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What Can a Society Do?

How to avoid activating the trick of evil when speaking of sciences? How to avoid freezing researchers in a defensive attitude? Such an attitude is understandable, given that researchers feel themselves exposed and subjected to imperatives that put them directly in the service of ensuring economic growth, while confronting a public that traditional institutions are no longer capable of disciplining, which seems to confirm their worst prejudices. When calling into question the bastion that goes by the name of Science, how not to run into blockage and inhibition, expressed as a kind of social panic, "let's hold on, not give an inch, or chaos will ensue"?

Thinking through the Milieu

The situation is not a war, however, in which each must choose their side. On the one hand, so many researchers would like to work on questions pertinent to these times of ecological and social collapse. On the other hand, the catastrophe-orientated vision according to which "people" would now think that facts are mere constructions is rather an exaggeration, even if many people are more likely now to question dismissals based on "there's no proof," which might previously have silenced them. We find ourselves in the type of situation I have associated with the possibility of a "diplomatic" intervention: belligerent parties are caught up in a logic that seems to make war inevitable, and yet, if the diplomats make them feel that it might be possible to avoid it, they might opt instead to suspend the reasons

pushing them toward war, allowing the diplomats to give peace a chance.[1]

As the diplomat knows, diplomatic intervention is possible because the reasons for war are "social" in Whitehead's sense. Logic and its "therefores" are not enough to deduce the necessity of conflict. The situation that gives logic its power could be characterized otherwise. In the case of Science, the reasons for conflict come at least in part from how scientific institutions encourage scientists to adopt a manner of self-presentation fated to pit them against the public, whose perspective becomes characterized as meddling in what it cannot understand. It is worth noting that this manner of self-presentation carefully omits the tensions arising among researchers over the imperative for science to serve economic growth. The public, such as it is characterized, would only too easily follow the example of those who take facts seriously only when facts are in keeping with their interests. Or else it would be only too happy to reject any scientific claim as corrupted.

Instead of making a frontal assault on the reasons mobilizing scientists, which would activate the trick of evil, the diplomat strives to inflect them. Diplomacy is a pragmatics: it is an art of effects, an art based on the fact that no reason, as such, has the power to determine what it requires. Considered in the terms proposed by Whitehead, we could say that diplomacy counts on the fact that how a society defines what makes it hold together remains an open question, which only the trick of evil turns into an inflexible self-presentation. In the terms proposed by Gilles Deleuze and Félix Guattari in *What is Philosophy?,* we could say that the diplomat has to think the reasons justifying the war "through the milieu," exploring how these reasons imply and capture a propitious milieu that nurtures evidence for them.

In *An Inquiry into the Modes of Existence,* Bruno Latour turns to the figure of the diplomat in a mode of thought experiment whose stake is to dramatize a discrepancy the brutal effects of which he has amply experienced. Through his fieldwork, he acquired an appreciation for the intelligence of practitioners of science who themselves were thoroughly happy for the opportunity to share their ambitions and concerns with an inquirer who, while posing questions that surely surprised them at times, displayed genuine interest in what they were doing and what mattered for them. During the great war-

like mobilization against skeptical relativism, however, Latour found himself the butt of reprisals on the part of the same practitioners (or others like them) who suddenly offered the public a dogmatic caricature of what they were doing. Refusing to recant, to recognize that "there is an objective reality, which science merely discovers," he was denounced as a supporter of irrationalism whose ascendency constituted a threat to civilization.

The diplomatic intervention Latour conceived is situated by this experience: he undertook not only to understand better how certain formulations had proven capable of inspiring such anxiety among practitioners but also to address the striking discrepancy between their practices and the ways in which they demand to have them recognized—or it means war.

