Views across Haiti's Divide* in the aftermath of the earthquake. Writing about the work that began in Haiti as soon as the first tremors stopped, and of the poor who had to continue to live in the midst of ongoing destruction, Bell (2013, 3) says: "They knew that their country's devastation — before the earthquake as now — was not inevitable." The work that I am theorizing as wake work took place in Haiti in the midst of searching for the injured, mourning the dead and dying, and sitting with those who hovered on the brink between material life and death. This was work that Haitian people knew would have to be done, and in carrying it out they drew on the "alternative principles and practices that the grassroots have tried to establish over time" (Bell 2013, 4). There is a before and an after to the earthquake: but there is no before the ongoing event of the disaster.[22] How, after all, to split time?

I hear in Zabou's outrage an echo of the outrage in novelist Fatou Diome's interview. I repeat, here, the words from Diome that began this section: "These people whose bodies are washing up on these shores, — and I carefully choose my words — if they were Whites, the whole Earth should be shaking now."[23] I hear an echo of Danticat (1996b) capturing the insistence with which Haitian women speak themselves into the present. Their greeting: "How are we today, Sister? / I am ugly, but I am here."

Coda

Aspiration. *Aspiration* is the word that I arrived at for keeping and putting breath in the Black body.

Living as I have argued we do in the wake of slavery, in spaces where we were never meant to survive, or have been punished for surviving and for daring to claim or make spaces of something like freedom, we

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yet reimagine and transform spaces for and practices of an ethics of care (as in repair, maintenance, attention), an ethics of seeing, and of *being* in the wake as consciousness; as a way of remembering and observance that started with the door of no return, continued in the hold of the ship and on the shore. As one survivor of the contemporary ship and the hold says, "We couldn't put him in the middle of the boat because the boat was damaged and we were taking on water. If we left him like this, he'd be gone, whoosh. So, we were really careful with him. I like things like this—when people care. It's all we have."[24] This is an account counter to the violence of abstraction, an account of surviving the ship when the wake, the ship, the hold, and the weather and their un/survival repeat and repeat. An account of *care* as shared risk between and among the Black trans*asterisked.

Dionne Brand offers us such accounts of care in all of her work. She moves in *A Map to the Door of No Return* from "A Circumstantial Account of a State of Things" to another kind of circumstantial account in her "Ruttier" for survival in the diaspora and in *Verso 55*. In Brand's work that door of no return marked the real and metaphorical site that "accounts for the ways we observe and are observed as people. It exists as the ground we walk. Every gesture our body makes somehow gestures toward this door" (Brand 2001, 26). In Brand's elaboration the door exists alongside and counter to the archive; it exists juxtapositionally as an account of the "thing in fact which we do not know about, a place we do not know. Yet it exists as the ground we walk." In the first instance, Brand (2001, 5) maps how we have come to live in the places we are and that "tear in the world" that is also "a rupture in history, a rupture in the quality of being." Brand maps a desire to say more than what is allowed by an archive that turns Black bodies into fungible flesh and deposits them there, betrayed. Brand began *Map* with that rupture, and she closes it with a song; the "Ruttier for the Marooned in the Diaspora" is her offering to guide us to how to live in the wake. The "Ruttier" is a guide to indiscipline and lawlessness; a map of disinheritance and inhabitation; a guide to how, traveling light, one might just live free of, "refuse, shut the door on," the weight of responsibility for one's planned demise. Simply, Brand's "Ruttier" insists us, Black people, into all of our largeness against that dysgraphia that would insist on the smallness of Black being in the wake. To do this, Brand plumbs the archives of the everyday that come from collecting, from thinking juxtapositionally, from "sitting in the room with history." *"They owe, own nothing. . . . They wander as if they have no century, as if they can bound time, as if they can sit in a café in Brugge just as soon as smoke grass in Tucson, Arizona, and chew coca in the high Andes for coldness"* (Brand 2001, 213–214).

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Living with immi/a/nent death, in the shadow of that door, in the wake of slavery, with the obstructed passages of the Mediterranean, with carding, stop and frisk, the afterlives of partus sequitur ventrem, respiratory distress, detention centers, *Lagers*, prisons, and a multitude of other forms of surveillance, "I want to do more than recount the violence that deposited these traces in the archive" (Hartman 2008, 2). So, I turn again to the photo of the beautiful girl with the word *Ship* on her forehead and to two images by Roy DeCarava that seem to speak to and anticipate it.

The images come from the photo text *The Sound I Saw*. The first photograph is of a little Black boy, approximately five years old. The shot is close cropped, and it is his face that we see; it is his face that is in focus. His face occupies the majority of the frame. He looks to be wearing a hospital gown; the material seems to be gauze, it is white, and it has a V-neck. He is lying on a white or light-colored sheet. He has a small mark over his right eyebrow. He looks concerned; his brow is slightly furrowed. His look, like the look of the girl, reaches out to me across time and space. His big brown eyes look out at something, at someone, at and to us.

In *In the Wake: On Blackness and Being*, I wanted to make present the someone that those eyes look out to. I wanted to stay in the wake to sound an ordinary note of care. I name it an ordinary note because it takes as weather the contemporary conditions of Black life and death. Another one of the textual scenes that exemplify this note of care of which I speak, this ordinary sounding of care in excess of the places where we are, arrives through the character of Hi Man in Toni Morrison's *Beloved*. Hi Man is the "lead chain" of the gang of men in the prison chain gang to which Paul D is sold in Alfred, Georgia, after he is captured during his escape from Sweet Home:

> "Hiiii!" . . . It was the first sound, other than "Yes, sir" a blackman was allowed to speak each morning, and the lead chain gave it everything he had. "Hiiii!" It was never clear to Paul D how he knew when

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> to shout that Mercy. They called him Hi Man and Paul D thought at first the guards told him when to give that signal that let the prisoners rise up off their knees and dance two-step to the music of hand-forged iron. Later he doubted it. He believed to this day that the "Hiiii!" at dawn and the "Hoooo!" when evening came were the responsibility Hi Man assumed because he alone knew what was enough, what was too much, and when things were over, when the time had come. (Morrison 1987, 108)

Hi Man sounds and holds the note that keeps the men with whom he is chained from the brink. And when the deluge comes, the rain that almost kills them, locked underground in the mud and silt, in that cage called the slave ship on land—that note provides the means through which Paul D and the forty-five other men escape that prison ship in Alfred, Georgia.

The second DeCarava photograph is of a Black woman and that same little boy. She is facing away from the camera, and her face is turned toward the boy. She holds a thermometer in her right hand. In this photo the little boy is sitting up in the bed, cross-legged, in front of her. He is drinking water from a glass; she is watching him. His white top now seems to be a pajama top that matches the bottoms we now see that he has on. The photo's caption tells us that the woman is his mother. It doesn't look like they are in a hospital room. It looks like he is at home. There is a chest of drawers against the wall, and there are belongings on top of it. There is a grate in front of the window. I imagine the little girl with *Ship* taped to her forehead alongside this little boy from half a century before. The photographs are similar in subject; the little boy and the little girl bear a striking resemblance; she is a sick girl, he is a sick boy, they are both awaiting care. But Roy DeCarava took the photographs of the little boy and the little boy with the woman who is his mother: DeCarava, the famous Black photographer of Black life who refused the documentary, who refused to let his images of Black people be used to frame someone else's *not* seeing, to abet our thingification. So DeCarava's photographs are also strikingly different. And it is through the care and the light and shadow of DeCarava's look that this woman who is the little boy's mother appears, here, in a scene that strikes an ordinary note of care.

I return to Brand's "Ruttier for the Marooned in the Diaspora" as

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a song of direction that contains mercy, a song that contains all of the things that we are. Her "Ruttier" writes and contains Black being as it has developed in the wake; Black being that continually exceeds all of the violence directed at Black life; Black being that exceeds that force. For Brand, all of this is knowledge and wealth. And she offers us a song, a map to anywhere, to everywhere, in all of the places in which we find ourselves. The Ruttier: a map to be held; to behold.

So we are here in the weather, here in the singularity. Here there is disaster and possibility. And while "*we are constituted through and by continued vulnerability to this overwhelming force, we are not only known to ourselves and to each other by that force.*"

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TUESDAY
06/08

Guided by: Patricia Reed

298 THE PLANETARY TURN
Amy J.Elias & Christian Moraru

TITLE: THE PLANETARY TURN
Author: Amy J.Elias & Christian Moraru
Publisher: Northwestern University Press
Year: 2015
Pages: 11-37

Introduction

The Planetary Condition

AMY J. ELIAS AND CHRISTIAN MORARU

As its title suggests, this essay collection attends to the planetary turn in contemporary criticism and theory. Like other critical "turns" before it—postcolonial, postmodern, or global—the shift under scrutiny here concerns artists' and critics' new speculations about our world, one which seems to be outgrowing modernity's reigning sociological, aesthetic, and political-economic systems. Less and less relevant to the twenty-first century, modern paradigms appear increasingly unable to predict, let alone adequately explain, the global operations of technologically enhanced finance capital, cosmopolitanism's struggle to reinvent itself from the ashes of post-empire Europe, and the risk environment brought about by the ever-escalating crises of world ecologies.[1] A reaction to the multiple and steadily widening inconsistency between what the world is becoming and how this change registers in prevalent epistemologies and cultural histories, the critical-theoretical model of *planetarity* attempts a move away from the totalizing paradigm of modern-age globalization—and thus a critique or critical "completion" of globalism—as well as from the irony and hermeneutics of suspicion typical of what came to be known as postmodernism. The postmodern has always been a fraught and unsatisfactory analytical category also because, as Guy Debord, Jean Baudrillard, Fredric Jameson, and David Harvey have maintained, it never severed its compromising ties to late socio-aesthetic modernity, market globalization, and the society of spectacle, simulation, and empty pastiche. Little surprise, then, that, on many fronts today, postmodernism is being relinquished as a dessicated—itself "exhausted"—descriptor of the social macrocosm and world art.[2]

The discourse of planetarity presents itself, in response to the twenty-first-century world and to the decreasing ability of the postmodern theoretical apparatus to account for it, as a new *structure of awareness*, as a methodical receptivity to the *geothematics of planetariness* characteristic of a fast-expanding series of cultural formations. Admittedly transitional, "fuzzy," and frustratingly amorphous at times, these formations nevertheless seem to indicate that there has been a paradigmatic translation of world cultures into a planetary setup in which globalization's homogenizing, one-becoming

pulsion is challenged by *relationality*, namely, by an ethicization of the ecumenic process of coming together or "worlding." That is to say, while unfolding within the same historical moment as globalization, planetarity is configured—artistically, philosophically, and intellectually—from a different angle and goes in another direction. It represents a transcultural phenomenon whose economical and political underpinnings cannot be ignored but whose preeminent thrust is ethical.

Synonymous, in a sense, with what Ulrich Beck and Edgar Grande have termed "second modernity," planetarity advances on a plurality of modernization paths, Western and non-Western, "tak[ing] the varieties of modernity and their global interdependencies as a starting point for theoretical reflection and empirical research."[3] In this emerging worldview and critical theory, *the planet as a living organism, as a shared ecology, and as an incrementally integrated system both embracing and rechanneling the currents of modernity is the axial dimension in which writers and artists perceive themselves, their histories, and their aesthetic practices.* Insufficiently systematic so far, planetarity has yet to reach critical mass culturally and stylistically. As such, it has not yet given birth to a well-defined world culture or to a coherent model of relational localisms that might make up this kind of geocultural conglomerate. We submit, however, that the burgeoning critical conversation around planetarity is leading to a better and better marked, more and more consequential set of thematic, discursive, and cultural protocols. Neither entirely new nor everywhere identical in terms of its meaning, material embodiment, and effects, planetary geoculture looks to be a powerful albeit nascent paradigm, leaving its daily imprint on how people imagine themselves and the world in the third millennium.

Our project rests on two principal, intertwined claims. First, planetarity as the location and formal operator of culture must be given pride of place by any rigorous, historically minded effort to come to grips with contemporary representation in general and the arts in particular: *the world rise of the bioconnective is the present-day event horizon.* Thus, planetarity should be distinguished from other, coterminous approaches connoting similarly ecumenic aesthetics and relational scenarios such as "globalization" and "cosmopolitanism." Second, if today's planetary life consists in an incessantly thickening, historically unprecedented web of relations among people, cultures, and locales, to comprehend the planetary must entail grasping the relationality embedded in it. Consequently, relatedness, dialogue, and interactivity are central to major aesthetic initiatives stirring at this stage in world history. Indeed, clusters of problems are coalescing in the twenty-first-century literary and visual arts around social connection, language translation, cultural exchange, trafficking, cross-border mobility, and other forms of "self-other" interplay. If planetarity is the cultural-discursive matrix of innovative art, then the dialogical and the relational may well encapsulate the planetary aesthetic.

Globalization and Planetarity

As a concept, "globalization" might be understood as a world vision, an economic trajectory, a thematic-stylistic repertoire, and a scholarly focus. It designates a highly complex category and array of concerns. Its planetary counterparts, "planetarization" and "planetarity," seem concurrently symbiotic and oppositional concepts insofar as they assume, for many commentators, the equivocal status of global studies offshoots.[4] Globalization, however, may be a fundamentally different animal. Its meaning spans three main semantic zones—internationalization, multinationalism, and transnationalism—each with its specific implications for political, environmental, and ethical global organization.[5] Thus, Nick Bisley interprets globalization as "the set of social consequences which derive from the increasing rate and speed of interactions of knowledge, people, goods and capital between states and societies."[6] His definition falls under the purview of sociology and economics, but the debate about globalization roams across an astoundingly wide panoply of discourses and disciplinary-historical perspectives. Given such a range, even the modern origins of globalization are contested. There are, for instance, those who take a "long view" of the phenomenon as well as those who place its beginnings closer to our time. Certain critics claim that the networks of intercultural contact originated with the seventh- and eighth-century spread of Islam throughout the Middle East, Asia, and Africa; others point to mercantilist Europe and early multinational corporations such as the Dutch East India Company; and still others situate globalization's "golden age" in nineteenth-century colonialism and in the international politics ushered in by industrial-era imperialism. Lopsided, scarcely affecting all people and places with the same force or in the same fashion, its benefits darkly ambiguous and unevenly distributed, globalization, some historians contend, has been in full swing for a while now, if not for ages.

The *longue durée* methodology of a number of authors influenced by the French *Annales* school merges these approaches, stressing that modernity had been globalizing since the late medieval period and only became *manifestly* global after World War II. These critics' broad-compass tack sweeps across whole geographical and geopolitical zones (countries, regions, continents) and historical periods (centuries, epochs). Holding sway inside this camp is Immanuel Wallerstein's "world-systems" theory. In Wallerstein's work, however, the world-system and the global are initially not equivalent; they would become so only in the nineteenth century. Modeled on Fernand Braudel's "Mediterranean world," the "world-system" may have "originated in Europe in the sixteenth century," Wallerstein ventures in *Geopolitics and Geoculture*, but it reached a truly global level hundreds of years later, following several globalizing stages.[7] Likewise, the economic theory of Giovanni Arrighi is centered in systems analysis and posits a 700-year period of development of capital. In this account, the genealogy of capitalism as a succession of "long

centuries" privileges certain nations and leads ultimately to the current world hegemony of the United States.[8] Wallerstein and Arrighi both postulate the existence of transhistorical systemic aggregates underlain by capital flows largely indifferent to the actions of human individuals and groups. For both writers and those influenced by their conclusions, political events such as the end of Word War II or of the Cold War do not change the trajectory of the world system but rather serve its developmental purposes.

There are, of course, those who "believe that globalization is a myth, or that, at any rate, it is much exaggerated as a distinctively new phenomenon."[9] Supporting this notion are critics who contest what they see as a Eurocentric bias in many globalization models, namely, an alignment of this historical process with Western modernity and, subsequently, an assumption that the globalizing system functions uniformly and on a world scale.[10] Authors such as Martin Albrow, however, reason that in order for globalization to have any meaning for current economic, social, and cultural systems, we must look for it solely within industrial and post-industrial capitalism.[11] Along the same lines, voices in critical theory, globalization studies, and cognate fields are keen to underline the more recent events leading to a qualitatively new, twenty-first-century globalization. In cultural history and anthropology, for example, many consider the tearing down of the Berlin Wall a watershed in the narrative of globalization. To critics such as Christian Moraru, 1989 is what "mondialization" historian Jean-Pierre Warnier would call *une année charnière*: a "hinge year" opening a historical door onto "thick" or late globalization.[12] That year, we are told, set off the later phase of a momentous shift from a "cubicular" world—Pierre Chaunu's *univers cloisonné*—to one experienced and conceptualized as an incrementally all-pervasive "network."[13] From this standpoint, the Cold War world was a "soft," quintessentially bipolar system, loosely if counterintuitively held together by an antagonist-separatist template whose keystone was the nation-state, with "division" the logic of the Cold War-era geopolitical *dispositif*. Accordingly, territory was parceled out worldwide into walled-in "influence zones" balancing each other and functioning centripetally under the jurisdiction of relatively stable and recognized political centers. Underwritten and kept in place by its mutually "deterring" antinomies of power, "common markets," pacts, and treaties, that world ended, some say, in 1991. The one to come, neoliberal institutions and pundits were eager to assure us, would close economic gaps between rich and poor and heal humanity's historical wounds. Immediately following the fall of the Berlin Wall, it seemed that the new world—or at least the new European-North American world—had a modicum of hope for a post-conflictual state of global affairs. Echoing Woodrow Wilson's 1918 "new world" speech, sweeping, "new world order" pronouncements made by Mikhail Gorbachev and George H. W. Bush fueled that optimism.

But this rhetoric was soon to be punctured by cultural theorists who had grown suspicious of the international political consensus on the putatively

universal economic gains of globalization. A case in point, Ken Jowitt wrote of a "new world disorder" and was followed in his apprehensiveness of post–Cold War sanguinity by Zygmunt Bauman, Tzvetan Todorov, Amin Maalouf, Wallerstein, and other chroniclers of "le Nouveau Désordre mondial." Concerned less with the Cold War, Joseph Stiglitz mounted a devastating critique of economic globalization, while Zilla Eisenstein and others laid the disenfranchisement of women and non-white, non-European peoples at the door of globalization's "philosophy," neoliberalism.[14] These critics painted pictures of a hopelessly entropic, world-scale pandemonium triggered by the liquefying of Cold War binaries and by the triumph of neoliberal economics seeping across continents and world financial markets. Their jeremiads outlined how, in a "planetar[ily] diasphor[ic]" age, autopoietic world-systems were bound to bypass human agency and meaningful planning altogether.[15] Before long, such critical exercises in catastrophism were joined by what would amount to a post-1990 flood of more applied and patiently documented analyses of "globalization," "globalism," and the "global age." As a result, contemporary theory underwent a "global turn" comparable to the paradigm-changing "turns" of decades past.[16] Breaks other than the end of the Cold War were offered as equally plausible causes of globalization's acceleration, with the Al-Qaeda attacks on New York's World Trade Center and the Pentagon as main contenders.[17] A Lacanian psychosocial examination of the same historical interval led Phillip E. Wegner, for example, to the conclusion that September 11, 2001, reenacted the earlier crumbling of the Berlin Wall and, more generally, that the Cold War actually ended only with 9/11 and the establishment of a twenty-first-century "New World Order."[18]

Media and technology theorists put forth a rather different perspective. Less interested in periodization, they zeroed in on cultural shifts, claiming that the decisive impetus of globalization was not a political occurrence—such as the demolition of the Berlin Wall or the fall of the Twin Towers—but the advent of wide-reaching communication technologies, including the Internet. Media studies have long examined how film, television, music, and other mediatic forms cross borders and transform cultural landscapes on a vast scale.[19] Epistemic or even ideologically colored political shifts are themselves viewed as indebted to technological advancements and networked media. In works by McKenzie Wark, Paul Virilio, Douglas Kellner, Richard Grusin, and others, the determining factor leading to new types of globalization is the forging of cross-national communication networks through affordable and transportable digital technologies.[20] In the most optimistic accounts, popular protest movements and even political revolution are seen as enabled by media or by newer technological communication networks. Manuel Castells, for example, has written that burgeoning democracy movements throughout the world are deeply indebted to international social networking systems, while Jennifer Earl and Katrina Kimport's work (mimicking studies of transnational advocacy networks in traditionally configured

organizations) exemplifies analysis that investigates how World Wide Web affordances enable Web activism that crosses national boundaries and class lines.[21] Similarly, popular authors such as Pico Iyer and Thomas L. Friedman tell "global stories" featuring extensively, if somewhat euphorically, the technologically enhanced milieux of transnational travel and the political "flatness" of a world within the purview of capital.[22]

The globalization accounts supplied by writers like Iyer and Friedman beg a number of questions. For even if statistics on population migration, data dissemination, goods and services transfer, and communications' internationalization were readily available, reliable, and easy to work into a cohesive theory of globalization, conclusions about globalizing trends drawn by political economists would still not necessarily match those by cultural theorists grappling with issues of identity and the cultural productions expressing it. As differentiated benefits accrue to different constituencies across the globe, there is meager consensus today about the advantages and disadvantages of globalization. Nor do all scholars agree on where we are right now in its history. Is globalization accelerating, some ask? Has it peaked? Is it perhaps now mutating into novel forms of local/global organization? If so, then what about the rising, trans-statal "jurisdictional geographies" and their bearings on the leverage, sovereignty, and overall significance of the nation-state?[23] And, again, what is the role of culture, art, and their reception and interpretation in the new geopolitical context? In a recent review, Albrow succinctly formulates the questions that remain unanswered in globalization debates. "In a democratic nation-state," he notes, "we accept the legitimacy of laws and regulations and demand that those responsible for their creation and for their implementation should be publicly accountable. But who are the authorities in global governance? And how can we, now a 'global public,' have any part in the process or exercise any kind of democratic control?"[24] What Albrow underscores is globalization theory's central critical struggle, and, we would add, overall failure to come to terms with issues of political control and technical administration in a developing world monoculture in which fewer and fewer are at home.

Planetary studies responds to these concerns and shortcomings in several ways, two of which are worth highlighting here not only because they carry more weight but also because they intersect with the anti-postmodern—and "post-postmodernizing"—reaction delineated earlier. Chiefly eco-cosmological, the first advocates an urgent conceptual shift away from globalization to "worlding"—or more precisely, from *globe* as financial-technocratic system toward *planet* as world-ecology. This reorientation calls for significant changes in perspective, which should eventually lead, we believe, to notably different outcomes in and for the world. Directly and indirectly, such a repositioning was influenced by the growth of environmental movements and ecocritical analysis throughout the twentieth century, especially in the decades when globalization theory was picking up speed.

Galvanized by the 1990s publication of Lawrence Buell's *The Environmental Imagination* and Cheryll Glotfelty and Harold Fromm's *The Ecocriticism Reader* as well as by the 1992 founding of the Association for the Study of Literature and Environment (ASLE), ecocriticism promotes a systematic inquiry into the place of nature in Western thought, oftentimes taking on the sagas and legacies of global modernity and opposing to its abstractions a grounded, phenomenal, earth-anchored ethics and aesthetics.[25]

Largely outside the projects of environmentalism and ecocriticism but ostensibly sympathetic to them was also Basarab Nicolescu's planetarily and cosmically minded "world vision." By the time the French polymath laid out the latter in his 1994 *Théorèmes poétiques* and brought it to bear on the modern schemas of territorially, politically, culturally, and disciplinarily discrete discourse, the world as *cosmological* entity had been part of conversation in the arts and humanities for some time.[26] The notion gained momentum as a critical theme with Yi-Fu Tuan's *Cosmos and Hearth*, Gérard Raulet's *Critical Cosmology*, Félix Guattari's "chaosmotic" and "ethico-aesthetic paradigm" (*Chaosmose*), Anne Phillips's cosmos-based multiculturalism, and other similar, late 1990s and early 2000s increasingly well-configured efforts to swerve from the rhetoric of the globe while drawing, with growing benefit, on the figures of cosmos and cosmology.[27] In hindsight, this looks like an important and necessary discursive stage in the transition from the rhetoric, hermeneutics, and, ultimately, the politics of globalization to planetarity. As a phenomenologically oriented idea, the cosmological appealed to critics, who, before leaving it behind, mined it for fertile, ecological-culturological and ethical tropes, which in turn would pave the way to another key move: from "cosmos" to "planet." Many found this progression justified, for at least two reasons. On the one hand, "cosmos" was too akin to "globe" and "globalization" in that it figured the Earth as a cosmic body, part of a macrosystem organized according to system-specific rules and, more generally, to a rationality some scholars found culturally and epistemologically constraining. On the other hand, the discourse of cosmos and cosmic relationality remained too broad from the vantage point of an anthropologically pertinent scalarity. As Amy J. Elias points out, "the planetary model" and the new "chronotope" it has made available to the arts and their interpretation were "opposed to the dehumanizing context of cosmic space constructed by science and then, as a metaphor for the cybernetic, to scientific rationality."[28]

The planetary field's most significant counter to the global—understood primarily as a financially, economically, and technologically homogenizing force—is its relationality model and return to ethics. Indeed, in our judgment, the best discussions of planetarity gravitate away from global studies' obsessions with economic, political, and technical administration and move closer to the vital problem of the *ethical relation* obtaining in new models of transnationality, internationality, or multinationality. This relational *potenza*—the "strength" of the multitudes of the planet—multiplies the

meaning of relatedness and, by the same movement, challenges us to stabilize relational ontosemantics, to articulate what relationality does and stands for in the world.[29] Concomitantly descriptive and prescriptive, analytic and normative ("aspirational"), theories of planetarity unfold a vision not of globalized earth but, as Elias maintains in her *Planetary Turn* essay, of a "world commons," thus helping us conceptualize how cultural productions such as art enable this vision.

This move is particularly indebted to Gayatri Chakravorty Spivak and Masao Miyoshi. The stakes of Spivak's 1999 essay "The Imperative to Re-Imagine the Planet" were profoundly ethical although, in keeping with her poststructuralist and psychoanalytic allegiances, the "imperative" she spoke of was non-totalizing and reaffirmed both a Levinasian ethics and a Derridean courting of the uncanny, of *unheimliche* unhomeliness.[30] In her intervention, Spivak positioned planetarity "to control globalization interruptively, to locate the imperative in the indefinite radical alterity of the other space of [the] planet[,] to deflect the rational imperative of capitalist globalization," and thus "to displace dialogics into this set of contradictions."[31] In line with Emmanuel Levinas's ethics of alterity, she insisted that life on the planet must be "lived as the call of the wholly other." Thus, in Spivak, the planet morphs into a "cosmopolitheia," both an astronomical body and a "defracted view of ethics," as space becomes another name for "alterity."[32] As she wrote a few years later in *Death of a Discipline* (2003),

> I propose the planet to overwrite the globe. Globalization is the imposition of the same system of exchange everywhere. In the gridwork of electronic capital, we achieve that abstract ball covered in latitudes and longitudes, cut by virtual lines. . . . To talk planet-talk by way of an unexamined environmentalism, referring to an undivided "natural" space rather than a differentiated political space, can work in the interest of this globalization in the mode of the abstract as such. . . . The globe is on our computers. No one lives there. . . . The planet is in the species of alterity, belonging to another system. . . . Planet thought opens up to embrace an inexhaustible taxonomy of such names [for a radical alterity and intention toward the other].[33]

The planetary claims of *Death of a Discipline* have provoked replies from various critical quarters. Continuing into the 1990s and the first decades of the third millennium, Spivak's inquiries into issues of translation, comparison and the incommensurable, communication, globalization, subalternity, and regional welfare led her to bring serious charges against globalist imperialism, cosmopolitan arrogance, and the cultural parochialism typically following from both. As a remedy, she proposed solutions as diverse as revaluation of place, familiarization with other languages and thought paradigms, and, more broadly, genuine contact with alterity, even though, in practice, her

handling of Levinasian ethics and the semiological indeterminism of poststructuralist extraction at play in her reasoning sometimes risked preventing such dealings and exchanges from working more concretely as an effectively relational, world-transforming dialogics.

Underscoring the same need for renewal on a similarly large scale, Miyoshi's 2001 article "Turn to the Planet: Literature, Diversity, and Totality" grounded its manifestly epochalist-epistemological argument in a planetary paradigm shift. Miyoshi observed that a change of historical proportions had been afoot since the globalizing 1980s; this change, as Neil Turnbull later noted, "heighten[ed] the conceptual importance of the earth" across all material and cultural forms and arenas.[34] Miyoshi too found globalism wanting because, plagued by a structural insufficiency, it appeared exclusionist, touting a universal good but bestowing it only on the privileged few for whom techno-mercantile connectedness operates beneficially. Since "the return to the nation-state," he specifies in his essay, is not a realistic solution, "there is [now] one such core site for organizing such an inclusiveness, though entirely negative at present: the future of the global environment. For the first time in human history, one single commonality involves all those living on the planet: environmental deterioration as a result of the human consumption of natural resources."[35] Acknowledging this "total commonality" as the premise for "map[ping] out our world and [for] engag[ing] in research and scholarship" is a stepping-stone to the all-too-important recognition that

> literature and literary studies now have one basis and goal: to nurture our common bonds to the planet—to replace the imaginaries of exclusionary familialism, communitarianism, nationhood, ethnic culture, regionalism, "globalization," or even humanism, with the ideal of planetarianism. Once we accept this planet-based totality, we might for once agree in humility to devise a way to share with all the rest our only true public space and resources.[36]

In certain respects, Miyoshi's take on planetarity is closer to posthuman environmentalism than to Spivak's cosmopolitan crypto-humanism. Moreover, some of his assertions are not completely clear, fully developed, or entirely persuasive. Together, however, the two critics made a decisive push down a path further blazed by comparatists and theorists such as Emily Apter, Paul Giles, and, in particular, Wai Chee Dimock, whose trans-nationalist, "deep-time" forays and conceptualizations of a new, planet-oriented scalarity and aggregation scheme in literary history have been particularly influential in this burgeoning planetary vocabulary. A quick glance at the amount of scholarship inspired by these three critics' ethical-relational and cross-territorial reconstructions of globalization as planetarity suggests that, historically co-articulated with the global lexicon and concerns as it has been, the planet model may be at this juncture well situated to fulfill, in the humanities at

least, earlier dreams of critically "purging" the globe (Apter) or even "overwriting" it (Spivak).[37]

Still somewhat bothersome, of course, is the "terminological quandary" lingering in the interchangeable use of "globalization," "globality," and "globalism," as Marshall Brown has remarked. On the one hand, "globality" has been defined by critics such as Beck as the global's abstract cousin. As such, it "means that we have been living for a long time in a world society, in the sense that the notion of closed spaces has become illusory." "No country or group," the German sociologist concludes, "can shut itself off from others" any longer. Globality also implies "that from now on nothing which happens on our planet is only a local and limited event; all inventions, victories and catastrophes affect the whole world."[38] On the other hand, "by globalism," critics such as Brown "understand an idea, an image, a potential; by globalization[,] a process, a material phenomenon, a destiny."[39]

As far as we are concerned, "globalism" is primarily a *cosa mentale*, a subjective, reflexive-evaluative position designating an attitude or mode of perceiving things "in global perspective." In globalism, we underscore a life perspective and an epistemological stance toward a *global ensemble* wherein the parts communicate and must face up to their interdependence. But, as we have stressed, the global paradigm has not been particularly effective in weighing the cultural, political, and ethical implications of world interconnectivity, and so, to avoid a confusion at once existential, methodological, and terminological, we offer up planetarity as a critical substitute. Retooled around planetary semantics and its ramifications across ethics, phenomenology, and epistemology, world cultures might leave room, in Roland Robertson's assessment, both for "relativism," that is, for a sense that cultures are "bound-up," and for "worldism," or "the claim that it is possible and, indeed, desirable to grasp the world as a whole analytically" while keeping in mind that no "reference t[o] the dynamics of the entire 'world-system' " can afford to lose sight of the complexities, contradictions, and other asystemic features that might leap at us whenever we do not base the analysis too strictly on the "world-systemic, economic realm."[40] It is in this light that, in an essay also chiming in with the positions formulated in *The Planetary Turn*, Min Hyoung Song reaches the conclusion that "there is . . . something sovereign about what gets signified by globalization, a *nomos* that divides, restricts, hierarchizes, and criminalizes. It is a royal epistemology, a striation. Planetarity, then, might be thought of as a different order of connection, an interrelatedness that runs along smooth surfaces, comprises multitudes, and manifests movement."[41] Thus, while flat-out dismissal or wholesale demonization of globalization processes in economy, technology, and culture remains misguided, the planetary perforce builds on the global, critiques it, and, to some degree, "completes" it. But, as Warnier puts it bluntly, if "speaking of the 'globalization of culture' is abusive," the abuse may be even more egregious if planetary culture is still conceived in similarly "globalistic"

ways.[42] The "hard" materiality of globalization—a "hard" planet—is or has the tendency of becoming a consistent oneness wedded to selfsameness, a homogenous and "defacing" or disfiguring whole impervious to smaller figures, cultural rhetorics, and voices. Instead, the geoaesthetic planetary ensemble toward which our book's essays variously work designates a "soft" materiality within which relatedness both recognizes and hinges on negotiations of difference and where, as such, being-in-relation may be pressed into service with an eye to fostering ethical relations worldwide.

Cosmopolitanism and Planetarity

A fairly substantial body of critical literature has already gone some distance toward accounting for this ethical relationality on a range of scales. This corpus has coalesced around cosmopolis, the cosmopolite, and cosmopolitanism, a set of time-honored ideas, foci, and geocultural-intellectual models that regained force in the academy and popular press roughly at the same moment as did globalization. As is well known, the ethical-philosophical concept of cosmopolitanism has a long history in the West and elsewhere. The origins of cosmopolitan deliberation can be traced back to the thinkers of ancient Greece and Rome, primarily to the Cynics and the Stoics, who argued for an individual's belonging both to the local-national polity and to humanity's greater commonwealth beyond his or her family, kind, or country, outside which the *kosmopolitēs* must care for and generally be in an ethical relationship with others. Is planetarity, then, simply another word for cosmopolitanism?

To answer, it might be useful to turn briefly to Amanda Anderson's discussion of the dialectical tension between cosmopolitanism and universalism in Western philosophy. Anderson treats cosmopolitanism not as a countermodernity but as a strain of thought within modernity itself. Differentiating between, on the one hand, a Habermasian, public-sphere approach that appeals to a sense of *universal* community, and, on the other, a popularized "cosmopolitan sensibility," she reminds us that cosmopolitanism was revived in the humanities as a reaction to "a strictly negative critique of Enlightenment" and combines a skepticism "of partial or false universals with the pursuit of those emancipatory ideals associated with traditional universalism."[43] Like "strategic essentialism" operating in cultural critique, cosmopolitanism so defined is compatible with some aspects of Marxism and also counters overly restrictive definitions of community sometimes expressed by identity politics. Moreover, it works against the early twenty-first-century reawakening of violent nationalisms and nationalistic identitarian agendas. "In general," Anderson explains, "cosmopolitanism endorses reflective distance from one's cultural affiliations, a broad understanding of other cultures and customs, and a belief in universal humanity."[44] She breaks down cosmopolitan philosophy

into two forms. One is "exclusionary" and values only an abstract or cosmic universalism. The other is "inclusionary." In this variant, universalism is shaped by "sympathetic imagination and intercultural exchange." In this sense, we learn, "cosmopolitanism also tends to be exercised by the specifically ethical challenges of perceived cultural relativisms; it aims to articulate not simply intellectual programs but ethical ideals for the cultivation of character and for negotiating the experience of otherness, . . . to foster reciprocal and transformative encounters between strangers variously construed."[45]

Neither moral relativism nor rigidly abstract universalism, this cosmopolitanism parts company with theories of local authenticity and rises at times in history when the world grows in population and, seemingly, in complexity.[46] Such a perspective shores up and qualifies universalism with a much-needed "rhetoric of worldliness" and enlists *translation* as an ideal. Anderson turns to James Clifford's notion of "discrepant cosmopolitanisms," Bruce Robbins's "mobile, reciprocal interconnectedness," Seyla Benhabib's "interactive universalism," and Julia Kristeva's "transnational Humanity" to illustrate the host of positions characterizing this "new cosmopolitanism." She also notes the more radical ideas that begin to swirl around it at this juncture, such as Judith Butler's "reconstructed universality" and Etienne Balibar's real, fictive, and ideal universalities, the last of which is characterized by an "insurrection" against normalcy.[47] Anderson admits, however, that anthropological ethics has not had significant purchase in old or new cosmopolitanisms, which by and large tend to gel instead around more urgent, counter-nationalist, antiparochial, and non-localist platforms.[48]

Where such philosophical propensities and political programs are concerned, new cosmopolitanism is closest to planetarity as we conceptualize it.[49] Very roughly put, planetarity is to globalization what neo-cosmopolitanism is to universalism. It is true too that, like certain neo-cosmopolitan varieties, some theories of planetarity are less "counter-modernities" than critical rearticulations of modernity's own dialectics, thriving as they do in the contestatory spaces between warring universalism and particularism or between local and global contexts. These interstices are, for example, the sites Ursula K. Heise links to "eco-cosmopolitanism" from an emphatically planetary perspective.[50] Similarly to some versions of neo-cosmopolitanism, a few models of planetarity align themselves openly with a "modified universalism" or new humanisms, affirming the role of shared human experiences and values across cultures. Finally, not unlike cosmopolitan ethics, planetarity puts much stock in encounter with difference, in recognition and toleration of alterity, and in reciprocity and translation as seminal to any peaceful, cross-cultural, and transnational interaction.[51]

The differences between planetarity and twenty-first-century cosmopolitanism, however, should not be discounted. Though ancient and recent cosmopolitanisms take into account behaviors, politics, and lifestyles and thus attend to phenomenological being in the world, cosmopolitanism manifests

itself chiefly as a philosophical enterprise whose cardinal thrust is ethical and hermeneutical. It is a kind of knowledge and interpretation of the world, a way one mentally processes environments, assesses them, and endorses attitudes in them. In contrast, the planetary reaches beyond the hermeneutical to the ontological. Planetarity is not, as Susan Stanford Friedman says, just an epistemology, merely an inquisitive *forma mentis*, a mindset eager to take the world in.[52] Planetarity is also *in and of* this world, its modality of being, describing both a phenomenological perception and a new theater of being whose novelty is becoming more conspicuous every day. "You wonder," writes Bharati Mukherjee in her 2004 novel *The Tree Bride*, "if everyone and everything in the world is intimately related. . . . You pluck a thread and it leads to . . . everywhere." And she goes on to ask: "Is there a limit to relatedness?"[53] If there is one, it is that of the cosmos itself, with planetarity both indexing and probing the world as a relational domain. Thus, sympathetic as we certainly remain to cosmopolitanism's spectacular resurgence in critical theory, we define "planet" and "planetary" as a noun and an attribute signifying and qualifying, respectively, *a multicentric and pluralizing, "actually existing" worldly structure of relatedness critically keyed to non-totalist, non-homogenizing, and anti-hegemonic operations typically and polemically subtended by an eco-logic.*

Here, the eco-logical is not a subsidiary appendage, for its logic signals another departure from new cosmopolitan theory. Unlike the latter, which spotlights solely human and largely discursive cultural and intergroup relationships, planetarity opens itself as well to the nonhuman, the organic, and the inorganic in all of their richness. Informed by an ecocritical perspective, it affirms the planet as both a biophysical and a new cultural base for human flourishing. Accordingly, planetarization and its outcome, planetarity, trace a three-layered process whereby (1) the earth *qua* material planet becomes visible to theory and its abstractions as the non-negotiable ecological ground for human and nonhuman life; (2) individuals and societies of the earth as cosmo-polis heed an imperative to "worlding," that is, the creation of an ethical, "diversal," and relational ensemble so as to guarantee the survival of all species; and (3) the phenomenal earth seeps into our conceptual elaborations and ways of seeing the world, thus refounding our interpretative categories, our aesthetics, and our cultural lives.