The diplomatic apparatus, as Latour imagines it, entails an attempt to activate possibilities for peace by putting in place a very particular milieu, an agora, the public place par excellence where Greek citizens listened to orators disputing among themselves. The agora he imagines would gather protagonists concerned by the possibility of formulating ways of speaking well about forms of knowledge locked in rivalry today, each trying to disqualify the other or coming to an agreement only in order to do away with yet other forms of knowledge. The diplomat in the agora must successfully "speak well of something to those concerned by that thing—in front of everyone, before a plenary assembly."[2]

Instead of inquiry, diplomacy involves an encounter with specialists in public, precisely where they are used to engaging in belligerent behavior. Scientists of diverse provenance will be there, as well as other practitioners, legal experts, theologians, and doctors, to name a few of those who belong to institutions that tend to hold public self-presentation at arm's length. And since diplomacy is an apparatus, it is all about seeing how it can function. How is the assembly to be composed? How will roles be distributed? How can it activate what the trick of evil inhibits?

A first protagonist is the one who has taken the initiative to hold the assembly, taking up the diplomatic challenge of speaking well before the others. Next are the "belligerents," those whose respective ways of presenting their practices would mean war against each other if they did not avoid explicit confrontation. Without the

initiator who has invited them and who professes to speak to them of what concerns them, they would not have gathered, because their habit is instead to "speak badly" of one another but in situations where they enjoy impunity, without consequences, in cold-war situations. Of course, those who take pride in their arrogant judgments, the hardened professionals, have refused the invitation. And finally comes what I have been referring to as the public, those who have grown accustomed to being taken as witnesses, or hostages, or empty-headed straw men. The belligerents agree only on this latter point. But the public today is troubled. Let us have the members of this public be chosen by drawing lots among volunteers in order avoid reconstituting cliques. The presence of the public, with its way of composing a "milieu" for the other protagonists, will be crucial. It will, in effect, give meaning to an injunction Latour inherited from Whitehead: "The goal always is not to shock common sense."[3]

This injunction, distinctive to the agora, also dramatizes the consequences of what I have previously called the defeat of common sense. The belligerents count on a public that is patient, unaccustomed to feeling shocked, even if today it is feeling uneasy and disoriented, and even if furious impatience has overtaken some of them, as we are all too aware.

Let us imagine this assembly. Each of those whom I call belligerent parties, when confronted with the challenge of a diplomatic proposition concerning it, will have to consider implications and consequences. The wager of Latour, diplomat, is that each practitioner is accustomed to presenting her practice to people deemed incompetent and incapable of understanding and is primarily concerned with maintaining an apparatus of "territorial defense," instead of explaining what they are doing in practical terms, elucidating how it matters to them. Even if a practitioner does not possess the blind arrogance of the true professional, he feels obligated to speak in terms of belonging to an institution, which is mobilized to defend instituted boundaries, and which strives to command the respect of outsiders, whose ignorance constitutes a threat. If he becomes caught up in giving an account that highlights the specificity of his practice, he knows that his peers might very well disavow him: "You got played, you've weakened us."

Instead of a faithful empirical description of the landscape of

practices, the "categories" in play in the agora correspond to the diplomatic problem posed there, which does not concern all the practitioners; many practitioners are prey to territorial struggles, habituated to living on the sidelines, in a subaltern position of formal or effective dependence. Consider, for instance, the relationship between those who take care of zoo animals and are acquainted with them and the researchers who come to observe these animals "objectively," or the relationship between farmers and the technicians of an ever-more-rationalized and industrialized agriculture. Caretakers or farmers know only too well the experience of being characterized pejoratively, yet they are not in the habit of presenting themselves as aggrieved or dissatisfied, and this is why they are not part of the belligerents; they are thus in the public.

Let us continue as the situation becomes increasingly complicated. One of the singularities of Latour's agora is that actually concerned practitioners, practitioners belonging to "predatory" institutions, are gathered together in the agora, and each has very good reasons to listen to the proposition the diplomat addresses to another, and to the reply. The exchange may concern him because he knows that this other may present his practice in a mode that often implicates him as well, and generally in an unflattering manner, explicitly or by default. Typically, science, then, is neither politics (a tone of disgust), nor religion (disgust again), nor a human convention like law (irony). Science is the one true (vibrato) source of technical innovation, and whoever likens it to mere technique, relative to the interests it serves, is the enemy (exclamation). Usually, this sort of knocking down of a straw man remains without consequences—think of the false courtesy that makes for the boring sterility of so-called interdisciplinary encounters. But in the agora, in the presence of a public that is as interested in their silence as in their interventions, each of the parties is concerned. Each must pay attention to the manner in which the diplomatic proposition addressed to another and the answer made to it implicate or enlist them. Tolerance no longer works; mutual ignorance is not an option. The staging requires a kind of choreography in which the protagonists, accustomed to bumping into each other or stepping on each other's toes, would learn the art of encounters, attunements, and distances.

Latour's agora, moreover, requires the presence of the public in

a mode analogous to that of the Athenian citizens, whose civic duty was to attend the spectacle of passions staged through tragedies and brood with the chorus commenting on the events. This public is not a direct stakeholder in the problem the agora dramatizes. But it listens, cogitates, and appreciates. It is vigilant. And if this public is shocked, it will be because of a pejorative judgment, of concern precisely because insulting to it, or else because, while it is brooding, it is shocked by authoritarian stupidity, a hasty shortcut, a dogmatic dismissal, or a blatant inconsistency on the part of those who claim to know. It is because the public feels empowered to evaluate and wonder that it introduces a constraint. The potential impatience of the public forces the belligerent parties to seek ways of speaking well, of not relying on predatory judgments to characterize what they are doing, what it demands, and how it situates them. The presence of the public even incites them to listen to one another, to let themselves be affected by the ways in which each of them tries to respond to the challenge.

Can the parties reach a point where each is capable of presenting itself, of speaking well about what matters for it, without any need to define itself against others? Latour's story does not say. But if they are able to do so, it is not because they have successfully come to respect common sense as one might respect traffic regulations. As I have emphasized, when Whitehead describes the welding of imagination and common sense as "a restraint on specialists,"[4] he does not mean someone slamming their foot on the brake pedal when running into the radar measuring their speed. At stake is the channeling of their imagination.

Deleuze and Guattari ask us to think through the milieu. Here we need in particular to think through the rarified frictionless milieu required by the institution called Science. Science makes it the right and even the duty of the specialist to resist the temptation of being affected by the objections of others or their perplexity, and so this rarified milieu produces predators and prey, those who judge and disqualify and those who are victims, whose reasons are dismantled derided or marginalized. The agora truly is a testing ground, because the way in which specialists themselves represent their practices is inseparable from this rarified milieu, inseparable from their adherence to the necessity of distancing themselves from uncertainties

that might entrap them in common-sense questions that they take for mere opinion. Distance is all the more required because getting interested in matters of common concern might make them lose time or lead them to hesitate in an unproductive mode that does not advance knowledge.[5]

In Latour's agora apparatus, not shocking common sense thus means speaking before an attentive public, a public that is demanding and alert, likely to take offense if it is treated as a herd in search of its master, a public that hypothesizes an "amateur" milieu whose participants are capable not only of taking interest and evaluating but also of objecting. Without recognizing it, modern institutions desperately lack such a milieu today.[6] Previously I alluded to Greek tragedies, which staged the unfolding of fatal passions, indifferent to their consequences. These tragedies were considered to be essential for the political culture of citizens, for citizens had to acquire some knowledge of these passions, to taste them, in order to avoid subjugation to them. The speculative character of Latour's agora underscores the absence of such apparatuses in the modern world, apparatuses nourishing a political culture capable of distinguishing between what we call democracy and the art of leading a herd.