Axial to the planetarity paradigm are the notion and practice of *stewardship* in the world commons. The regulative principle is either largely absent from or suspect in cosmopolitan debates, where it raises uncomfortable associations with paternalism, colonialism, and monopoly capital. In point of fact, theories of cosmopolitanism are constantly plagued by—much as they struggle to undo and reweave—the historically close and forever taxing relation between, on the one side, cosmopolitan overtures and Orientalist curiosity, and, on the other side, cosmopolitan contact and colonial control.[54] In the ecocritically informed discourse of planetarity, however, "stewardship" may be better positioned to take on politically less fraught connotations. It

connotes both an ethics of care for both organic and inorganic planetary resources and a social stance mindful to conserve cultural legacies. At the end of the day, the most controversial aspect of planetary stewardship may not be its paternalistic-colonialist disposition but rather its anthropocentric bent, insofar as it implies that humans hold (and deserve) the privileged role of stewards among animate and inanimate entities that are all together entangled in planetary relation. Stewardship as we conceive it here, however, would be both a recognition of and a counter to the negative effects of the Anthropocene and anthropocentric effects in a global environment.[55]

In asserting a "world commons" as stewardship's theater of operations, planetarity also deviates from cosmopolitanism's well-trodden geographies, itineraries, and spatial fantasies. Cosmopolitan's champions frequently talk about travel and contact, border-crossing, and negotiating difference in unfamiliar territories. In contrast, planetarity's proponents discuss how to make the world a commonly familiar space, a shared resource, and a home for all. Furthermore, the world commons so grasped are not universalist, homogeneous, monocultural, or monological. They imply a complex planetary network including nested but nonhierarchical cultural and material ecosystems—commutual constellations, sites, and forms of life ranging in scale but acknowledging, serving, and honoring a shared, affectively and materially interrelated, inhabited world space.

Planetary relatedness is thus *bioconnective*. Not a monologue but an echo, speaking to us not through a mouthpiece but as through a sonar, cultural discourse and identity come about through the connection of bodies in space and time in the post–Cold War, planetary age. They surface more relationally and dialogically every day, according to the logic of the Greek *dià*: always belatedly, obliquely, by a detour through the world's distant or just "different" places, intervals, and styles. Reading planetarily, then, is necessarily reading comparatively, and this is a main reason we are witnessing, within critical theory, a resurgence of interest in translation as comparative reading and cultural interaction.[56]

Actively *worlding* the world, making it a world of relations, and attending to them: what we are talking about when we talk about the planet in these terms is (1) the planetary configuration or ontological *condition* the planet brings about and (2) an *approach or cluster of approaches* befitting this condition's cultural-aesthetic symptomatology, an apposite understanding of virtual and physical spatiality that constitutes the lived circumstance of interrelatedness. While tribal, feudal, consanguinean, and kindred relationships are usually worked out in face-to-face relations or through established community networks and protocols ordinarily closed to outsiders, woven together into the classical, territorialized, geographically bounded *Gemeinschaft* or "community" type of human association, the relationships typical of planetary contemporaneousness operate across space, launched as they are both from nearby and afar. In that, they are no less concrete or life-enhancing,

for they render the planet a cultural geography of distance management, a platform of survival, an aesthetic trope connoting these attributes, and a critical lens through which to evaluate their shape, meaning, and impact. Now that more and more of us are awaking to the fragility of our common world ecosystems as well as to the tenuousness of some of their immediate, national allegiances, a theoretically plausible and critically effective, social and aesthetic model turning on planetary relation is, we think, a matter of urgency.

Planetarity and the Bioconnective Aesthetic

A caveat is in order at this point: the planetary culture notion should be taken as heuristic rather than deterministic. The function we assign it for now is cautiously exploratory; we posit the planetary as an absolutely defining and sole context neither for cultural production nor for its interpretation. As a new episteme, and in contrast to well-known globalization models, the planetary is not, to us at least, a one-world, genetically determinant, uniform, and homogenizing totality. Poised to forge a culture of sharing and participation, harbingers of planetarity have not yet erected a stable and wholly crystallized sustentation for an ecumenically and equitably enjoyed, economic or sociocultural commonwealth. Such an ethical configuration of material planetarity is still to be adequately thought out and built, which is one reason a sufficiently consolidated ecoculture is still on the horizon. Nonetheless, if, "soft" and "loose" as it may be, planetarity furnishes the cultural-discursive matrix of emerging art, then the dialogical and the relational may well encapsulate the operations and values of a planetary imaginary and of its thematic-aesthetic protocols. Moraru has observed that the post-1989 historical intermezzo of "cosmodernism" translates, inside and outside the United States, primarily into an *imaginary*, a way of picturing the world. As the contributors to *The Planetary Turn* notice repeatedly, the planetary imaginary currently making inroads across the arts shows a predilection for certain themes—particularly the arche-thematic "world"—specifically for a sheaf of *metathemes* deployed with characteristically growing frequency around the quasi-omnipresent world subject and its worldly subcategories. And, while a distinctively planetary stylistics is still in the offing, isomorphic to this geothematics seems to be a relational aesthetics visible in artists' keen attention to at-distance interaction, intertextuality, remediation, mash-up, recycling, and quotation. As marginalia to such encodings and interpolations of planetarity, our book asks (1) if a geocultural arena of aesthetic production is taking shape in which the various discourse-engendering functions, narratives, and epistemological tools historically attributed to the operations of the nation-state model are now being put to the test, broken, or refashioned; (2) if the twenty-first century is witnessing the rise of a broader, postnational formation, which is the planet; and (3) if the latter is thus becoming a dominant environment,

onto-ethical ground, and conceptual-methodological frame of reference for proliferating socio-aesthetics and critical exercise.

As a material and analytic master framework rather than a fully consolidated system, the planetary is capacious and integrative; it has its ebbs and flows; it transforms and surprises. In keeping with the etymology of the ancient Greek *planaō*, the planetary remains shifty, cannot help turning, literally and linguistically, and so it is neither an ontological nor a hermeneutic given, let alone a completed project. The planetary does not stamp all art objects or all artworks equally, nor does it elucidate them completely. To us, the planet is not only a new cultural landscape throughout which people and their sustaining projections wander, connect, and reproduce, but also a "wondering" domain of twists and turns, perplexities, inquiries, and flashes of insight. Our overall objective is to start mapping this expanse, that is, to begin to read the planetary as a repertoire of aesthetic routines *structurally presupposing and further stimulating relationality.*

This reading prompts at least five categories of query. First, what are planetarity's ethics, politics, and theories of value? Which are the benchmarks, yardsticks, and tools that supply the basis and instruments of planetary criticism? Second, in what ways is this geoaesthetic condition of planetarity new, and how does it rehearse or critically move beyond the forms and tenets of earlier cultural-aesthetic theories or historical movements such as modernism and postmodernism? What new vocabulary do we need to talk about the planetary's distinctive nature? Third, to what extent are geoaesthetic spaces familiar or compatible with the traditional cartographies, analytic grids, narrative recipes, measuring and scalar units, and aggregation entities recognized by "methodological nationalism" and, in particular, by literary history?[57] Fourth, what would a "planetary art" be like? What would mark an unfolding planetary aesthetics, and in what kind of stylistics, if any, are planetarity's relationality and dialogics couched? How might such an aesthetics reframe classical values such as authenticity, originality, and novelty? What do we mean when we claim that the planet animates work X or that author Y operates within a planetary horizon or outlook? Fifth and finally, what is the relation between the universal and the particular, geoculture and local culture, place and planet in artworks stemming from or interpreted through a planetary aesthetic? How does the planetary paradigm's relational-dialogical *poiesis* play out across discourses, styles, and media? How does "world art" promote dialogue among and between people, institutions, traditions, and forms? How are we to receive, decipher, and distribute planetary works?

Planetary Theory and Critical Praxis

In answering these questions, our contributors take steps toward (1) theorizing the planetary condition; (2) devising and testing modalities of reading

aesthetic and cultural symptoms of planetarity in a fashion germane to the planetary ethics of relationality; and (3) working out, albeit independently and, for the most part, inductively, a reasonably functional and sufficiently detailed model of the planetary aesthetic and its geocultural *modus operandi.*

With this threefold end in sight, we lead off with John D. Pizer's "Planetary Poetics: World Literature, Goethe, Novalis, and Yoko Tawada's Translational Writing," which addresses the recent planetary turn against the backdrop of eighteenth-century German criticism. Pizer examines the tripartite translation schemes of Goethe and Novalis to stress that Goethe's "world literature" model, so perennially influential in comparative studies, was grounded in a largely Eurocentric literary cosmopolitanism that we might associate nowadays with a similarly oriented globalism. Novalis, on the other hand, envisioned, in Pizer's reading, a proto-*Weltliteratur* in literary fragments that introduced an intermediary, collective, or local level of human contacts that subtly shifted transnational literature from a global cosmopolitanism of cultural interchanges to one similar to contemporary planetary relationality. Today, Japanese-German author Yoko Tawada enacts such planetary consciousness as sensitivity to translation issues in a way that proves, Pizer asserts, more consonant with Novalis's pre-nationalist cosmopolitanism than with Goethe's *Weltliteratur*.

Focusing, in the next chapter, less on the historical genealogy of planetarity and more on its dimensionality, Hester Blum examines the mutual investment of planetary and oceanic studies in the recalibration of the static optics and chronometrics of land. "Terraqueous Planet: The Case for Oceanic Studies" explains how the sea nulls time and space metaphors and abstractions imposed by global capital and nation-sponsored, landed geographies, and, further, how authors like Henry David Thoreau and Herman Melville endorse alternate, materialist, and labor-based understandings of time and space that are so important to our own planetary moment. Both planetary and oceanic studies reveal, Blum concludes, "the artificiality and intellectual limitations of national, political, linguistic, physiological, or temporal boundaries," as well as the risks incurred by a thinking that, wedded too deeply to land-derived tropes and calculations, abstracts earth and sea from human toil, employment, and daily struggle for survival.

In "The Commons . . . and Digital Planetarity," Amy J. Elias aligns the planetary with "the commons" and implicitly offers a rejoinder to the Spivakian poststructuralist ethics of alterity. Elias investigates how the "commons," as a social space organized on the model of neither the nation-state nor the free market, is now brought in line with the idea of the Internet as a new planetary collective. Reviewing key theoretical claims about commons construction within the fields of public economy, digital media, and affect studies, she contends that, because fully functioning common pool resources demand dialogic relationality among users, such theories fail to account for the necessarily ethical foundations of those resources. For, Elias demonstrates,

conceptions of human agency, ethics, and law—all suspect in contemporary digital theory for some time—are or should be central to the construction and maintenance of any planetary digital commons.

"The Possibility of Cyber-Placelessness: Digimodernism on a Planetary Platform," Alan Kirby's contribution to *The Planetary Turn*, furthers Elias's inquiry into the digital by nuancing the "digimodernist" coinage he introduced in his 2009 book. As we learn, digimodernism is a descriptor of the present stage, which replaces, Kirby ventures, a now obsolete postmodern paradigm and is characterized by the digitizing of the textual artifact and the technologizing of cultural expressions. Tying into "cyber-placelessness," digimodernism allows Kirby to refute Spivak's claims that planetarity should be set in opposition to computerization. The local, he proposes, can be reinscribed within a globalizing platform by way of a planetary dialectic.

Raoul Eshelman's "Archetypologies of the Human: Planetary Performatism, Cinematic Relationality, and Iñárritu's *Babel*" directly takes on the planetarity views Spivak articulated in *Death of a Discipline*. Not unlike her, Eshelman is skeptical of traditional humanism. His solution, however, is "performatism," the new, anthropologically founded episteme he proposed in his 2008 book. Performatist planetarity, Eshelman argues, casts light on the human as a unified, biosocial construct motivated by the nondiscursive modes of mimesis and intuition. Its dominant technique in artworks is "double framing." This procedure takes a narrative scene or detail and correlates it to the mimetic logic of the whole work so as to manipulate audiences into subscribing to the claims of an artificial, closed construct. Laying out the performative as a textual-interpretive category over and against Spivak's discursive figure, Eshelman illustrates how performatism structures Alejandro Iñárritu's film *Babel* (2006) and, more broadly, how a performatism-guided planetary approach might work.

Also dealing with film, Laurie Edson's "Planetarity, Performativity, Relationality: Claire Denis's *Chocolat* and Cinematic Ethics" too trades on Spivak's planetarity to drive home the point that the relational ethics of planetarity is well poised to replace globalization's treatment of singularities. Her patient examination of Claire Denis's 1988 film *Chocolat* dwells on relationality, performativity, "learning from below," "minor" transnationalism, horizontal networks, and related issues and phenomena instrumental to the planetary.

In "*Gilgamesh*'s Planetary Turns," Wai Chee Dimock seeks to rethink world literature within the paradigm the planetary turn has made available to literary studies. As she observes, revisiting the venerable notion from the standpoint of shared planetary time and space changes our perceptions of world literature from a set of texts in a static canon to mobile cultural material—tropes, motifs, themes, and texts in intercontinental circulation. Focusing on the ways the Gilgamesh epic has been recycled throughout history in different cultural locations, she explicates how literature and ecology

are both co-articulated with processes of decomposition and recomposition and how planetary life continuously works archetypal tropes into cultural productions.

Paul Giles warns, however, in "Writing for the Planet: Contemporary Australian Fiction," against what might be described as a "reglobalization" of planetarity, namely, against the notion's lapsing back into a globalist-essentialist trope liable to erase geographical and historical differences among the world's cultures once again. A theoretical-analytic stay against globalizing U.S. market capitalism, the planetary is, in Giles's assessment, also laden with features of the American romantic worldview, and planetary critics would be well advised to keep the term's ambiguities in mind. Against Miyoshi's notion of the planet as unifying totality, planetary consciousness needs to be, Giles further counsels, more tightly bound up with, and supportive of, the pluralizing and "disorienting" perspective of cultural and historical "crosscurrents and crossovers" such as those traced in the nineteenth-century prose of Edgar Allan Poe and Melville as well as in twentieth- and twenty-first-century Australian literature and art criticism of Bernard Smith, J. G. A. Pocock, Tim Winton, Gail Jones, Christos Tsiolkas, and Alexis Wright. These authors are exemplary in that, in Giles's view, they disrupt conventional notions of social scale and human agency and shed light on planetarity as a theater of unequal cultural traffic and barterings.

The Planetary Turn's next chapter, Bertrand Westphal's "The White Globe and the Paradoxical Cartography of Berger & Berger: A Meditation on Deceptive Evidence," specifically tackles the idea of "globe" as totality. In his reflections on Laurent P. Berger and Cyrille Berger's 2001 sculpture *Astre blanc* (*White Star*), Westphal raises questions about the nature of the blank map, uncharted space, and the planet's depopulated areas. In the critic's interpretation, whiteness adduces in Berger & Berger's works "deceptive evidence," a saturation rather than a negation of meaning, which nonetheless evokes images of emptiness, cataclysmic decimation, and "white sands." Applying the geocritical method formulated and tested in *La géocritique: Réel, fiction, espace* (2007) and elsewhere, Westphal understands geographical space as dynamic, mobile, and transgressive. Thus, he helps us discover the complex chromatics of a planet whose multiple colors fade out in the very attempt to colorize it on our geographical and political maps.

"Comparing Contemporary Arts; or, Figuring Planetarity," Terry Smith's chapter, articulates a vision of twenty-first-century world art as characterized by multiple, antinomial temporalities. He argues thus for a current move from modernity through postmodernity, contemporaneity, and planetarity. However, this historical trajectory does not rehearse traditional periodization. Instead, it foregrounds a "splitting" of modernity complete with uneven developments occurring at different rates and times throughout the world. Smith's critical narrative identifies three currents in post-1989 art: remodernist, retro-sensationalist, and spectacularist tendencies flow into the first

while aesthetic expression following nationalist/identitarian priorities and Do-It-Yourself art constitute the second and third. In these contexts, planetary figuration comes into play on a number of levels, including world-scales of vision enabled by technology, an aesthetics of disappearance, and the by now ubiquitous imprint of "worlds within the World."

In "Beyond the Flaming Walls of the World: Fantasy, Alterity, and the Postnational Constellation," Robert T. Tally Jr. maintains that through its estrangement techniques, the "discursive modality" of fantasy undercuts the conventions and standards of beauty embedded in national literatures and draws the reader imaginatively into the world and beyond it. Unlike the historical novel, which writers such as Walter Scott saw as serving national interests, fantasy fundamentally attends to planetary otherness and in so doing sets in train an otherworldly literary cartography of the postnational world-system. In his argument, the critic pays special attention to how the 1968 *Time* magazine "Earthrise" photo embodied this otherworldly view of the planet and became the focus of science fiction and fantasy literature as well as the master figure for a utopianism linked to similar meditations on the impossible.

Our book's closing chapter, Moraru's "Decompressing Culture: Three Steps toward a Geomethodology," is something of a hybrid. In the genre's formally and intellectually exploratory spirit, "Decompressing Culture" blends a Deleuzian-Guattarian discourse of worldly territoriality, Levinasian ethics and concerns of space technology, analysis of post-9/11 fiction, and a more provocatively couched axiomatics so as to compose a manifesto of sorts and thus enter a plea on behalf of a certain algorithm of "planetary reading." A systematic description of this interpretive model, he tells us, is as necessary as a strong emphasis on the model's urgency, hence the rhetorical shifts of Moraru's presentation throughout his piece. Moraru enumerates some key planetary themes: the greater elsewhere and the planet itself; remote spaces, customs, and their "others" represented as intrinsic or internal to closer ("our") places, groups, and their habits; a whole gamut of time-space constriction games and the bioconnective imaginings they spawn; and a new sense of togetherness and interdependence the resulting planetary iconology in turn endorses. After laying out the components or steps of his geomethodology, he applies it to works by Joseph O'Neill, Orhan Pamuk, Mircea Cărtărescu, and other novelists, and goes on to conclude by pinpointing the ethical consequences of planetary reading.

Notes

1. See Ulrich Beck, *World Risk Society* (Cambridge, Eng.: Polity; Malden, Mass.: Blackwell, 1999).

2. The literature on post-postmodernism is now threatening to rival in volume the archive of postmodern theory, with scholarship by Mary Holland,

Amy J. Elias, Timotheus Vermeulen, and Robin van den Akker (proponents of "metamodernism"), Alison Gibbons, Caren Irr, Leerom Medovoi, Rachel Adams, Min Hyoung Song, Bharati Mukherjee, and others steadily adding to it. Works addressing the question "What comes after postmodernism?" include Jeffrey T. Nealon's *Post-Postmodernism or, The Cultural Logic of Just-in-Time Capitalism* (Stanford, Calif.: Stanford University Press, 2012); a post-millennial special issue of *symploke* (12, nos. 1–2 [2004)]; a *College English* cluster of essays titled "Twentieth-Century Literature in the New Century: A Symposium" (64, no. 1 [September 2001]: 9–33); and a *Twentieth-Century Literature* special issue edited by Andrew Hoberek, "After Postmodernism: Form and History in Contemporary American Fiction" (53, no. 3 [Fall 2007]). See also Timothy S. Murphy, "To Have Done with Postmodernism: A Plea (or Provocation) for Globalization Studies," in *symploke* 12, nos. 1–2 (2004): 20–34; Robert L. McLaughlin, "Post-Postmodern Discontent: Contemporary Fiction and the Social World," in *symploke* 12, nos. 1–2 (2004): 53–68; Brian McHale, "What Was Postmodernism?" in *Electronic Book Review*, December 20, 2007, http://www.electronicbookreview.com/thread/fictionspresent/tense; Christian Moraru, *Cosmodernism: American Narrative, Late Globalization, and the New Cultural Imaginary* (Ann Arbor: University of Michigan Press, 2011); Neil Brooks and Josh Toth, eds., *The Mourning After: Attending the Wake of Postmodernism* (Amsterdam: Rodopi, 2007); and Terry Smith, *Contemporary Art: World Currents* (Upper Saddle River, N.J.: Prentice Hall, 2011). In "Thirteen Ways of Passing Postmodernism: Introduction to Focus," 3–4, an essay introducing his guest-edited *American Book Review* issue (34, no. 4 [May–June 2013]) on "metamodernism," Moraru shows that the post-postmodern debate has reached the planetary stage. Additional evidence is provided, along these lines, by *Narrative* in the "Postmodernist Fiction: East and West" issue coedited by Wang Ning and Brian McHale (21, no. 3 [2013]).

3. Ulrich Beck and Edgar Grande, "Varieties of Second Modernity: The Cosmopolitan Turn in Social and Political Theory and Research," *British Journal of Sociology* 61, no. 3 (2010): 412.

4. See Christian Moraru, "The Global Turn in Critical Theory," *symploke* 9, no. 1–2 (2001): 80–92. David Held advances the "strong globalization thesis" in the "Afterword" to his anthology *A Globalizing World? Culture, Economics, Politics* (New York: Routledge in association with The Open University, 2000), 171. Christopher J. Kollmeyer takes up Held's weak/strong globalization distinction in "Globalization, Class Compromise, and American Exceptionalism: Political Change in 16 Advanced Capitalist Countries," published in *Critical Sociology* 29, no. 3 (October 2003): 369–91. On "late globalization" and its cultural relevance in world and U.S. context, see, among others, Moraru, *Cosmodernism*, 33–37.

5. Nicholas A. Ashford and Ralph P. Hall, *Technology, Globalization, and Sustainable Development: Transforming the Industrial State* (New Haven, Conn.: Yale University Press, 2011), 4–5. For useful and succinct introductions to globalization, see Jürgen Osterhammel and Niels P. Petersson, *Globalization: A Short History*, trans. Dona Geyer (Princeton, N.J.: Princeton University Press, 2009); Manfred Steger, *Globalization: A Very Short Introduction*, 3rd ed. (Oxford: Oxford University Press, 2013); and Akira Iriye and Jürgen Osterhammel, eds., *Global Interdependence: The World after 1945* (Cambridge, Mass.: Belknap Press of Harvard University Press), 2013.

6. Nick Bisley, in *Rethinking Globalization* (Basingstoke, Eng.: Palgrave Macmillan, 2007), 6, 30, outlines what he sees as the three key engines of globalization: economics, sociology, and politics (23). Bisley lists a number of theoretical models for post–World War II global development including, for economic globalization, those of Samir Amin's *Re-Reading the Postwar Period* (New York: Monthly Review, 1994) and of Alex Callinicos, ed., "Europe on the Edge," a special issue of *International Socialism* 63 (1994). On sociological globalization, Bisley references David Held and Anthony McGrew, eds., *The Global Transformations Reader: An Introduction to the Globalization Debate,* 2nd ed. (New York: Palgrave Macmillan, 2005); and Manuel Castells's *The Information Age* trilogy: *The Rise of the Network Society, Vol. 1: The Information Age: Economy, Society, and Culture* (Oxford, Eng.: Blackwell, 1996); *The Power of Identity, Vol. 2, The Information Age: Economy, Society, and Culture*, 2nd ed. (Hoboken, N.J.: Wiley-Blackwell, 2009); and *End of Millennium, Vol. 3, The Information Age: Economy, Society, and Culture* (Hoboken, N.J.: Wiley-Blackwell, 1998). Discussing political globalization, he cites, among others, Ankie Hoogvelt, *Globalization and the Postcolonial World: The New Political Economy of Development*, 2nd ed. (Baltimore: Johns Hopkins University Press, 2001); and Randall D. Germain, *Globalization and Its Critics: Perspectives from Political Economy* (Basingstoke, Eng.: Palgrave Macmillan, 2000). Germain's more recent book on world administration and finance, *Global Politics and Financial Governance* (Basingstoke, Eng.: Palgrave Macmillan, 2010), also deserves mention.

7. Immanuel Wallerstein, *Geopolitics and Geoculture: Essays on the Changing World-System* (Cambridge, Eng.: Cambridge University Press; Paris: Maison des Sciences de l'Homme, 1991), 140. Wallerstein's autopoietic globalization is articulated in his books *The Modern World-System,* volumes I–IV, all reissued in 2011 by the University of California Press; see too Immanuel Wallerstein's *Utopistics, or Historical Choices of the Twenty-First Century* (New York: New, 1998).

8. See Giovanni Arrighi, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (New York: Verso, 2010), originally published in 1994.

9. Allan Cochrane and Kathy Pain, "Chapter 1: A Globalizing Society?" in *A Globalizing World? Culture, Economics, Politics*, ed. David Held (New York: Routledge in association with The Open University, 2000), 23.

10. In the context of media studies, for instance, this perspective informs Don Slater's *New Media, Development and Globalization: Making Connections in the Global South* (Cambridge, Eng.: Polity, 2013).

11. See, for example, Martin Albrow, *The Global Age: State and Society Beyond Modernity* (Stanford, Calif.: Stanford University Press, 1997).

12. Jean-Pierre Warnier, *La mondialisation de la culture*, 3rd ed. (Paris: La Découverte, 2004), 32. Also see Moraru, introduction to *Cosmodernism*, 15–75.

13. On Pierre Chaunu's *univers cloisonné*, most relevant is the author's book *Histoire, science sociale: La durée, l'espace et l'homme à l'époque moderne* (Paris: Société d'édition d'enseignement supérieur, 1974).

14. Ken Jowitt, *New World Disorder: The Leninist Extinction* (Berkeley: University of California Press, 1992). Zygmunt Bauman refers to Jowitt's book in *Globalization: The Human Consequences* (New York: Columbia University Press, 1998), 59. For Tzvetan Todorov, see *Le nouveau désordre mondial: Réflexions d'un Européen* (Paris: Robert Laffont, 2003). On the "chaos" of the

contemporary world, the reader might consult Amin Maalouf's recent book *Le dérèglement du monde* (Paris: Grasset & Fasquelle, 2009); and Immanuel Wallerstein's article "New Revolts Against the System," *New Left Review*, 2nd series, 18 (November–December 2002): 37. Joseph Stiglitz develops his critique most famously in *Globalization and Its Discontents* (New York: W. W. Norton, 2003). Zillah Eisenstein's views have been set out in *Against Empire: Feminisms, Racism, and the West* (New York: Zed Books, 2004).

15. Allan Cochrane and Kathy Pain refer to Paul Q. Hirst and Grahame Thompson's 1996 book *Globalization in Question: The International Economy and the Possibility of Governance,* 2nd ed. (1999). "Planetary dysphoria," Emily Apter explains in the closing chapters of her latest book, is a "geo-psychoanalytic" concept that captures the essence of our planet's "dark ecology" or "state of the world at its most depressed and *unruhig* [restless], awaiting the triumphant revenge of acid, oil, and dust." See Apter's *Against World Literature: On the Politics of Untranslatability* (London: Verso, 2013), 338, 341.

16. We refer the reader to the essays in Frank J. Lechner and John Boli, *The Globalization Reader* (Malden, Mass.: Blackwell, 2000); and in Fredric Jameson and Masao Miyoshi, eds., *The Cultures of Globalization* (Durham, N.C.: Duke University Press, 1998). Some critics point to a "postglobal age." See, in this regard, Ulrike Bergermann, Isabell Otto, and Gabriele Schabacher, eds., *Das Planetarische: Kultur-Technik-Medien in postglobalen Zeitalter* (Munich: Wilhelm Fink, 2010).

17. See Slavoj Žižek, *Welcome to the Desert of the Real: Five Essays on September 11 and Related Dates* (New York: Verso, 2002), and his *First as Tragedy, Then as Farce* (New York: Verso, 2009); Douglas Kellner, "Globalization, Terrorism, and Democracy: 9/11 and Its Aftermath," http://pages.gseis.ucla.edu/faculty/kellner/essays/-globalizationterroraftermath.pdf; as well as Kellner's *From 9/11 to Terror War: Dangers of the Bush Legacy* (Lanham, Md.: Rowman and Littlefield, 2003).

18. See Phillip E. Wegner, *Life between Two Deaths, 1989–2001: U.S. Culture in the Long Nineties* (Durham, N.C.: Duke University Press, 2009), especially the introduction.

19. See, for example, Terhi Rantanen, *The Media and Globalization* (London: Sage Publications, 2004); William Uricchio, *We Europeans? Media, Representations, Identities* (Bristol, Eng.: Intellect, 2009); Tanner Mirrlees, *Global Entertainment Media: Between Cultural Imperialism and Cultural Globalization* (New York: Routledge, 2013).

20. McKenzie Wark, *Virtual Geography: Living with Global Media Events* (Bloomington: Indiana University Press, 1994) and *Telesthesia: Communication, Culture, and Class* (Cambridge, Eng.: Polity, 2012); Paul Virilio, *The Information Bomb* (New York: Verso, 2006); Douglas Kellner, *Media Spectacle and Insurrection, 2011: From the Arab Uprisings to Occupy Everywhere* (London: Bloomsbury Academic, 2011); Richard Grusin, *Premediation: Affect and Mediality after 9/11* (London: Palgrave Macmillan, 2010). Sources discussing the relation of media and technology to globalization are myriad and range through political positions and disciplinary contexts. A few examples might include David Tabachnick and Toivo Koivukoski, *Globalization, Technology, and Philosophy* (Albany: SUNY Press, 2004); Kevin Robins and Frank Webster, *Times of the Technoculture: From the Information Society to the Virtual Life* (London:

Routledge, 1999); and Kaushalesh Lal, *Information and Communication Technologies in the Context of Globalization: Evidence from Developing Countries* (New York: Palgrave Macmillan, 2008).

21. Manuel Castells, *Networks of Outrage and Hope: Social Movements in the Internet Age* (Cambridge, Eng.: Polity, 2012); Jennifer Earl and Katrina Kimport, *Digitally Enabled Social Change: Activism in the Internet Age* (Cambridge, Mass.: MIT Press, 2011).

22. See, for instance, Pico Iyer's *The Global Soul: Jet Lag, Shopping Malls, and the Search for Home* (New York: Random House, 2000) and Thomas L. Friedman's books *The Lexus and the Olive Tree: Understanding Globalization* (New York: Picador, 2012) and *The World Is Flat 3.0: A Brief History of the Twenty-First Century* (New York: Farrar, Strauss and Giroux, 2006).

23. Saskia Sassen takes on "the development of new jurisdictional geographies" in "Neither Global nor National: Novel Assemblages of Territory, Authority, and Rights," published in *Ethics and Global Politics* 1, no. 1–2 (2008): 61–79.

24. Martin Albrow, "Who Rules the Global Rule Makers?" in *La Vie des idées* (November 3, 2011). The text is also available in English at the mirror site "Books and Ideas," http://www.booksandideas.net/Who-Rules-the-Global-Rule-Makers.html.

25. Lawrence Buell, *The Environmental Imagination: Thoreau, Nature Writing, and the Formation of American Culture* (Cambridge, Mass.: Belknap Press of Harvard University Press, 1996); Cheryll Glotfelty and Harold Fromm, eds., *The Ecocriticism Reader: Landmarks in Literary Ecology* (Athens: University of Georgia Press, 1996).

26. Basarab Nicolescu, *Théorèmes poétiques* (Paris: Rocher, 1994).

27. Yi-Fu Tuan, *Cosmos and Hearth: A Cosmopolite's Viewpoint* (Minneapolis: University of Minnesota Press, 1996), 187–88; Gérard Raulet, *Critical Cosmology: On Nations and Globalization—A Philosophical Essay* (Lanham, Md.: Lexington Books, 2005), especially 65–80; Félix Guattari, *Chaosmose* (Paris: Galilée, 1992); Anne Phillips, *Multiculturalism without Culture* (Princeton, N.J.: Princeton University Press, 2007), 42–72.

28. Amy J. Elias, "The Dialogical Avant-Garde: Relational Aesthetics and Time Ecologies in *Only Revolutions* and *TOC*," *Contemporary Literature* 53, no. 4 (Winter 2012): 749–50.

29. For the concept of *potenza*, see Antonio Negri, *Art and Multitude: Nine Letters on Art, Followed by Metamorphoses: Art and Immaterial Labor*, trans. Ed Emery (London, Eng.: Polity, 2011), 30. Maurizia Boscagli translates Negri's *potenza* as "strength" in *Insurgencies: Constituent Power and the Modern State*, trans. Maurizia Boscagli, with a New Foreword by Michael Hardt (Minneapolis: University of Minnesota Press, 2009). Boscagli's note on p. 337 defines potenza as "strength . . . resid[ing] in the desire of the multitude."

30. Gayatri Chakravorty Spivak, "Imperative to Re-Imagine the Planet," originally published in *Imperatives to Re-Imagine the Planet/Imperative zur Neuerfindung des Planeten*, ed. Willi Goetschel (Vienna: Passagen, 1999). Reprinted in *An Aesthetic Education in the Era of Globalization* (Cambridge, Mass.: Harvard University Press, 2011), 335–50.

31. Spivak, "Imperative to Re-Imagine the Planet," 348.

32. Ibid., 349.

33. See Gayatri Chakravorty Spivak, *Death of a Discipline* (New York: Columbia University Press, 2005), 72–73. For earlier formulations of this idea, see her *A Critique of Postcolonial Reason: Toward a History of the Vanishing Present* (Cambridge, Mass.: Harvard University Press, 1999) and "Imperative to Re-Imagine the Planet."

34. Neil Turnbull, "The Ontological Consequences of Copernicus: Global Being in the Planetary World," *Theory, Culture & Society* 23, no. 1 (2006): 133.

35. Masao Miyoshi, "Turn to the Planet: Literature, Diversity, and Totality," *Comparative Literature* 53, no. 4 (Fall 2001): 295.

36. Ibid., 296.

37. Some of these titles include Moraru's *Cosmodernism*; Ursula K. Heise's by now classic *Sense of Place and Sense of Planet: The Environmental Imagination of the Global* (Oxford: Oxford University Press, 2008); Wai Chee Dimock's articles "Literature for the Planet," *PMLA* 116, no. 1 (January 2001): 173–88, and "Scales of Aggregation: Prenational, Subnational, Transnational," *American Literary History* 18, no. 2 (Summer 2006): 219–28 as well as her trailblazing book, *Through Other Continents: American Literature across Deep Time* (Princeton, N.J.: Princeton University Press, 2008); Amy J. Elias, "Interactive Cosmopolitanism and Collaborative Technologies: New Foundations for Global Literary History," *New Literary History* 39, no. 3 (Summer 2008): 705–25; Joni Adamson, "American Literature and Film from a Planetary Perspective: Teaching Space, Time, and Scale," *Transformations* 21, no. 1 (Spring–Summer 2010): 23–41; Frances Ferguson, "Planetary Literary History: The Place of the Text," *New Literary History* 39, no. 3 (Summer 2008): 657–84; Susan Stanford Friedman, "Planetarity: Musing Modernist Studies," *Modernism/Modernity* 17, no. 3 (September 2010): 471–99; Caren Irr, "Toward the World Novel: Genre Shifts in Twentieth-First-Century Expatriate Fiction," *American Literary History* 23, no. 3 (Fall 2011): 660–79; Leerom Medovoi, "'Terminal Crisis?' From the Worlding of American Literature to World-System Literature," *American Literary History* 23, no. 3 (Fall 2011): 643–59; Mark Poster, "Global Media and Culture," *New Literary History* 39, no. 3 (Summer 2008): 685–703; Mary Louise Pratt, "Planetary Longings: Sitting in the Light of the Great Solar TV," in *World Writing: Poetics, Ethics, Globalization*, ed. Mary Gallagher, 207–23 (Toronto: University of Toronto Press, 2008); and Min Hyoung Song, "Becoming Planetary," *American Literary History* 23, no. 3 (Fall 2011): 555–73.

38. Ulrich Beck, *What Is Globalization?* trans. Patrick Camiller (Cambridge, Eng.: Polity, 2000), 9–10. Otherwise treading carefully, Beck is getting here on a slippery slope toward a notion of the world as fully integrated "totality."

39. Marshall Brown, "Globalism or Globalization?" *Modern Language Quarterly* 68, no. 2 (June 2007): 143. Brown's definitions can be inconsistent (see, e.g., 137).

40. Roland Robertson, "Social Theory, Cultural Relativity, and the Problem of Globality," in *Culture, Globalization, and the World-System: Contemporary Conditions for the Representation of Identity,* ed. Anthony D. King (Minneapolis: University of Minnesota Press, 2000), 73.

41. Min Hyoung Song, "Becoming Planetary," 568. Song draws from Carl Schmitt's controversial *The Nomos of the Earth*, Paul Gilroy's *Postcolonial Melancholia*, and Hardt and Negri's three-volume opus on global-era multitudes.

42. Warnier, *La mondialisation de la culture*, 107.

43. Amanda Anderson, "Cosmopolitanism, Universalism, and the Divided Legacies of Modernity," in *Cosmopolitics: Thinking and Feeling Beyond the Nation*, ed. Pheng Cheah and Bruce Robbins, 265–89, especially 278 and 265 (Minneapolis: University of Minnesota Press, 1998).

44. Ibid., 267.

45. Ibid., 268, 269. Quoting from Bruce Robbins's *Secular Vocations: Intellectuals, Professionalism, Culture* (New York: Verso, 1993), 181, Anderson notes that cosmopolitanism "enables an embrace of worldliness in two senses: '1) planetary expansiveness of subject-matter, on the one hand, and 2) unembarrassed acceptance of professional self-interest, on the other.' "

46. Anderson, "Cosmopolitanism," 267, 274, 276.

47. See Robbins, *Secular Vocations*, 197; James Clifford, "Traveling Cultures," in *Cultural Studies: Now and in the Future*, ed. Larry Grossberg, Cary Nelson, and Paula A. Treichler, (New York: Routledge, 1992), 108; Seyla Benhabib, *Situating the Self: Gender, Community, and Postmodernism in Contemporary Ethics* (New York: Routledge, 1992), 153; Judith Butler, "For a Careful Reading," in *Feminist Contentions: A Philosophical Exchange*, ed. Linda Nicholson (New York: Routledge, 1995), 130–31; Etienne Balibar, "Ambiguous Universality," *differences* 7, no. 1 (1995): 48–74; and Julia Kristeva, *Nations without Nationalism* (New York: Columbia University Press, 1993)—all discussed and quoted in Anderson. Our summary here follows her language. For an updated formulation of "agonistic universalism" by Butler, see *Contingency, Hegemony, Universality: Contemporary Dialogues on the Left* (New York: Verso, 2000) and *Dispossession: The Performative in the Political* (New York: Polity, 2013). Also see Benhabib's *Another Cosmopolitanism* (New York: Oxford University Press, 2008) for a more recent discussion of the pragmatic ethics of interactive cosmopolitanism.

48. Anderson cites David Hollinger's *Postethnic America*; Martha Nussbaum's "Patriotism and Cosmopolitanism"; and Arjun Appadurai's postnationalist stance from "Patriotism and Its Futures" (*Public Culture* 5 [1993]: 411–29). Hollinger's distinction between pluralism and cosmopolitanism is particularly important to our discussion. Pluralism endows certain groups with specific privilege and protects culture, while cosmopolitanism has been typically more oriented to the individual and disputes claims to cultural integrity (*Postethnic America: Beyond Multiculturalism* [New York: Basic Books, 1995], 85–86, quoted in Anderson, 278).

49. Shared topics and areas of theoretical concern inform such studies as the transatlantic cosmopolitanism reconstituted by Susan Manning and Andrew Taylor's *Transatlantic Literary Studies* (2007), Paul Gilroy's *The Black Atlantic* (1993), Kwame Anthony Appiah's *Cosmopolitanism: Ethics in a World of Strangers* (2006); the contributions to *Hemispheric American Studies*, edited by Caroline Field Levander and Robert S. Levine (2008); Yunte Huang's books, chiefly *Transpacific Displacement* (2002); Paul Jay's *Global Matters: The Transnational Turn in Literary Studies* (2010); Paul Giles's *Antipodean America: Australasia and the Constitution of U.S. Literature* (New York: Oxford University Press, 2013); and the Spring 2003 *Modern Fiction Studies* special-topic issue on the "trans-American imaginary," guest-edited by Paula M. L. Moya and Ramón Saldivar. To be sure, the list could go on.