The modern world inspired Whitehead to call for cultivating vigilance toward our modes of abstraction. The apparatus of the agora gives new meaning to that call for vigilance. Instead of a task for philosophy, maintaining such vigilance now calls for a change in milieu. Recall that Whiteheadian societies depend on the patience of the milieu they affect. Here this means making a wager on a milieu empowered to feel its impatience when faced with hegemonic claims that shock it. What might practitioners prove capable of if their institutions of affiliation did not spare them the challenge of this impatience, if they did not teach them to remain narrowly focused on the interests of their practice to the exclusion of all else? Conforming to this injunction, specialized practitioners may be highly skilled and innovative in their domain yet ignorant, naïve, and arrogant about the rest, what Whitehead called "professionals." Latour's wager implies that such conformity is not essential to modern practices. Exposed to a demanding (yet not accusatory) milieu, practitioners might become capable of exploring other ways of characterizing themselves and their practices.

Today, the agora as Bruno Latour imagines it might appear to belong to a dead past. Diplomats could have intervened at the time when the science wars were waged, when the public still paid attention to specialists. But is not such a public on the verge of extinction? Panic now overcomes the herd previously held in check by promises of progress and economic growth as well as the inexorable advance of knowledge that placed the planet at the service of humans. The agora designates a possibility that today seems eclipsed by the urgent need to mobilize in defense of specialists against the hatred of facts.

To be sure, because specialists now are attacked when their facts prove bothersome, encouraging them to abandon their institutionally inculcated defensive habits brings to mind Jean de la Fontaine's fable about the schoolmaster who reprimands a child who is drowning. Specialists might well take up the retort from the fable: "Hey, friend, pull me out. You can yell at me after." In our case, however, the "after," which is supposed to arrive when specialists are finally respected again, is also in vital need of them becoming capable of respect for others as well, abandoning their dream of a herd that is calm, trusting, and governable once more. Mobilizing in an emergency, deriding the possibility of peace in the name of the harsh reality of priorities, is a dangerous advisor.

I hope that I made clear that thinking through the milieu is not at all about conforming to what the milieu makes probable or improbable. It is instead about resisting explanations that normalize, that anesthetize the imagination, and that give free reign to the trick of evil. It is especially about refusing to retroactively validate the claim that critical attention with respect to the authority of scientific facts amounts to a threatening rise of irrationality. Thinking through the milieu does not mean denouncing institutions as such, but characterizing modern institutions through the rarified milieu required by this authority, institutions promoting the myth of "isolated facts." In this context, it thus means bearing in mind that a situation demanding such rarefaction is dangerous and profoundly unhealthy, but without separating the situation from what Whitehead called its potentialities. Instead, thinking through the milieu is about the kind of option that William James characterized as genuine, alive and insistent, of importance to us, and above all, forced. For James, when an option is genuine, we are forced to opt, to make a wager, be-

cause "there is no standing place outside the alternative."[7] To abstain is to take sides against what might be. By dramatizing the possibility that specialists may betray the institutions that make professionals of them, Latour's experiment with the agora opts for the possibility that what we call our civilization may have a future. Latour thus pursues a path Whitehead would not have rejected.

I now head down another path, however, different from Latour's yet complementary to it. Both may be taken, each in its manner, as applying the famous Spinoza dictum to Whitehead's societies: "We do not know what a body can do." I will return to Latour, but in his exploration of what it takes to "face Gaia." The path I will now follow starts from Whitehead's impatient opposition between "nature lifeless" and "nature alive." To learn to speak well of sciences is also to learn to speak well of the way in which they address what is habitually called "nature." To deal with this habit diplomatically means to avoid rushing into oppositions that are likely to push scientists to adopt a belligerent stance. It will mean wondering about so-called "natural societies" and the way scientists explore what those societies can do. How do scientists learn to make sense of the reckless plurality of the social ways to make an environment matter, a plurality that makes up our worlds?

Finding More

Diplomacy is an art of words. The diplomat does not fear words, but understands their danger. She will not attempt to proscribe certain words, but will focus on detecting uses that make them dangerous.

Let us return to the bifurcation of nature. The question no longer concerns the bifurcation between objective facts and values or other subjective add-ons, at least not for now. The question bears on this ambiguous and controversial word, "nature." Some point out that nature no longer exists in the sense of being free of any trace of human activity. Plastic waste permeates even the ocean, and in the sky, the increasing amounts of debris threaten the security of space flights. Others primarily fear the connotations of the adjective "natural," understood to mean legitimate, normal, or authentic. Others yet reject the opposition between nature and culture, as much for its connection to human exceptionalism (a world in which the others

may be globally qualified as "nonhumans") as for its theoretical imposition of a great divide between those who know how to distinguish between nature and culture and those who mix them up. And all the while, physicists in ultratechnologized laboratories continue to define themselves as being in search of the laws of nature.

The idea that nature should be "pure" or "wild" in order for her to "exist" obviously attributes far too much to human activity. Even bonsai, meticulously "civilized" by the Japanese, are not products of human activity. Neither are GMO monocultures, any more than are shepherd dogs. Humans have to go through what a tree, a plant, and a dog require to live if they wish to produce bonsai, GMO, and shepherds. The limit case may be industrial animal farms, where animals are kept "alive"—that is, prevented from dying, with doses of medications. For physicists in contrast, purity, authenticity, and abuse are of no concern: the earth moves, and the adversaries of Galileo can do nothing about it. This is nature for physicists, something indifferent to our ideas about it, which their laws strive to characterize.

It is utterly impossible to salvage any sort of "good definition" from this jumble of meanings and issues. What is needed instead is to create meanings that suit the needs of those for whom these meanings are of concern. As early as *The Concept of Nature,* Whitehead sought to create a concept of nature assuming "as an axiom that science is not a fairy tale."[8] Today we would say a science that is not a mere social, linguistic, or cultural construction. The nature scientists refer to must be able to provide them a *grasp* of it. Nature must not be reduced to a mute reality, thus relegating responsibility for what is attributed to it to the famous subject of knowledge alone. Neither must nature be something only scientists have access to. *The grasp nature provides them is a matter of concern for many others as well.* We thus need to ask what type of grasp the sciences require. "We are instinctively willing to believe that by due attention, more can be found in nature than that which is observed at first sight. But we will not be content with less."[9]

The "we" here is indeterminate. Indeed, it could equally well comprise nonhuman animals, paleolithic humans, or scientists. The attention of an animal on alert, the rabbit's ears directed toward the least sound, attests to the relation between perception and the possibility of finding more. Does the rabbit make a conscious decision

to prick up its ears? No more than we do, no doubt, when we react to a sudden noise. In any case, that which we call consciousness intervenes only afterward in such cases, unless we have made a conscious decision to remain impassive (but even then micromovements would betray us to those with the means to decipher them). If nature is, as Whitehead proposes, articulated with the notion of a grasp enabling us to find more, it is not an object of conscious representation, but of pragmatic concern. The rabbit's business here is a matter of survival. Its way of paying attention implies the vital importance for it to distinguish between what is only a noise and the real approach of what it must flee.

Of course, what we are now calling nature entails different stakes for the fleeing prey, the approaching predator, and the observing experimenter. All of them, unanimously but each in its manner, reject the hypothesis of an inconsistent nature, a kaleidoscopic fabric of dreams that is made and unmade, transforming each time the way of paying attention changes. If they speak the Whiteheadian jargon, they also make clear that the stakes articulated around nature will be social, implicating occasions as they participate in societies instead of actual occasions as metaphysical abstractions. Thinking in terms of "finding more" forces us to confront ontological questions that hinge on the question of knowing what the different societies making up the world in which we live can do.