50. Heise, *Sense of Place and Sense of Planet*, 50 and following. Heise further develops her eco-cosmopolitan argument in *Nach der Natur: Das Artensterben und die Moderne Kultur* (Berlin: Suhrkamp, 2010).

51. For an interesting contrast between a focus on rights in the context of globalization, on the one hand, and ethics within the framework of planetary cosmopolitanism, on the other, consult the audio dialogue between Judith Butler and Spivak, "A Dialogue on Global States, 6 May 2006," *Postmodern Culture* 17, no. 1 (2006).

52. Susan Stanford Friedman writes in her 2010 article "Planetarity: Musing Modernist Studies" (*Modernism/Modernity* 17, no. 3 [September 2010]): "As I use the term, . . . planetarity . . . is an epistemology, not an ontology" (494).

53. Bharati Mukherjee, *The Tree Bride* (New York: Hyperion, 2004), 231.

54. "Heterogenizing" interplays with the global are outlined in Roland Robertson's concept of "glocalization," while in "creolizations" the global is further customized, blending into native mixtures more aggressively, and even goes "slumming."

55. For a posthuman critique of the human-nonhuman hierarchy embedded in classical ecocriticism, see Heise, *Nach der Natur*, especially 115–49. Much has been made recently in ecocriticism of the "Anthropocene era," Paul Crutzen's 2002 term for the geologic-chronological age in which humans radically affect and alter the planet's ecology; see Jan Zalasiewicz et al., "Are We Now Living in the Anthropocene?" *GSA Today* (February 2008): 4–8.

56. See, for example, Spivak's *Death of a Discipline* (2005); Emily Apter's *The Translation Zone* (2006) and "Untranslatables: A World System," *New Literary History* 39, no. 3 (Summer 2008): 581–98; Wai Chee Dimock, "Planetary Time and Global Translation: 'Context' in Literary Studies," *Common Knowledge* 9, no. 3 (Fall 2003): 488–507.

57. Paul Gilroy, "Planetarity and Cosmopolitics," *British Journal of Sociology* 61, no. 3 (September 2010): 620. For "methodological nationalism" and the cosmopolitan reaction to it, see Ulrich Beck, "Toward a New Critical Theory with a Cosmopolitan Intent," *Constellations* 10, no. 4 (2003): 453. On postnational/post-territorialist aggregation and its role in new literary history, see Wai Chee Dimock's pioneering articles and books, especially *Through Other Continents*.

WEDNESDAY
07/08

Guided by: Sumugan Sivanesan, BIPoC vs. CO2.

TITLE: CARING FOR COUNTRY: AN URBAN APPLICATION
Author: City of Melbourne / Monash University
Publisher: City of Melbourne / Monash University
Year: 2002

https://www.monash.edu/__data/assets/pdf_file/0006/720681/Caring-for-Country-Literature-Review.pdf

Caring for Country: An Urban Application

The possibilities for Melbourne

Developed by

CITY OF MELBOURNE

MONASH University

Monash Sustainability Institute

Supported by

INDIGENOUS ARCHITECTURE AND DESIGN VICTORIA

THE UNIVERSITY OF MELBOURNE

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National Environmental Science Programme

1

A note on terminology

This report uses the term 'Aboriginal' rather than 'Indigenous' to refer to the First Nation Peoples of mainland Australia. This is because the report is focused towards the application of Caring for Country to urban sustainability specifically in Melbourne, Victoria. This report recognises that the term 'Aboriginal' collapses a vast number of specific individuals and communities within Melbourne, Victoria (Heiss, 2012, p. 4). However, there is a reluctance to use more localised terms such as 'Koori' or even 'Boon Wurrung' to maintain the relevance of Caring for Country for widespread application to urban sustainability throughout Australia. The term 'Indigenous' is sparingly used in instances where other individuals, literature or institutions and their initiatives have been quoted or referred to. The description of 'Western' is used to indicate ideas, people and cultures descending from Anglo-European origin which have dominated and continue to dominate the philosophies, structures and institutions of human society both nationally and internationally (Plumwood, 2002).

What is Caring for Country?

Caring for Country embodies set stewardship values for land and sea environments which are deeply embedded in Aboriginal culture (Zurba & Berkes, 2014, p. 823). It is the possession of, the sense of responsibility for and the inherent right to manage one's Country in a way that is ecologically, socially, culturally and economically sustainable (Atkinson, 2004; "Yotti" Kingsley, Townsend, Phillips, & Aldous, 2009, p. 291). The assertion of Aboriginal rights to remain on Country and to Care for Country is not simply an act of entitlement, rather it is a deep loyalty to fulfilling the responsibilities to Country that have been handed down through generations for tens of thousands of years (Atkinson, 2004).

Each Aboriginal person has his or her Country. Country is the place that provides, supports and receives all life within an Aboriginal person's metaphysical world. It is spoken about amongst Aboriginal Australians as if it were not only a person, but a blood relation such as a mother or a brother (Neidjie, 2002; Watson, 2009; Weir et al., 2011).

> "This ground is mother. This ground, she's my mother. She's mother for everybody. We born top of this ground. This [is] our mother. That's why we worry about this ground" (Riley Young cited in Rose, 1992, p. 220).

As such, loss of Country or loss of the ability to care for Country can be understood as the loss of a family member and causes significant emotional and psychological trauma.

> "Take away the land, it is often said, and you take away our soul and identity as a people" (Atkinson, 2004, p. 1).

In addition, there is the cultural loss that occurs as rapid species extinction and land degradation eliminate the necessary resources for cultural practices and ceremonies (Rose, 2012).

The Dreamtime Stories

The Dreamtime Stories are the foundation of customary law which provide a set of human obligations to their local environment and symbolise an inseparable and innate human-nature relationship (Zurba & Berkes, 2014). The ability to carry out these obligations through traditional practices such as plant harvesting, burning and native species protection is seen as vital by Traditional Owner groups in the retention and intergenerational transmission of Traditional Ecological Knowledge (Atkinson, 2004; Weir et al., 2011; Zurba & Berkes, 2014).

Traditional Ecological Knowledge can be defined as a 'cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission.'

(Zurba & Berkes, 2014). Through the Dreamtime stories, each Traditional Owner group is endowed with an intricate system of customary laws, kinship systems and totem relations that determine a system of resource management, which nourishes economic, environmental, cultural, social and physical wellbeing.

The notion of kinship embodies the importance of all relationships including relationships with the land and non-human species. A totem is a particular animal or plant to which a person or clan is specifically related, and whose spirit protects them.

Caring for Country conceives the land and its non-human inhabitants as deeply embedded in both the practical use of natural resources and the spiritual nourishment of society (Head, Trigger, Mulcock & others, 2005).

This interrelatedness eliminates any demarcation of separate sectors of life such as economy, environment, society, culture, technology, science etc. Rather each sector becomes fluid and deeply dependent on all others in order for Traditional Owner groups to fulfil their obligations to Country (Atkinson, 2004).

This holistic approach emphasises that not only are cultural, environmental, economic and societal systems not in opposition to one another, but they are necessary for each other's survival. It also has implications for notions of ownership and resource use. Caring for Country embodies an alternative view of ownership than those conceptualised by Western legal institutions. Ownership within Caring for Country represents a profound connection to place that goes hand in hand with stewardship relations of responsibility and obligation to Country, its human and non-human inhabitants. Ownership is also a duty to transfer Traditional Knowledge regarding the preservation of those relationships (Atkinson, 2000, 2004; Battiste & Henderson, 2000; Watson, 2009; Weir et al., 2011; Zurba & Berkes, 2014). Thus as Country is part of a network of relationships just as much as fellow human beings, ownership does not translate to the ability to sell one's Country.

> "Our ancestors are alive in the land, and this is in accord with saying that to sell the land is akin to selling one's own mother." (Watson, 2009, p. 40).

TITLE: GEONTOLOGIES - A REQUIEM TO LATE LIBERALISM
Author: Elizabeth A. Povinelli
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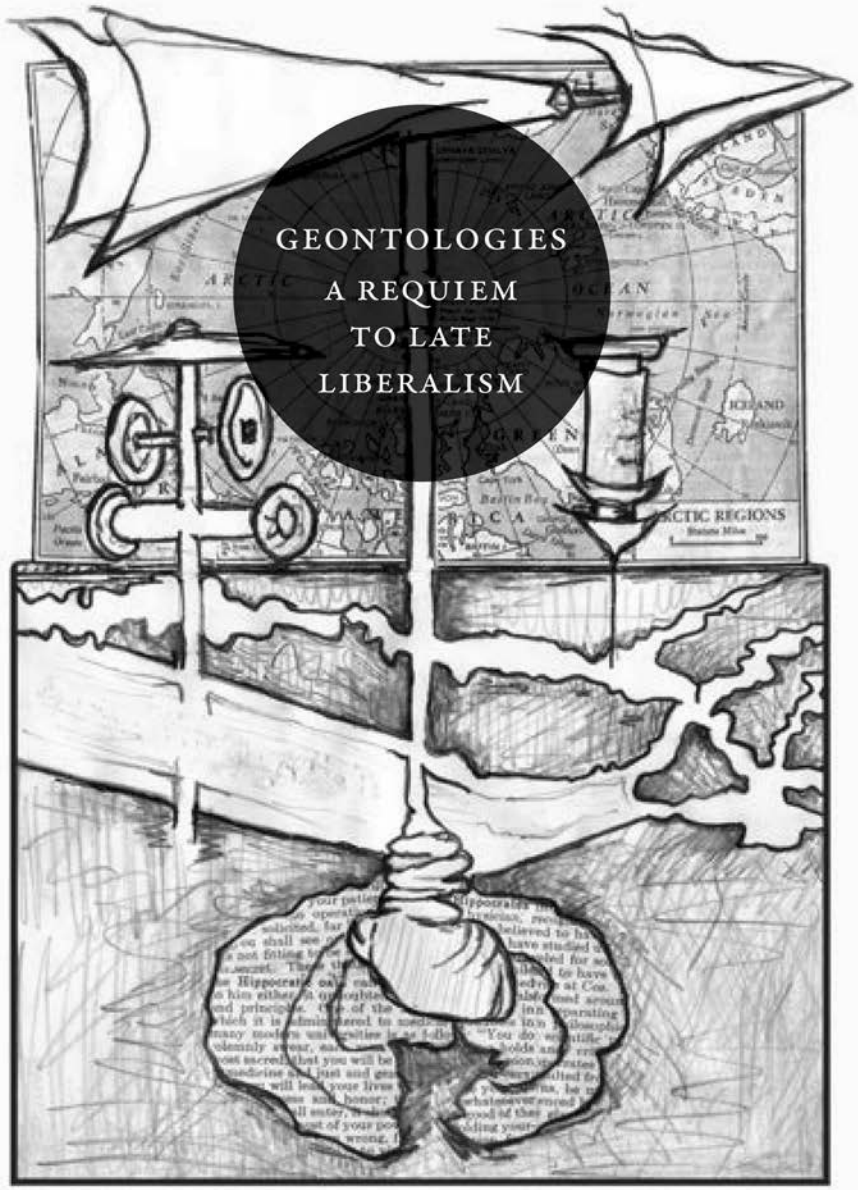

2

CAN ROCKS DIE?
LIFE AND DEATH INSIDE THE CARBON IMAGINARY

The Rat and the Bandicoot

In the far north of Australia, the Aboriginal Areas Protection Authority brought a gutsy desecration lawsuit against OM Manganese Ltd., a subsidiary of OM Holding, for deliberately damaging an Indigenous sacred site, Two Women Sitting Down, at its Bootu Creek manganese mine.[1] The suit seemed like a classic face-off between David and Goliath, a small underfunded state agency suing a large international corporation. The claimant, the Aboriginal Areas Protection Authority, was established in 1978 under the Northern Territory Sacred Sites Act (SSA) to preserve and protect such sites as part of a broader reconsideration of Indigenous culture in relation to national law. However progressive the initial idea, subsequent legislative amendments and hostile governments continually narrowed and underfunded its mandate. Nevertheless, for the first time in its history, under the leadership of Benedict Scambary, the Aboriginal Areas Protection Authority sued a major corporation—and then in 2013 it won. Scambary knew what the stakes were. His dissertation had demonstrated that the lauded partnership between mining companies and Indigenous communities was heavily weighted toward long-term capital enrichment for the companies and short-term, quickly expended cash outcomes for Indigenous people.[2]

The legal case focused on a narrower question: did the mining company intend to damage Two Women Sitting Down, or, more narrowly, should they have known that in acting as they did that the consequence would have been this damage? The magistrate, Sue Oliver, noted, "There is no dispute that the geological feature [at] the subject of all these charges is a sacred site." Nor was there any dispute about the Indigenous insights about its formation. Oliver cites a 1982 anthropology consultant's report that Two Women Sitting Down consists of "two female dreamtime ancestors, a bandicoot and a rat. The bandicoot had only two children while the rat had so many the bandicoot tried to take one of the rat's children, which caused them to fight. The manganese outcrops in this area, of which this Sacred Site is one, represents the blood of these ancestors." It was Two Women Sitting Down's blood that OM Manganese was after as it dug ever closer toward her edges. Manganese is the fourth most-used metal per tonnage in global manufacturing just behind iron, aluminum, and copper, and it is a critical component of various commodities ranging from high-quality steel production to pharmaceuticals. And Australian mining accounts for about 9–11 percent of global production.[3] (At the beginning of the end of the mining boom in 2012, economic demonstrated resources [EDR] showed "manganese ore dropped by 5 percent to 187 million tons, mainly because of a fall in EDR at Groote Eylandt and Bootu Creek. But resources mined in other areas of Australia were being extracted at either the same or increasing rates."[4]) Thus the timing of the suit was interesting. In 2013 the mining industry was still being given credit for buffering Australia from the worst excesses of the global financial collapse of 2008. And a series of conservative state, territory, and federal governments were still encouraging the expansion of mines across Indigenous and non-Indigenous lands largely because the initial expansion of a mine demanded an intensive high-paying labor force during the construction period. The peak of the mining boom was just breaking when OM Manganese shattered Two Women Sitting Down.

Given that both the anthropological report and the legal judgment consider Two Women Sitting Down a geological formation *represented by* a human narrative, perhaps it goes without saying that the mining company's action within the lawsuit was not prosecuted as manslaughter, attempted murder, or murder but as a "desecration" under criminal liability law. The case pivoted on whether OM Manganese intentionally wrecked features of the site when it undermined its foundations. OM Manganese lost the case and became the first instance in which the destruction of a sacred site was successfully prosecuted under Australia law.[5] But it is unlikely that the influence mining companies and other extractive industries have on government policy will be greatly diminished by this legal setback. The actual fine was relatively small (AU$150,000), and the Indigenous custodians of the site received none of the money.[6] It is far more likely that those with interests in decomposing Two Women Sitting Down will attack the foundations of such lawsuits than they will fundamentally alter their practices. Indeed, soon after the Authority's legal success, a conservative Northern Territory government sought to change the Authority's charter, abolishing its independent board and absorbing the Authority into an existing cabinet portfolio. In Western Australia, the government proposed legislation that would restrict the meaning of *sacred* to "devoted to a religious use rather than a place subject to mythological story, song, or belief" and would charge AU$100,000 compensation and twelve months' imprisonment for damage to an Indigenous site as compared to AU$1 million compensation and two years' imprisonment for damage to a non-Indigenous site.[7]

Not surprisingly, given the amounts of money at stake, many Indigenous individuals and groups and their non-Indigenous supporters have not only signed contracts with mining companies but also actively advocated for mining on Indigenous lands as a means of advancing their welfare.[8] And why not? People whom capital benefits are in fact enriched, at least in the short run. And as successive governments have reduced aid to Indigenous people and communities, mining is one of the few alternatives for landholding groups to sustain their homelands, if in an often severely compromised fashion—indeed, many have argued that this contraction of state aid is meant to force Indigenous groups to open their lands to mining.[9] But the staunch opposition between some Indigenous people and extractive capital is also not surprising. The late Lang Hancock, the founder of one

of the largest mining companies in the world, the Australian-based Hancock Prospecting Pty Ltd., was blunt about his opposition to Indigenous land rights, "The question of Aboriginal land rights and things of this nature shouldn't exist." And his daughter and heir, Gina Rinehart, the CEO of Hancock Prospecting, the wealthiest Australian and at one time the thirty-seventh richest person in the world, has vigorously resisted any Aboriginal claims impeding her efforts to extract minerals from anywhere she finds them and has opposed any and all carbon and mining taxes. In order to promote her cause, Rinehart purchased a substantial stake in the Ten Television Network and Fairfax Media. Rinehart's public presence became so large that in May 2012 then Prime Minister Julia Gillard had to remind the Minerals Council of Australia, "You do not own the minerals. I don't own the minerals. Governments only sell you the right to mine the resources, a resource we hold in trust for a sovereign people."

Let's not be confused. The sovereign people to whom Gillard referred were not the Indigenous people who testified to the existence of Two Women Sitting Down and its surrounding lands, nor any other Indigenous group like them who testify about other such existences stretching across Australia. And Two Women Sitting Down was not the first and will not be the last formation destroyed by the contemporary ravenous hunger for mineral wealth. Indeed the demand on Indigenous people to couch their analytics of existence in the form of a cultural belief and obligation to totemic sites (a belief and obligation that is absurd from the point of view of geontopower and its figure of the Desert) is a crucial longstanding tactic wherein settler late liberalism attempts to absorb Indigenous analytics in geontopower. Take, for example, a scene I described nearly twenty years ago.

> One hot, sticky November day in 1989, a large part of the Belyuen Aboriginal community was gathered on the coast of the Cox Peninsula, across from the Darwin Harbour, to participate in one of the last days of the Kenbi Land Claim. Five of us—myself, Marjorie Bilbil, Ruby Yarrowin, Agnes Lippo, and Ann Timber—stood back from the hustle of microphones and notepads and the hassle of nonstop questions from government officials for as well as against our side. The other four women ranged in age from 38 to 70 (I was 27) and came from a variety of Dreaming (totemic) backgrounds. We

stood listening to Betty Billawag describing to the land commissioner and his entourage how an important Dreaming site nearby, Old Man Rock, listened to and smelled the sweat of Aboriginal people as they passed by hunting, gathering, camping, or just mucking about. She outlined the importance of such human-Dreaming/environmental interactions to the health and productivity of the countryside. At one point Marjorie Bilbil turned to me and said, "He can't believe, eh, Beth?" And I answered, "No, I don't think *so*, not him, not really. He doesn't think she is lying. He just can't believe himself that that Old Man Rock listens."[10]

The inability of the land commissioner and lawyers to believe is exactly what allowed them to enjoy "authentic difference" without fundamental changes to the metaphysics of the law—an experience of a form of difference that has been denuded of any threat to the hierarchy of governance in late liberalism. At the heart of this experience, what makes it work, are the presuppositions of geontopower. While human advocates for animal rights may well be slowly disturbing the consensus of what counts as a legally recognizable person and the new animism is extending Life into all entities and assemblages, Nonlife has remained fairly firmly sealed in its opposition to Life within extractive capital and its state allies.[11] The enjoyment of this scene, thus, indexes the safety of those transforming an Indigenous analytics of contemporary existence into a traditional cultural belief about subjects and objects and then assessing the truth of those beliefs not on the basis of the potential truth of the analysis but on the basis of their more-or-less consistency with a past perfect pre-settlement form. Indeed, the solicitation of totemic stories such as seen in Two Women Sitting Down and Old Man Rock is not meant to challenge dominant geontologies on which capital depends but rather a means for the state to sort kinds of humans who are "stakeholders" in geontopower. Rocks separate, divide, and assess different humans based on how, or whether, they differentiate Life and Nonlife. Rocks are a means for colonized groups to gain access to some of the goods that were appropriated from them—or to gain access to some of the capital that will be generated from them. For instance, OM Manganese is required to pay native title royalties (a fixed-dollar amount per dry ton shipped) to the traditional owners of the country into which their mines tear—the Kunapa/Kurtinja/Mangirriji, Jalajirrpa, Yapa Yapa, and Pirrtangu groups.[12]

And here we see the connection between geontopower, the governance of difference and markets, and the figure of the Animist. In Australia, at least, Indigenous groups gain rights to fixed compensations through participating in land-claim hearings, during which they testified that they believe that specific features of the landscape such as Old Man Rock and Two Women Sitting Down are sentient, and equally important, that, as the human descendants of these still sentient sites, they are obligated to act on this belief.[13] A fierce insistence that rocks listen creates an enjoyable kind of difference because it does not (or did not) unsettle the belief of those assessing these claims, and the majority settler public listening in, that rocks cannot perceive or intend or aim; that they are nonlife (*geos*), not life (*zoe* or *bios*). The rights that Indigenous groups receive from the state are not the right to make their view the norm but to attach a small spigot in the larger pipeline of late liberal approaches to geontology. Thus, unsurprisingly, the nearly ten years between the Kenbi Land Claim and the suit against OM Manganese have seen little containment of mining in Australia.[14] It has merely been "rationalized."[15] All of which takes us back to the sovereign people to whom Gillard referred.

The sovereign people of geontopower are those who abide by the fundamental separation of Life and Nonlife with all the subsequent implications of this separation on intentionality, vulnerability, and ethical implication. That is, what is sovereign is the division of Life and Nonlife as the fundamental ground of the governance of difference and markets. Where Indigenous people agree to participate as an Animist voice in the governmental order of the people they are included as part of this sovereign people. Where they do not, they are cast out. But what of Two Women Sitting Down? Does *it* have standing before the public, law, and market as a political subject? Are the subjects of politics now not merely humans and other forms of living labor and capital—corporations, miners, politicians, and Indigenous custodians, protected plant and animal species—but also the undead and never-have-lived? Is it possible to assert that Two Women Sitting Down and other existents like her should matter equally to or as much or more than a form of human existence? Or, riffing on Fredric Jameson, is it easier to think of the end of capitalism than the intentional subjectivity of Two Women Sitting Down and Old Man Rock?[16] If not, on what basis do we allow or deny geological formations like Two Women Sitting Down an equal standing before the law? Is the manganese blood

of Two Women Sitting Down as ethically burdened as the vital power of the human worker who extracts it? Doesn't the ability of these miners to decompose Two Women Sitting Down show its vulnerability and precarity? Is it more important to keep Two Women Sitting Down in place than to support the lifestyle and well-being that most Australians have come to expect? And what about Indigenous people who wish to put their children through private school and look at sites like Two Women Sitting Down as potential capital with which to do so? From what, or whose, perspective should the answers to these questions be posed and answered—cultural, economic, ecological, literary?

The fight over the meaning and significance of the damaging of Two Women Sitting Down provides a perfect example of why a growing number of geologists and climate experts are urgently calling for new dialogues among the natural sciences, the social sciences, the philosophies, and humanities and the arts. The governance of Life and Nonlife is no longer, we hear, merely a matter of human differences nor of the difference between humans and nonhuman animals, but is now also a matter of the entire assemblage of Life and Nonlife. If we are to answer these questions, and by answering them, alter the coming crisis of an overtaxed and overburdened planet, we are told that we need to reopen channels of communication across the natural sciences and critical humanities and social sciences. This multidisciplinary perspective is crucial for making sense of the standing that places like Two Women Sitting Down and Old Man Rock should have in the contemporary governance of difference and markets in late liberalism. Indeed, a new interdisciplinary literacy is the only hope for finding a way to square our current arrangement of life with the continuation of human and planetary life as such. Scientists, philosophers, anthropologists, politicians, political theories, historians, writers, and artists must gather their wisdom, develop a level of mutual literacy, and cross-pollinate their severed lineages. The pressing nature of such discussions is glimpsed in the shadow cast by dinosaur-sized mining trucks carving away at the foundation of the Bandicoot and Rat. In the massive twilight of these gigantic earthmovers it is hard not to be seduced by the figure of the Desert, not to imagine that the Anthropocene, the geological age of the Human Being, will be the last age of humans and the first stage of Earth becoming Mars, a planet once awash in life, but now a dead orb hanging in the night sky. By squaring the difference between the natural sciences and the critical humanities and social

sciences we might be able to decide whether it makes sense to say that OM Manganese murdered Two Women Sitting Down—or that "the site" was (merely) desecrated. In other words, honest, considered, but hard-hitting interdisciplinary reflection is the only way we will find the right foundation for a decision about whether it is appropriate to say that such and such happened to Two Women Sitting Down—and whether we should refer to it as "that," "it," or "they" (a demonstrative, a third nonperson, or two subjects).

But what if we looked at this conversation between the natural sciences and critical humanities and social sciences differently? What if we asked not what epistemological differences have emerged over the years as the natural sciences of life and the critical sciences have separated and specialized, but what common frameworks, or *attitudes, anxieties, and desires*, toward the lively and the inert have been preserved across this separation and specialization? What unacknowledged agreements were signed long before the natural and critical sciences parted ways? In subsequent chapters I look at how the analytics of existence of my Indigenous colleagues are apprehended across specific theoretical, social, and capital environments. Here I begin by outlining the key features of the propositional hinge that joins the natural and critical sciences and that creates the differences between them. I call this hinge the Carbon Imaginary. The Carbon Imaginary is the homologous space created when the concepts of birth, growth-reproduction, and death are laminated onto the concepts of event, *conatus/affectus*, and finitude. As I noted in the introductory chapter of this book, the Carbon Imaginary is the central imaginary of the figure of the Desert. It seeks, iterates, and dramatizes the gap between Life and that which is conceived as before or without Life. And, while certainly central to the Desert, the Carbon Imaginary informs far broader conceptual and pragmatic attempts to overcome it—such as the Animist extension of vitalisms across all existents and assemblages.

I am clearly adapting the concept of a "propositional hinge" from Ludwig Wittgenstein, who argued that propositional hinges function as axles around which an entire apparatus of practical and propositional knowledge about the world turns rather than a set of propositions about the state of the world.[17] Put another way, propositional hinges aren't truth statements. They are nonpropositional propositions, a kind of statement that cannot be seriously doubted, or, if doubted, the doubt indicates the speaker is or

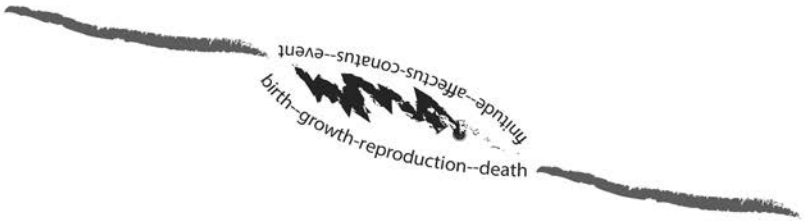

FIGURE 2.1 · A scarred homology.

is doing something other than making a truth statement—she is being provocative or is a lunatic or expressing her cultural difference. For Wittgenstein one either remains within the axial environment of a hinged world or one converts to another. In the kind of conversion Wittgenstein proposes one is not merely repositioned in the space established by an axial proposition but moves out of one space and into another, from one kind of physics into another, from one metaphysics into another.[18] But, hinge and axle rod also seem, as metaphors, too smooth an imaginary joint. The image of the scar would probably be a better image of the homologous productivity of the space between natural life and critical life and the nature of the Carbon Imaginary.[19] The Carbon Imaginary would then be the pulsing scarred region between Life and Nonlife—an ache that makes us pay attention to a scar that has, for a long time, remained numb and dormant, which does not mean unfelt.

Natural Life

The distinction between Life and Nonlife is, of course, foundational to the separation of the geosciences and the biosciences, geochemistry and biochemistry, geology and biology. This distinction is based on a series of evolving technical experiments and mediated by highly specialized vocabularies. For instance, a standard contemporary biochemical definition of life is "a physical compartmentation from the environment and self-organization of self-contained redox reactions."[20] Redox is shorthand for a series of reduction-oxidation reactions in which electrons are transferred between chemical species. For those not conversant in contemporary chemistry, oxidation occurs when an element loses one or more oxygen electrons; reduction is a gain of the same. Redox reactions are instances when these electrons are simultaneously transferred. Take, for instance, the creation of pure iron in the following instance of redox: $3C + [2Fe_2O_3] \rightarrow [4Fe] + [3CO_2]$. To create pure iron, one electron of oxygen is transferred from iron oxide $[2Fe_2O_3]$ to $[3C]$, creating three molecules of carbon dioxide $[3CO_2]$. In order to accomplish this transfer, a certain amount of energy needs to be added to $2Fe_2O_3$, energy usually derived from carbon sources such as coal. But various forms of natural oxidation/reduction occur all around us. For instance, combustion is a redox reaction that occurs so rapidly we experience it as heat and light. Corrosion is a redox reaction that occurs so slowly we perceive it as rust and moisture.

But redox reactions are not themselves the basis of the distinction between biology and geology. Rather, the distinction between biological redox and geological redox is that the former is considered to be relatively self-organized, self-oriented, and self-contained whereas geological redox reactions are not. Biological redox depends on, as Karen Barad has argued in other contexts, conceiving some existences as capable of performative boot-strapping—a molecularly based self-oriented sovereignty.[21] This performative power is situated in a cell's metabolic function.[22] And metabolism is the full range of chemical and mechanical processes that all organisms (all life) use to grow, reproduce, and maintain their integrity. It consists of all the biochemical processes that emerge from and are directed toward creating and sustaining a certain kind of intentional substance—that is, a substance that is goal-directed at every and all levels and whose final end, or goal, is to sustain and reproduce a version of itself. And it is this imaginary of sovereign metabolic performativity that separates biological redox from geological redox.

The concept of metabolic function, in other words, allows us to consider each and every part of the living being as having its own very narrow and contained goals and yet still be part of a living being's broader purpose. The goal of an enzyme catalyst, for instance, is to transfer electrons and to be able to continue to transfer electrons. That the enzyme has an intention beyond this (contributing to the larger goal of producing and reproducing the organism) isn't necessary for it to function as an efficient causal agent. Most consider the final goal of each and every part of an organism to be whatever higher independent life form it supports (such as the individual body or the species being). But defining life as a self-directed activity works

best when biochemical processes are viewed from the standpoint of the organism's so-called final membrane. The final membrane of the animal cell is usually considered to be its lipid surround, a membrane that links and separates it from its environment. The final membrane of an individual human is usually thought of and experienced as skin. The final membrane of the human species is situated in its reproductive encounters and regulations. It is only from the point of view of these different kinds of skins that we can claim a larger, or final, cause—the production and reproduction of this particular kind of skinned existent. This epidermal point of view provides us with the grounds for thinking and experiencing the facts and ethics of birth and death and for evaluating a well-lived life and good death. This is exemplified in the fact that cells, the smallest units of life, are said to experience "birth" by metabolizing nutrients outside themselves and to suffer death. And lest one think "suffer" is a strong word to use, it might help to know that biologists give cellular death an ethical inflection. Cells are said to have a proper and improper death—in a good death, a tidy death, the cell self-destructs; in an untidy death it swells, leaks, explodes—what biologists call respectively apoptosis as a programmed form of cell death and necrosis as an unordered and unintended form of cell death. Our vocabulary for changes in rock and mineral formations such as Two Women Sitting Down and Old Man Rock have a very different event imaginary, one of accretion, of the residual, of schistosity, of seismic gaps—external forces that cause a change rather than self-activated or self-oriented goals and intentions that can fail to work.

But these days the more we press on the skin of life the more unstable it feels for maintaining the concept of Life as distinct from Nonlife, let alone the existence of any particular life form. Take, for example, the biochemical reactions that have allowed biologists to understand the distinctions between and interdependencies of metabolic processes across the categories of life, namely, the two major forms of biological redox: plant-based photosynthesis and animal respiration. Plant-based photosynthesis uses solar (light) energy to convert carbon dioxide, its source of carbon, and water into glucose ($C_6H_{12}O_6$), its source of internal energy. The chemical equation is $6CO_2 + 6H_2O + \text{light energy} \rightarrow C_6H_{12}O_6 + 6O_2$. The glucose is stored in plants and, as enzymes remove hydrogen from the glucose, is used as energy for growth and reproduction. Animal-based life uses organic compounds such as plants as its source of carbon and uses redox reactions as its

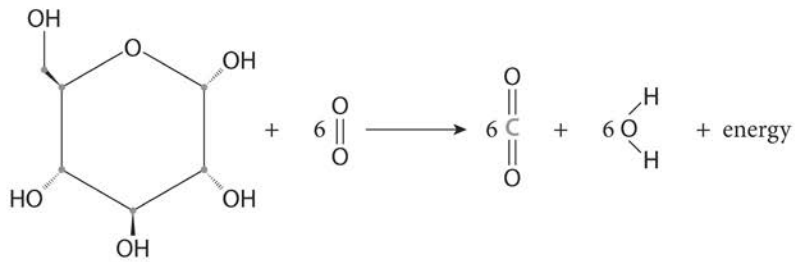

FIGURE 2.2 · Coca-Cola chemistry.

energy source. Its cells consume organic compounds containing stored and processed carbon, $C_6H_{12}O_6 + 6O_2$, and then expel $6CO_2 + 6H_2O$ through a series of redox reactions based on respiration. An online ChemWiki (produced by the University of California, Davis) provides a simple example of the role redox plays in metabolic function. When we guzzle our soft drinks or sip them slowly, the body converts the original form of sugar, disaccharide sucrose, into glucose. Enzyme-catalyzing reactions then transfer the electrons from glucose to molecular oxygen, oxidizing the carbon molecule to produce carbon dioxide (our exhalation) and reducing the O_2 to H_2O, or the moisture in breath that we exhale.[23] Respiration is, indeed, one of the fundamental qualities of living things—"respiration" in humans is a mode of bringing oxygen into the system and expelling carbon dioxide, a form of taking in and getting rid of that indicates a self-oriented aboutness if not consciousness.

But this same can of Coca-Cola is, under the pressure of Anthropogenic climatic consciousness, becoming symptomatic and diagnostic of a broader assemblage of existents that is irrevocably altering the integrity of Life and of the way we produce a good life. That is, when I wrote above, "the more we press on the skin of life the more unstable it feels for maintaining the concept of life, let alone the existence of any particular life form," I should have first asked, "What is causing the natural sciences to place ever more pressure on the skin of life, shredding this fragile membrane in the process?" The answer takes us to the increasingly unavoidable entanglements of Life and Nonlife in contemporary capitalism. Let's stay with our can of Coca-Cola. The political left and right have long struggled to model

and transform the manner in which industrial capital extracts value from human labor. But vast networks of Life *and* Nonlife are created and mobilized for the creation of the cans of Cokes we guzzle daily. Plants make the sugars for some Coca-Cola products, but genetically modified bacteria make the sweetness of others. Aspartame, the primary "artificial sweetener" in sodas, is a biological product—it is made through the accumulation and processing of amino acids produced from genetically modified bacteria. Most studies examine the effect of aspartame on the health of humans or other life forms as it accumulates in the environment. But Two Women Sitting Down might assess its effects from a different point of view: the amount of coal, steel, and copper needed to compose the global factories that compose the can and produce the aspartame. And these globally distributed factories gobble up aquifers, leaving local communities starved for water as they create waste products that are returned, one way or another, into the environment.[24]

It is this larger breathing, drinking, and perspiring public that is left out of the online chemistry lesson but is now an increasingly unavoidable factor in global life as every aspect of industrial based production and consumption is related back to the planetary carbon cycle. Eating, drinking, breathing: these activities provide virtual glimpses of the Viruses operating within the technical divisions of Life and Nonlife. The same techniques that allow the natural sciences to distinguish between categories of life also demonstrate not merely the interdependent entanglements of Life and Nonlife but the irrelevance of their separation. Animals and minerals, plants and animals, and photoautotrophs and chemoheterotrophs are extimates—each is external to the other only if the scale of our perception is confined to the skin, to a set of epidermal enclosures. But human lungs are constant reminders that this separation is imaginary. Where is the human body if it is viewed from with the lung? The larger, massive biotic assemblage the lungs know intimately—including green plants, photosynthetic bacteria, nonsulfur purple bacteria, hydrogen, sulfur and iron bacteria, animals, and microbes—is now what is thought to produce the metabolism of the planetary carbon cycle, which may be on the verge of a massive reorganization due to human action. Indeed, the shift of scale entailed in the study of Anthropogenic climate change is what allows biologists to link the smallest unit of life and death to planetary life and death (the planetary carbon cycle). And this shift in scale allows the thought of extinction to scale up

from the logic of species (species extinction) to a planetary logic (planetary extinction). What wonder that we are hearing a potential shift in our political discourses from Logos to *πνεῦμα τοῦ στόματος* and from the demand "listen to me" to the statement, "I can't breathe."[25]

Given the Möbius nature of geochemistry and biochemistry, it should come as no surprise that some in the natural sciences are attempting to perforate the clean separation of biochemistry and geochemistry, biology and geology, through the concepts of biogeochemistry and geomorphology and physics. Biochemists and geochemists long ago had to confront the fact that although to be "life" a living thing must be structurally and functionally compartmentalized from its environment, nothing can remain alive if it is hermetically sealed off from its environment. Thus rather than focusing on the difference between Life and Nonlife, many within the natural sciences are rethinking "the link between the geochemistry of Earth and the biochemistry of life."[26] To be sure, some geologists have long thought that although rocks cannot exactly die and definitely cannot be murdered, they do come into existence. Indeed, their origins are the basis of rock classification. Igneous rocks are made up of a small range of crystalline minerals formed from the molten interior of the planet. Most rocks, however, are sedimentary: they are composed as water moves around composite pieces of eroded igneous material, carbonated animals and plant material, and siliceous bits of marine microfauna, and these composites are slowly cemented together by gravity. Others have concentrated on far stranger metabolic and symbiotic relationships between geological and biological substances. Many bacteria do just fine in environments deprived of oxygen because they breathe rocks (*geos*) rather than oxygen.[27] And bacteria may well be the origin of certain rock formations and minerals now essential and potentially toxic to other forms of life. For instance, manganese, the material OM Holding was mining near Two Women Sitting Down, is a sedimentary rock found in purer or more contaminated forms but typically mixed with other rocks, pre-rocks, and rock debris. Some geochemists believe it is the by-product of a specific living organism, namely the bacteria *Roseobacter* sp. Azwk-3b.[28] But if this bacteria (a form of life) is responsible for the formation of certain forms of manganese (a form of nonlife), manganese is in turn an "essential toxic element" for organic life; it is essential to plants for photosynthesis and to all organisms that process elemental oxygen such as humans, *and* it is toxic to both groups if absorbed in large concentrations.

But what has come together can be taken apart if enough resources are in play. Rocks and minerals formed by eons of compression can be transformed into other forms. The entire point of mining Two Women Sitting Down, after all, was to transform her from one form of existence into another so that wealth could be created via commodity trade. The rich deposits of the manganese blood of Two Women Sitting Down is turned into purer forms of manganese, which is then united with other ores to form steel through the intervention of coal, an organic sedimentary rock formed mainly by plant debris. When manganese pyrolusite (MnO_2)—found in large abundance in Australia—and rhodochrosite ($MnCO_3$) are processed into manganal steel through coal fire burning, they then release dust and fumes that can more easily be absorbed into life-forms at high levels and toxically disrupt molecular and cellular processes. The *Guardian*, for instance, reported in 2009 that thirteen hundred Chinese children suffered serious lead poisoning through exposure to the fumes and dust of a nearby manganese-smelting factory, ores which might well have originated in Australia.[29] And here we see, once again, that the perspective and scale from which we examine the relationship between Life and Nonlife creates *and* undermines the distinctions between Life and Nonlife. Life and Nonlife breathe in and breathe out. And if Nonlife spawned Life, a current mode of Life may be returning the favor.

These new directions in the natural sciences have not, however, completely fractured the drama of Life and the abjection of Nonlife. Indeed the very sciences that seem to be deconstructing the divisions of Life and Nonlife most dramatically—say, climate science—also rely on a certain drama and mystery of Life. As Earth (Gaia) becomes, in its totality, a biosphere, the question of how this vibrant living planet emerge out of the vast expanse of Nonlife is intensified. How did something emerge out of the nothing? The one out of zero? Gaia stripped of life is a tragedy, the final dramatic conclusion of the drama of life and death on Earth. In other words, the scaling of extinction from a species level to a planetary level depends on the dramatization of the difference between Life and Nonlife. Indeed, extinction as a form of mass death is something that only Life can experience. Only Life has a self-oriented intention and potentiality, and thus only Life can fail, die, and cease to be. Only Life has the potential to be or make something that is not yet—a more developed form of itself, a reproduction

of itself, an absence of itself. And this seems as self-evident as gravity. Leave aside the perspective that Life's dynamism is a dull repetition—the endless cycle of birth and death. Focus instead on the fact that Nonlife is affect without intention and is affected without the intentional agency to affect. Focus on Nonlife as inert, no matter the force with which it hurtles itself through space or down a hill. If we focus on these opposing qualities of Life and Nonlife, then we can linger over the miracle of bootstrapping metabolism. We can dramatize how this amazing something (Life) come from nothing (Nonlife). What conditions of a prebiotic broth led to the first cellular process? What are the geochemical conditions in which the break from Nonlife to Life emerged, absent a God who declared that it be so? If we focus on the difference between Life and Nonlife we won't be tempted to wonder what if the miracle was not Life, the emergence of a thing with new forms and agencies of potentiality, but Nonlife, a form of existence that had the potential not merely to be denuded of life but to produce what it is not, namely Life? Nonlife has the power self-organize or not, to become Life or not.[30] In this case, a zero-degree form of intention is the source of all intention. The inert is the truth of life, not its horror.

Round and round we go. The natural sciences are now running in an ever faster loop around an ever deeper understanding of how Nonlife extruded Life and Life absorbs and extrudes Nonlife. When biological life brings too much or a kind of nonlife inside itself, it risks its structural and functional form and integrity (i.e., manganese poisoning). And when biological life extrudes itself into its environment it risks radically altering the environment from which it must ingest what sustains it. But this is also true of nonbiological entities. Rocks extrude into their environment, changing wind patterns and leaving soil deposits, and they ingest the living that changes their geochemical imprint. A textbook in "biogeochemistry," for instance, notes the dynamic relationship between biochemistry and geochemistry, arguing that "the influence of life" on most surface features of the earth make the study of biochemistry necessary to any study of geochemistry and vice versa. "Indeed, many of the Earth's characteristics are only hospitable to life today because of the current and abundance of life on this planet . . . liquid water, climate, and a nitrogen-rich atmosphere, are at least partially due to the presence of life."[31] Once existent, life makes the conditions in which it can flourish. But note how, once again, the distinction between

Life and Nonlife reemerges even as we are cautioned to understand their symbiotic relationship. Life shapes its Nonlife environment but it is absolutely distinguishable from it.

Swallow, digest, breathe out, then cut away the outside coming in and the inside going out. These excisions are becoming more difficult as the carbon cycle, where forms of existence produce themselves as atmosphere, is interrupted by the consumption of carbon to produce and expand one form of existence: late liberalism. But the gyrations sweeping Life and Nonlife have not yet, it seems, deeply shaken the hold of late liberal geontopower. The court considering the desecration of Two Women Sitting Down did not consider what the sacred site desired or intended as a living or vital matter. They did not seem to care whether it wished to stay in place, to commit suicide as a political statement, or to suffer a transformation so that settler Australians could accumulate more capital from Indigenous lands. They simply assumed that Nonlife has no capacity to intend, desire, or seek. They simply assumed that the Indigenous men and women had a cultural belief about things rather than a probing analytics of their existence.

Critical Life

The rhetoric surrounding Anthropogenic climate change and capital markets suggests that the work to bring the natural and critical sciences into a mutually intelligible framework will be long and hard. But will it? Has a common consensus already been quietly reached beyond, or under, or stretched across their different discourses and methods? Let's take, as example, a domain within political theory that would appear to oppose starkly the epistemological assumptions and methodological approaches of the natural sciences of biochemistry and geochemistry and thus be of assistance to Two Women Sitting Down and Old Man Rock, namely, critical theories of potentiality and vitalism. If there is a scarred homology between the biological concepts of birth, growth, and reproduction, and death and the critical philosophical concepts of event, *conatus/affectus*, and finitude, it is in the concepts of potentiality and vitalism that we might begin to see them.

A common ancient name and text provides a useful place to begin thinking about the scarred homology between contemporary natural life and critical political life; the name is Aristotle and the text is "On the Soul."[32]

In "On the Soul," Aristotle argues that both biological *and* nonbiological substances are self-reflexive forms—things endowed with the sovereign quality of *thishereness*. But whereas all things are sovereign, not all sovereign things are alike. Within the sovereign order of substance lies a crucial division between those things that are saturated with actuality when they arrive in existence (Nonlife, inanimate things) and those things defined by an inner dynamic potentiality at birth (Life, animated things). The source of the dynamic potentiality of life, and thus the key to the division between sovereign substances, is the soul. The legal discussion of Two Women Sitting Down makes Aristotle's distinction clear. For him, both Two Women Sitting Down and any two human women looking at it are things. But only the "actual" women have souls; Two Women Sitting Down does not. "Actual" women are defined by the dynamic potentiality that courses through them. Nothing courses through Two Women Sitting Down that it itself mobilizes or actualizes. For Aristotle, Two Women Sitting Down is, and will always be, a soulless saturated actuality. To be sure, he notes that most souled things do little more with their potentiality than flick it on and off. For example, humans have the capacity to be thinking creatures, but they activate that capacity only intermittently. As a result, Aristotle must introduce a division within the domain of dynamic potentiality, that between the actual (energia, ενέργεια) and actualization (ἐντελέχεια). (An aside: you might wonder why fully actualized entities such as rocks, metal, gas, and heroin aren't considered the highest form in Aristotle's metaphysical hierarchy. After all, they beat souled things to the goal line by achieving full and complete saturated actualization while we struggle on. One answer is the drama of the struggle is more important than the actual end of the struggle.) For Aristotle it is a sad but true fact that most humans spend their lives laboring to be actual rather than ever achieving true and complete actualization. But these gaps provide him with an ethical ruler with which he can sort and measure a hierarchy of beings. The truth of human existence can be measured by how much people have actualized their potential from the point of view of their end. If Aristotle were called to testify at the trial of OM Manganese, he would probably state that the rock has no such measure. Whereas rocks are sovereign *thisherethings* they are not living things with inner gaps and possibilities, the condition and measure of ethical action. They are saturated nonethical actuality. As a consequence they can kill us accidentally. We can destroy their form or reform them for our own

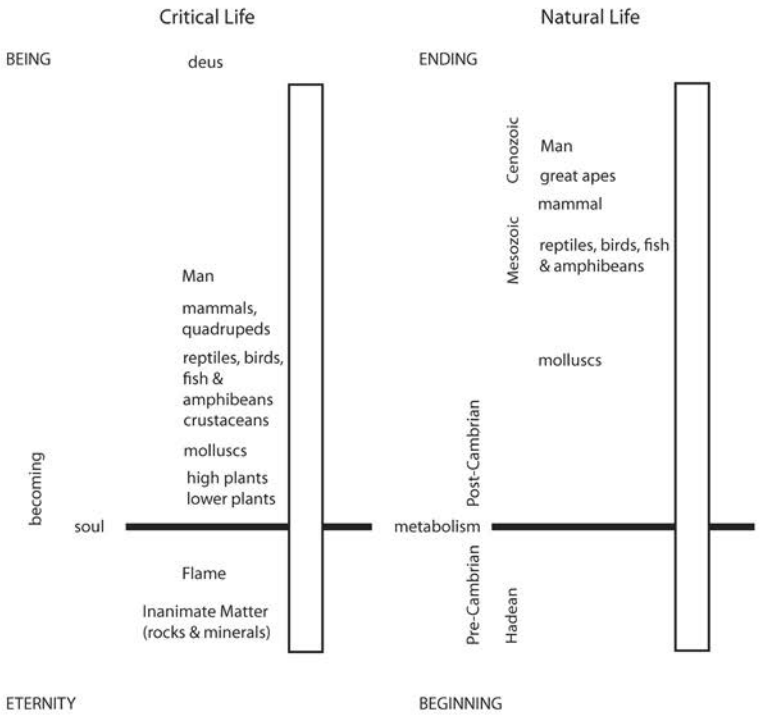

FIGURE 2.3 · Natural life and critical life.

purposes, say, in order to accumulate capital through the mining of Indigenous lands. But they do not die nor can they purposefully murder us. And we cannot murder them except by metaphorical extension—because we cannot take away a soul they never had.

A contemporary biochemist might agree with Aristotle that Two Women Sitting Down exists as a sovereign *thishereness*, as do the miners that carved into her sides, until some more powerful force dislodges or decomposes them. But this same biochemist would probably disagree with how Aristotle distinguished living and nonliving things, namely, by the presence or absence of a soul. The philosopher Michael Frede has a reassuring answer to this biochemical skepticism. Frede sees the disagreement between Aristotelian and biological categories as not so much about a chasm of causal explanation separating modern biological science and Aristotelian metaphysics, but simply a matter of terminology. For Frede, the soul is the concept-thing that simply and "essentially distinguishes a living body from an inanimate body."[33] The soul, in other words, is the ancient understanding of carbon-based metabolism insofar as carbon-based metabolism is what provides the inner vitality (potentiality) that defines Life as absolutely separate from Nonlife.[34] Certainly Frede's is not the only perspective on the relationship between Aristotle and contemporary biology. And the purpose of my evocation of Aristotle is not intended to draw an unbroken line of thought running from the history of metaphysics to the contemporary natural sciences and critical humanities. Rather this brief reminder of the Aristotelian metaphysics is meant to provide a background to a set of problematics that continues to haunt critical theory when its focus turns to the governance of Life and Nonlife (exemplified in the case of Two Women Sitting Down and Old Man Rock). In other words, these problematics are meant to point to the scarred homology between natural life and critical political life, restricting the space for new modes of practical and analytical (analysis as a practice of) existence.

So let me start with a simple question. Does the concept of potentiality consign Two Women Sitting Down and Old Man Rock to a form of existence that can only be used or abused by humans in a battle over who will survive and thrive and who will not—about which *human lives* matter? This is a crucial question that the bulk of this book examines. But to untangle the answer to this question, wrapped as it is around the tactics of geontopower, I need to begin with the status of Two Women Sitting Down and Old Man Rock in two regions of contemporary theory that seem most appropriate to lend them support: a debate among theorists of potentiality working within the broad field of biopower on the one hand, and the emergence of biophilosophy and new vitalism on the other hand. In relation to the first field, the obvious contemporary reference is Giorgio Agamben, who has, over his long career, carefully mined the works of Aristotle and Heidegger in order to rethink the foundations and dynamics of Foucauldian biopolitics.[35] Perhaps most well-known is Agamben's recuperation of the Greek distinction between *zoe* and *bios* in order to demonstrate how contemporary biopower works.[36] Instead of beginning with the absent term *geos* in his critical political theory, let's begin with a distinction within

bios that separates human potentiality from all other forms of potentiality. Agamben takes Aristotle's distinction between those sovereign things saturated with actuality and those sovereign things endowed with an inner dynamic potentiality, and he creates another. As opposed to other forms of life, humans have two forms of potentiality. They possess the *generic potentiality* that Aristotle identified, a form of potentiality that is exhausted when it is actualized. And they possess *existing potentiality*, namely, the capacity *not* to do what one actually has the capacity to do and *not* to be what one already actually is. To be sure, if living things, in Aristotle's work, are ethically evaluated at their death on the basis of how much of their potential they had actualized, Heidegger grounded the same judgment not on the fact of death as such but the concept of finitude as initiating an active stance in life—the decision to become authentic. Dasein transforms an existing negative potentiality ("humans, like all living things, will die") by actively becoming a subject that thinks from its point of view ("what will I have been"; "what stance will I take in the unfolding of what I am and am becoming").[37] This negative form of potentiality absolutely differentiates human life from all other forms of life even as life is defined as that which has the potential to be or not to be what it is potentially. Finitude *skins* Dasein and allows it to find and differentiate itself from the other forms of Life and provides it with the political and ethical dynamism of the coming community. Any other animal, or form of life, that wishes to walk into Heidegger or Agamben's Open must conform to this form of doubled potentiality.[38] It is very unclear how Two Women Sitting Down would do so. The Rat and the Bandicoot seem not merely to have failed to finish the race—they were never allowed to get to the starting line.[39] In the presence of Two Women Sitting Down, ontology's claim to provide a general account of beings reveals a biological bias.

Agamben is hardly our only source for critical approaches to potentiality and politics and their political and ethical capture of Two Women Sitting Down and Old Man Rock. Take, for example, Roberto Esposito's critique of Agamben's approach. As his student, Timothy Campbell, puts it, Esposito provides a way of "thinking life beyond merely zoe and bios."[40] The life one finds if one moves beyond Agamben's negative biopolitics is a pure positive pulsing interval between what is and what is not and beyond what is to what could be. For instance, in the chapter "Biopolitics and Potentiality," Esposito reminds his reader that, for Nietzsche, "the human

species is never given once and for all time, but is susceptible in good and evil, to being molded in forms."[41] Humans are always a "form of life" that has at its origins only an interval between itself and its origins. Thus, the human is not in itself; its body is always also against itself and others. As a consequence, one does not preserve life through ridding oneself of conflict. Nor does one merely survive by preserving and expanding one's form. The will to power seeks an expansion but this power is not seeking to expand a particular form but the interval between this particular form and its past and coming forms. "Identifying life with its own overcoming means that it is no longer 'in-itself'—it is always projecting beyond itself."[42] "Life doesn't fall in an abyss; rather, it is the abyss in which life itself risks falling. Not in a given moment, but already at the origin, from the moment that the abyss is not other than the interval of difference that withdraws from every identifying consistency." Thus at the heart of man, in his essence, is the otherwise, the beyond. For Esposito, humans are not "a being as such, but a becoming that carries together within itself the traces of a different past and the prefiguration of a new future."[43] The power (*potenza*) of potentiality is the positivity within biopower, within Life.

Life. Humans. How might these contemporary theories of biopower and potentiality might help Two Women Sitting Down? Can Nonlife find a narrow crevice into which its massive bulk and granular nature could infiltrate critical Life as certainly as it has already infiltrated the lungs, water, and air of the humans performing the critique? Thinking about Life as something that is not in-itself but always beyond-itself seems to take us back to the unraveling of the significance of the difference between Life and Nonlife in some subdisciplines of the natural sciences. Once again the lung seems the most appropriate organ for the Anthropogenic climate change era because it points to the openness of all beings to their surroundings. Several strands of contemporary critical theory might agree. Perhaps the best-known, powerful, and insightful works in this domain are those of Eugene Thacker and Jane Bennett. Thacker, for instance, has pushed sharply and concisely against the epidermal imaginary, and its immunological implications, of "the body politic."[44] For Thacker the nested ordering of parts and wholes of bodies creates the conditions for the medical-political immunological response—the creation of an outside of the body and the defensive attack of any outside part or whole seen as a threat to its functionality. In order to counter this aggressive foundation of the body politic, Thacker has outlined

a new biophilosophy. He begins with a clearing gesture, claiming that Western ontologies can be sorted by how they account for the self-organization of being—a self-organization that has "an inward-turning and an outward-turning aspect." He observes, in other words, something similar to what I am calling the biontological nature of Western ontology in order to found a new biontology.

> The inward-turning divides, orders, and interrelates species and types; the outward-turning manages boundaries and positions the living against the nonliving, making possible an instrumentality, a standing-reserve. The inward-turning aspect is metabolic, in that it processes, filters, and differentiates itself internally; it is the breakdown and production of biomolecules, the organization of the organs, the genesis of species and races. The outward-turning aspect is immunologic, for it manages boundaries, exchanges, passages; it is the self-nonself distinction, the organism exchanging with its environment, sensing its *milieu*, the individual body living in proximity to other bodies.

Thacker argues that if we wish to interrupt the constant immunological response of the body politics and substitute for it new vital forms of existence, biophilosophy must abandon "the concept of 'life itself' that is forever caught between the poles of nature and culture, biology and technology, human and machine" and develop "concepts that always cut across and that form networks."[45] When the focus of the ontology of self-organized being is shifted from the search for essences to the desire for events, from sharp epidermal boundaries to fuzzy and open borders, and from simple local bodies to complex global patterns, the following emerge as exemplary ontological objects: weather systems, carbon cycles, computer routing systems. Timothy Morton's concept of hyper-objects seems relevant here.[46]

This movement away from epidermally enclosed, self-oriented and -organized entities and toward the event horizons of assemblages likewise characterizes Bennett's model of a post-biopolitics grounded in the concepts of actants, affects, and events rather than in the processes of Life and their difference from Nonlife. As Bennett notes, actants are defined by their ability to intrude into the course of other actants—the classic bump in the road; the biochemical trigger that alters the typical expression of a sequence of DNA; the thought that comes when the lights are switched on—

even as the extimate relation between agencies, actants, and materialities makes differentiating one actant from another, this one from that one, a fool's errand. As Bennett notes, and was noted above, even within the natural sciences the closed, self-organized body is at best a working fiction. Our "flesh is populated and constituted by different swarms of foreigners . . . the bacteria in the human microbiome collectively possess at least 100 times as many genes as the mere 20,000 or so in the human genome. . . . We are, rather, *an array of bodies,* many different kinds of them in a nested set of microbiomes," but not merely biological bodies.[47] And what support our bodies are other equally distributed agencies such as "the wiring and transformers and fingers that regulate the computer regulations." Wherever we look we find "a swarm of vitalities" in play, from the wiring of touchpads and cooling systems, to the hum of nuclear power stations and power grids, to the shimmering fetid heat of peat bogs and waste dumps, and beyond.[48]

> The task becomes to identify the contours of the swarm, and the kind of relations that obtain between its bits . . . this understanding of agency does not deny the existence of that thrust called intentionality, but it does see it as less definitive of outcomes. It loosens the connections between efficacy and the moral subject, bringing efficacy closer to the idea of the power to make a difference that calls for a response.[49]

Central to both Thacker's and Bennett's works is a deep and creative engagement with Gilles Deleuze's idea of the assemblage and event. This gravitation to Deleuze and his longtime partner, Félix Guattari, is hardly surprising. Not only does their approach demand that we see the potential for actualization, deactualization, and reactualization in any arrangement of existence, they do so through a language that draws on geological, ecological, and geometrical metaphors more than biological ones, and thus appear to provide critical theory an exit from the prisonhouse of biontology. Moreover, by grounding ontology in univocal multiplicity, Deleuze seems to liberate critical theory from the drama of the zero and the one and from the question of how Being emerged from Nothingness. And yet what of this fixation with the event? And how discrete a phenomenon are we making the assemblage? As is well known, Deleuze and Guattari proposed three modes of thought in which eventfulness occurred: *philosophy*, which produces concepts, or *multiplicities*, that do *not* interpret the world of

essences and appearances but connect existing intensities on the plane of immanence into new actualities; *art*, which produces affective intensifications of the concept, creating, as Deleuze and Guattari put it in *What Is Philosophy?* "a bloc of sensation, that is to say, a compound of percepts and affects"; and *science*, which produces functional matrixes that fix and refashion our frame of reference.[50] For instance, in *The Logic of Sense*, the event is a differential geometrical concept that demands we cease opposing the singular to the universal and start understanding that the opposite of the singular is the ordinary. Take the square. The lines of the square are composed of multiple points, all of which can be considered ordinary with respect to each other. The event is what takes place at the joints, the singularity of the transition, the differential, between the directionality of one line and the directionality of the other. Space is such an event even as events are understood geographically. The Battle of Waterloo, for instance, is a multiplicity of exchanges and intensities between forms of embodiment without self-evident borders. The concept does not interpret or represent what is already there but configures it—it is *rhetorical* in the sense of a nexus between conceptual and material configuration. And by the time we get to *A Thousand Plateaus*, sense itself is made a minor actor on the plane of geological experimentation. The artist tries out an intensification of affect. The scientist tests a matrix. The philosophy invests a concept. But across these modes of thought lie a radical, nonmilitant, infelicitous desire; a pulse of constant becoming; a nonintentional intensity that explores a multitude of modes, attributes, and connections and produces new territorializations.

On the one hand, these ecological, geological, and geometrical models of the virtual, potentiality, and eventfulness seem to open new avenues beyond the Carbon Imaginary, the scarred region is ripped open and sutured to some pretty inappropriate parts. But what I want to press on here by way of transition to the next chapter, a pressure that I hope builds as the chapters progress, is a strange penumbral homology that begins to form when contemporary biophilosophy and vibrant matter turn to the event, when they embrace the *conatus* and *affectus* of assemblages, and when they engage Deleuze's infamous infatuation with monstrosity.[51] Thatcher and Bennett agree with Deleuze that the point isn't to find the essence of a (or "the") thing, but to probe the possible existence of another thing.[52] And in this way they agree with a vital question of immanent critique: not merely what activates an event but, of all the possible events that may occur, which event

will decisively disrupt the current organization of the actual. From this perspective, truth is a particular kind of event, an event that disturbs the current territorization of existents, say the territorializing of Two Women Sitting Down according to the regulatory concepts of Nonlife (*geos*) and Life (*bios* and *zoe*). Truth is measured, in other words, not by propositional consistency or logic, but by its link to a monstrous interruption, a seismic shift. Deleuze wagered that the more monstrous the emergent entity, the more event-full it is, and thus the more "true" (the more it maximally transverses the given reality). A Deleuzean political slogan might be, "Free yourself from the domination of the apparatus of meaning—the signifier and signified, the logos and the phonos, and the body-with-organs. Turn the sense-meaning into event-making." For Foucault and Michel Serres the rallying call might be "Exercise your noise."[53] But each of these theorists also acknowledged to be an event is a dangerous proposition. The more event-full, the more unlikely the event will survive its "birth." If the transversality of freedom as potential existence is a practice of becoming otherwise, then the freer the becoming the higher the phenomenological risk to the emergent being. Put another way, the purer the event, the more existential the risk. Certainly for Deleuze the pure event was unrealizable but, perhaps more importantly and tellingly, even impure events were usually not survivable.[54]

The question that will haunt this book—and continue to haunt theory and politics in the coming decades—is how our fixation on the politics of the event and the vibrancy of the assemblage is reiterating rather than challenging the discourse and strategy of geontopower. How far are we distancing ourselves from the scarred space between the biological concepts of birth, growth/reproduction, and death, and the critical philosophical concepts of event, *conatus/affectus*, and finitude? Do we desire the virtual and ceaseless becoming because they allow us to escape what is worse than death and finitude, namely, absolute inertness? And insofar as we do, are we simultaneously extending the qualities and dynamics of one form that we believe existence takes (Life) onto the qualities and dynamics of all forms of existence? When we do this are we denying the ability of other forms (the not-Life not-Nonlife) to undefine, redefine, and define us? The Animist says, Life no longer needs to face its terror—the lifeless, the inert, and the void of being—because we can simply refuse to acknowledge any other way of existing than our own. We can simply extend those attributes that some regions of human existence define as the most precious qualities of life (birth,

becoming, actualization) to all forms of existence, to existence as such. We can saturate Being with familiar and reassuring qualities. We do not have to face a more arduous task of the sort Luce Irigrary phrased as moving from being the other of the same to becoming (being) the other of the other.[55]

And thus with Two Women Sitting Down and those who support them and others like them: The event of becoming might have been the claim that Two Women Sitting Down did not die, was not murdered, and was not desecrated. What she did was turn her back on the world as it is being organized by becoming something that will potentially extinguish that world and the way we exist in it. This claim was not made in the court of law. Moreover, if this claim had been made it is unlikely that the court would have legally metabolized it. But as the foundations of geontopower continue to crumble such claims may come to be made and may gain hold.

TITLE: IS THE ATHROPOCENE RACIAL?
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Racial Capitalocene

Is the Anthropocene racial?

Downtown Houston, seen from Eleanor Tinsley Park, August 27. via YouTube.

To celebrate the publication of *Futures of Black Radicalism*, edited by Gaye Theresa Johnson and Alex Lubin, we have 40% off our Race and Ethnicity reading list until Sunday, September 3 at 11:59 PST.

Futures of Black Radicalism, *edited by Gaye Theresa Johnson and Alex Lubin, brings together 17 essays on the development of the black radical tradition, all informed by both the groundbreaking work of Cedric J. Robinson and the contemporary flourishing of black political movements.*

Included in the collection is the essay by Françoise Vergès reprinted below. Vergès examines how most theories of the anthropocene have failed to reckon with the ways in which racism and imperialism structure the uneven distribution of climate catastrophe. These reflections take on additional urgency in the aftermath of Hurricane Harvey, whose ongoing effects can already be seen to be shaped by race and class — and the extreme flooding that has swept through South Asia this summer.

In the debates on the "Anthropocene," global warming, and climate change, voices of the South and of minorities — the prime victims of these phenomena's consequences — have developed an analysis that brings together race, capitalism, imperialism, and gender. This analysis rests on past struggles, such as the organization of farmworkers led by Cesar Chavez in California in the early 1960s for workplace rights, including protection from toxic pesticides, and of African American students in 1967 to oppose a city dump and in 1979 to oppose a landfill in Houston. Environmental racism became a site of struggle. The publication in 1987 of *Toxic Waste and Race in the United States*, a report by the Commission for Racial Justice of the United Church of Christ, was a turning point. **1** It showed that race was the single most important factor in determining where toxic waste facilities were sited in the United States and that the siting of these facilities in communities of color was the intentional result of local, state, and federal land-use policies. In the 1980s, the Reagan administration's practice of cutting the budgets of federal environmental agencies had aggravated racist decisions. The report demonstrated that "three out of every five Black and Hispanic Americans lived in communities with uncontrolled toxic waste sites." **2** Twenty years later, the United Church of Christ published another report confirming that "people of color make up the majority of those living in host neighborhoods within 3 km of the nation's hazardous waste facilities. Racial and ethnic disparities are prevalent throughout the country." **3**

Between the two reports a global movement for environmental justice had emerged. In October 1991, the Delegates to the First National People of Color Environmental Leadership Summit drafted and adopted the "Principles of Environmental Justice," which became a defining document for the growing grassroots movement for environmental justice. The preamble read:

> *WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and*

> *communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the genocide of our peoples.* **4**

The authors of the 2007 report warned that "for many industries, it is a 'race to the bottom,' where land, labor and lives are cheap." **5** Similar studies in India, South Asia, South America, Africa, and Europe demonstrated a global pattern of environmental racism and the ways in which states and multinationals have been avoiding environmental justice.

In this chapter, I try to answer the following question: Though minorities and peoples of the South have shown that they are the victims of racialized environmental politics — toxic waste, polluted water and rivers, pesticides, polluted food — have studies on the emergence of the "Anthropocene" addressed the role of race in its making? In other words, is the Anthropocene racial? Scholars have studied race as a central element of destructive environmental policies, but what connection can be made between the Western conception of nature as "cheap" and the global organization of a "cheap," racialized, disposable workforce, given the conception of nature as constant capital and the fact that "the organizers of the capitalist world system appropriated Black labor power as *constant* capital"? **6** What methodology is needed to write a history of the environment that includes slavery, colonialism, imperialism and racial capitalism, from the standpoint of those who were made into "cheap" objects of commerce, their bodies as objects renewable through wars, capture, and enslavement, fabricated as disposable people, whose lives do not matter?

What does this have to do with Cedric Robinson? In *Black Marxism*, Robinson writes that "for the realization of theory we require new history." He adds, "Black radical theory was not made by choice but dictated by historical inheritance." **7** In the spirit of Robinson's advice, I will try in this chapter to suggest ways of writing a history of environment that takes into account the history of racial capitalism. My interest in the history of racialized environmental politics is partly biographical: I come from Réunion Island in the Indian Ocean, which became a French colony in the seventeenth century and is today a French department. Growing up in a communist, anticolonial, and feminist family, I learned early that the environment had been shaped by slavery and colonialism — a reading of space that gave meaning to where cities were built, where poor people lived, and how the large sugarcane fields, rivers, mountains, volcanos, and beaches had been inscribed in the colonial and postcolonial economy. I studied the combined work of scientists (first botanists, then biologists, oceanographers, and volcanologists), engineers, soldiers, and business executives (whether slave traders, slave owners, bankers, or multinational CEOs), which fabricated "nature" as excess that needed to be tamed and disciplined and, through the tourism industry, enjoyed. I observed how the Cold War and studied the nature of the "green revolution" continued to transform nature in the Indian Ocean and the alliance between the military, the engineering company, the multinational, and the scientist. More recently, understanding what is at stake in the negotiations about "climate change" means considering the place of these stakeholders in the context of a global counterrevolution — the erosion of rights, the politics of nonraciality beneath which, as David Theo Goldberg has argued, lurk more sinister shadows of the racial everyday and persistent institutional and structural racisms — and racial capitalism. Global warming and its consequences for the peoples of the South is a political question and must be understood outside of the limits of "climate change" and in the context of the inequalities produced by racial capital.

Anthropocene or Racial Capitalocene?

The term "Anthropocene" to describe the "human dominance of biological, chemical and geological processes on Earth" was first introduced in 2000 in an article jointly written by Paul Crutzen and Eugene Stoermer. They dated its emergence to the latter part of the eighteenth century, admitting that

> *alternative proposals can be made (some may even want to include the entire Holocene). However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data retrieved from glacial ice cores show the beginning of a growth in the atmospheric concentrations of several ''greenhouse gases,'' in particular CO_2 and CH_4. Such a starting date also coincides with James Watt's invention of the steam engine in 1784.* **8**

When and why the Anthropocene had occurred, its dangers, and what could stop them were widely debated in scientific journals and conferences. The narrative centered on the threat to human beings as an undifferentiated whole and was summarized thus: humanity would not survive if it did not slow down the emission of CO_2. Films and advertisements began to highlight the dangers of climate change, accentuating the loss of animal species and the idea of Earth as a common good. These media did not, however, take into account the asymmetry of power and instead marginalized what had been demonstrated in the 1980s: the role of racialized policies of public health and toxic waste disposal, weapons and pollution, land grabs and deforestation, the importance of the Cold War with its alliance between the chemical industry and the military, laws of commerce and monopolies. It was remarkable that these studies did not seek to locate points of intersection with emerging studies on imperialism and environment. **9** When Dipesh Chakrabarty wrote "The Climate of History: Four Theses" in 2009, the hope was that a dialogue was finally starting between scientists and postcolonial thinkers. **10** By focusing on the immediacy of climate change as a crisis, Chakrabarty framed the Anthropocene as a current transformation. This presentism ignored a deeper history and created the illusion of an organic and undifferentiated universal humanity. In his 2012 essay "Postcolonial Studies and the Challenge of Climate Change," Chakrabarty referred again to the abstract figure of "the human in the age of the Anthropocene," but, moving away from his 2009 conclusion somewhat, stated: "There is no corresponding 'humanity' that in its oneness can act as a political agent. A place thus remains for struggles around questions on intrahuman justice regarding the uneven impacts of climate change." **11** In answering his critics especially about "the rich always having lifeboats and therefore being able to buy their way out of all calamities including a Great Extinction," he asked, "Would not their survival also constitute a survival of the species (even if the survivors quickly differentiated themselves into, as seems to be the human wont, dominant and subordinate groups)?" **12** Chakrabarty defends a notion of the Anthropocene that, according to Aaron Vansintjan, infers a "blanket humanity, a blanket history, a blanket geological record" **13** which relies on "apolitical and colonialist assumptions" and "highlights the danger of using one framework (geology and climatology) to make universal claims about the world — it helps make only one world possible." **14**

But the Anthropocene is a catchy term that makes for an easy story.

> *Easy, because it does not challenge the naturalized inequalities, alienation, and violence inscribed in modernity's strategic relations of power and production. It is an easy story to tell because it does not ask us to think about these relations at all.* **15**

The notion "sweeps up within it the diverse, dynamic, and even contradictory discourse of peoples throughout the globe contending with catastrophic environmental change" and maintains the nature/society division dear to Western thought, masking the fact that relations between humans are themselves produced by nature. **16** The notion of the Anthropocene is "de-historicizing, universalizing, eternalizing, naturalizing a mode of production specific to a certain time and place," a strategy of ideological legitimation that blocks off any prospect of change. **17** Student of anthropology Elizabeth Reddy has coined the expression "charismatic mega-category" to describe the temporality and spatiality produced by the notion of the Anthropocene. **18** Sociologist Jason Moore has suggested the notion of a Capitalocene **19** which brings back capitalism "as a world-ecology, joining the accumulation of capital, the pursuit of power, and the co-production of nature in dialectical unity." **20** As Moore puts it, scholarship that posits

> *the exploitation of nature as an external relation to the exploitation of labor power does two things. First, it confuses matters, because nature and labor are not comparable entities. Nature is the field within which human activity unfolds, and is also the object, and precondition of, human activity. Second, it confuses matters yet further by establishing an arbitrary discontinuity between human environment-making — the exploitation of nature — and environment-making by other forms of life.* **21**

Moore dates the beginning of the Capitalocene to the sixteenth century, which also witnessed the "discovery of the New World" into which people were brought through the force of "blood and fire," the slave trade, the division of colonies among European powers, and the organization on a global scale of a mobile, racialized, gendered, and bonded workforce. Slavery and colonialism had a deep impact on the world-ecology. **22**

To the historian Joachim Radkau, "the chief problem of colonialism seems to have been not so much its immediate ecological consequences as its long-term impact, the full extent of which became apparent only centuries later, in the era of modern technology, and many times only after the colonial states had acquired their independence." **23** We must, in our narrative of the racial Capitalocene, integrate this long memory of colonialism's impact and the fact that destruction in the colonial era becomes visible in the postcolonial era. In other words, we must add to the United Church of Christ's 1987 study of racialized policies of the environment in the twentieth century a history of racial Capitalocene, with an analysis of capital, imperialism, gender, class, and race and a conception of nature and of being human that opposes the Western approach. In the 1991 "Principles of Environmental Justice," the first principle stated that "Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction." The principle posits a new understanding of what it is to be human and challenges the international dialogue on climate change that focused on a strategy of adaptation. Adaptation through technology or the development of green capitalism has indeed been presented as a good strategy. Yet it does not thoroughly address the long history and memory of

environmental destruction about which Kaikai has written, for the asymmetry of power.

In the reconfiguration of the world that followed the colonization of the Americas and the Caribbean, nature was transformed into a cheap resource, as endlessly renewable as the bonded workforce. It is human praxis as labor and the global use of a color line in the division of labor that must be studied, and not a "human" death drive. When Andreas Malm argues that "there is also a different kind of violence, not rapid but slow motion, not instantaneous but incremental, not body-to-body but playing out over vast stretches of time through the medium of ecosystems," he raises the question of the narratives that would bring to light this kind of violence. Indeed, if we find and read "stories and essays on the slow violence of the Bhopal disaster, oil exploitation in the Arabian Gulf and the Niger Delta, mega-dams in Indian, depleted uranium in Iraq" — to which we can add Katrina in New Orleans, the moving tide of toxic iron-ore residue in Brazil, polluting the water supply of hundreds of thousands of residents as it makes its way to the ocean, the consequences of nuclear tests in French Polynesia, the polluted water in Flint, Michigan, and the negative impact of agro-business — there are none "on climate change as such," as if "the capacity to imagine violence seems to have reached its limits." **24** We have to renew the ways that violence is narrated.

Apocalyptic/Optimistic Views of Climate Change and Environmental History

Two views about climate change and the environment have been dominating the media and politics shaping the public debate: apocalyptic (humans are responsible for ecological destruction) and optimistic (scientists and engineers will find solutions). In 1991, Clive Ponting's book *A Green History of the World* offered a wide view of human and ecological history that covered the globe and centuries. Though Ponting discussed slavery, colonialism, and the creation of the Third World, "Man" was his main culprit. But it was his narrative of the ecological suicide of Easter Islanders that became the exemplary apocalyptic narrative. In his opening paragraph, Ponting wrote:

> *Easter Island is one of the most remote, inhabited places on earth. Only some 150 square miles in area, it lies in the Pacific Ocean, 2,000 miles off the west coast of South America . . . At its peak the population was only about 7,000. Yet, despite its superficial insignificance, the history of Easter Island is a grim warning to the world.* **25**

Ponting's analysis blamed the disappearance of Eastern Islanders on a human predisposition for destruction. His book was an instant success, offering a paradigm for the whole environmental history of the world that both frightened and pacified: if there was nothing to do, there was nothing to do. The book inspired, and continues to inspire, movies and novels. A whole genre of popular cinema has blossomed that offers a narrative of human hubris in which a white American male saves first "his" family and then "his" community. Individual mad scientists or cynical politicians are the villains; nothing is said of an economic system that privileges profit and fabricates racialized, disposable beings. The success of Ponting's book shows why the apocalyptic narrative is an ideological strategy that blames out-of-control forces rather than structures of power. But Easter Islanders did not commit suicide; they were the victims of systematic murder committed by Peruvian slave traders in the nineteenth century. The apocalyptic view rests on a pessimistic view of human nature. The optimistic view, on the other hand, is deeply steeped in the tradition of belief in progress. Ferdinand Braudel, whose work has been vital to historians of the environment, embodies that tradition. To him, climate is a longterm, mostly stable element which changes more slowly than historical time (though Braudel sometimes portrays nature — the sea, the mountains, rice, maize — as the main actor of history). Yet, as Eyal Weizman has written,

> *the climate can no longer be considered a constant . . . The current acceleration of climate change is not only an unintentional consequence of industrialization. The climate has always been a project for colonial powers, which have continually acted to engineer it.* **26**

Apocalyptic and optimistic approaches have inspired the current rhetoric of a "crisis" produced by human nature or by an error in progress, evident in three recent moments in politics of the environment. The first moment is the emergence of a Western-led transnational network of conservation work which appeared in the years before World War I. The second is the Western-led boom of environmentalism that appeared around 1970 and developed rapidly in response to decolonization, the first oil crisis, the alliance between the chemical industry and the army (pesticides for war and the green revolution), the culmination of international programs on birth control in the Third World, the War in Vietnam, the proxy wars in Africa, revolutionary social movements, the dictatorships in South America, the interventions in the Middle East. **27** Indeed, starting in the early 1970s, European states as well as the United States started to issue regulations about clean air, clean water, and the protection of nature. In 1972, *The Limits to Growth* by the Club of Rome became an international best seller; that year in Stockholm, representatives from more than 100 countries met for the first United Nations Conference on the Human Environment and the United Nations Environment Programme (UNEP) was created. The third moment is the upswing of environmental issues all over the globe at the end of the Cold War, culminating in the Earth Summit in Rio de Janeiro in 1992. In December 2015, not long after the Paris attacks, the COP 21 opened. The rhetoric on the relationship between political opposition to climate change and world security, and the "war on terror," has opened a new chapter in the development of the racial Capitalocene.