The expression "due attention" is equally indeterminate. Due to what, and why? The experimenter's attention has little to do with the rabbit's, or with the ethologist learning to decipher animal behavior, and yet, in the three cases, attention is due to find more, or so it is hoped. At the same time, there exists a number of other ways of paying attention, implying other modes of grasp, other relations, and other stakes than finding more. In those cases, sticking to Whitehead's proposition, I will no longer speak of "nature." This term will be reserved for that which is implied in the possibility of finding: a practical differentiation between the ones who seek to find and what they aim at. To find *more,* it is imperative for what is aimed at to remain itself, to remain that with respect to which finding occurs. Although to find is not the only way to learn, it is the best suited to the scientists' insistence on defining their successful outcomes in terms of accessing reality in itself, independently of their own

anticipative interpretation. For all the exaggeration of their claim, we can understand it in terms of what a successful grasp requires for the one attempting this grasp. The alpinist who seeks a grasp with which to pull herself upward needs it to bear her weight. For the scientist, the ambition of finding more requires that the one about which there is finding be indifferent regarding what this finding entails. *Eppur si muove,* whatever the theological problems it raises, claims Galileo.[10]

Although the proposition may seem bizarre, it merits attention for the effects and problems it raises. In other words, its efficacy arises from pragmatics: it addresses a practice from the question of what it requires without turning this requirement into a defining condition. Indifference is relative to what the scientist aims at finding, it does not define "nature" in general.

Whitehead's proposition excludes assertions whereby "nature does not exist" or "nature is inaccessible to knowledge," which insult scientists, spurring them to adopt a belligerent stance. Indeed, how could we learn the attention due to find more of something that does not exist? How can something providing a grasp be called inaccessible? Nonetheless, that to which scientists' attention gains access does not constitute an authority for others whose attention implies different stakes. The concept of nature allows scientists to resist those who would reduce what they obtain to mere constructions. But it does not permit them to forget that they are situated by what they ask of nature.

Any grasp allowing a connection engages both parties concerned. If a realistic value can be associated with scientific practices, it comes from their mode of engagement, and if we can associate nature with the possibility of finding more, it is to the extent that that to which we pay attention agrees to the offer of engagement in the required mode. It cannot be a matter of seduction, nor of common interest, nor of obedience, nor of a unilateral imposition. Thus, we again find scientific objectivity associated with the theme of the event of a successful outcome. Sciences do not presuppose the bifurcation of nature, but when there is a successful outcome, a bifurcation passes between those who are actively responsible for the offer and the one who was empowered to turn it down and has accepted it. The story of a science is a story of "making societies," of recruiting, not conquering, what has lent itself to its grasp.

At the same time, when it is a question of the sciences we call experimental, the offered relation bears features of an enrolement that requires a maximum of dissymmetry between the two poles, between the one who acts, chooses, or develops and the one who must play its part without endorsing it as a role. The answer obtained must be identifiable with an impartial result: the being that answers must be indifferent to the stakes articulated around its answer, and thus indifferent to the role it takes on. The answer must be assimilable to a simple result of the experimental intervention.

The singularity of the experimental fact, then, lies in exacerbating the opposition between the one who asks questions and what answers. The experimental fact articulates ways of "making society" that authorize this opposition. The successful experimental outcome implies a passionate, intensely purposeful way of "making society" on the part of experimenters, since the success of an enrolement that meets the demands of proof really matters or has value only for them.[11] At the same time, this successful outcome is able to implicate only societies that let themselves be enrolled in an indifferent mode: for such societies, the laboratory is an environment like any other, where they just go on in their own way. The indifference required by an experimental setting cannot be obtained by simulating neutrality or cheating about what is at stake. It is an ontological requirement.

The term "successful outcome" is of diplomatic importance here. While it may satisfy experimenters, it separates them from those for whom proof is generally required, whatever the price. A successful outcome is not a right. The experimental finding demands a mode of attention that may not be the *due* attention in many other cases.