To unpack the different levels of racialized environment we need to go back the long sixteenth century, the era of Western "discoveries," of the first colonial empires, of genocides, of the slave trade and slavery, the modern world mobilized the work of commodified human beings and uncommodified extra-human nature in order to advance labor productivity within commodity production. Racialized chattel were the capital that made capitalism. Africa was forced to share its social product — human beings — with the Atlantic slave system. But the slave trade consisted of not only the organized deportation of millions of Africans to continents and islands, but also a massive transfer of plants, animals, diseases, soil, techniques, and manufactured goods from Europe. Capitalism relied for growth on an endless access to nature as excess, as a "bounty of extra-human biological systems and geological distribution: plants, silver, gold, iron, coal." **28**

Radical Agenda

A history of the racialized Capitalocene à la Cedric Robinson will help us understand that climate change is not about human hubris, but the result of the long history of colonialism and racial capitalism and its Promethean thinking — the idea that "Man" can invent a mechanical, technical solution to any problem. To develop a theory from a renewed history of the racial Capitalocene is to study the matrix constructed by the army/science/engineers/business/state alliance. On January 8, 2016, a court in Oregon fined the Biotech firm ArborGen $53.5 million in compensation and punitive damages for using "trickery and deceit" to defraud workers. ArborGen is a US-based company, a leader in research and development for genetically engineered trees. It presents itself as a "leading global provider of conventional and next generation plantation trees." **29** The company develops mostly eucalyptus, which is the second-most-popular tree for the paper industry (pine is the first). On its website appear the following questions and their answers: "What Makes a Profitable Forest? Advanced Technology, Incomparable Value"; "What Makes a Valuable Tree? Superior Growth, Maximum Value"; "What Makes a Superior Seed? Exceptional Breeding, Outstanding Results." It is the vocabulary of profit for profit. ArborGen has a rival: the Israeli biotech company Futuragene, which has developed a unique technology that accelerates tree growth, again mostly eucalyptus. It is now a branch of the Brazilian plantation group Suzano, which grows 500,000 hectares of eucalyptus trees a year and has partners in China, Thailand, and South Africa. ArborGen and Suzano compete in an industry (forestry and paper) which generates $400 billion annually. The eucalyptus is known for being invasive and contributing to the depletion of water, desertification of soils, and loss of biodiversity. Once they are engineered, these effects are multiplied. Further, the paper industry always hides the waste it produces. Yet, waste embodies, more than ever before, the new era of the Capitalocene. Capitalist production is waste production. According to a 2000 study carried out by five major European and US research centers, one-half to three-quarters of annual resource inputs to industrial economies are returned to the environment within a year as waste. It must be said, however, that there is a huge gap between the amount of waste produced by multinationals and countries of the North and the amount of waste produced by populations of the South. **30**

Green capitalism and the biotech industry hold the optimistic discourse, offering seductive solutions: a green and sustainable future created by engineers and scientists, with the help of drones, satellites, and the new international laws of property and trade. Philosopher Isabelle Stengers has argued that we are witnessing an authoritarian management of societies based on Margaret Thatcher's "There Is No Alternative." Stengers argues for a "skepticism of the probable" in order to take a stand with the "possible" and commit to the multiple and always precarious attempts which bet on the possibility of a world which does not answer the probabilities offered by green capitalism. Building counterpowers means exposing the dangers of bioengineering to human health, biodiversity, and the lives and well-being of minorities, indigenous communities, and poor peasants, the majority of whom are women. It also means developing a radical curriculum based on a decolonization of knowledge production and institutions and a de-nationalization of knowledge. Knowledge production must take place with an awareness of diverse living realities and multiple publics without imposing the distance, disregard, or disdain of privilege. World citizenship and humanism must be brought in as decolonializing alternatives. A curriculum of radical pedagogy for the politics of the possible will challenges all forms of dehumanized work in favor of shared, life-affirmative labor practices, resisting the economy of speed for efficiency and acknowledging that time is needed to nourish knowledge. The politics of the possible also rest on the imagination — on the freedom to dream other pasts and imagine other futures than those suggested by the racial Capitalocene. Afrofuturism, for example, offers a way of looking at possible futures or alternate realities through a Black cultural lens, blending the future, the past, and the present. "Each generation must out of relative obscurity discover its mission, fulfill it, or betray it," Frantz Fanon wrote in 1961. We are at a critical juncture, a historical moment that sends us into our inheritances to find sources and references for the struggle ahead.

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27. In the late 1950s, at a series of World Congresses on world population, representatives of the US government started an ideological campaign in which they argued that global security and peace were tied to a low birth rate in the Third World. It became a truth: Third World countries were said to be condemned to poverty and underdevelopment if their birth rate was not controlled.

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TITLE: UNCOMMONING NATURE
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Marisol de la Cadena

Uncommoning Nature

On June 5, 2009, at dawn, a violent confrontation took place between police forces and a large group of Peruvian citizens declaring themselves as belonging to the Awajun-Wampis indigenous groups. The police's objective was to break up a blockade at a major highway near the town of Bagua in the Amazonian lowlands of northern Peru. The Awajun-Wampis had taken control of the highway at a place called La Curva del Diablo (Devil's Curve) as part of a general strike that started on April 9 that same year, organized by several Amazonian indigenous groups. They were protesting a series of legislative decrees conceding their territory to oil exploration without abiding by the Indigenous and Tribal Peoples (ILO) Convention No. 169, which requires that governments consult inhabitants of territories that corporations may approach for exploration and exploitation. Accordingly, the concession was illegal, as the protestors declared. The clash yielded more than thirty deaths between policemen and the Awajun-Wampis, according to the official count. On June 19 that same year, against the will of then president Alan García, the congress canceled the decrees. The local state ordered the arrest of a number of indigenous leaders, among them Santiago Manuin Valera, the prominent Awajun-Wampis leader. They face thirty-three counts of death. During his testimony on April 10, 2014, Manuin said:

> The government is taking away our territory, the territory of the Awajun-Wampis people, so that we become dependent on its [form of] development. The government never asked: Do you want to develop? They did not consult us. We responded: "Cancel the legislative decrees that affect our existence as a people." Instead of listening to our complaint, the government wanted to punish us – other peoples surrendered, we did not. The government ordered our forced eviction.

The event is part of what I am calling the *anthropo-not-seen*: the world-making process through which heterogeneous worlds that do not make themselves through the division between humans and nonhumans – nor do they necessarily conceive the different entities in their assemblages through such a division – are *both* obliged into that distinction *and* exceed it. Dating from the fifteenth century in what became the Americas, the anthropo-not-seen was, and continues to be, the process of destruction of these worlds *and* the impossibility of such destruction. It might very well represent the first historical apocalypse: the will to end many worlds that produced the *one-world* world

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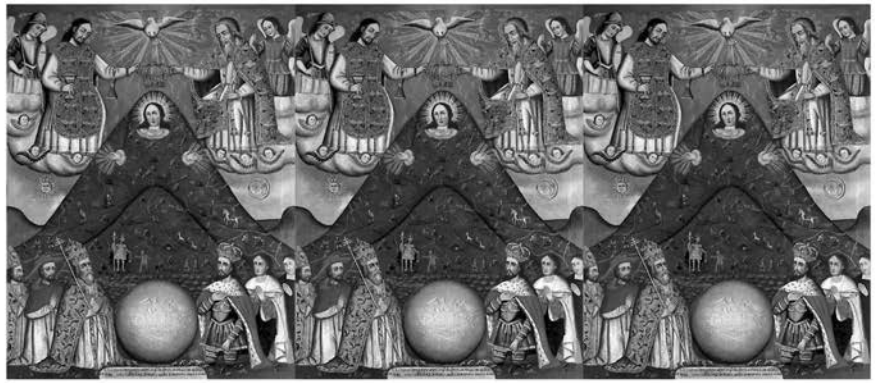


Anonymous, *Virgen-Cerro*, c. 1730. Museo de la Casa Nacional de Moneda, Potosí. The painting represents an Earth-being that is also a mountain, occupied by the Virgin and guarded by the Church, from where the Devil might have been expelled.

and its excesses.[1]

Scholars have discussed the Anthropocene as a transformation of humanity into a geological force capable of affecting, and possibly destroying, what we currently know as the world. The *anthropo-not-seen* has been sustained since its early beginnings by a human moral force – and the unseen part of its destructive dynamic can be found in how this force has been considered constructive. Counterintuitively, this particle of the word (the not-seen) does not refer only to the anthropos – "the one who looks up from the Earth" – and is capable of destroying what refuses to be made in its image.[2] Exceeding this destruction, the anthropo-not-seen includes more-than-human assemblages, both in the usual sense (i.e., that they may include humans and nonhumans), and in the sense that these categories (human and nonhuman, and therefore species) are *also* inadequate to grasp such compositions, which as said above, may not become through these categories.[3] The assemblages of the anthropo-not-seen may be translated as "articulated collectives" of nature and humans, yet may also express conditions of "no nature, no culture."[4]

The antropo-not-seen was, and continues to be, a war waged against world-making practices that ignore the separation of entities into nature and culture – *and* the resistance to that war. The antagonism was clear in the seventeenth century: Christian clerics walked the Andes from Colombia to Argentina and Chile "extirpating idolatries" that the friars conceived as "devil-induced worship." Extirpation required dividing entities into God-created nature (mountains, rivers, forests) and humans, and saving the soul of the latter. The invention of modern politics secularized the antagonism: the war against recalcitrance to distinguish nature from humanity silently continued in the name of progress and against backwardness, the evil that replaced the devil. Incipient humans became the object of benevolent and inevitable inclusion, enemies that did not even count as such. Until recently, that is.

The War is Not Silent Anymore (But it Continues Undeclared)

The expansion of markets for minerals, oil, and energy, as well as for new technologies that allow for their quick and profitable extraction, stimulate what appears to be an unprecedentedly unstoppable – and mighty – corporate removal of resources in places formerly marginal to capital investment. The construction of infrastructure (necessary to send the resources to market) sponsored by central financial institutions like the IMF, the World Bank, and new regional financial entities like the Latin American Development Bank has made even the most remote territories the object of financial investment. The reach of the current destruction of indigenous worlds is historically unparalleled; the anthropo-not-seen (the destruction of worlds and resistance to it) has acquired a scope and speed that early extirpators of idolatries and nineteenth-century explorers (turned rubber and sugar plantation investors) would envy.

Overlapping with environmental devastation and converging on Anthropocenic forces at the planetary level, the transformation of territories into grounds for investment has met with strong local opposition and forceful disagreement – transforming the silent war into a relentless demand for politics that reveals, to paraphrase and tweak Rancière, the presence of many worlds being forced into one. Digging a mountain to open a mine, drilling into the subsoil to find oil, damming all possible rivers, and razing trees to build transoceanic roads and railroads translates, at the very least, into the destruction of networks of emplacement that make local life possible. Among other demands, local worlds – labeled indigenous or not – defy the monopoly of modern practices in making, inhabiting, and defining nature. With their hopes for economic growth at stake and the sovereignty over their territorial rule threatened, national states waver between rejecting the proposal for politics that local worlds extend and ending the silent war to wage it overtly – always in the name of progress. The confrontation in 2009 in La Curva del Diablo is emblematic of the war becoming public: those who oppose the transformation of universal nature into resources and oppose the possibility of the common good as the mission of the nation-state are its enemies and deserve prison at the very least.

Conceptualized through the anthropo-not-seen, the war is, however, peculiar. Defending themselves, worlds whose sacrifice progress demands have publicly revealed their practices through television stations and newspapers. Thus, it has come to the attention of the public (and majoritarian derision) that nature – as the alleged grounds for the common good – is not only that. For example, warning about the destruction of its world, the Awajun-Wampis leadership has described their sibling relation to the Amazon rainforest: "The river is our brother, we do not kill our brother by polluting and throwing waste on it" – kinship transforms rivers, plants, and animals into entities that financial capital, infrastructure, and contamination can kill rather than "merely" destroy or deplete. As ubiquitous as the war, these revelations slow down the translation of those entities into universal nature. The one-

world world that Christianity and modernity collaboratively built and sustained is perhaps being challenged with an unprecedented degree of publicity for the first time since its inauguration five hundred years ago. This possibility needs to be cared for.

04/08

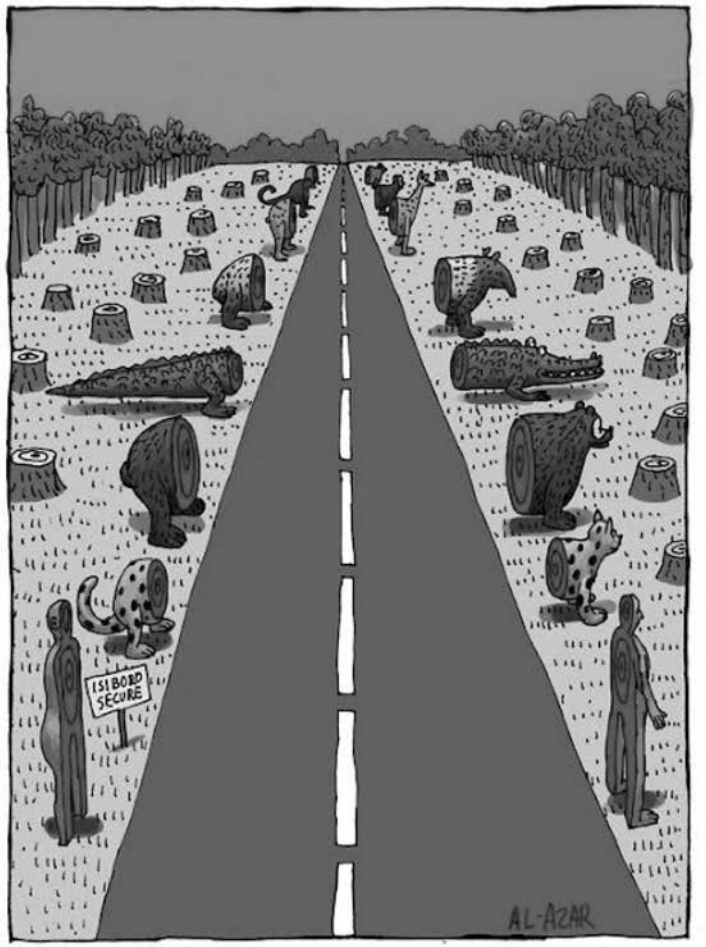
Uncommoning Nature: Or, a Commons through Divergence[5]

Analogous to the Awajun-Wampis's claim of kinship with the forest, in a dispute about petroleum extraction in a site called Vaca Muerta (Argentina) a Mapuche group declared "Our territories are not 'resources' but lives that make the Ixofijmogen of which we are part, not its owners."[6] In contrast, developers from Neuquén defined Vaca Muerta as one of the states included in the alleged hydrocarbons deposit: "Vaca Muerta is an immense *páramo* [a barren cold plateau]. A desert that extends beyond what the eyes can see ... It is a hostile territory that shelters enough energy to make Argentinian self-sufficient and even export gas and oil to the world." The stark contrast suggests that the dispute about the extraction of petroleum is also a dispute about the partition of the sensible into universal nature and culturally diversified humanity, to paraphrase Rancière and Latour, respectively.[7]

Emphasizing the inherent relationality between local entities (humans and other-than-human beings), the dispute questions the universality of the partition: what is enacted as humans and nature is *not only* enacted as such.[8] John Law calls this the capacity for *both/and* (rather than *either/or*). The interruption of the universal partition is a political and conceptual worlding event; what emerges through it is not a "mix" of nature and human. Being composed as humans *with* nature – if we maintain these categories of being – makes each more. Entities emerge as materially specific to (and with!) the relation that inherently connects them. An example located in the Andes of Cuzco: the materiality that relates modern humans *and* mountains is different from that which makes *runakuna* (the local Quechua word for people) *with* Earth-beings – entities that are also mountains.[9]

The processes questioning the universality of partitioning the sensible into universal nature and humans, of course, do not require *runakuna* with Earth-beings. Here is another example: in the northern Andes of Peru, a mining corporation plans to dry out several lagoons to extract copper and gold from some, and to throw mineral waste

Awajun-Wampis protest in Bagua, northern Peru. Police violence sent many of the protesters to the hospital, despite a peaceful blockade of the Corral Quemado Bridge, June 5, 2009.



The cartoon *Paving Bolivia* shows the road across TIPNIS, which stands for "Territorio Indígena y Parque Nacional Isiboro Sécure."

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into others. In exchange, reservoirs with water capacity several times that of the lagoons would be built. Opposing the plan, environmentalists argue that the reservoirs will destroy the ecosystem of the lagoons, a landscape made of agricultural land, high-altitude wetlands, cattle, humans, trees, crops, creeks, and springs. The local population adds that the lagoons are *their* life: their plants, animals, soils, trees, families *are with* that specific water which cannot be translated into water from reservoirs, not even if more water is provided, as the mining corporation promises to do. It would not be the *same* water, which they defend as "guardians of the lagoons." People have died in this making-public of another instance of the war against those who oppose the translation of nature into resources. Yet the guardians of the lagoons have never said that the water is a being – it is local water, and as such, nature, yet untranslatable to H_2O.

An iconic "guardian of the lagoons" is a peasant woman whose property the corporate mining project wants to buy to fully legalize its access to the territories it plans to excavate. The woman refuses to sell – even for what is most likely an amount of money she will not see in her lifetime. Countless times, the national police force has attacked her, her family, even her animals – as I was writing this piece, the police destroyed the woman's crops. The property has been under siege for more than three years now. "I fight to protect the lagoon" has been one of her responses. And asserting attachment to place, she adds: "I am not going to stop; they will disappear me. But I will die with the land." Like Bartleby, she "would prefer not to" sell; yet she is not politically a-grammatical, at least not in the usual sense.[10]

Within the grammar that separates humans and universal nature, this woman can be interpreted as defending the ecosystem: an environmentalist, and thus an enemy (and a fool), or an ally (and a hero), depending on who speaks. In both cases she is a subject in relation to an object. However, the "refusal to sell" may express a different relation: one from which woman-land-lagoon (or plants-rocks-soils-animals-lagoons-humans-creeks – canals!!!) emerge inherently together: an ecological entanglement needy of each other in such a way that pulling them apart would transform them into something else.[11] Refusing to sell may also refuse the transformation of the entities just mentioned into units of nature or the environment, for they are part of each other. The woman's refusal would thus enact locally an ecologized nature of interdependent entities that simultaneously coincides, differs, and even exceeds – also because it includes humans – the object that the state, the mining corporation, *and* environmentalists seek to translate into resources, whether for exploitation or to be defended. Thus seen, she is a-grammatical to the subject and object relation – or, she is *not only* an environmentalist.

Occupying the same space (that "cannot be mapped in terms of a single set of three-dimensional coordinates"), this complex heterogeneous form (universal nature, the environment, and what I am calling ecologized nature – or nature recalcitrant to universality) allows for alliances and provokes antagonisms.[12] Confronted with the mining company's proposal to desiccate the lagoons, its local guardians and environmentalists have joined forces against the mining corporation. Yet their shared interest – to defend nature, or the environment – is not only the same interest: ecologized nature and universal nature exceed each other; their agreement is also underpinned by *uncommonalities*. This condition shapes a possibility for an alternative alliance, one that, along with coincidences, may include the parties' constitutive divergence – even if this opens up discussion of the partition of the sensible and introduces the possibility of ontological disagreement into the alliance. An oxymoronic condition, this alliance would also house hope for a *commons* that does not require the division between universal nature and diversified humans: a commons constantly emerging from the uncommons as grounds for political negotiation of what the interest in common – and thus the commons – would be.

Instead of the expression of shared relations, and stewardship of nature, this commons would be the expression of a worlding of many worlds ecologically related across their constitutive divergence. As a practice of life that takes care of interests in common, yet not the same interest, the alliance between environmentalists and local guardians (of lagoons, rivers, forests) could impinge upon the required distribution of the sensible into universal nature and locally differentiated humans, thus disrupting the agreement that made the anthropo-not-seen and questioning the legitimacy of its war against those who question that distribution. The alliance would also queer the requirement of politics for sameness and provoke ontological disagreement *among those who share sameness* – inaugurating an altogether different practice of politics: one across divergence.

×

Police guard the machinery of Yanacocha, the largest gold mine in South America.

Marisol de la Cadena is an anthropologist, born in Peru, who teaches at UC Davis.

1
I will use examples of events and conditions of life in Latin America because it is the space that I am familiar with. However, anthropo-not-seen is an event throughout the planet.

2
Karolina Sobecka, "Last Clouds," in *Art in the Anthropocene*, ed. Heather Davis and Etienne Turpin (London: Open Humanities Press, 2015), 215. http://openhumanitiespress.org/Davis-Turpin_2015_Art-in-the-Anthropocene.pdf

3
Dorion Sagan, "The Human is More than Human: Interspecies Communities and the New 'Facts of Life,'" *Cultural Anthropology Online*, April 24, 2011. http://www.culanth.org/fieldsights/228-the-human-is-more-than-human-interspecies-communities-and-the-new-facts-of-life

4
Donna Haraway, "The Promise of Monsters: A Regenerative Politics for Inappropriate/d Others," in *Cultural Studies*, ed. Lawrence Grossberg, Cary Nelson, and Paula A. Treichler (New York: Routledge, 1992), 314; Marilyn Strathern and Carol MacCormack, ed., *Nature, Culture, and Gender* (Cambridge: Cambridge University Press, 1980).

5
Divergence is a notion I borrow from Isabelle Stengers. It refers to the constitutive difference that makes practices what they are and as they connect across difference, even ontological difference. See Isabelle Stengers and Philippe Pignarre, *Capitalist Sorcery: Breaking the Spell*, trans. Andrew Goffey (London: Palgrave MacMillan, 2011).

6
"Vaca Muerta, Una Situación Urgente Que No da Para Más," *Argenpress*, October 7, 2014; and "Un Viaje a las Entrañas de Vaca Muerta, el Futuro Energético del Pais," *Misiones Online*, March 7, 2015. "Ixofijmogen" is the Mapuce concept of "biodiversity."

7
Jacques Rancière, "Ten Theses on Politics," *Theory and Event* 5:3 (2001).

8
I have explained this in other works. Dwelling across more than one and less than many worlds, practices may enact not-only entities: other-than-human beings emerge not only as such, but also as nature and humans. See Marisol de la Cadena, "Indigenous Cosmopolitics in the Andes," *Cultural Anthropology* 25:2 (May 2010); and Marisol de la Cadena, Earth Beings (Durham, NC: Duke University Press, 2015).

9
Marisol de la Cadena, "Runa: Human But Not Only," *Journal of Ethnographic Theory* 4:2 (Fall 2014). http://www.haujournal.org/index.php/hau/article/view/hau4.2.013/1128

10
Gilles Deleuze, "Bartleby, ou la Formule," in *Critique et Clinique* (Paris: Editions de Minuit, 1993), 89–114.

11
Another example of a similar relational materiality: peasants in the Isthmus of Juchitán (Oaxaca, Mexico) have rejected the installation of windmills which would transform the relationship between air, birds, ocean water, fish, and people. See Cymene Howe, "Anthropocenic Ecoauthority: The Winds of Oaxaca," *Anthropological Quarterly* 87:2 (Spring 2014).

12
Annemarie Mol and John Law, "Complexities: An Introduction," *Complexities: Social Studies of Knowledge Practices*, ed. Annemarie Mol and John Law (Durham, NC: Duke University Press, 2002).

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Between Us and Nature - A Reading Club

382 THE FALLING SKY: WORDS OF A YANOMAMI SHAMAN
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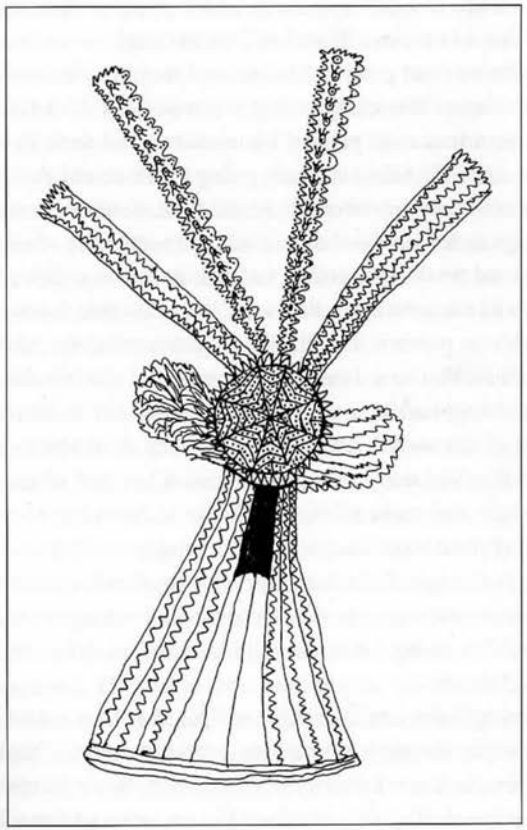
CHAPTER 8

The Sky and the Forest



Mirror and paths of the *xapiri*

SOMETIMES, WHEN the sky makes threatening noises, women and children whimper and cry in fear. These are not empty cries! We all fear being crushed by the falling sky, the way our ancestors were in the beginning of time. I still remember an occasion when that nearly happened to us! I was young then.[1] We were camping in the forest, near a small stream that flows into the Rio Mapulaú. I had accompanied a few

elders on the search for a young woman of the *Uxi u* River who had been taken away by a man from a house in the Rio Toototobi highlands. It was early in the night. There were no sounds of thunder or lightning in the sky. Everything was quiet. It was not raining and we could not feel a breath of wind. Yet suddenly we heard several loud cracks in the sky's chest. They came in rapid succession, each more violent than the last, and they seemed very close. It was really alarming!

Everyone in our camp started to yell and weep in fear: "*Aë!* The sky is starting to collapse! We are all going to perish! *Aë!*" I was also scared! I had not become a shaman yet and I anxiously asked myself: "What is going to happen to us? Is the sky really going to fall on us? Are we all going to be hurled into the underworld?" At the time, there were still great shamans among us, for many of our elders were still alive. Several of them instantly started working together to hold up the sky. Their fathers and grandfathers had taught them this work long ago, this is how once again they were able to prevent its fall. Then, after a moment, everything got quiet. Yet I think that this time the sky nearly did shatter above us again. I know it has happened before, far away from our forest, where it is closer to the edges of the world. These distant places' inhabitants were wiped out because they did not know how to hold it up. But where we live the sky is very high, and more solid. I think this is because we are at the center of the terrestrial layer.[2] But one day, a long time from now, it may finally come crashing down on us! It will no longer want to stay in place. It will come apart and crush us all. But this will not happen so long as the shamans are alive to hold it up. It will lurch and roar but will not break.[3] This is what I think!

All the beings who live in the forest fear that they could be crushed and wiped out by the sky's immensity, even the *xapiri!* Thinking of this makes the people of our houses scared and they begin to cry. They know very well that the sky has fallen before! I know some of this talk about the sky's fall. I heard it from my elders' mouths when I was a child. It was so. At the beginning, the sky was still new and fragile. The forest had barely come into existence and everything there easily returned to chaos. It was inhabited by other people, who were created before us and have since disappeared. It was the beginning of time, during which the ancestors changed into game one after another. And when the sky's center finally collapsed, many of them were hurled into the underworld. There they became the *aõpatari*, those sharp-toothed carnivorous ancestors who devour everything the shamans throw them. They still live underground with *Yariporari*, the wind storm being, and *Xiwãripo*, the chaos being. They also live surrounded by peccary, wasp, and earthworm beings who also became other.

The back of this sky that fell in the beginning of time is now the forest where we live and the ground that we walk on. This is why we call the forest *wãro patarima mosi*, the old sky, and the shamans also call it *hutukara*, which is the name of this ancient celestial layer. Later another sky came down and fixed itself above the earth, replacing the one that had collapsed. It was *Omama* who drew its **project**, to use the white people's word. He asked himself how to consolidate it and put rods of his metal inside it, which he also buried like roots in the ground.[4] This is why this new sky is more solid than the old one and will not come apart so easily. Our shaman elders know all this. As soon as the sky starts to shake and threatens to crack, they instantly send their *xapiri* to reinforce it. Without that, it would have collapsed again long ago!

The people of the beginning of time were not as wise. Yet they worked hard to prevent its fall. But they were overwhelmed by fear, so they cut overly fragile stays from the soft hollow wood of the *tokori* and *kahu usihi* trees to sustain it. Most of these ancestors were crushed or thrown underground, except in one place where the sky finally came to rest on a wild cacao tree, which bent under its weight but did not break. This happened in the center of our forest, where you find the hill region we call *horepë a*.[5] Finally, a *werehe* parrot slowly gnawed at the surface of the sky, lying on the cacao tree canopy, and made a hole through which these first people finally escaped. They went out into the new forest on the back of the old sky and continued to live there. The shamans call them *hutu mosi horiepë tʰëri pë*, the people who came out of the sky. Yet later these ancestors also died. They metamorphosed and were carried away by the waters or were burned when the entire forest went up in flames long ago.[6] This is what I know. We came into existence after them and we too have grown in number. So we are their ghosts.

When a very old shaman is sick for a long time and eventually dies of his own accord, his *xapiri* silently leave his spirit house. Once abandoned, it gradually falls apart. Nothing else happens. On the other hand, if a still-young shaman dies suddenly, arrowed by warriors or eaten by enemy sor-

cerers, his spirits get angry. The sky gets dark and the rain does not stop coming down. The wind storm lashes into the trees in the forest, the thunder beings angrily roar, and the lightning beings crash. The rain falls endlessly, and the spirits of the sky pour snakes all over the forest. The jaguar spirits' mirrors come loose and these fierce animals start prowling. All this happens after the death of a shaman who owned a very tall spirit house.[7] His *xapiri*, furious to be orphans, start cutting up the sky. The spirits of the *ëxama* and *xotʰetʰema* woodpeckers, followed by those of the *yōkihima usi* birds, thrash its chest with their axes and sharp machetes. Entire patches of the sky then start to come apart with a tremendous noise, so loud that even the surviving shamans are terrified![8] They must rush to send their own spirits to consolidate it and contain the fury of the orphaned *xapiri*.

The sky moves, it is still unstable. Its center remains solid, but its edges are already heavily damaged and have become fragile. It warps and sways with terrifying cracking sounds. The feet holding it in place at the ends of the earth are so unsteady that even the *xapiri* worry. Yet one of them, *Paxori*, the spider monkey spirit, proves particularly courageous. He travels from far away, but is always first to hold up the patches of sky threatening to come apart and to try and reinforce it. He is not a forest monkey but a celestial being, an ancient and powerful *xapiri* with skillful hands. Yet it would be impossible for him to carry out these repairs if he were working alone. Many other spirits come to help him, including those of the night monkey, the kinkajou, the *hoari* marten, and the *wayapaxi* squirrel. But he also calls the *hutukarari* celestial spirits, the *yāripirari* lightning spirits, and the *yārimari* thunder spirits to back him up.

All these *xapiri* arrive in great numbers. They tear the axes and machetes out of the angry *xapiri* orphans' hands. They squeeze them in their arms to make them squat and try to calm them down. Then, by joining their efforts, they succeed in preventing the sky from breaking up. The sloth spirits consolidate the cracks with metal rods fired from their shotguns. The *ahōrōma asi* ant spirits pour glue to fill in its gaps. Then the cracking gradually comes to an end. Once silence has returned to the forest, the people of our houses—and even those who often doubt the shamans—tell themselves: "It is not a lie! They really become spirits and know how to contain the sky's fall!" Our ancestors have done this work since the beginning of time. If it had not been so, the sky would have collapsed on us long ago! Yet despite their efforts, it always remains unstable and fragile, at the mercy of the spirits of dead shamans who constantly want to cut it up.

The *xapiri* also constantly work to prevent the forest from turning into chaos. When the rain falls without interruption for days on end and the sky remains full of dark low clouds, we start to get tired of it. We cannot hunt or burn our new gardens to plant banana plants. We feel sad for our women and children, who are hungry for game. We are tired of the dampness and we also long for eating fish.[9] Eventually we turn to our shaman elders for help, for they know the rain being *Maari* well and can ask him to stop. So they drink the *yākoana* and start working. Their spirits wash the sky's chest and call the sun being *Motʰokari* and the dry season being *Omoari*. Then they turn the **key** that holds back the rain and bring light back to the sky. In my childhood, I often saw my father-in-law work this way to make the rain retreat and the forest happy. We call this *payëmuu*.

During flood times, the sons and daughters of the rain being *Maari* and the cloudy weather being *Ruëri* dance joyously above the forest waving young *hoko si* palm leaves, like guests performing their presentation dance. When these palm leaves are very damp, the rain never stops! To put an end to it, the spirits of the *rōrōkona*, *kutemo*, *kreemo*, and *tāitāima* cicadas, as well as those of the *kori*, *ixaro*, and *napore* cacique birds, must seize them and lift them towards the sky's heat. They shake the leaves to dry them off, producing a light breeze. This is the summer wind we call *iproko*. All these *xapiri* are the daughters and sons-in-law of the dry season being *Omoari*. This is why they can do this work. But for the showers to end once and for all, the spirits of the *ëxama* woodpecker and the small *roha* iguana must also lift the *Maari* rain being's penis and tie it back around his belt.[10] Other *xapiri* have to make him lie down in his hammock, hand him a tobacco wad to calm his anger, and delicately remove his wet feather headdress to put it somewhere dry. Then daylight and warmth finally return to the forest. The dry season settles there and the waters start to go down. White people do not know the images of the rain being and his children. They probably think the water falls from the sky for no reason! But me, I have often contemplated them in my dreams, like my elders saw them before me. It is so. The people of the forest's words are other.

We also do not return to the low water time so long as the daughters of *Motu uri*, the underground water being, continue to play happily in the

rivers. The shamans must send their *xapiri* to interrupt their games and bring them back to dry land. The cicada and butterfly spirits are responsible for this, along with the wife, daughters, and daughters-in-law of the sun being *Mot^{h}okari*. But *T^{h}orumari*, the celestial fire spirit, must still arrow *Motu uri* himself, then drag him by the arms and burn him.[11] Finally, the *Kōromari* ibis spirit pierces the ground with its metal bar so that the waters run off underground; only then will the water level go down. But the *xapiri* can also tackle the *Maa hi* rain tree to bring the rains and flooding to an end. Our elders know it well, and my father-in-law told me it stands at the borders of the earth and sky. It is gigantic and its leaves are endlessly dripping with dampness. Everything around it is cold and dark. The ground is covered in mud. It is the home of the *titiri* night beings and the *horemari* earthworm beings.

When the *Maa hi* tree blooms, it begins to rain in the forest and the rivers rise. To stop it from dripping, the *napore* cacique and howler monkey spirits must vigorously shake its branches and make its flowers fall. Then the macaw spirits must cut its branches with the help of the tapir spirit, who comes with them in his big pirogue. When this happens, the rain tree wraps itself in heat and the cicadas start to make their voices heard there. The *xapiri* who are the sons-in-law of the *Omoari* dry season being go after their father-in-law and call him back into the forest through a *hiimuu* invitation dialogue. They pick up the dead fish in the dried-up streams to offer them to him. Then he agrees to slowly return from the distances where he had taken refuge. It is so. *Omoari* does not answer to the spirits of the leaves and the trees, nor to those of the animal ancestors. If the *xapiri* who are of his people did not go get him, he would not come of his own accord. Then dampness and darkness would overrun the forest forever and it would finally return to chaos.

When they also want to put an end to the thunder beings' anger, the *xapiri* go to their homes on the sky's back. They squat before them and reprimand them: "Your loud vociferations are bothering us! What are you doing? Why won't you stay quiet?" The furious thunders respond by threatening to strike them. To appease them, the spirits stretch out in their hammocks to demonstrate their friendship, as we do with a brother-in-law.[12] Then they offer them food and tobacco. Sometimes they also blow a little *yākoana* in their nostrils to calm them. Then little by little the

thunders finally grow quiet. If it were not so, the storm's roar would have no end, as it was in the beginning of time.

Thunder was an animal then, a kind of big tapir who lived in a river, near a waterfall.[13] At the beginning our ancestors did not know him. They were merely exasperated by constantly hearing the powerful roar of his voice echoing through the forest. They grew weary and decided to make him shut up. Finally they went after him and arrowed him. They cut up his body, careful to avoid spilling his blood on the ground. They cooked his flesh for a long time and ate it with great satisfaction. At the end of this meal, a mocking, well-fed hunter insisted on offering a leftover piece of raw liver to Thunder's son-in-law, the ancestor of the *h^{w}āih^{w}āiyama* bird. Furious, the latter struck the tiresome hunter's hand and the piece of the tapir's liver was projected onto the sky's back, where it came back to life and multiplied in every direction, like so many thunders with booming voices. These are the ones we hear above the forest today and who the shamans admonish to be quiet.

As for the lightning beings, they look like big macaws covered in splinters of light. When they flap their wings, they cast blinding glints of light with a loud crash. They are very powerful too, and do not hesitate to express their violent anger when they are famished. Their feet of fire fall into the forest from the sky's back with a terrifying din. This is why the shamans try to contain their fury. To get them under control, they make their own images dance and send them back to them as *xapiri*. These spirits then grab the lightning beings and reason with them: "*Ma!* Do not be so irascible! Do not destroy the forest like this! Other people live there! Humans have children there!" Then they play with them and tickle them, but if the lightning beings do not calm down after that, they will hit them and scold them sharply. Finally, they make them simmer down and become quiet and the storm goes silent in the forest.

The storm wind being *Yariporari* is also very dangerous.[14] He grows innumerable arrow-canes in his vast garden. When he wages war, he travels through the forest, angrily blowing its arrows in every direction. He is so frighteningly strong that even the *xapiri* fear him as he knocks over everything in his path. He turns our houses upside down and pushes the big trees onto our campsites. He smashes the branches, tangles up the underbrush, and slams into the tree trunks. He is accompanied by the giant armadillo being *Wakari*, who cuts out the trees' roots with his enormous machete. *Yariporari* is a formidable wind who fell into the un-

derworld in the beginning of time. He hides in a hole underground, covered by a heavy lid that *xapiri* mourning their dead fathers or shamans angry at their enemies can lift to get revenge. Then *Yariporari* lets loose all his brutal power, ravaging the forest and terrorizing its inhabitants. When this happens, the spirits of the *witiwitima namo, xiroxiro,* and *teateama* birds and the *Koimari* bird of prey spirits attempt to grab him and tie him up. They must then destroy his arrow-cane plantations and lock him back up in the underworld. If not, his violence would eventually wipe out everything in the forest and sweep us far away. Until the elders taught me about the wind spirit *Yariporari,* I did not think there could be such a powerful evil being in the underworld! Yet despite the fact that he is so dangerous, the shamans can also make his image dance as *xapiri.* But in this case it is the image of his ancient form, his father spirit, whom they bring down to repel the epidemic fumes with which the white people fill the forest. It is so. Without the shamans' work, the forest would soon return to chaos, as I said. Rain and darkness, the thunders' anger, lightning and wind would never stop there. Only the *xapiri* can protect it and keep it solid and steady. This is why we follow in our ancestors' footsteps and become spirits with the *yākoana.* This makes the *xapiri* happy and therefore they continue to take care of us. White people do not know these things! They are satisfied with thinking that we are more ignorant than they are, just because they know how to produce machines, paper, and tape recorders!

People also complain to the shamans when the dry season lasts too long, when the banana plants and the sugarcane are parched in the gardens and the streams dry up in the forest. To put an end to drought, the shamans try to bring *Toorori,* the damp weather being and master of rain,[15] back into the forest. They send him their flood, rain, and chaos spirits, who are the images of the evil beings *Riori, Maari,* and *Xiwāripo,* to invite him to return. Then they send him the images of the cloudy weather and night beings, *Ruëri* and *Tītiri,* as reinforcements. Then little by little the shriveled rainy season being *Toorori* is able to pull himself out of the belly of the sun being *Mot^{h}okari,* who had swallowed him. Little by little, he comes back to life by pouring water on his head, then takes revenge and establishes himself in the forest in his turn. Once this happens, the rain starts to fall again.

I tried to make the rains come back myself, without really knowing this work the elders do. It was here, in *Watoriki,* already a long time ago.[16] The drought would not come to an end. The heat was getting more and more intense. The sun being *Mot^{h}okari* had come down from the sky's chest and had really put his feet down in the forest. *Omoari,* the dry season being, also seemed to want to settle in forever! He had dried up all the watercourses and had eaten his fill of fish and caimans. He had scorched the trees and roasted the ground. The stones had gotten burning hot. Game and humans suffered from thirst. The time had come to burn the plots of land we had cleared in the forest. We did so, but the wind carried sparks into the underbrush, which was too dry and covered in dead leaves. The surrounding forest began to burn. Then little by little the fire spread in every direction. When fire is so powerful, it is no longer friendly. It becomes an unknown and dangerous being who seizes every tree around him to build his house. He even started to ascend the slopes of the *Watoriki* mountain, not far from our house, right where the evil beings of the forest grow their own sorcery plants. We were very worried because we thought that these burning plants could spread a *xawara* epidemic on us. The smoke was constantly increasing. First it rose very high in the sky's chest. Then it came back down, getting lower and lower and thicker and thicker, and covered the entire forest. Our eyes were irritated and our chests dried out. We could not see anything around us and we were coughing all the time. It had become very difficult to breathe. We were afraid everything would burn and that we would die suffocated. We were really worried for our children, our houses, and our gardens.

Then I joined my father-in-law and the shamans of *Watoriki,* as well as a few others from neighboring houses whom I called up by radio,[17] and we drank the *yākoana* and started working to attract the rain. First we made *Omama*'s image dance to strike the fire and squash it. Then we called the thunder spirits and those of their sons-in-law to make the storm waters come and pour them on the blaze. We also brought down the storm wind being's image to push the smoke back into the sky and throw it far away from us. After that, little by little, the huge fire started to diminish. Our spirits drove away the dry weather being *Omoari* while admonishing him: "Go home! Don't try to stay here or the entire forest will burn with all its inhabitants!" Then they started to call back the rainy season being *Toorori* so he would wash the forest.

We worked like this for days, and finally the rain started to fall. If we

had not done so, all the trees of the forest would have burned, all the way to the white people's land, for this fire was not just a fire. It was a formidable evil being, a flesh-hungry fire spirit we call *Naikiari wakë*. This was the spirit of the *Mõruxi wakë* blaze who came out of the ground, the same one who had previously consumed the entire forest in the beginning of time. This fire comes from where the sun lives, and in the place where he comes from, the waters never stop boiling. His representative is what white people call a volcano. He is so powerful that he even burns sand and stones. In their night talks, the elders often told us of the fire that ravaged the highlands in *Omama*'s time. They told us that in some places the trees never grew back. So the bare land we call *purusi* at the sources of rivers is the trace of this ancient blaze's path. It did not appear by itself, without a reason![18] Yet the forest grew back in other places because the being of the earth's fertility, whom we call *Huture* or *Në roperi*, worked ceaselessly to replant it. He is an indefatigable worker. He repopulated the scorched earth with all its trees, but also its garden plants, manioc, banana plants, and *rasa si* peach palms so that our ancestors, their children, and grandchildren could feed themselves. If he had not existed, we would forever be famished and we would be sad to see!

In the past, when our elders used to become shamans under the effect of *hayakoari hana* sorcery leaves,[19] they were also able to call the images of the white-lipped peccaries and use them to attract these animals in the forest around their houses. One of the *Watoriki* house elders, whom I called brother-in-law, knew how to make the peccary spirits dance like that, but he is no longer. When he died, I saw his spirit house collapse and tear apart the *xapiri*'s fragile paths as it fell. He had warned us: "As soon as my ghost leaves for the sky's back, you will no longer see peccaries in the forest. Then you will lament yourselves over your meat hunger!" Yet while he was still alive no one had told him: "*Awe!* I too want to know how to tend the peccary spirits' paths so they won't run away!" I myself said nothing to him. I was still ignorant at the time. If I had done so, maybe this game wouldn't have vanished from the forest for so long?[20] But it is true that no one in that time was wise enough to hold on to these spirits' paths!

Only the shaman elders truly knew how to make the peccaries come out of the ground by calling their image. In the past, people often used

the *hayakoari hana* leaves for sorcery. But it is a plant that belongs to the *hutukarari* spirits of the sky. This is why those who were hit by its power became other without delay. They saw the image of the *Hayakoari* tapir-like being in front of them. Then they began to gesticulate elatedly and go yelling out of their house. But it was not really in the forest that they started running. Though their relatives could not see this, their image fled and rode the *Hayakoari* being all the way to his home, very far away. They remained lost in the forest like this for a long time while they had become other. At that moment, they started to see the images of the peccary ancestors dancing for them. Finally, they left the *Hayakoari* being's path and little by little they calmed down. They came back to their homes, guided by the *xapiri* of the shaman elders who came to their rescue. Without them, they would have died of hunger and exhaustion, forgotten on the *Hayakoari* being's mirror.

Later, as well-tried shamans, they were able to open the paths of the *worëri* peccary ancestors and make their images come down again. To call them, they would first send the spirits of the *xotokoma* birds,[21] who are their sons-in-law. These emissaries cut down trees to make an entrance into the forest for their fathers-in-law and hung magnificent bead ornaments there to attract them. Then they let their *t*^{h}*ora* bamboo flutes' call ring out so the *worëri* spirits came to dance near the shaman who sent them. After that the animal peccaries also drew close to our houses. This is how our elders worked to satisfy their people's hunger for game. Yet the peccary spirits' paths are very fragile. As soon as their father dies, they break and sink deep underground. The other shamans try everything to bring them back, but in vain. The peccary ancestors remain in the underworld until another young man becomes other under the effect of the *hayakoari hana* leaves and learns to call them again.

As for tapirs, they only appear within range of the hunters in the forest when the shamans succeed in bringing the image of the tapir ancestor *Xamari* there. To do so, they must first send their ocelot and hunting dog spirits to find his trail, then the spirits of the *xoapema* birds, *herama* falcons, and *ëxëma* woodpeckers to call him. Otherwise *Xamari* would continue sailing his pirogue on distant rivers. Tapirs like to laze about in the water, don't they? All these birds' spirits are his sons-in-law,[22] which is why he gladly answers their bamboo flutes' call and their invitation: "Father-in-law! Come to us! We are hungry for meat! We want you!" But he barely has time to say a friendly word to them before they tie a rope to

his pirogue and pull it to the riverbank with the help of the *kana* giant otter spirit. The tapir ancestor then disembarks to set foot in the forest. Right away, his sons-in-law take great pains to show him where he can find his favorite food: the fruits of the *rio kosi* and *ëri si* palms, as well as those of the *apia hi, oruxi hi, makina hi, hapakara hi,* and *pirima ahɨtʰoᵗʰo* trees. This is how shamans attract tapirs onto dry land so they can be hunted in the forest.

But even then they can only be spotted by very skillful trackers; those we call *xama xio,* "tapir's bottom."[23] Though they are not shamans, these hunters possess images of the tapir spirits and his sons-in-law inside them. These images come down to them and set up their hammocks in their chests, for their fathers were also great tapir hunters. Without their skill, we would never eat meat from this game! It is true! You never see a tapir when you merely think about your things and hunt without real interest. You only find tortoises on the forest floor like that! But if a hunter is truly in love with the tapir ancestor's image and longs for him,[24] he will easily spot one of these animals who have come from deep in the forest, even very close to his house.

This is how our long-ago shamans drew the peccaries and tapirs close to their homes, but also the spider monkeys, parrots, curassows, and deer. They drank the *yākoana* and made the *yarori* animal ancestors' images dance. And when they decided to bring the macaw spirits down to them, these birds were seen appearing in the forest. It was really so. Animals are only happy if their *xapiri* let their songs be heard, and the spirits do not like their fathers to laze about in their hammocks, not drinking the *yākoana.* Game only become easy to hunt if the shamans bring down their ancestors' images. It is so. Our elders from the past were very wise and knew how to do this work. They did not just sing in vain, as the white people often think, for if the shamans do not work relentlessly, game becomes irascible and fierce. It keeps complaining about hunters: "*Ma!* These are other people! They treat us without care. They are filthy, pouring our cooking juice outside their houses! Casually throwing our bones and skin into the forest! It is painful to see! Let's stay far away from them!" Animals are also human beings. This is why they turn away from us when we mistreat them. In the time of dream, I sometimes hear their unhappy and angry talk when they want to refuse themselves to the hunters. If you are really hungry for meat, you have to arrow the game with care and it must die on the spot. If it happens like this, the animals

are satisfied to have been rightly killed. Otherwise they flee far away, wounded and furious at humans.

THE *kori* and *napore* cacique birds and *piomari namo* jaybird never gather in the forest trees if they are not bearing fruit. Then no other bird will perch on them either. It is so. Parrots, toucans, macaws, curassows, agamis, guans, and *pokara* quails are in the habit of following caciques and jaybirds to their food. They feed on their leftovers, the fruits their noisy flocks peck at on the treetops or drop on the ground. This is why the shamans make cacique and jaybirds' spirits dance when they want winged game to be abundant in the forest again. These spirits' images make the fruit of the trees ripen to feed all the other bird spirits who are in love with them and follow them. People who have never drunk the *yākoana* do not realize this. They only hear the shamans sing in the night, without really understanding what they are doing. Yet when the forest has the value of hunger, the shamans send their cacique and jaybird *xapiri* very far in the direction of the setting sun in order to bring back the image of its fruit. Upon their return, the other bird spirits call out with joyful impatience: "*Awe!* We're finally going to eat! Let's ask them for our share of the food they're bringing back! We're ready for it! We are starving and in pain!" Then they all dash for this unhoped-for pittance in a happy troop. This is how winged game starts reappearing in the forest! First it comes back very far from us, then little by little it gets closer to our houses. The hunters pass the news along enthusiastically: "Game is eating near that river, and also that colony of trees, over there, and also in this other place!"

This was the work our great shamans used to do to attract game to their forest. Today we have lost this knowledge and many of our fathers had even forgotten it before us! Only the real long-ago elders were able to do it. They could gather a multitude of parrots and macaws on *hoko si* and *ōkarasi si* palms, where they played tamely, staying within range of hunters while they nibbled young leaves. It is true! Long ago, when my grandfathers lived at the sources of the Rio Tootobi, they really had this power! Sometimes they used it so the people of their house could eat their fill of bird flesh and decorate themselves with their feathers. They wanted to make them happy. And when their relatives were too hungry for meat, they even brought game from the ghosts' forest, which lies on

the sky's back! To do so, they used to send their *xapiri* to set the game running, so they could drive it and make it fall to earth. Shamans know that the ghosts' forest is covered in ever-abundant fruit trees and that there are far more peccaries, spider monkeys, curassows, and guans there than down here!

FOREST TREES and garden plants do not grow all by themselves, as white people think. Our forest is vast and beautiful. But it is not like this without reason. Its value of growth makes it so. This is what we call *në rope*.[25] Nothing would grow there without it. It comes and goes like a visitor, making plants grow everywhere on its path. When we drink the *yãkoana*, we see its image spreading all over the forest and making it damp and cool. In the trees, the leaves are bright green and the branches loaded with food. We see a profusion of *rasa si* peach palms, covered in heavy bunches of ripe fruit, hanging low on their thorny trunks, as well as vast plots of banana plants and sugarcane! The land's value of growth is at work everywhere. It creates the forest's abundance, feeding human beings and game. It makes all the plants and fruit we eat come out of the ground.[26] Its name is that of everything that flourishes in our gardens, as well as in the forest.[27]

In the beginning of time, *Omama* placed this value of growth inside the land where we live. Its image was later disseminated everywhere until it reached the white people's territory. Its real center is our forest home, where *Omama* came into existence. This is true. We live in the place where the father of *në rope* growth resides, the place from which he came into being. This is why his image, which we call *Në roperi*, dances with those of the animal ancestors as soon as we bring them down. When the forest has the value of hunger, shamans can drink the *yãkoana* to bring its value of growth's image back. Yet we never need to do this work where we live now, at *Watoriki*. Our land is beautiful and full of richness.[28] The evil being of hunger, *Ohiri*, remains far away and *Në roperi*, the image of growth, has danced by our side since we settled there. After each time of rain, she generously makes the trees' fruit and our garden plants grow. Everything flourishes easily and game eats in abundance from the trees, on the ground, and in the waters.

The image of *Në roperi*, the forest's richness, looks like a human being, but is invisible to ordinary people. She only lets their ghost eyes see

the food she makes grow. Only shamans can truly see her presentation dance. She comes to them preceded by a noisy troop of cacique birds and jaybird spirits, followed by a multitude of macaw, parrot, toucan, and curassow spirits. The *xapiri* leading the other birds are the image of growth's **companions**, they are her **collaborators**. She never dances without them. The shamans make them come down when the people of their house are hungry, for no food grows where their resounding call is not heard. These animal ancestors discovered and propagated the earth's fertility in the beginning of time. This is why today's birds, who are their ghosts, continue to eat the fruit of the forest. They are their representatives. This is what the elders say. But the forest's richness is also the images of the *yamanama* bees who make the trees' flowers bloom and spread sugar in their fruit and those of the papaya tree and sugarcane. It is also the images of the banana plant women and the *aro kohi* and *wari mahi* big trees, whose leaves are so lush.[29] In the highlands, the spirits of the *witiwitima namo* kite are responsible for the abundance of the *kaxa* caterpillar, the fruits of the *momo hi* trees and *xoo mosi* palms, and the edible flowers of the *nãi hi* tree.

As soon as the cacique birds and jaybird spirits' strident call rings out from every direction, one can also hear the low-pitched song of *Në roperi*, the spirit of plants' growth. He arrives dancing joyously, carrying all the food of the forest on his back. He looks like a human being, but he is other. He is much more beautiful! His eyes are magnificent and his hair looks like a profusion of yellow and white flowers. His body is covered in luminous down feathers and he wears a stark black saki tail headband. He moves slowly, followed by a company of images of trees, lianas, and leaves. He is surrounded by a noisy cloud of colorful bird spirits: *sei si*, *hutucama nakasi*, *ayokora* caciques, and small araçari toucans. He is also followed by a multitude of *yarori* animal ancestor spirits and *urihinari* forest spirits, waving frayed young palm leaves in an inebriating fragrance of flowers. He dances among them, brandishing the forest fruit he carries, which are also covered in a dazzling white down. I saw this image of the forest's richness in a dream after drinking the *yãkoana* all day long. She is truly superb! I even felt the smooth, sweet taste of her ripe fruit in my mouth!

Once he has finished his presentation dance, the *Në roperi* spirit of growth feeds the shaman who called him and sets up his mirror in a separate dwelling inside his father's spirit house, like the other *xapiri* do.

From this moment on, this shaman will know how to bring the forest's value of growth to his people. Without their knowledge, he will be able to make all the plants flourish and to cure the forest of its sterility. As soon as he makes his *Në roperi* spirit dance, the flowers will start blooming on the trees. Then their branches will become fertile and the fruit will develop in abundance. If the spirit of growth did not come down with his cacique birds and jaybird spirits, our land would remain barren and game would not come into our forest. These images of fertility make the animals' food grow, and ours too. And after that, it is *Omoari*, the dry season being, who puts heat down on the ground to help make the forest fruit ripen, for he eats it too!

In the past our shamans drank the *yãkoana* and exhorted their *xapiri*: "Our women and children are starving! Make the food in the forest grow!" Then they sent them to fetch the image of *në rope* growth very far away, where the *Huture* being who owns her lives, and they brought her back with them. Then the plants grew and the trees flowered along her path. She came all the way to their forest and continued on her way beyond. Today we are not as wise as our grandfathers, but we try to follow in their footsteps. They did not teach us how to bring the forest's growth back before they died. Yet now that we have also become spirits as they did, we too have learned to know the image of forest richness by making her dance in the time of dream. It is so. When the value of growth moves away from our houses, she does not come back by herself. The shamans must really work hard to bring her image back because without her the fruit of the trees and the plants of our gardens stop growing. Then they have to work often to keep her by our side, for she can always run away again, this time never to come back.

When this happens, it means *Ohiri*, the hunger being, has settled in the forest in her place. Having come from very far away, where the white people have nothing to eat, he lies in ambush to mistreat us. No matter how much we plant or how hard we work, nothing grows in our gardens, not bananas, not manioc, not sugarcane! All the cultivated plants shrivel up and the branches of the trees remain empty. Game becomes increasingly scarce. Then we say: "*Urihi a në ohi!* The forest has taken the value of hunger!" *Ohinari* is what white people call **poverty**. He is an evil being who kills little by little, through hunger. Once he has decided to settle in

the forest, he can stay in the same place for a very long time. When this happens, people soon have nearly nothing left to eat. Day after day, *Ohiri* blows his *yãkoana* powder in their nostrils and makes them become other. They constantly get weaker. Their limbs have no energy and they get dizzy. Their ears get blocked, their voice is dry, and their empty eyes are sad to see. Little by little they waste away and finally lose consciousness. Then they die, completely emaciated.

To avoid this, the shamans must drink their *yãkoana* again and again and send their *xapiri* after the *në rope* fertility image in distant forests or even on the sky's back. It is true. As I said, there is another value of growth above us. It is that of the ghosts and thunder beings who also eat the fruit of their forest and the plants from their gardens. Their forest abounds with *oruxi hi, mõra mahi, yawara hi* trees and many other fruit trees! Its richness is truly very great and the cacique birds and jaybird spirits can bring it back on earth. Yet the ghosts can also decide to let a little of this abundance fall down to humans on their own. This sometimes happens during their feasts, once they are sated and sing their *heri* songs, when they hear the women of the living complain of their hunger and ask them to give up some of their leftovers. In those places where the ghosts prove generous, the fruit of the forest trees and the *rasa si* peach palms in the gardens become abundant and the happy humans eat their fill.

In the beginning of time, *Koyori*, the ant ancestor,[30] discovered the gardens' value of growth when the forest was still transforming and passed it down to our elders of long ago. But he was not the one who made the forest's trees grow. It was *Omama*. *Koyori* worked alone in the forest all day long, until his people were intrigued by his long absences. He eluded their curiosity by pretending to cut down trees on the search for wild honey. But he was lying! In fact, he was secretly spending his time clearing the forest to open a huge garden, which he was constantly expanding. Yet there were no cultivated plants at the time. To make them grow, *Koyori* just tapped his foot on the ground and repeated: "May the roots of these plants grow! The maize will come out here! The banana plants here!" Then the maize and banana plant plantations instantly started to grow before his very eyes. *Koyori*'s mother-in-law was called *Poomari*. She was a quick-tempered old woman who constantly complained about her

son-in-law. She was furious that he spent so much time in the forest without bringing back any food for her. One day she finally lost her temper and insulted him by making fun of his prominent bottom. He decided to get revenge. He sent her to get maize farther and farther into his vast plantation so that she would lose her way. Finally, she got lost and in her distress she turned into a *poopoma* bird. You can still hear her resounding call in gardens: *"Pooo! Pooo!"* As for her son-in-law, he changed into a *koyo* ant.

Since then, shamans have known how to bring down the images of *Koyori* and his mother-in-law *Poomari*. I heard their songs when my wife's father made them dance and I often saw them in my dreams after drinking the *yākoana*. These images also own the earth's value of growth. This is how it first appeared. In the time when *Koyori* came into existence, there were no gardens yet. People only ate fruit from the forest. *Koyori* then called the *Në roperi* being of land richness for cultivated plants. He was the first to grow maize, banana plants, manioc, taro, and yams. He taught us this work. So even if a man is not a shaman, if he possesses *Koyori*'s image, it will help him to work in his garden without getting tired, whether he is sound or sick. You will never see him slumbering in his hammock! It will constantly make him want to open new plots in the forest and plant all sorts of food. It is so. When we work in our gardens, we also imitate the image of the giant *wāsikara* lizard who enables us to work hard in the sun without weakening. These images pass from a father to his son through his sperm, through the blood of his sperm.[31] They are invisible; they are deep inside us, in our thought, in our ghost, in our own image.[32]

In gardens, the spirits of the *horeto* dove look after the banana plants. They plant them along with humans and follow their growth, for these are also *në ropeyoma* fertility spirit women. However, the bat and spider monkey spirits are the ones to play and copulate with the banana plant shoots when they are still young women.[33] These *xapiri* make them pregnant with their value of growth and so they start to carry voluminous bunches of fruit.[34] This is true. Plants do not grow by themselves, without reason! Banana plants are plant-women. Their fruit are born because they are gravid and they give birth. The same is true of every plant that grows in gardens and the forest. First the plant-women are pregnant. Their pregnancy lasts for some time, then they deliver. This is when their

fruit appear. They are born like humans and animals. This is why the people of a house also call on shamans when their banana plantations have trouble growing or when they are in a hurry to have enough bananas to hold a *reahu* feast and their gardens are still young. They ask them to make their bat and spider monkey spirits dance so they will impregnate the banana plant–women and their fruit will develop quickly. These *xapiri* put their offspring and the taste of sugar in young banana plant shoots,[35] like human beings with their sperm! This is what they do; I have often seen them copulate like that in the time of dream.

As for the giant *waka* armadillo spirits, they are the owners of manioc tubers and their fertility.[36] They plant them along with humans and are the ones to make them grow. A man who possesses the image of this animal inside himself will have a very beautiful manioc plantation! This image will help him while he is working in his garden and his arms will be full of its value of growth. The man's manioc plant tubers will then become long and firm. It is so. If you ask them, the shamans can also call the spirit of the giant armadillo and make him dance to enlarge the tubers of a manioc plantation that is not yielding much. For *rasa si* peach palms, the shamans can also bring down the spirit of the *marokoaxirioma* bird,[37] who impregnates the *raxayoma* peach palm–women's image by slipping the eggs of their fruit around their necks. Then these fruit start to grow profusely. To stop them from prematurely dropping from their trunks, the *napore* cacique bird spirits also have to give their mothers baby slings in which to carry their heavy bunches like newborns.[38] Finally, the macaw spirits will be in charge of making them ripen.

THE SPIRIT of the small *yōriama* tinamou makes the *ara si* taro plants grow in our gardens. To increase the number of their tubers, shamans can also call his image and make his value of growth dance. Yet it is merely the forest soil that makes yams grow;[39] this soil that *Koyori* made fertile in the beginning of time. This ant ancestor's image also makes the maize plantations thrive, like he did in the past by tapping his foot on the ground. A very long time ago, our ancestors hosted their *reahu* feasts by offering their guests maize.[40] Today we do not grow much maize anymore. But the ant ancestor *Koyori* is the real keeper of the forest soil fertility anyway. He is also responsible for the growth of sugarcane and

sweet potato. We do not need to water the ground the way white people do for the food in our gardens to be abundant! The forest's *në rope* value of growth is enough. Without it, plants would remain ugly and shriveled up.

When what we have planted in our gardens really does not grow well, we sometimes think that enemy shamans might have diverted the forest's richness far from our home. Yet a shaman from a friendly house might also take it with him without meaning any harm. Once he has eaten his fill, a guest at a *reahu* feast might unwittingly steal the image of his hosts' forest's value of growth by dreaming. Having become a ghost under the effect of the plantain soup they had offered him,[41] he can bring the bat spirits who made these fruits grow back to his home so they can dance there too. It is so. If we drink a lot of plantain soup or peach palm fruit juice at a feast, we become other and at night the images of their fertility come to visit us. This happened to me once during a *reahu* feast with the *Xamat*^{h}*ari* of the *Kapirota u* River. I drank so much of their peach palm fruit juice that I stole the image of the *marokoaxirioma* bird who made these palm trees grow in their garden! He appeared to me during my sleep and followed me to make my own plantation in *Watoriki* grow! My hosts noticed, but did not hold it against me. They simply told me: "You can keep these fruits' *në rope* fertility! We will make another one come to our gardens!" But even when visitors carry away our plantations' richness, it does not last for long. The value of growth remains abundant in the forest and if our gardens take the value of hunger, our shamans drink the *yākoana* to bring it back home. And if need be we can also borrow the forest's fertility from a friendly house. So we tell the shamans there: "My people are hungry because my plantations are not growing well. I too would like to obtain the value of growth you possess! But I do not know how to do it!" In this case, they will prove generous and will make its image dance to give it to whoever asked for it.

Animals are just like humans. We eat our fill when our gardens are full of bananas and *rasa si* palm fruit and they eat their fill when the fruit of the forest trees is abundant.[42] This is their food as it is ours, for the animals we hunt are the ghosts of our ancestors transformed into game in

the beginning of time. Another group of the first human beings were hurled into the underworld, but these remained in the forest in which we too were created. We refer to them as game, but in fact we are all human. It is so. When the forest's richness runs away, the game becomes skinny and scarce, for this richness is what makes game prosper. The animals get fatter, then make young that grow and multiply in their turn because they feed on the forest's sweet, ripe fruit.[43] To live, their images must feed on the image of the forest's value of growth. This is why shamans also bring down the image of the game's fat with that of the forest's fertility. This tapir, peccary, and spider monkey fat comes from beyond the land of the white people's ancestors. It fattens up their **cattle** and also makes some of the white people very big! We call it *yarori pë wite*, the fat of the animal spirits.

Shamans must send the *napore* cacique and *hutuma*[44] birds' *xapiri* far into the distance to bring this game fat back into their forest. It comes from an unknown and ancient being who looks like a giant spider monkey and remains hidden downstream of the sky, where the sun is born.[45] This being is extremely adipose, for he keeps all the game's fat on himself and does not easily give it away. If he is late distributing it, the animals might remain too scrawny and sick to be hunted. Yet when his image is willing to come dancing down into the forest, they start to fatten up again, however many there are of them: monkeys, deer, tapirs, peccaries, curassows, guans, macaws, and parrots, as well as turtles and fish. When we sleep in a ghost state, having eaten our fill of plump game, this fat's image comes to stouten us up too! I myself have only seen this giant spider monkey being once, by drinking the *yākoana*. When he wants to make the game he owns fleshy, his image travels alone through the forest. He divides his fat up among all the animals along the way. Only the elders, the great shamans, can call him to fatten up the game. I do not know how to do it yet, and I do not want to pretend. I will try when I am certain that I will really know him. I do not want to behave like those shamans who constantly lie and brag about bringing down *xapiri* whom they have barely glimpsed and do not know anything about!

As I said, the *xapiri* travel and work in the forest, on the sky's back and under the earth, in every direction, innumerable and powerful, in order to protect us. They relentlessly attack evil beings and the epidemics that

try to devour us. They clean the wombs of women made sterile by *xapo kiki* sorcery things and copulate with them so they can have children by their husbands again.[46] They consolidate the forest when it becomes other and wants to transform itself. Without them, the plants of our gardens would not grow, the trees of our forest would not bear fruit, and game would remain skeletal. The forest would never stop having the value of hunger. They hold up the sky when it threatens to collapse, contain the thunders' anger, send the rain being's daughters away, and shut the storm winds in. They admonish the cloudy weather being and delay the nightfall being. They repel the night spirit and call the dew so that dawn breaks faster. They contain *Xiwāripo*, the chaos being, who wants to tangle up the forest when he smells the menstrual blood of girls who have left their seclusion enclosure too soon. They return the snakes and scorpions who fell from the sky's back to the place they came from. They keep the jaguar spirits' mirror closed to keep these animals from coming out of the ground, from the place where our ancestors found the egg that gave birth to them. It is true, the first jaguars were born from a huge egg! In the beginning of time, old women collecting crabs and shrimp in a stream found it floating in the water. Their curiosity piqued, they approached and heard it making a muffled roar. They carried it in a basket to their house where the people, though perplexed, finally cooked and ate it. After that they threw away the pieces of its shell outside their house and the people changed into jaguars who scattered all over the forest!

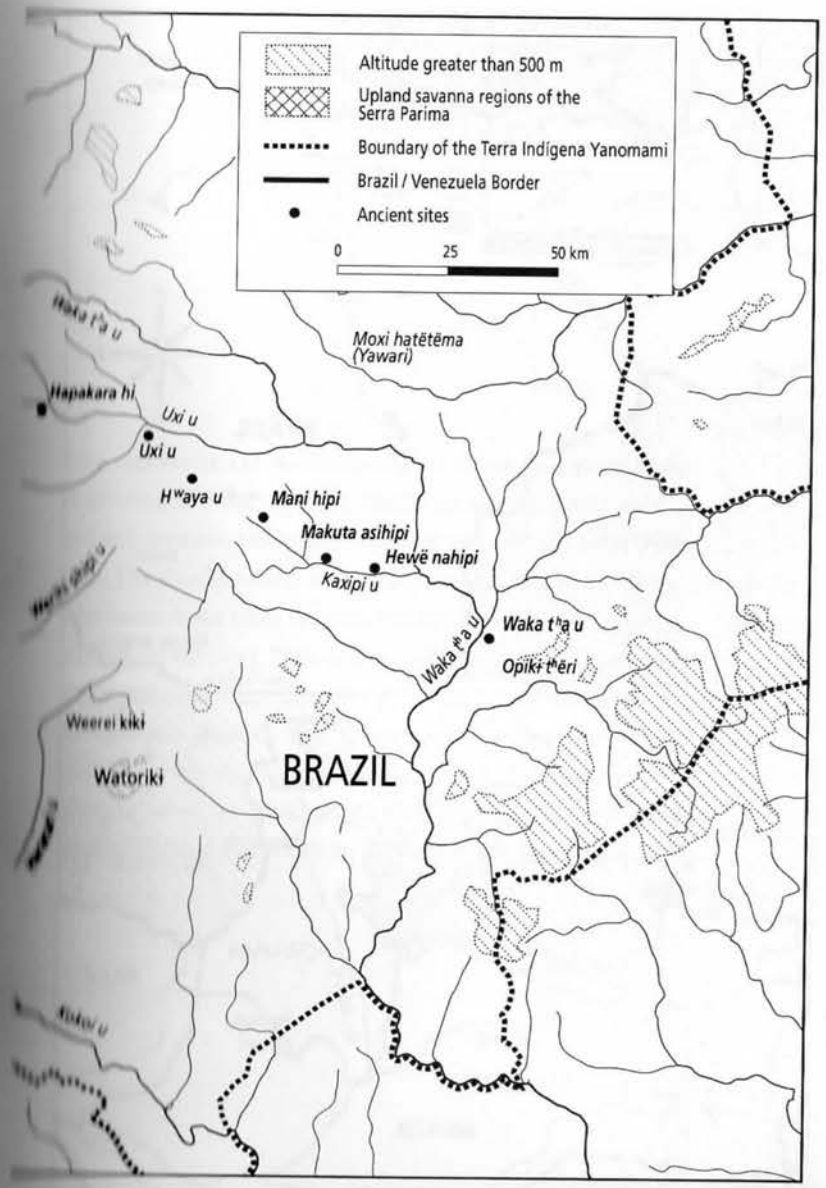
It is so. The *xapiri* defend us against all the evil things, darkness, hunger, and sickness. They repel them and combat them unceasingly. If they did not do this work, we would be sad to see! Wind, lightning, and rain would leave us no respite; the rivers would constantly rise and flood the forest. It would be infested with snakes, scorpions, and jaguars; invaded by evil beings and epidemics. Night would cover everything. We would have to stay hidden in our houses, starving and terrified. Then we would start to become other and the sky would eventually break apart again. This is why our ancestors started to make the *xapiri* dance in the beginning of time. Their concern has always been to protect their people, as *Omama* taught his son. We are only following in their footsteps. Yanomami shamans do not work for money the way white people's doctors do. They simply work so that the sky and forest remain in place, so that we can hunt, plant our gardens, and live in good health. Our ancients did not know of money. *Omama* did not give them any talk of this kind. Money

does not protect us, it does not fill our stomachs, it does not create our joy. For white people, it is different. They do not know how to dream with the spirits the way we do. They prefer to ignore that the shamans' work is to protect the earth, as much for us and our children as for them and theirs.

Location of cited ethnic groups. © F.-M. Le Tourneau/P. Mérienne

THE FOREST IS ALIVE. It can only die if the white people persist in destroying it. If they succeed, the rivers will disappear underground, the soil will crumble, the trees will shrivel up, and the stones will crack in the heat. The dried-up earth will become empty and silent. The *xapiri* spirits who come down from the mountains to play on their mirrors in the forest will escape far away. Their shaman fathers will no longer be able to call them and make them dance to protect us. They will be powerless to repel the epidemic fumes which devour us. They will no longer be able to hold back the evil beings who will turn the forest to chaos. We will die one after the other, the white people as well as us. All the shamans will finally perish. Then, if none of them survive to hold it up, the sky will fall.

—DAVI KOPENAWA



Detailed map of the Terra Indígena Yanomami (cited Yanomami toponyms).
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The Yanomami Territory in Brazil (Terra Indígena Yanomami).
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FRIDAY
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Guided by: Daphne Dragona

412 PROGRAM EARTH
Jennifer Gabrys

446 OCEAN SENSING AND NAVIGATING THE END OF THIS WORLD
Jennifer Gabrys

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PROGRAM EARTH

Environmental Sensing Technology and the Making of a Computational Planet

JENNIFER GABRYS

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Figure I.1. Scientists at the International Geophysical Year (IGY) 1957–1958 conference viewing *Sputnik* model. Photograph by Howard Sochurek, the *LIFE* Picture Collection. Courtesy of Getty Images.

INTRODUCTION

Environment as Experiment in Sensing Technology

THE EARTH BECAME PROGRAMMABLE, Marshall McLuhan once wrote, the moment that *Sputnik* was launched.[1] Rocketed into orbit on October 4, 1957, and circling around the earth every ninety-six minutes, *Sputnik* was a technological intervention that turned planetary relationships inside out. Inevitably, what springs to mind with McLuhan's easy statement about the transformation of the earth and our relationship to it are the familiar images of *Earthrise* and the *Blue Marble,* which are often pointed to as simultaneously signaling the rise of environmentalism as well as the distancing of the planet through a disembodied space view. And yet, *Earthrise,* an image captured by *Apollo 8,* was not to appear for another eleven years, in December 1968, and the whole-earth view of the *Blue Marble* did not appear until 1973.[2] In contrast, *Sputnik 1* generated not photographic icons of whole or fragile earths, but rather produced a series of inexplicable beeps through a radio transponder, and relayed information about the likely conditions of Earth's upper atmosphere.[3] If *Sputnik* made the earth programmable, it was in part through radio transmissions that encircled the planet and created a live auditory map of a new orbital environment.

Although the twenty-three-inch *Sputnik* did not offer up a *view* of Earth from afar, it did activate a multitude of new experiences for inhabiting the earth. While it sent a signal of Cold War triumph (and even suspected propaganda) for the Soviet Union, in the United States the orbital machine regularly pacing through the skies portended catastrophe, where GDP and money markets as well as science education were all feared to be on the brink.[4] The continual revolutions of *Sputnik* around the earth, which spurred viewing sessions of its orbits in numerous cities, recast spaces of earthly sensibility and began to reshape environments.

Launched during the International Geophysical Year 1957–1958 (IGY), *Sputnik 1* was in many ways a proof-of-concept technology, which contributed to the

development of a method for putting a satellite into orbit, while also testing the propagation of radio waves through the upper atmosphere and assessing the endurance of the satellite in space.[5] The testing of *Sputnik 1* further facilitated the development of *Sputnik 2* and *3*, which were launched in 1957 and 1958. *Sputnik 2* was sent into space complete with a dog, Laika, whose heartbeats could be heard through radio transmission. These later satellites were designed to be geophysical laboratories that collected data on the earth's magnetic field, radiation belt, and ionosphere. The remote sensing that the *Sputnik* triad undertook consisted of sending telemetry signals from space to Earth and of experimenting with the conditions necessary for developing a sensing laboratory that could eventually provide data about terrestrial ecologies through further satellite development.

Subsequent to *Sputnik*, satellites such as Landsat became key technologies for undertaking environmental monitoring, whether to detect change or to identify natural resources.[6] As Andrew Horowitz details in a 1973 issue of *Radical Software*, Eastman Kodak Company launched an advertisement in the *New York Times* that promoted the environmental benefits of satellite systems and detailed the endless possibilities for aerial monitoring to aid in the management of the environment, suggesting that this could not only reveal undiscovered dynamics within nature

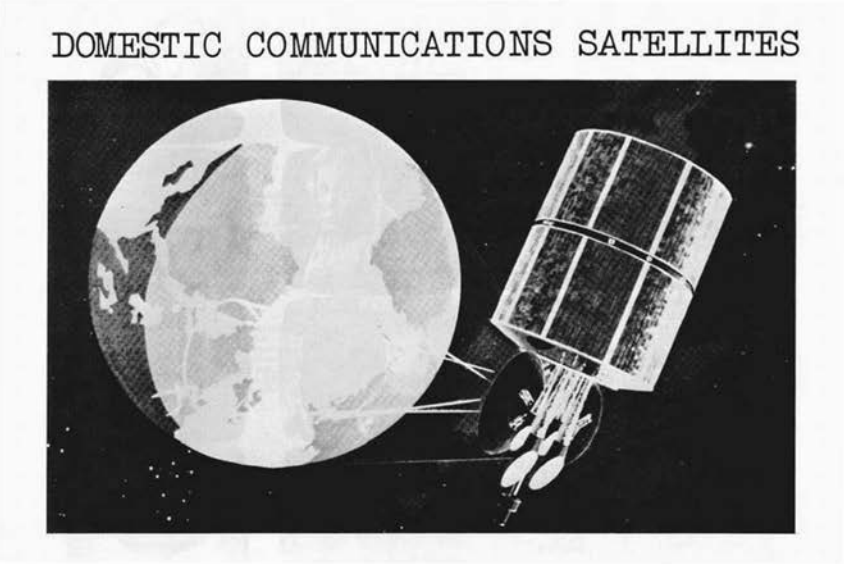

Figure I.2. Domestic communication satellites. Image from article by Andrew Horowitz, *Radical Software* 2, no. 5, chief editors Beryl Korot and Ira Schneider. Courtesy of Radical Software, copyright 1973 by the Raindance Foundation.

but also extend to identifying resources for extraction, and monitoring land use and living patterns.[7] Satellites were promoted as making an easy transition from military research and development to ecological and social applications.[8] Remote sensing developed into a critical technology and method within environmental science and became a crucial way in which to study environmental change on a global scale.[9]

Satellites now regularly monitor environmental change, tracking carbon dioxide in the atmosphere and patterns of deforestation. Satellites are referred to as "eyes in the sky" that communicate to ground stations while relaying data about and through environments, as they watch over earthly spaces and even transform the planet into a digital earth. Our understanding of environmental systems is now bound up with communication technologies that sense earthly processes. Satellites have played an important role in this development. And practices of monitoring environments have further developed from remote sensing to a more distributed array of sensing technologies.

I begin with this discussion of *Sputnik* and the programmability of the earth since this was a moment when a particular approach to sensing emerged that would inform monitoring and approaches to environments. However, what I attend to in this book is not a history of satellites or even Earth as understood from outer space. Instead, I develop an account of more recent developments in sensing technologies through distributed and networked environmental sensors within more earthly realms.

As it turns out, sensing has come down to earth since the time of *Sputnik*. Environments are now monitored not just by satellites but also increasingly by a wide range of sensors that track everything from air quality to traffic levels to microclimates and seismic activity. Such environmental monitoring is a practice that is computational, often networked, frequently automated, and increasingly ubiquitous. Many current scientific initiatives suggest that the monitoring of Earth processes remains one of the core areas of focus and development for the scientific understanding of environmental change. But sensors are also collecting data on any number of environmental processes that include managing cities and facilitating logistics, as well as providing and harvesting a range of data to and from smartphone users. The programmability of environments has expanded from the earth as enveloped in an orbital if experimental technology to a distributed and embedded range of monitoring technologies that inform how environments are sensed and managed. It is this explosion of environmental sensors and environmental sensing operations that I discuss in this book.

While there is much to debate in McLuhan's characterization of *Sputnik* and its relationship to "the natural world," I find the provocation of a planet that has become programmable a key point to take up in relation to the current proliferation

of environmental sensors. In his characteristically sweeping essay on media environments, which ranges from the death of Queen Victoria to poetry and newspapers as "corporate poems," as well as Xerox as enabling everyone to become a publisher, and the immersive experiences of electronic "man," McLuhan suggests that *Sputnik* is yet another communications-based revolution that remakes people and environments.

What might he have meant by this rather elliptical discussion, written seventeen years after the launch of *Sputnik 1*? If we take him at his word, *Sputnik* seems to have given birth to a new planet and new environment. As he writes, "Perhaps the largest conceivable revolution in information occurred on October 17, 1957, [*sic*] when *Sputnik* created a new environment for the planet."[10] The usual way to read McLuhan and his sudden leaps of logic would indicate that such a statement runs the risk of technological determinism, and so it might. But I take up in a rather different way the provocation that this proto-remote-sensing device—and that our newer environmental sensing devices—are creating new environments and are programming Earth in distinct ways. I also depart from McLuhan in his understanding of the programmability of the planet, where he goes on to render *Sputnik* as yet another "extension of man," to consider instead how programmability might signal a quite different and distributed way of remaking environments. Programmability, the programming of Earth, yields processes for making new environments not necessarily as extensions of humans, but rather as new configurations or "techno-geographies" that concretize across technologies, people, practices, and nonhuman entities.[11]

Program Earth addresses the programmability of the planet by focusing on the *becoming environmental of computation*. I understand computation to include computationally enabled sensors that are distinct and yet shifting media formations that traverse hardware and software, silicon and glass, minerals and plastic, server farms and landfills, as well as the environments and entities that would be sensed. In other words, I am attending to the extended scope of computation that includes its environmental processes, materialities, and effects. Through discussing specific instances where sensors are deployed for environmental study, citizen engagement, and urban sustainability across three areas of environmental sensing, from wild sensing to pollution sensing and urban sensing, I ask how sensor technologies are generating distinct ways of programming and concretizing environments and environmental relations. I further consider how sensors inform our engagements with environmental processes and politics, and in what ways we might engage with the "*technicity*" of environmental sensors to consider the possibility for other types of relations with these technologies.[12] But before I unfold these concepts and explain how they are important for attending to the specific capacities of these machines, I first provide a bit more background on the growing sensorization of environments.

Figure I.3. Types of sensors. Sensors detect and measure stimuli through a wide range of inputs, including chemical, mechanical, and biological sources. The sensor assemblage typically involves using electronics and software to convert stimuli into electrical and digital signals. Screen capture.

GROUNDING SENSE

While satellites eventually became fully equipped with numerous sensor packages, sensors for use in environmental monitoring on the ground have also proliferated from initial military use to scientific study and commercial deployment. Nonnetworked and analog sensors have been in use in multiple applications for some time, and depending upon how one classifies sensors these could include cameras and microphones, not to mention sensors for use in applications such as radiation detection. For instance, in his work related to the Association for Computing Machinery (ACM) "Working Group on Socially Desirable Applications of Computers" and the "Citizen's Committee for Radiation Information," Edmund Berkeley proposed that radiation sensors could be put to work for political and environmental purposes to better understand radiation hazards and in aid of nuclear disarmament during the Cold War.[13] But the development of one of the first *sensor networks* has been traced to the air dropping of seismic and acoustic

sensors by the U.S. military in Project Igloo, where sensors were used to detect movement along the Ho Chi Minh Trail in Vietnam.[14]

Beyond these early instances of sensors and sensor networks, however, the most usual reference for discussing the distributed and networked possibilities of sensors in the form of ubiquitous computing is Mark Weiser's 1991 text, "The Computer for the 21st-Century." Weiser makes the case for computing—and the sensors that would facilitate computational operations—to be distributed in and through environments. Identifying how computers were already present "in light switches, thermostats, stereos and ovens [that] help to activate the world,"[15] Weiser suggested these technologies might allow computing to "disappear" into the fabric of everyday life. Rather than the well-known trope of engagement that involves making the invisible visible, Weiser advocated for further invisibility, to develop computing not as a project principally of cognition and awareness, but rather as something that is integrated into environments and experience.

To this end, Weiser stressed that ubiquitous computing was not simply a project of populating far-flung places with computers. As he writes, "'Ubiquitous computing' in this context does not mean just computers that can be carried to the beach, jungle or airport." Such a strategy would still be focused on the self-contained box-like quality of computing, which would remain a discrete object demanding attention. Weiser emphasizes that ubiquitous computing is not "virtual reality, which attempts to make a world inside the computer." Rather than simulating worlds, he was interested to enhance the world already in existence by making computing an invisible force that runs through the background of everyday life.[16] And he imagined this would take place through networked and computationally enabled sensors.

A growing wave of interest in sensors and ubiquitous computing has occurred on either side of Weiser's proposal, from the 1984 launch of *Sensor Magazine,* to the proposal for technologies such as "smart dust" in 1998 (ambitiously micro-scaled sensors that were imagined to drift in clouds or swarms and monitor environments), to the coining of the term "Internet of Things" in 1999.[17] "Earth Donning an Electronic Skin," a 1999 article in *Business Week,* made predictions for the imminent encircling of the planet in electronic sensors that would measure and transmit data from millions of points:

> In the next century, planet earth will don an electronic skin. It will use the Internet as a scaffold to support and transmit its sensations. This skin is already being stitched together. It consists of millions of embedded electronic measuring devices: thermostats, pressure gauges, pollution detectors, cameras, microphones, glucose sensors, EKGs, electroencephalographs. These will probe and monitor cities and endangered species, the atmosphere, our ships, highways and fleets of trucks, our conversations, our bodies—even our dreams.[18]

Moving well beyond the singular object of *Sputnik* in space, this article presents a much different vision for a programmable earth, composed of the implementation of "trillions of such telemetric systems, each with a microprocessor brain and a radio,"[19] which would gather and transmit data on the ground by monitoring people, infrastructures, and events. No realm fell outside the reach of these sensor systems, where even dream activity could be surveyed.

A planetary brain, working through parallel and distributed computing, these electronic devices were envisioned to eventually form "a whole ecology, an information environment that's massively connected."[20] Imagined as a "huge digital creature," this ecosystem of electronic sensors, software, and communication networks was intended to be designed to "help human beings, not harm them."[21] With the planetary sensing fabric in place, scientists and technologists could then also turn their attention back to outer space, where this sensory network could spread to Mars and beyond.

While this vision for an electronic sensory network spanning the planet is now nearly two decades past, it continues to influence developments in environmental sensing and the Internet of Things. Today, sensors can be found in traffic infrastructure and ocean buoys, as well as in trees in forests and planted in soil underground. Sensors are used to manage urban traffic flows and to aid in the movement of freight, to signal flooding alerts, and to enable rapid responses in disaster situations. Sensors are located in environments, attached to infrastructure, fixed to vehicles, ported around as wearables, and embedded in smartphones, of which there are now one billion sold every year.[22] As an IBM video pitch for a "Smarter Planet" explains, the increasing instrumentation of the planet is meant to give rise to a "system of systems" that will facilitate heightened levels of observation, responsiveness, and efficiency.[23] "New insights, new activity, new forms of social relations" are meant to come together through an instrumented planet, which as "an information creation and transmission system" becomes newly intelligible. In the aspirations of the Smarter Planet vision, networked environmental sensors make it possible to listen in on a planet that has always been "talking to us," but which we can only now begin to hear.[24]

The drive to instrument the planet, to make the earth programmable not primarily from outer space but from within the contours of earthly space, has translated into a situation where there are now more "things" connected to the Internet than there are people. Some commentators suggest that the defining moment for implementing the Internet of Things was in 2008, when machinic connectivity to the Internet outnumbered human connectivity.[25] Sensing occurs across things and people, through environments and within infrastructures. People-to-people communication is becoming a smaller proportion of Internet and networked traffic in the complex array of machine-to-machine (M2M), machine-to-people (M2P), and people-to-people (P2P) circuits of communication. Cisco has projected,

somewhat fantastically, that there could be fifty billion connected objects in circulation by 2020.[26] Many more objects than this could be eventually interconnected, since the IPv6 address system creates 10^{30} Internet addresses per person.[27] Intel ultimately envisions a future where sensors will be monitoring and reacting to us at every second, which would involve "altering reality as we know it."[28]

The basic diagrammatic flow of how sensors are meant to improve environmental understanding and responsiveness goes something like this: Distributed computational sensors monitor real-time events while collecting data on environmental conditions. Data on phenomena such as air quality and temperature, as well as location and speed of bodies and objects, are processed and trigger responses that may be human- or machine-based. These responses are often oriented toward making systems and processes more efficient or "balanced." The real-time "intelligence" provided by sensors is meant to translate into smart systems that continually enable corrective actions. The ambition is that environments and infrastructure can be managed intelligently and cohesively with networked sensor data. Preventative decisions can be taken. And major events such as floods can be instantly reported to ensure intelligent and immediate environmental management.[29]

Sensors are devices that typically translate chemical and mechanical stimuli such as light, temperature, gas concentration, speed, and vibration across analogue and digital sensors into electrical resistors and voltage signals. Voltage signals further trigger digital circuits to output a series of conversions into zeros and ones, which are processed to form readable measurements and data.[30] Data points are captured from a distributed multiplicity of sensors that are often measuring simple variables. By sensing environmental conditions as well as detecting changes in environmental patterns, sensors are generating stores of data that, through algorithmic parsing and processing, are meant to activate responses, whether automated or human-based, so that a more seamless, intelligent, efficient, and potentially profitable set of processes may unfold. Yet what are the implications for wiring up environments in these ways, and how does the sensor-actuator logic implicit in these technologies not only program environments but also program the sorts of citizens and collectives that might concretize through these processes? *Program Earth* takes up these questions and examines the distinct environments, exchanges, and individuals that take hold through these sensorized projects.

THE BECOMING ENVIRONMENTAL OF COMPUTATION

When Weiser made the case that computing should recede into the background, he signaled toward the ways in which environments would become the experiential envelope through which computing would unfold. Computation was to become environmental, or to become even more environmental than it already was. However, at the time of his writing he notes, "Silicon-based technology . . . is far from having become part of the environment," since although "more than

50 million personal computers have been sold," nevertheless, "the computer nonetheless remains largely in a world of its own."[31] The environment that Weiser would have computing disappear into was a very particular type of milieu, one of inattention and everyday activity, an automated surround that did not require reflection or focus. But the ways in which computation becomes environmental are not necessarily always a project of disappearing as such, and Weiser articulated a distinct way of understanding what the environment is or would be as computing became more pervasive.

While Weiser suggested that ubiquitous computing would be a way to enhance reality, and Intel goes so far as to propose that sensor networks will create new versions of the real, I take up the work of writers such as Gilbert Simondon and Albert North Whitehead to consider how these technologies are involved in individuating and concrescing environments, entities, and relations. Simondon uses the term "individuate" to describe the processes whereby individuals and collectives take form as they concretize from a "preindividual reserve." For Simondon, not only are individuals not automatically given but also the process of becoming individual is always incomplete and continues to provoke new modes of becoming and individuation.[32] Whitehead uses the term "concresce" to capture ways in which actual entities and actual occasions are realized and joined up as distinct and immanent creatures.[33] In not dissimilar ways, these writers and philosophers are searching for and establishing a set of concepts that help us approach entities not as detached objects for our subjective sensing and contemplation, but rather as processes in and through which experience, environments, and subjects individuate, relate, and gain consistency.

"Environment" as a term has multiple resonances and genealogies. Within this space of examining ubiquitous computing and sensor networks, I consider specifically how environments inform the development of sensor technologies and how these technologies also contribute to new environmental conditions. Not only do computational technologies become environmental in distinct ways, the environments they populate are also in process. The *becoming environmental of computation* then signals that environments are not fixed backdrops for the implementation of sensor devices, but rather are involved in processes of becoming along with these technologies. Environment is not the ground or fundamental condition against which sensor technologies form, but rather develops with and through sensor technologies as they take hold and concresce in these contexts. Distinct environmental conditions settle and sediment along with these technologies as they gain a foothold.[34] These processes involve not just the creation of the entities and environments that are mutually informed but also the generation of the *relations* that join up entities and environments.

As much as computation becoming environmental, this discussion also attends to the ways in which environments become computational, or programmable.

Following Whitehead, this would be a way of saying that environments and entities concresce through processes of relating (as well as excluding) and as units of relatedness and modes of prehension that involve each other.[35] From this perspective, it is possible to see that Whitehead's notion of concrescence does not entail a simple adding together of preformed subjects and objects into an assemblage, but rather articulates the very processes by which entities are parsed, are able to conjoin (or not), and persist in environments. Relations, furthermore, do not precede the acts of relating and are specific to the entities and environments that concresce. Following Simondon and his notion of concretization, this would be another way of saying that how individuals and collectives are individuated gives rise not just to individuals and the environments in which they form but also the relations and potential—especially collective potential—expressed across those entities.

Far from being passive matter upon which human or nonhuman "sense" operates, environments in this way are an active part of how actual entities come to concresce and relate, how organisms endure, and how values—including those values implicit in technology—are expressed.[36] These distinctions and approaches are important since, in discussing the ways in which environments are sensed and monitored by sensor networks, I am bypassing an automatic understanding of sensors as merely detecting preformed environmental data as though there is a world of substantialist phenomena to be processed by a cognizing device. Instead, I consider how distinct environments and environmental relations emerge, take hold, and are programmed with and through these technologies.

Programming Environments, Programming Sense

Sensing is in fact a key part of the way in which computation works, as described in early diagrams outlining the basic components of a computing machine.[37] From input to logic, memory, control, and output, the five basic components of the von Neumann–influenced computer architecture depend upon sensing as part of the process by which computation works in the world. While the modes of input might consist of everything from keyboards to scanners to microphones, the point is that each of these "peripherals" is engaged in a transformation and conversion process. Sensing (broadly understood) in this arrangement has to do with all the ways in which computers input data into internal calculative processes in order to output data in another form. Sensors (as more specific input devices) emerged within this computational arrangement as just one of many possible devices for inputting data into the machine. With this system of input-output, it would seem that you simply need to get a bit of the environment into the machine, process that input, and output the results for onward action.

Environmental monitoring and sensing are inevitably situated within this computational diagram. On one level, environmental sensors are input devices

that facilitate monitoring, measuring, and computing. Yet on another level, environmental sensors can be described as engaged in processes of individuating by creating resonances within a milieu, where individual units or variables of temperature and light levels, for instance, are also operationalizing environments in order to become computable. Simondon uses the term "in-forming" as a way to indicate exactly how information-related processes are also ways of giving form, above and beyond an epistemological project, since for Simondon in-forming involves registers of affect and experience as much as cognition and rationality. Sensing is then not just a process of generating information but also a way of informing experience.

The title of this introduction, "environment as *experiment in sensing* technology," speaks to the ways in which programming and programmability are approached in this book as experimental engagements in individuating—through sensing—environments. This is not an experimentalism that requires a control subject in order to understand results against a stable indicator. Rather, it is a more speculative way of asking what new entities and environments concresce through computational and distributed sensors. Programmability, in this way, is approached less as an ontology and more as an ontogenesis,[38] where processes of operationalizing environments put dynamic attributes into play rather than simply writing a script against which a workflow is executed.

In her discussion of the "regime of computation," Hayles suggests a salient characteristic of computation is that it is more than a practice of observing and simulating—it is also a process of *generating* new conditions.[39] While one could argue that multiple practices of scientific instrumentation are also generative, Hayles calls attention to the ways in which—within its own inherent logic—computation undertakes generative, rather than merely descriptive, engagements. Computing computes. It processes data to arrive at another point of synthesis. Programming is a way of making operative. In some ways, it attempts to enable processes of self-replication and automaticity. In other ways, it unfurls processes that are potentially open-ended and even speculative.[40] Throughout *Program Earth,* I address these varying ways of understanding programmability in relation to the becoming environmental of computation to consider how environments become programmable and are made to be operational through sensor technologies, as well as the ways in which they might open into speculative engagements and inhabitations.

"Programmability," as I employ the term, has a somewhat wider use than just software or code. Instead, this expanded engagement with programmability considers how code is not a discursive structure or rule that acts on things, but rather is an embodied and embedded set of operations that are articulated across devices, environments, practices, and imaginations.[41] Programmability then exceeds software (and even computation) to encompass the formation of events, spaces, and

things. In this study, I open the concept and practice of programmability out into a question of how environments are generated and made operational through sensors and to the ways in which programmability often yields unpredictable (or unscripted) results.

The Multiple Milieus of Environmental Computation

In developing this analysis of the processual environments of sensor technologies, I work across discussions of environments, milieus, technologies, and sensing practices as found in Simondon, Whitehead, Isabelle Stengers, Michel Foucault, and Georges Canguilhem to consider the implications of how computation becomes environmental, and to what a/effects. I start from a point of understanding environments as made up of multiple milieus. "Milieu" is a term with a rich and long history within the history of science and technology, and as Canguilhem draws out in his arresting analysis of milieus, the term has moved from connoting a mechanical-fluid space, to something like the ether, a seemingly necessary binding agent or surround that would bring entities into communication even if not directly connected, an environment influencing genetic adaptation and evolution, and to the contrary, even an environment to which living entities are indifferent.[42]

Both Simondon and Foucault were students of Canguilhem's, and both use milieu as a way to variously describe spaces of transfer, influence, and environmental inhabitation. Foucault's use of milieu often signals the material-spatial conditions in and through which modes of governance may be experienced and lived.[43] Milieus in this respect have relevance for discussions of power and politics. Simondon used multiple terms in his discussion of milieu, including inner milieu, exterior milieu, and associated milieu. These concepts describe the processes whereby environments and entities are formed across individuals (inner) and environments (exterior) through energetic and material exchanges that occur through the transversal field of the associated milieu.[44]

I take up these discussions of milieus to consider how they become situated and multiple zones of transfer and inhabitation within environments. My use of the term "environment" is perhaps closest to Simondon's exterior milieu, which is one milieu of several that designate spaces in communication. I also draw connections across these discussions of milieu to engage with Whitehead's designation of environment as the processual condition and datum influencing the formation of feeling subjects. Environment and milieu are concepts that are threaded throughout Whitehead's and Simondon's approaches to the processual formation of subjects. In varying but not dissimilar ways, for both Whitehead and Simondon there is no such thing as a founding or original subject that cognizes discrete objects. Instead, subjects concresce together with environments to form

subject-superjects, where everything—even a stone, as Whitehead would say—counts as an experiencing subject;[45] or where everything is individuated from a shared preindividual reserve, which includes a preformed collective of nonhumans both natural and technical, as Simondon has noted.[46]

In his rather distinct understanding of "mediation," Simondon develops a use of this term that addresses phases of being and becoming that occur through communication. As an example, he describes a plant communicating and mediating between the cosmic and the mineral, the sky and the ground, taking up and transforming energies and materials through its processes. The *associated milieu* operates as this mediatory space, a transversal ground through which transformations play out and new phases of being emerge. Mediation is not, however, a negotiation between two preformed units, but rather is a process in and through which entities transindividuate through communicative exchange. And it is not simply the entities that are individuated but also a milieu with which these entities interact. As Muriel Combes writes in relation to Simondon, "No individual would be able to exist without a milieu that is its complement, arising simultaneously from the operation of individuation: for this reason, the individual should be seen as but a partial result of the operation bringing it forth."[47]

I take up a parallel approach to how sensors harness energies and materials, transforming their own configurations and the environments they would tap into in the process.[48] Sensors are exchangers between earthly processes, modified electric cosmos, human and nonhuman individuals. The environmental computation that materializes here could be described as individual-milieu dyads that become as they communicate, subject-superjects that concresce as entities, and thereby enable particular environments to materialize and sediment. In this way, I am extending an understanding of communication-as-exchange to address the programmability of environments, the conversions across electronics and environments, and the material redistributions of environments and electronics through distinct phases and processes of individuation.

Planetary Computerization and Media Ecologies

The programmability of the earth and its environments as operation-spaces activates distinct ways of approaching the planet as a modifiable object. However, the earth of *Program Earth* is not a stable object undergoing a certain modification. Instead, one could say that, from *Sputnik* to the multiplicity of networked sensors that have since developed, sensing technologies are involved in parsing and making present certain entities and capacities that are bound up in the relational project of programmability. The "earth," as this discussion so far has suggested, is an entity that might be approached as both an antecedent object or datum as well as an entity in process and formed through modes of individuation and concrescence

that enable this entity to stabilize and have consistency—as a unit of relatedness, concern, observation, and experience. The planetary then describes processes of individuation and concrescence that in-form the potential of this entity, Earth, to take hold and be experienced in particular ways. Programmability is one way of characterizing a particular process of individuation and concrescence that activates the planet and its entities as an operation space.

Earthly observations can be generative of distinct engagements and relationships. As discussed earlier, *Earthrise* is typically discussed as sparking international environmental initiatives through a "Spaceship Earth" photographic perspective and a counterculture ethos that was simultaneously a sort of neoliberalism in the making.[49] A planetary perspective can at once prove to be limiting and enabling for environmental practices.[50] It can also be the basis for an "infrastructural globalism," as Paul Edwards argues, that binds certain types of scientific practice together in the interest of understanding the planet as a discrete system.[51]

If the satellite view has largely been narrated as a project of making a global observation system and of seeing the earth as a whole object, then the more distributed monitoring performed by environmental sensors points to the ways in which the earth might be rendered not as one world, but as many. Here are multiple earths, in process, programmed and in operation, unfolding through distinct environmental conditions, sites of study, and responsive inhabitations. Where global observation systems might be working toward a planetary-scale project of knowing the earth as an entire system through (ideally) linked-up data sets,[52] in contrast multiple earths are articulated through numerous distributed sensors that as currently implemented rarely form a "system of systems," and more likely produce discrete and localized data sets for particular purposes. What "counts" as an environment—and Earth—then concresces in different ways in relation to the sensors sensing within distinct conditions.

The multiple "views" or "senses" that environmental sensors concretize might be approached through the machinic polyphony described by Félix Guattari in his discussion of "the age of planetary computerization."[53] At the time of his writing, Guattari suggested there was an emerging age characterized by a "polyphony of machine voices along with human voices, with databanks, artificial intelligence, etc." In addition, "New materials made to order by chemistry (plastic matters, new alloys, semi-conductors, etc.)" would take the place of previous materials. In this age, where time and experience were shifting, "the temporality put to work by microprocessors, enormous quantities of data and problems can be processed in miniscule periods of time." With the new machinic subjectivities that he anticipated would arise, as well as the "indefinite remodeling of living forms" that would occur through "biological engineering," he imagined there would be "a radical modification of the conditions of life on the planet, and as a consequence, all the ethological and imaginary references relating to it."[54]

Guattari captures a sense of how the earth and its inhabitants are remade through planetary computerization. In resonance with Simondon, Guattari identifies how the material, energetic, and machinic conditions that take hold and gain consistency become the basis both for remaking environments and remaking the human-machinic subjectivities that unfold in those environments.[55] In this sense, environments are not merely antecedent objects to be translated through informational devices, but rather are entities that concretize along with technologies. Computerization, in Guattari's view, becomes at once planetary and polyphonous, generating new living conditions, subjectivities, and imaginaries.

As the planet becomes a space of newly modified connections and relations, it also joins up and gives rise to new ecologies. McLuhan described *Sputnik* as a machine for generating ecologies.[56] The programmability that he identified as being key to this proto-remote-sensing technology was bound up with notions of what environments are and what it means to monitor and understand them. Contemporaneous with *Sputnik* and the rise of remote sensing, ecology shifted from an embedded field practice to an informational and even cybernetic undertaking, where the earth materialized as an object of management and programmability.

"Ecology" is a term that has multiple resonances and, as discussed throughout this study, also refers to informational or cybernetic management of environments as much as a philosophy of interconnectedness. Moreover, our post–World War II understanding of ecology is predominantly articulated through communication technologies, systems theories, and information science.[57] Donna Haraway has described how ecosystems, similar to immune systems or organisms, materialize through specific technoscientific practices that are in-formed by cybernetic logics. She therefore suggests a project of "probing the history and utility of the concept of the ecosystem."[58] Numerous texts—many of them referring to Haraway's early insights—engage with the question of how information theory and cybernetics have influenced the understanding and practice of ecology.[59] I draw on these informational and cybernetic approaches to ecology to consider how environmental processes and relations are not only increasingly studied through computational technology but also seen to be analogous to computational processes. Read through devices such as sensors and satellites, and assembled into networks and code, ecology is now a shifting entity that typically becomes visible—and manageable—as information. In this way, such ecologies in-form our lived material, political, and ethical engagements, and they contribute to the scope of our environmental practices.

Clearly, in developing these articulations of environment and ecology, I am also situating this work in relation to research on *media* ecologies. "Media ecologies" as a term and area of media research has expanded from its former associations, where ecologies and environments might have been used rather interchangeably to discuss the at-times deterministic effects that media spaces were assumed to

have on subjects.[60] Newer work on media ecologies focuses on discussing the material-spatial conditions of media as part of an extended way of understanding what media are and the effects they have—encompassing but also extending beyond devices.[61] More recent approaches to media ecologies also draw extensively on Guattari's notion of the "three ecologies," which makes the case for approaching ecologies across mental, socio-cultural and environmental realms.[62] Within this space, some work on media ecologies goes so far as to even disavow the use of the term "environment" as a problematic term leaning toward unquestioned environmentalisms.[63]

An important point of clarification that is stressed throughout *Program Earth* is that a practice of attending to the milieus of media technology does not automatically translate into an environmental*ist* encounter with media. While these are often discussed in the same space in relation to sensors for environmental monitoring, I make a point of understanding "environment" as not always already environmentalist in order to consider the distinct ways in which environmentalist practices and politics concresce in and through computation technologies as they become environmental. Environmentalism might then be articulated as a response to having monitored environments, for example, in relation to declining habitat or increasing temperatures. Or it might provide the impetus to monitor in the first place, where sensors are tuned to looking for patterns of change or disturbance, and where data is seen as the necessary resource for motivating political action.

Furthermore, "environmental media" as a term often signals a media-based focus on environmentalist topics and environmentalist modes of representation, or alternately points to the "greenness of media." However, I discuss the becoming environmental of computation through the technoscientific processes that environmental sensors enable, rather than assume that this is automatically a project in sustainability.[64] Computational media unfolds not only through the capacities of devices but also through their environmental entanglements and effects, where material conditions such as soil and air together with circuits and screens generate concrete sensor-entities and experiences. With this focus, I am also building on my previous work that has attempted to draw out the environmental aspects of media by, on the one hand, attending to the atmospheric modalities and milieus of media and,[65] on the other hand, by considering the environmental effects of media in the form of electronic waste, which includes disposed gadgets as well as the extended spaces of mining, manufacturing, use, storage, recycling, and decay in and through which electronics circulate.[66] Computational technologies are constitutive of environments, have environmental effects, and also in-form environmentalist practices.

Program Earth then builds on research into media ecologies while making a distinction between environment as referring to *conditions* that form through multiple milieus, in the first instance, and to ecology as articulating the *connections* that take shape within a milieu and across environments, in the second instance, as a way to develop sufficient analytical clarity to be able to discuss both the connections and the conditions whereby the environmental media of sensors take hold. By making this distinction, I am also working in relation to the descriptions of ecology made within scientific literature, which this study draws on in considering how computational sensors are used to study environmental change and advance engagements in citizen sensing.

As mentioned above, the earth in *Program Earth* is not a whole or singular figure. Instead, the earth articulated here is multiple in the ways in which it is put to work, and in the ways it is drawn into experiences of environmental change, practices of environmental citizenship, and optimizations of urban systems. In this sense, I look at this multiplicity not to celebrate the more-than-singular ways in which earth-ness is animated, but instead to consider how a multiplication and accumulation of programming-earth projects shifts the ways in which the practices and effects of digital media unfold. And one of the primary ways in which I take up these environmental sensing practices is by examining the modes of

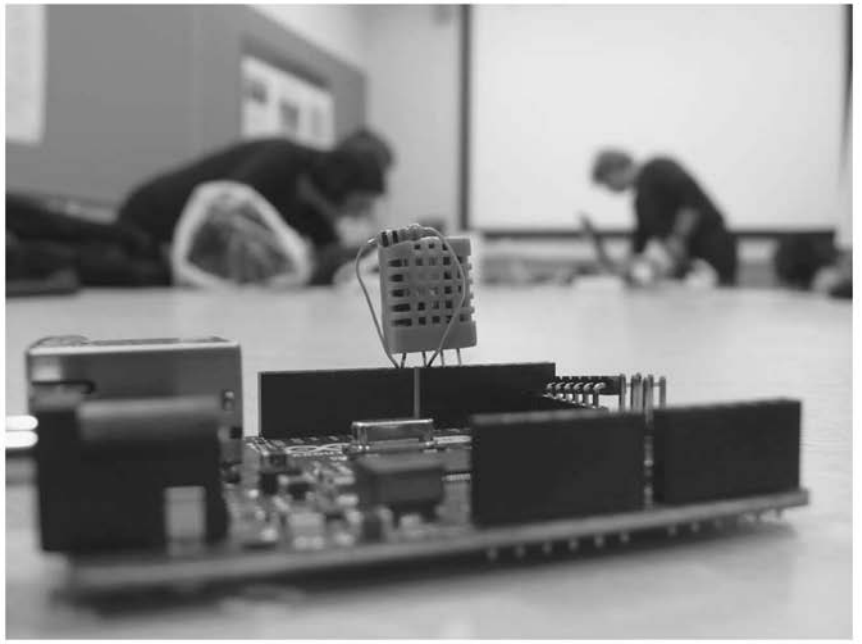

Figure I.4. One basic example of a "DIY" sensor in the form of Arduino open-source electronics with a carbon monoxide (CO) sensor that would typically be found in a smoke detector. Assembled at a citizen-science workshop in London. Photograph by author.

citizen sensing that are expressed in and through the use of sensors. Since many environmental sensor applications are oriented toward understanding environmental change or managing environments, so too do the ways in which environments come to be articulated through sensing technologies have relevance for the types of environmental politics and citizenship that take hold along with these technologies.

FROM ENVIRONMENTAL SENSING TO CITIZEN SENSING

A key tool within ubiquitous computing, sensors are the technologies that make possible the distribution of computational logics beyond the screen and interface to spatial and environmental applications. While sensors have become embedded in everyday spaces and infrastructures, practices of monitoring and sensing environments have also migrated to participatory applications such as citizen sensing, where users of smart phones and networked devices are able to engage with DIY modes of environmental observation and data collection. Beyond monitoring ecological processes, sensors have then become key apparatuses within citizen-sensing projects that monitor air quality, radiation concentrations, noise levels, and more.

Yet how did the ostensibly technoscientific technology of environmental sensors migrate from computational and scientific uses to more everyday applications? And how effective are practices of citizen sensing in monitoring and addressing environmental issues and in giving rise to new modes of environmental awareness and practice? *Program Earth* examines the migration of environmental sensors from ecological research and commercial applications to a wider array of environmental and "citizen" engagements. By analyzing informational ways of understanding environments, I map the trajectory of the computational and informational approach to environments from ecological sensing applications to more citizen-focused undertakings, and to urban and infrastructural developments that join the objectives of sustainability, intelligent cities, and engaged citizens. I further identify the material, political, and spatial relationships that environmental sensor practices enable; and I ask how a particular version of the "environmental citizen" has become entangled within these relationships and practices. The becoming environmental of computation includes processes of making citizens *and* milieus.

From citizen science to participatory sensing, crowdsourcing, civic science, street science, DIY media, and citizen sensing, a number of widespread practices of environmental monitoring and data gathering are emerging that variously work through ways of democratizing the technoscientific tools and understandings of environments.[67] While these terms are used in different ways to stress the scientific, big data, or civic aspects of these practices, I work with the term "citizen sensing" in order to draw explicit attention to the ways in which computational and mobile practices of environmental monitoring might be discussed as modes of citizen *sensing*, specifically.

Citizen-sensing practices have been described as making inventive contributions to both the research and development of technological tools, as well as to modes of environmental monitoring.[68] These practices range from the use of sensor data to complement other environmental observations, including remote-sensing; ubiquitous-computing approaches that often focus on the capacities and practices of sensor technologies to achieve efficiencies; and engagement with social or civic media projects that emphasize the ways in which social networking can mobilize collected data to influence policy and political action.[69] Citizen sensing as I am defining the practice for the purposes of this study encompasses or refers to those sensing activities that use computational sensing technologies in the form of smartphones, as well as mobile and low-cost electronic devices such as Arduino and Raspberry Pi, and online platforms to monitor and potentially act on environmental events through the collection of environmental data.[70] Such distribution of sensing capabilities across sensor networks and multiple mobile and individualized platforms has become a focused site for environmental and technological engagement.

Citizen-sensing projects are often closely related to citizen-science studies, but differ in the ways in which they seek to enable environmental practice through direct engagement with environmental monitoring technologies. Such citizen-sensing applications, similar to citizen-science, are frequently based on practices of individuals voluntarily tracking and monitoring everything from pollution levels to biodiversity counts.[71] Citizen-science projects are even increasingly transforming into citizen-sensing projects, where digital devices equipped with sensors are used to monitor environments and gather data.

In some cases, sensor technologies have enabled more thorough practices of environmental monitoring and observation that have already been underway through citizen-science initiatives, as in counting and tagging biological activities. In other cases, the capacities of sensor technologies have facilitated more distributed and potentially more accurate collection of data, such as urban air or noise pollution. Some applications extend the scope of citizen sensing not only to encompass sensor data and use of smart phones but also to draw on remote sensing and mapping to enable the tracking of deforestation or animal movements. In still other instances, these mobile sensor applications have sparked new forms of democratic organization and communication about environmental issues by effectively crowdsourcing environmental observations in order to influence environmental policy and action.

Another reason for engaging with these practices as *sensing* practices is then to draw out the ways in which computational devices are at once sensing and actuating technologies, as well as modes for sensing and experiencing environments.

Citizen- or participatory-sensing projects often propose to create "shorter circuits" between environmental information and the observers of that information, and in this way technologists and environmental practitioners have suggested that a more direct line of environmental action may be possible.[72] *Program Earth* specifically charts the ways in which citizen-sensing projects configure environmental practice through data gathering and sensing in order to offer a more in-depth understanding of how environmental practices and politics materialize in relation to observing technologies and communication networks.[73] I consider how environmental monitoring and citizen sensing consist not just of observations of environmental change but also of technical, political, and affective practices that are part of a complex ecology of sensing for environmental action.

What is typically activated in this diverse set of practices is a set of proposals for democratizing environmental engagement and developing other ways of doing environmental science and politics. Yet just as many new questions arise about the ways in which citizen engagement with environments and environmental concerns are in-formed with and through sensing technologies. By using the term "concern," I am here specifically drawing on Whitehead's discussion of concern as an "affective tone" drawn from objects and placed in the experiences of subjects.[74] The becoming environmental of computation includes these ways in which distinct monitoring practices and modes of reporting are enabled—and delimited—through environmental sensors, as well as the citizens and publics that would be activated and affected by these technologies and sensing practices.

Working across citizen-sensing projects that take the form of proposals, experiments, and established practices, *Program Earth* examines the ways in which the distributed and accessible capacities of computational sensors are meant to enable greater engagement with environmental issues. It asks: In what ways do computationally based citizen-sensing engagements influence modes of environmental participation? Citizen-sensing initiatives often depend upon forms of monitoring, reporting, managing, and even self-managing in order to establish environmental engagement. How might the practices of environmental citizens as data gatherers be advanced through a more intensive understanding of these modes of environmental and political practice?

SITUATING THE FIELD

From the Internet of Things to the "quantified self," there is a new set of terms circulating that engage with the ubiquitous aspects of digital media. Within this overarching area there are specific studies that focus on the imagined futures of ubiquitous computing, the distributed and spatial qualities of wireless or pervasive digital technologies,[75] and the ways in which sensor hardware and software move computation out of the black box and into the environment.[76] New texts are also emerging that provide an overview or wide-ranging survey of ubiquitous computing,[77] yet these collections often do not focus intensively on issues of environmental sensing and practice.[78] Other texts engage with the use of ubiquitous computing for social activism, for instance, but the focus on environmental topics is also less intensive.[79] These existing ubiquitous computing texts are useful in establishing context for this emerging area of computing, as well as participatory approaches to digital technology. However, I address sensors explicitly as *environmental sensor* technologies, a function that becomes more evident when devices are used for monitoring environments and collecting environmental data. And although the speculative aspects of computational sensors do influence this study, I especially focus on the ways in which sensors are actually being used and deployed.

Program Earth considers environmental sensing as a technological practice that spans environmental studies, digital culture and computation, the arts, and science and technology studies. As discussed above, the becoming environmental of computation includes considering not just how environments concresce along with individuals and objects but also how distributions of experience might be recast in and through environmental processes. Environmental sensing technologies open up new ways of approaching digital technology as material, processual, and more-than-human arrangements of experience and participation.

While there is comparatively less research within digital media studies that focuses specifically on the environmental articulations and capacities of sensors, there is a significant body of literature dealing with social media and the participatory aspects of digital devices, typically in the form of the mobile and online platforms.[80] Research into social and participatory media is a rapidly burgeoning field, where social media are often analyzed through considerations of alternative content generation, community formation, or social change,[81] as well as the politics and practices of observation, control, and tactical intervention.[82] This work forms an important reference point for understanding the rise in participatory engagements with digital media. However, *Program Earth* is situated somewhat obliquely to studies of participatory and social media, in that while it is focused on the political and participatory enablement of environmental sensing, it is primarily oriented toward more-than-human, environmental, and distributed analyses of how citizens and citizen-based engagements are expressed through this distinct set of technologies. At the same time, this research focuses on the ways in which computing has not only moved beyond screens to environments but also given rise to new imaginaries for how to program environments for digital functionality and participation.

Rather than focusing primarily on individual use or content generation for human-led manipulation of Internet- or screen-based media, I consider how environmental sensors variously articulate practices constitutive of citizenship in and through sensed environments that come into formation through an extended array of technologies and practices. Participation, as I engage with the concept and

practice, is also a more-than-human undertaking.[83] I investigate how machines, organisms, energy, networks, code, and atmospheres in-form how distributed and environmental computing materializes and operates. Taking up the more-than-human, machine-to-machine, and algorithmic operations of wireless sensor networks, *Program Earth* addresses the proliferation of environmental and computational entities that concretize and participate in wireless sensor networks.

While this research synthesizes and draws on emerging media theories that deal with ubiquitous and participatory computing applications, it also seeks to develop a new terrain for thinking through distributed sensing technologies as articulating distinct modalities of environmental politics and practices. This book makes the case for different approaches to "sensing" within digital media studies, arguing that distributions and processes of sensation might be more effectively understood by not simply collapsing sensation into fixed sensing categories such as sight or hearing. Environmental sensing technologies entail a transformation of the "objects" that are turned into information; to produce information is a technological intervention that generates distinct types of realities, rather than simply mirroring them. With these insights in mind, it is possible to move beyond the notion that environments are something "out there" to be studied and acted upon by citizen sensors with their sensing devices and instead to look specifically at how the spread of informational techniques co-constitute monitored environments and informed environmental citizens. I draw on the work of Stengers specifically as she discusses the philosophy of Whitehead to develop a constructivist approach to environmental sensors to suggest not that environments are "constructed" (in the sense of being concocted) through sensing technologies, but rather that distinct capacities for *feeling the real* are articulated through these monitoring practices.[84]

It is important to note that in focusing on environmental sensing, *Program Earth* is working in a register that is not a phenomenological treatment of sense and sensation. In existing literature, sensemaking aspects of media technologies are often discussed through theories of mediation or individual attention and embodiment.[85] In related approaches, "sensing" is focused on a human subject and often rendered through theories of phenomenological or prosthetic engagement. The difference in this approach pertains to how environmental sensors are not simply providing access to new registers of information for established subjects but are changing the *subjects of experience* as well as the sensing relationships in which subjects are entangled and through which they act. Hence, vis-à-vis Whitehead's notion of the superject, we could say that the *superjects of experience* are also changing. *Program Earth* works to develop new theories of sensing that do not rely on an a priori human-centric subject or mediated subject–object relationship. Sensing here is not primarily or exclusively about human modalities of sensing, but rather has to do with distributed formations and conjunctions of experience across human and nonhuman sensing subjects, in and through environments. Sensing, in this respect, is understood as a multifaceted process of participating, individuating, and concrescing.

Methods and Chapters

Program Earth examines the monitoring and sensing of environments to question how sensing technologies give rise not just to new modes of environmental data gathering but also to new configurations of citizen engagement, environmental relationality, sensing, and action. Along the way, this work raises questions about the politics and practices of sensing that concresce at the intersection of sensor technologies, citizen participation, and environmental change.

Methods used in developing this material include fieldwork at sites of environmental sensing and testing, interviews with scientists and creative practitioners who have developed environmental sensing applications and devices, residencies and fieldwork at scientific field stations and sensing laboratories, ethnography at creative and scientific conferences and events where sensors for environmental monitoring have been exhibited or under active development (e.g., urban prototyping festivals), a visit to a sensor factory, attending and developing events for using sensing equipment to monitor environments, inventories of sensors and tests with sensor toolkits, virtual ethnography of online sensing communities, and an extensive review of environmental sensing literature, media, and practices.

This book works across this research material while developing a theoretical account of how sense, environmental participation, and politics shift through ubiquitous computing and environmental sensing technologies. Working within a radical empiricism modality, I do not "apply" theory to empirical material, but rather attend to the emergent intersections across theory and practice in order to create openings to inventive encounters with environmental sensing, as well as to enable propositions for practice.

In order to undertake this study of environmental sensing and its migration to more participatory applications, I have divided this text into three main sections that address key aspects of environmental sensing, including "Wild Sensing," "Pollution Sensing," and "Urban Sensing." The first section, "Wild Sensing," discusses the development of sensor networks within ecological applications to track flora and fauna activity and habitats and the ways in which these technologies have moved "out of the woods" to be deployed in more urban and citizen-focused applications. Within this section, chapter 1 focuses on fieldwork conducted at one sensor test site, the James Reserve in California. This chapter suggests that these experimental environmental sensor arrangements mobilize distinct sensing practices that are generative of new environmental abstractions and entities, which further influence practices such as citizen sensing. In chapter 2, I discuss two webcams, a Moss Cam and a Spillcam, to consider how images now operate as sensor

data, even more than as stand-alone "pictures." Often located as one mode of input within sensor networks, images are generated from webcams and translated into data that can be parsed through image analytics while also drawing citizens into distinct practices of watching and reporting. Chapter 3 examines how the movement of organisms has become a key site of study facilitated through sensors. Migration-tracking sensors provide new data about the movement of organisms while also indicating the distinct environments and environmental relations in and through which organisms are living.

The second section, "Pollution Sensing," addresses the use and adaptation of environmental sensing technologies to monitor pollution, specifically focusing on the use of sensors as tools within creative practice and citizen-sensing projects. This is an area of sensor development that continues to trigger new proposals for citizen engagement in environmental issues. Yet how do these applications influence the becoming environmental of computation, as well as the concrescence of distinct environmental practices and politics? Beginning this section with chapter 4, I discuss fieldwork and observations gathered from my time spent at the Kilpisjärvi Biological Station while participating in an art-science residency. This field station is located within observation networks focused on studying the Arctic and environmental changes that are primarily influenced by climate change. I relate this site to a discussion of carbon and other environmental monitoring projects underway to consider how climate change is sensed and expressed across arts, sciences, and community monitoring practices. Chapter 5 shifts from carbon sensing to garbage sensing, more specifically in the form of plastic debris in the oceans in the form of "garbage patches." In this chapter, I look at the different ways that forms of marine debris that are relatively amorphous and invisible are brought to sense (or not) across Google Earth platforms, iPhone apps, and drifting ocean sensor floats. Moving from carbon sensing to ocean debris sensing, chapter 6 considers the numerous projects and sensors engaged with sensing air pollution. I develop a discussion of how air pollution is distributed across an array of devices and environments and how the data that are generated through pollution monitoring technologies and practices operate as distinct "creatures" of sense.

The third section, "Urban Sensing," looks at the ways in which citizen-sensing applications have become central to the development of the latest wave of smart city proposals that focus on urban sustainability. Smart cities proposals are developing apace, from IBM to HP and Cisco, and new projects are spun out that address not just the development of new intelligent infrastructures but also the compatible inhabitations of smart and connected citizens. How do these imaginings and deployments of environmental sensing technologies across infrastructures and citizens influence urban environmental politics? And in what ways do new versions of digital technopolitics take hold that potentially limit democratic urban ways of life? Chapter 7 takes up these questions by focusing specifically on

governance and power as they are distributed through the new milieus and environments of smart cities. Using the notion of "environmentality" to describe these spatial power dynamics, the chapter asks how visions for an efficient and sustainable city might restrict urban practices and modes of citizenship. Chapter 8 considers the versions of participation that are enabled within DIY digital urbanism projects and platforms and explores the ways in which the "idiot" operates as a noncompliant digital operator and figure that does not participate as intended. Chapter 9 takes up the speculative aspects of smart cities and digital infrastructures as they are built to ask how sensor networks enable distinct types of withness in these new urban environments. I conclude *Program Earth* with a reconsideration of how planetary computerization might point toward expanded ways of engaging with sensor networks as generative of experimental worlds and speculative practices.

Each of the chapters within these sections deals with distinct deployments of and participations within sensing systems while engaging with these technologies as actual concrescences of computation and distributed arrangements of environmental sensing, practice, and politics. Across the chapters, there are multiple grounded instances of sensor technologies used in environmental projects that organize monitoring, facilitate participation, and manage urban processes. In each of these examples, the political implications of how sensing systems inform environmental practice and participation, as well as become enrolled in distinct ways of life, are articulated and addressed. While I have emphasized the becoming environmental of computation, the aspects of citizen sensing as they are expressed within environmental sensing projects are no less important, as they are intimately connected to the ways in which environments and environmentalisms materialize. Moreover, citizen engagement is a recurring lure and organizing device for enfolding people into sensing projects.

Ultimately, this book sets out to advance the conceptual understandings of environmental sensing—and the possibilities of sense—through a theoretical and empirical engagement with technologies and practices of sensing, citizenship, and environmental change. *Program Earth* explores the assertion made by a diverse range of researchers and practitioners that distinct practices of observation connect up with and enable distinct political possibilities.[86] It asks: How do different sensing practices operationalize distinct affective and political capacities? And what are the ways in which these computational sensors *become environmental*, as they take hold and create new feelings for the real?

NOTES

INTRODUCTION

1. McLuhan, "At the Moment of Sputnik."

2. There is an extensive literature across multiple disciplines on "whole earth" imagery. For example, see Cosgrove, "Contested Global Visions"; Jasanoff, "Image and Imagination"; Poole, *Earthrise;* Diederichsen and Frank, *The Whole Earth*.

3. Committee on Scientific Accomplishments of Earth Observations from Space, National Research Council, *Earth Observations from Space,* 15.

4. *New York Times,* "Sputnik's Legacy."

5. Tikhonravov, "The Creation of the First Artificial Earth Satellite."

6. Mack, *Viewing the Earth*. For a discussion of satellites in relation to the televisual, see Parks, *Cultures in Orbit*.

7. The complete text for the Kodak advertisement reads, "The whole earth from a business viewpoint," and details the boundless capacity of satellite sensing technology: "Aerial photographic surveillance started as an art of war. Now it has found work in helping mankind make a better peace with his environment. Kodak Products, for example, monitor dangerous ice on the sea, as well as the health of lakes, and the readiness of hillsides to slide down. Snow fields as fresh water sources are inventoried, as are fishing grounds off continental coasts. Aerial photography also measures social phenomena. Our color-infrared film has been found capable of providing accurate estimates of number of families in areas of high population density. Statistics in the public library may lag behind population shifts. Business decisions require fresh, solid facts. We have customers who can pick economic facts out of the air—from an appropriate altitude. Decision-makers who wish to get in touch with such people should write Eastman Kodak Company." Cited in Horowitz, "Domestic Communications Satellites," 38.

8. Ibid. As Horowitz notes in this article, rather than serving ecological and public interests, primarily, "the principal contractors for NASA's Earth Resources Technology Satellite, launched last July (1972) to identify sources of environmental pollution and monitor mineral resources, are General Electric and Eastman Kodak"; and "one prospective satellite

owner, RCA Globcom, has already noted in its satellite plan to the FCC that it intends to make satellite facilities available to the mining and petroleum industries."

9. For a discussion of how "informational globalism" coincides with "infrastructural globalism," see Edwards, *A Vast Machine,* 23–25.

10. McLuhan, "At the Moment of Sputnik," 49. *Sputnik* was launched October 4, 1957, rather than October 17, 1957, as cited in this instance.

11. Simondon, *Du mode d'existence,* 56.

12. Ibid., 152; Combes, *Gilbert Simondon,* 60; Lamarre, "Afterword," 92.

13. Berkeley, "Edmund C. Berkeley Papers."

14. Welsh, "Sensor Networks, Circa 1967."

15. Weiser, "The Computer for the 21st Century," 98.

16. Ibid., 94.

17. Helmers, "Creating Sensors"; Hsu, Kahn, and Pister, "Wireless Communications for Smart Dust"; Postscapes, "A Brief History."

18. Gross, "The Earth."

19. Ibid.

20. John Parkinson, chief technologist of Ernst & Young, quoted in Gross, "The Earth."

21. Toshitada Doi, chairman of Sony Corporation's Digital Creatures Lab, quoted in Gross, "The Earth."

22. Arthur, "Smartphone Explosion in 2014"; Thomas, "Smartphones Set to Become Even Smarter."

23. IBM, "The Internet of Things."

24. Ibid.

25. Evans, "The Internet of Things." For a discussion of the things in the Internet of Things, see Gabrys, "Re-thingifying the Internet of Things."

26. Bradley et al., "Internet of Everything (IoE) Value Index"; Cisco, "Internet of Everything."

27. Chan, "IPv6."

28. Intel, "What Does the Internet of Things Mean?"

29. For instance, see Scottish Sensor Systems Centre.

30. Wilson, *Sensor Technology Handbook;* O'Sullivan and Igoe, *Sensing and Controlling.* See also Gertz and Di Justo, *Environmental Monitoring with Arduino.*

31. Weiser, "The Computer for the 21st Century," 78.

32. Combes, *Gilbert Simondon;* Simondon, *L'individuation à la lumière.*

33. Whitehead, *Process and Reality,* 31 and 67–88 passim.

34. Stengers, *Thinking with Whitehead,* 163–64.

35. Whitehead, *Process and Reality,* 5–24.

36. Simondon, *Du mode d'existence,* 149, 222; Combes, *Gilbert Simondon,* 62.

37. Neumann, "First Draft of a Report on the EDVAC."

38. As Combes writes, "Simondon's approach entails a substitution of ontogenesis for traditional ontology, grasping the genesis of individuals within the operation of individuation as it is unfolding." See Combes, *Gilbert Simondon,* 3.

39. Hayles, *My Mother Was a Computer,* 17–31.

40. For instance, see Cox, *Speaking Code.*

41. Mackenzie, *Cutting Code,* 169; Gabrys, *Digital Rubbish*.

42. Canguilhem, *Knowledge of Life.*

43. For example, see Foucault, *Security, Territory, Population*.

44. Combes, *Gilbert Simondon*, 78; Lamarre, "Afterword"; Simondon, *Du mode d'existence*, 55–56.

45. Whitehead, *Modes of Thought*, 94, 112; Whitehead, *Process and Reality*, 15, 41.

46. Simondon, "The Genesis of the Individual," 306.

47. Combes, *Gilbert Simondon*, 4.

48. Ibid., 19.

49. Turner, *From Counterculture to Cyberculture;* Höhler, "'Spaceship Earth.'"

50. Heise, *Sense of Place and Sense of Planet*.

51. Edwards, *Vast Machine*, 25.

52. Ibid., xix.

53. Guattari, *Schizoanalytic Cartographies*, 11–12.

54. Ibid.

55. Ibid., 6.

56. McLuhan, "At the Moment of Sputnik," 49.

57. For example, see E. Odum, *Ecology;* H. Odum, *Environment, Power and Society;* Bateson, *Steps to an Ecology of Mind*.

58. Haraway, *Simians, Cyborgs and Women*, 164.

59. There is a rich literature that explores the ways in which cybernetics and information theory have influenced understandings of and approaches to ecologies (and systems, more generally). See, for instance, Haraway, "The High Cost of Information"; Taylor, "Technocratic Optimism"; Elichirigoity, *Planet Management;* Martin, "Environment c. 1973"; Bowker, "How to Be Universal."

60. For an overview of the area of these media-ecological distinctions, see Fuller, *Media Ecologies*.

61. See, for instance, Hörl, *The Ecological Paradigm*.

62. Guattari, *The Three Ecologies*.

63. See Fuller, *Media Ecologies*, 4.

64. Massumi discusses the "becoming-environmental of power" in relation to Foucault's exposition of environmentality. I take up this specific use of becoming-environmental of power in chapter 7 of *Program Earth* in relation to smart cities. Here, however, I draw on Whitehead and Simondon to develop an expanded notion of the *becoming environmental of computation* through the individuations and concrescences generated through environmental sensors. See Massumi, "National Enterprise Emergency"; Foucault, *The Birth of Biopolitics*.

65. Gabrys, "Atmospheres of Communication."

66. Gabrys, *Digital Rubbish*.

67. "Civic science" is a term from Fortun and Fortun, "Scientific Imaginaries and Ethical Plateaus." "Street science" is a term used by Corburn in *Street Science*. See also Burke et al., "Participatory Sensing."

68. For example, see Goodchild, "Citizens as Sensors."

69. For example, see Paulos, Honicky, and Hooker, "Citizen Science"; Aoki et al., "A Vehicle for Research."

70. The most commonly referenced platform for environmental data is one that has been in continual transformation. First taking the form of Pachube, as developed by Usman Haque, this platform was subsequently developed as an open yet commercially

based structure in the form of Cosm and has now become a more commercial and subscription-led platform rebranded as Xively. The development and migration of this platform from an open community to a commercial enterprise is a topic that could be researched and analyzed at length. However, there is not room here to deal in depth with how environmental sense data are aggregated, presented, and made accessible—or commercialized—in online platforms.

71. Key citizen-science research within science and technology studies includes (but is not limited to): Irwin, *Citizen Science;* Irwin and Michael, *Science, Social Theory and Public Knowledge;* Jasanoff, "Technologies of Humility"; Ellis and Waterton, "Environmental Citizenship in the Making"; Wynne, "May the Sheep Graze Safely?"

72. Bratton and Jeremijenko, "Suspicious Images, Latent Interfaces."

73. The work of Kim Fortun is relevant here in thinking about how the "informating of environmentalism" takes place. See Fortun, "Biopolitics and the Informating of Environmentalism." At the same time, I read Fortun's work alongside Simondon, who in a less epistemological register considers how in-forming and in-formation are processes of exchanging material and energy, of taking form, and of giving shape to individuals and environments. See Simondon, *L'individuation à la lumière,* and Combes, *Gilbert Simondon*, 5–6. I discuss this concept in more detail throughout this study, particularly in chapter 4.

74. Whitehead, *Adventures of Ideas*, 176. Latour and Stengers take up Whitehead's notion of concern to discuss "matters of fact" and "matters of concern." For instance, see Latour, "Why Has Critique Run Out of Steam?"; Stengers, "A Constructivist Reading of *Process and Reality*."

75. Mackenzie, *Wirelessness;* Greenfield and Shepard, "Urban Computing and Its Discontents."

76. Hayles, "RFID"; Kitchin and Dodge, *Code/Space;* de Souza e Silva and Frith, *Mobile Interfaces in Public Spaces*.

77. Dourish and Bell, *Divining a Digital Future*.

78. Ekman, *Throughout*.

79. Foth et al., *From Social Butterfly to Engaged Citizen*.

80. Boler, ed., *Digital Media and Democracy;* Jenkins and Thorburn, eds., *Democracy and New Media;* Delwiche and Henderson, eds., *The Participatory Cultures Handbook;* Ratto and Boler, *DIY Citizenship*.

81. Castells, *Networks of Outrage and Hope;* Earl and Kimport, *Digitally Enabled Social Change;* Feenberg and Barney, *Community in the Digital Age;* Rainie and Wellman, *Networked*.

82. Dean, Anderson, and Lovink, *Reformatting Politics;* Lovink, *Networks without a Cause;* Raley, *Tactical Media*.

83. Approaches to the more-than-human registers and materialities of participation have been attended to and developed across a wide range of feminist technoscience literature. One key reference here is Barad, "Posthumanist Performativity." See also Suchman, "Agencies in Technology Design." Haraway also develops this approach, drawing on Whitehead's notion of "misplaced concreteness," where she works beyond the abstractions of primary and secondary qualities to consider the expanded ways in which the materialities and practices of technoscience are situated. See Haraway, *Modest_Witness*, 269.

84. Stengers, "A Constructivist Reading of Process and Reality."

85. For example, see McCullough, *Ambient Commons*.

86. Latour, *Pandora's Hope;* Stengers, *The Invention of Modern Science*.

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Jennifer Gabrys

Ocean Sensing and Navigating the End of this World

01/09

Edges and ends of worlds are encountered frequently in the films of Harun Farocki. They form recurrent courses of navigation, tugging along ships and airplanes, riders and avatars, waves and clouds, memories and simulations. In one sequence in the eight-minute-long film *Parallel II*, a rider on horseback charges toward a horizon that at once recedes and refreshes. While the riding is swift and purposeful, it also folds back on itself, creating the conditions that would make or give sense to the journey. The rider and horse gallop along a dusty track as though in search of someone or something. Just as the purpose of the scene would sharpen into focus, the rider traverses into another refreshed landscape that presents an altered visual frame oriented toward a new pursuit. Rather than the rider following a self-defined objective, the computer world delineates the arc and aim of the journey, of which the rider is merely an expression or effect. In this scene from *Parallel II*, the narrator relates:

> Galloping swiftly out from the gate
> How far can the rider ride?
> Where does this world end?
> This world appears infinite
> A world generated by the gaze that falls upon it.

These are self-generating worlds. The contours of these worlds propel navigational practices that simultaneously unfold the narrative and structure of computer games. *Parallel II* is one film within the four-part film installation *Parallel I–IV* (2012–14), where Farocki explores computer vision and video games.[1] By probing at the logics of computer vision and navigation, Farocki tests the limits of worlds, both in terms of their mechanics and structure, as well as what they operationalize. By deliberately staging confrontations with these edge conditions, figures in *Parallel I–IV* traverse building edges and scramble along cliff faces to demonstrate how these worlds are constructed, and how they in turn organize ways of seeing, sensing, and feeling. Working in the context of computer games, Farocki draws attention to the shifting digital horizons that the gamer–player navigates in any particular game world. These digital technologies inform ongoing navigational practices, as well as ways of encountering and ending worlds – this one, or those to come.

World-ending is by now a pervasive topic. It is the default script written into the story of environmental change. Yet it is also a concept and event with a longer history. Worlds are projected to end in the face of climate breakdown, with people displaced and dispossessed from melting landscapes and

e-flux journal #101 — summer 2019 Jennifer Gabrys
Ocean Sensing and Navigating the End of this World

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Harun Farocki (with Matthias Rajmann), *Parallel II*, 2014. HD video, 16:9, color, sound, 8:38 min (loop). Courtesy of Harun Farocki GbR, Berlin.

submerged communities. Worlds have also continually been ending, with settler colonialism, environmental racism, and ecological exhaustion wreaking terminal destruction over the span of several centuries. The worlds and endings that are conjoining and collapsing are then many, with different consequences for the inhabitants and relations of those worlds. In the context of this issue of *e-flux journal* on navigation, I begin with Farocki's computer-game provocation to consider the question of where *this* world ends, especially through digital environmental sensing technologies tuned to detecting environmental change. How are worlds delineated, and their endings sensed, within a matrix of catastrophic environmental events and digital sensing technologies? Operating in a different register than computer games, environmental sensors nevertheless sense and make worlds that also express distinct edge and limit conditions.

The worlds I explore here are ocean worlds. They are less exclusively situated within the realm of the virtual, and are more distributed as particular ontogenetic formations that concretize through what I call the "becoming environmental of computation."[2] The becoming environmental of computation involves not merely the extension of sensor technologies across multiple different ecosystems, but also in-forms ways of encountering environments and environmental change. Sensors directly and indirectly detect the increasing pollution of oceans with plastics, rising temperatures, and accumulating carbon dioxide as it converts to carbonic acid. Oceans are spaces that are increasingly approaching limit conditions, from rising temperatures and acidification to saturation with plastic debris, sea-floor mining, habitat destruction, and the industrialization of ocean spaces.[3]

In this essay on ocean sensing and navigating the end of this world, I consider how Argo floats, remote-sensing satellites, wave buoys, and ship sensors assemble to form a world or worlds to be acted upon and navigated. By attending to these distinct forms of environmental sensing practices,[4] I examine the limit conditions and points of transformation that these sensing ensembles detect, especially in the form of oceans contaminated with plastic pollution and altered by climate change through rising temperatures and acidification. How do sensing and navigational strategies that unfold through digital ocean sensor systems tilt toward the end of this world by calculating and predicting the saturation of oceans with thermal pollution and plastics, as well as carbon dioxide and toxins?

These sensor systems monitor the accumulation of pollutants in ocean spaces, and as they navigate through ocean spaces with the aid of satellite and tracking systems, they also give rise to speculations about how to navigate the end of a world, or indeed how to move beyond a horizon for which there is no clear course of action. At the same time, the end of this world is a designation that is up for grabs, as many writers from Fred Moten to Déborah Danowski and Eduardo Viveiros de Castro have noted. Multiple worlds have already ended through environmental, racial, and economic violences that have razed possibilities for being otherwise. This provokes the question: Which world is *this* world that could be ending? How might these sensor systems or perceptive capacities then be extended to attend to worlds that have already ended, or that might be hastened along in their endings?

Plastic Oceans

Located across the world's oceans are several sizeable concentrations of plastic debris that have variously earned the title of "garbage patches." The Great Pacific Garbage Patch in particular has become an object of popular and scientific interest. It is an environmental anecdote to confirm our worst fears about overconsumption – and the dark side of the durable wonders of plastics that were promoted in so many postwar contexts. It is also an imagined indicator of what may even outlive us, given the lengths of time that plastics require to degrade. The garbage patch is in many ways an amorphous object, drifting through oceanic and media spaces as an ominous sign that focuses attention toward the ways in which oceans have become planetary-sized landfills. Yet it also signals a certain world-ending moment, arriving as the oceans become saturated with this synthetic and disposable material.

Popular imaginings of the Pacific Garbage Patch have included comparisons of its size to the state of Texas, or suggestions that it is an island that might be named an eighth continent, formed of anthropogenic debris. Upon hearing of the concentration of plastic wastes in the Pacific, many people search for visual evidence of this environmental contamination on Google Earth. Surely a human-induced geological formation of this magnitude must be visible even from a satellite or aerial view? However, because the plastic wastes are largely present as microplastics in the form of photo-degraded and weathered particles, the debris exists more as a suspended soup of microscopic particles that is mostly undetectable at the surface of the ocean.

While Google Earth may be a platform for visualizing and locating ocean data,[5] this visualization technique presents a much different approach to "sensing" than seeing the

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patch as a photographic object. The inability to locate the garbage patches on Google Earth, a tool for scanning the seas through a conjunction of remote sensing, aerial photography, and online interfaces, even gives rise to popular controversy about how to locate the patch and whether the plastic conglomerations are actually present in the oceans, and if so, how to address the issue. The relative invisibility and inaccessibility of the patches render them as looming imaginative figures of environmental decline and yet relatively amorphous and unlocatable and so seemingly resistant to incentives toward environmental action. All of which raises the question: To what extent do environmental problems need to be visible in order to be actionable? Or do they instead become sense-able and navigable in different ways, less as images that raise concern, and more as shifting conditions that unevenly surface and require unfolding and expanded sensing practices and tactics? As Farocki's computer game investigations indicate, modes of navigation and sensing can also become ways of constructing these worlds, and their edge conditions.

If Google Earth or a satellite view of the garbage patch proves to be an impossible undertaking, it is because the plastics suspended in oceans are not a thick choking layer of identifiable objects but more a confetti-type array of suspended plastic bits. Locating the garbage patch is on one level bound up with determining what types of plastic objects collect within it and what effects they have. Yet on another level, locating the garbage patch involves monitoring its shifting distribution and extent in the ocean. The garbage patch is not a fixed or singular object, but a society of objects in process. The composition of the garbage patch consists of plastics interacting across organisms and environments. But it also moves and collects in distinct and changing ways due to ocean currents, which are influenced by weather and climate change, as well as the turning of the earth (in the form of the Coriolis effect) and the wind-influenced direction of waves (in the form of Ekman transport). As an oceanic gyre, the garbage patch moves as a sort of weather system, shifting during El Niño events, and changing with storms and other disturbances.[6] Ocean sensing then requires forms of monitoring that work within these fluid and changeable conditions.

The garbage patch as a figure does not directly come into view through ocean-sensing practices and technologies, but instead registers in a more indirect way, through proxy sensing. Environmental monitoring techniques often developed for purposes other than sensing plastics are subsequently tuned in to the drift of oceanic debris. Most sensors are set to detect salinity, temperature, and movement of ocean currents in order to bring patterns of climate change into view, a similarly elusive event that is not easily visualized. Rather than a *visual* fix on plastic pollution, sensing practices and technologies for monitoring environmental change instead indirectly register plastics within the mix of other environmental processes, geopolitical infrastructures, and digital devices.

Sensorized Oceans

Oceans have become highly instrumented sensor spaces. An extensive array of sensing nodes and drifting sensor points can be found on buoys and hulls of boats, underwater gliders, and Argo floats (instrument platforms for observing oceanic temperature, salinity, and currents). Ocean sensing also occurs via coastal webcams, remote satellites, remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), airborne sensors, unmanned aerial vehicles (UAVs), high-frequency radar, instrumented drilling platforms, and apps that citizens can use to document marine debris sightings.[7] Marine traffic tracking sites also document the movement of container ships and other large vessels; and some platforms and maps focus on capturing data from ocean-going objects that are part of the Internet of Things, revealing just how densely populated oceans and seas are with sensing devices.[8]

The importance of monitoring oceans has increased considerably, since oceans are the primary sink that absorbs both CO2 and heat, and the dynamics of these sink-based processes are less well understood in relation to climate change.[9] While many sensors are in place to take temperature observations, as well as feed into climate-change monitoring and modeling, other sensors are used to survey noise underwater in order to prevent damage to marine organisms' ability to navigate these spaces. On one hand, there has been a lack of monitoring in the oceans, which current practices are attempting to mitigate. On the other, the current spread of instrumentation is leading some researchers to propose remote access to the ocean from any number of sensor networks. As Stefan Helmreich writes in one instance about the proposed establishment of a "distributed ocean observatory," this project would involve "a network of remote sensing buoys that can provide continual Web access to data from the sea" and "would allow scientists to sit in their living rooms gathering oceanographic data."[10] One imagines scientists becoming avatars in an ocean-world computer game, searching out signals of environmental distress, while also asking, *where does this world end*?, as the ocean observatories generate more evidence of catastrophic environmental change.

The becoming environmental of computational sensors in oceanic spaces involves the instrumentation of oceans via extensive sensing networks as well as the reworking of the environments in which sensing takes place (from underwater to living rooms). Yet computational sensors become environmental in yet another way, where sensors themselves might be adapted to ocean environments and processes, with drifting buoys, Argo floats, and sensors on vessels circulating through oceans across surfaces, sub-surfaces, and at depths now down to six thousand meters.[11] And as sensors fill these spaces and provide monitoring data, they also generate other sensor tales, including observations about the likely drift of marine debris (especially in the form of plastic) through ocean currents, along with the increasing temperature of ocean spaces. Oceans might then be seen as an environmental medium with medial effects, guiding and informing the very sensing instruments that would navigate and make sense of oceanic spaces.

Ocean sensing and the detection of pollution, plastics, rising temperatures and carbon levels then involves numerous sensing instruments, including most pervasively Argo floats. Since 2000, thousands of Argo floats have been deployed to form a worldwide ocean-observing system. With nearly four thousand drifting Argo floats now in circulation (and over 2 million dive profiles contributing to global datasets), the Argo system captures temperature and salinity data that informs climate-change projections, while providing a map of ocean currents. Along with climate data, other ocean events such as plastic accumulation also surface as part of the tracking and tracing that Argo floats perform. The floats drift and dive down to one thousand and two thousand meters, and surface, providing data on conductivity and temperature, pressure, salinity, and location. As a communication system composed of Argo floats and the Jason satellite mission, this ocean sensing at once signals Greek mythologies of navigation, the accumulated histories of colonial shipping routes, as well as near-future trajectories for steering Spaceship Earth through the gathering storms of planetary collapse in the form of climate change and the collapse of ocean spaces.

Similar techniques for mapping the circulation of ocean debris include systems such as the Global Drifter Program, one ocean observation project among many that has deployed surface drifting (rather than diving) buoys equipped with sensors that communicate

with satellites, and which are used to study the drift of plastics and other debris in the oceans. Using drifter tracing and sensor communications, the Global Drifter Program has deployed tracking buoys that communicate with satellites to establish circulation patterns in ocean currents. Along the way, the drifters have also become devices for establishing the likely movements of marine debris, since where the drifters collect is likely to indicate the same locations in which other flotsam collects.[12]

The Global Drifter Program consists of a platform of more than 1,250 drifting buoys that have been deployed over several decades spanning from initial development in 1979 to current annual mass deployments to monitor the oceans.[13] The buoys monitor the upper water column and provide information on ocean surface and atmospheric conditions, as well as fluxes between air and sea. Run through the Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, Florida, the drifters are deployed at study sites and then circulate across oceans. Detecting and sensing sea surface temperature, barometric pressure, wind velocity, ocean color, salinity, and subsurface temperatures, the buoys monitor ocean conditions primarily to determine weather and climate patterns. As they circulate, the buoys can also send one-hundred-and-forty-character messages on location and ocean conditions – what physical oceanographer Erik van Sabille has referred to as "Twitter from the ocean."[14] Part of the Global Earth Observation System of Systems (GEOSS) of monitoring technologies, the Global Drifter buoys also link up with earth models to provide forecasting data.

In addition to functioning as weather, climate, and circulation observation devices, the drifters have provided detailed and longer-term data on the likely movement of debris in oceans. A high proportion of drifters has gravitated toward the five gyres, and in this sense the drifters have provided further data for establishing where gyres are located and how long drifters or debris may converge in these areas.[15] Global Drifter data has led to the identification of a sixth Arctic gyre, as well as observations about the ways in which patches are "leaky" and circulate debris across regions, potentially over a time span of centuries.[16] The drifters are in many ways proxies for demonstrating how debris travels over time in oceans, how debris converges in gyres, and the length of time it may take debris to exit convergence zones (if at all) and wash up in coastal regions. The drifters were not originally developed as monitoring devices to study the accumulation of debris directly, since they focused on ocean circulation patterns. But the drifters became an imported technique for studying how debris circulates and settles in ocean spaces in relation to the study of ocean circulation. The drifters also eventually become debris, as they have a limited (five-year) battery life, and cease to function due to mechanical error, environmental stress, and more.[17]

The Global Drifter Program potentially not only validates or corrects prior and differing studies on ocean circulation but also provides a more real-time observation platform for understanding how gyres may shift – and debris concentrations along with them. In many ways, the ongoing deployments, shifting oceanic trajectories, and real-time communication of the drifters are practices that emerge in relation to and through a fidelity to the shifting techno-scientific objects under study. The sensing and satellite-linked drifters enable sensing practices that are able to more continually monitor these shifting conditions and processes. Sensing buoys concresce along with the circulation patterns and debris under study, thereby materializing a distinctly environmental and oceanic form of computational sensors. The shifting materialities of the garbage patch inform the technologies that come to be used to monitor them. Littered oceanic spaces are co-constituted through the becoming environmental of these computational monitoring technologies. Environmental monitoring techniques "sense" an object such as the garbage patch that is relatively invisible and continually in process by navigating with and through ocean currents, in turn proxy-sensing the routes of plastics.

Oceans and objects are sites for sensing practices in the making. Drifters and sensors, together with studies of particle movement and ocean currents, are both abstract approaches to understanding the garbage patch, as well as concrete things that navigate as they generate worlds to be sensed.[18] Such techno-scientific observation techniques focused on marine debris in the gyres inevitably also mobilize responses for remediating and managing the issue of plastics in the seas. In this sense, the garbage patch in its intractable plasticity gives rise to techno-scientific practices not just to monitor but also to repair, control, or manage this object of study and concern.[19] Emerging systems for sensing oceans materialize as information infrastructures with embedded modes of governance. Yet these attempts to monitor the ocean might also arrive at the inability to arrive at a knowable or governable ocean.[20] Ocean-sensing practices reach a limit condition, where they observe and yet cannot fully predict the phase changes that the oceans will experience with plastics pollution and climate breakdown.

Such stress-testing of drifters and oceans resonates with the opening scene of Farocki's early film *Images of the World and the Inscription of War* (1989), where a wave machine in a laboratory creates waves that simulate, test, and observe the meeting zone between wave and land, as a technique that speculates toward the likely effects of waves on navigational abilities. Yet the wave machine cannot possibly capture the full array of waves likely to be encountered, or know the conditions that might cause these navigational challenges. The wave machine constructs conditions that imperfectly align with the stochastic wave worlds of multiple seas and oceans.

The material occasions of oceans are not only a remote object of digital study, but also an actual occasion in which we are now participating and through which we will continue to be affected. Here, new societies of objects emerge from the remains of techno-scientific pursuits and in turn give rise to new monitoring practices for studying these residual and yet generative objects with unknown and indeterminate effects. A key question arises from monitoring the oceans as generative techno-scientific and computational objects: What experimental forms of politics and environmental practices might materialize that are able to attend to these indeterminate and emergent effects, which also portend the end of a world, if not this world?

Sensing the End of this World

In a pluralistic ontological register, we could say that there is already more than one world in the present; and yet the world that is navigated via sensing technologies is presented as one that is at a saturation point and under crisis. By tracking the geo-spatial recordings of these ocean-sensing systems, it is then possible to ask, along with Farocki, *where does this world end?* Or in other words, how do sensing and navigational technologies chart the contours of a world that seems to be continually approaching an ending, while also suggesting strategies for sensing, mapping, navigating, and inventing worlds otherwise? Beyond navigating the end of this world through sensing devices, it could be possible to tune into other worlds that are typically not on the maps of drifts and floats. This is another way of suggesting that it could be possible to reassess the politics and "ontology of the navigational."[21]

These multiple worlds surface other sorts of "residence time," as Christina Sharpe has written about seafaring and oceanic spaces in the context of slavery and the "amount of time it takes for a substance to enter the ocean and then leave the ocean."[22] A concept from oceanography, residence time refers to the extended time frames within which materials, pollution, heat, and more circulate and transform within and through ocean spaces. Indeed, the plastics, heat, and carbon dioxide that are added to oceans can take many decades or centuries to circulate, with materials from the mid-twentieth century surfacing only now. Yet along with these chemical-material markers of extraction, there are also other entities churning through oceans that are less easily detectable through sensor technologies. Sharpe addresses the legacies of colonialism and slavery that have traversed oceanic spaces and left residues of bodies, violence, and inequality that continue to cycle through the depths, surfacing and recirculating further material histories of these events.[23] All that circulates through oceans also makes worlds, which can create violent and destructive spaces to navigate. They force the question: When will the residence time of *this* world come to an end, and how will the "end" be navigated?

Indeed, these endings might also indicate how the time of the present is "already dystopian," as Kyle Powys Whyte has suggested in relation to "indigenous perspectives on climate change." In other words, the rupture that marks endings in fact permeates present conditions, rather than being something that is yet to come.[24] Rather than search for strategies to sustain this world, such perspectives suggest other approaches and practices that might be tuned toward science fiction, in order to draw out the sedimented endings and forms of environmental and colonial violence that are undergirding this world, and to speculate toward other environmental inhabitations.

Or, as Fred Moten has suggested in the *Undercommons*, this world might not be suitable for repair and so should not be engaged with through recuperative logics and practices.[25] Rather than extend and maintain *this* world, its end should be hastened along in order to build something new. The question of what *this* world is within the context of a black radical tradition takes on another designation that suggests the limitations of what might be sensed and engaged with as self-evident. The sense of "common sense" is a social and political settlement that often elides the subjugating conditions that have enabled these forms of sense-making. Denise Ferreira da Silva picks up on the topic of the end of the world and suggests that by surpassing "the known and knowable World" it might also be possible to exceed universal subjects, racial subjugation, and "efficient causality." This is a way of "opening up the possibility for a radical departure from a certain kind of World."[26] The world that could be ending, that could be proposed to be ending, is always a particular

construction that makes possible some inhabitations and not others. How such worlds are sensed, the ontologies that they operationalize, and the endings that are traversed, are conditions to be queried and even exceeded.

There are multiple worlds and multiple endings layered into these discussions,[27] as well as emerging through the sensing systems and sensing practices of environmental observatories and geopolitical infrastructures. Returning to Farocki's *Parallel* series, one can begin to consider the emergence of speculative practices and technologies for navigating at and beyond the end of this world. Toward the end of *Parallel II*, the narrator, having cycled through multiple game worlds, describes a program that is meant to prevent "the game figures from falling off the edge of the world." Yet in another game it is also possible to change the settings and cross over the edge of the game, making it "possible to break through the safety barrier and fall out into space" where one would free fall "like an astronaut catapulted from his spaceship." Where the limits of the game are made visible, and the end of this world is encountered, there is a distant urban conglomeration, a black cavernous space, and a subject in free fall.

By attending to the constructions of worlds, as well as the ends of worlds, it is possible to engage with how these ways of seeing, sensing, feeling, and navigating test the boundaries and conditions of worlds. The end of this world could occur on one level through the saturation, pollution, acidification, and defaunation of oceans as they alter through environmental change. Yet this ending and ways of sensing this ending also suggest that it could be necessary to attend to how these worlds are constructed, as environments of distributed computation, as digital worlds in the making, and as sedimented zones of colonial extraction and subjugation that continue to be plundered for labor, minerals, and resources. What does not show up at the edges of these worlds are the conditions whereby these worlds have been constructed – the *navigational meshes*, as Farocki has captured them. These navigational meshes are the parallel yet often hidden infrastructures that support and enable worlds and their circumnavigation. When brought into view, they show up as the wireframe guides and coded protocols for operating within a particular zone. Navigational meshes could even constitute parallel worlds, a matrix of programs and programmability that could be rendered and reconstituted. By devising speculative instruments for tuning into these parallel worlds, it might be possible to sense the limit conditions of extractive ontologies, and to navigate beyond endings toward potentialities for otherwise inhabitations.

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This text includes portions of an abbreviated and revised reprint from chapter 5 of *Program Earth*, courtesy of the University of Minnesota Press.

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SATURDAY
10/08

CLIMATE CARE PARASITIC READING ROOM
- A SERIES OF RE-READINGS

Guided by: Rosario Talevi

The Parasitic Reading room is a nomad, spontaneous and parasitic set of reading spaces taking place along cultural venues and other spots in the city, with the intention of 'parasiting' the event's participants, visitors, ideas, contents and places, and to provoke a contagion of knowledge. For Climate Care, the Parasitic Reading Room will re-enact words, phrases, fragments, incomplete texts, random parts, occasional sentences that have inhabited the iceberg during the 10 days of the Climate Care Reading Group.

By reading aloud we share a space of intimacy, a time and place of learning not only from the contents, but from the nuances, the accents, the cadence of the reading. Abigail Williams called this ‘the social life of books,’ “How books are read is as important as what’s in them,” she pointed-we call it ‘the book as a space of encounters.’ This means spaces where different books coexist and enrich each other; books as the necessary space where the author can have a dialogue with the reader, where different readers can read between the lines and find a place of exchange, where to debate, and discuss ideas. Books and encounters as an open school.

The Parasitic Reading Room is an on-going project initiated by Ethel Baraona Pohl and Cesar Reyes Najera (dpr-Barcelona) together with Rosario Talevi for the 4th Istanbul Design Biennale. Other instalments includes The Parasitic Reading Room: Repair Acts as part of RepairActs, International Network Meeting & Conversation, Bristol [February 2019]; and Friend/ships: l’amitié comme moyen de transmission, with Rebekka Kiesewetter, Continent, and dpr-barcelona, Centre culturel suisse, Paris [March 2019]; and more to follow.

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