> An angry man, except when emotion has swamped other feelings, does not usually shake his fist at the universe in general. He makes a selection and knocks his neighbour down. Whereas a piece of rock impartially attracts the universe according to the law of gravitation. . . . It is true that the rock falls on one special patch of earth. This happens, because the universe in that neighbourhood is exemplifying one particular solution of a differential equation. The fist of the man is directed by emotion seeking a novel feature in the universe, namely, the collapse of his opponent.[12]

We can take the fall of the rock as a particular example of a general law established experimentally. But when the man punches his neighbor, the idea of reducing the punch to the impartial result of an ensemble of causes that scientists should actively identify is but the chimerical dream of neurophysiologists. Still, the man in anger is not a free and responsible subject. It is impossible to pass without transition from the laws of nature to the laws of humans that may judge him guilty. Whitehead construes the man's gesture as an example of purposeful animal behavior. A hungry tiger pouncing on its prey would have served him equally well as an example. What the two have in common is that their behavior cannot, unlike the movement of the stone, be characterized in abstraction from what they aim for. As regards behaviorists who feel it important to deny such aims and to reduce behaviors to an indifferent succession of actions and reactions, Whitehead remarks: "A consistent behaviourist cannot feel it important to refute my statements. He can only behave."[13]

The example of how experimental sciences "make society" is thus not generally pertinent in regard to animal behavior. The man's fist might well aim for the experimenter himself, if he found out that the latter is in fact responsible for the provocation that aroused his anger, that he was "manipulated" or "baited." To be sure, the capacity to be sensitive to decoys or lures is not the prerogative of all living beings, but it signals what could be called the end of experimental innocence. The animal, too, might well be capable of finding more, and notably with respect to the apparatus that is supposed to enroll it in the service of science. The meaning of science then mutates: the apparatus is now that to which the animal gives meaning, in one mode or another, yet always in a partial manner, for its own reasons.

Those who, "outside science," learn to know an animal, always *this* animal, may well be indifferent to the question of knowing whether or not what they learn responds to the values allowing science to affirm that it has found more with respect to nature. For ethologists, however, the question is critical. They would really like it, for instance, if what they call "habituation" allowed them to claim that animals have become indifferent to their presence and have resumed a "natural" behavior. The term "nature" becomes dangerous as soon as the dissymmetrical enrolement that allows for "finding more" becomes tied to the idea of nature having its own laws or natural behavior

having its own rules. The same trap occurs with words such as "obeying," "resulting," or "being indifferent." "You see, you broke it," said Epictetus to the master who mistreated him. But the indifference of the stoic does not make him into an instrument that tests the limits to the resistance of a tibia. *Perinde ac cadaver,* or obeying in the manner of a corpse, was the vow of obedience taken by ascetic monks. The obedience of the monk who renounces his own will does not make him an inert body. Even Pasteur's and his successors' experimental success does not depend on the indifference of microorganisms to experimentally controlled variations in their milieu. On the contrary, success depends on the decidedly piecemeal, partial manner in which they evaluate this milieu. Pipette, petri dish, and living body matter little to the microorganisms that lend themselves to this type of cultivation. But food utterly matters. If they accept the offer, they will provide a determinate answer to the question: does this milieu permit them to grow and multiply? This is, together with that of poison, the question that articulates the relationship between the experimenter and his population of microorganisms.

The term "partial" is central to Whiteheadian ontology. Every society is partial, making its environment matter in its own mode, valorizing it in this way and not any other. The fall of a piece of rock is an exception; it is an example of impartial behavior. Where it falls depends only on its initial conditions, and as a consequence, it may be the instrument of a crime or an example of misfortune that had someone in the wrong place at the wrong time. Impartiality means that aim is foreign to a body that is subject only to the law of gravity (parachutists who take advantage of friction, or birds, gliders, and airplanes, are another matter entirely). It is only because the piece of rock, as it falls, is indifferent to its effect that cause and effect can be defined as equivalent.

Privileging ties between "impartial" movements and the notion of mathematical function is normal enough.[14] But it is a disaster for them to be accepted as the model of intelligibility, implying the illusion of self-sufficient science denounced by Whitehead. From the point of view of Whiteheadian ontology, any analogy privileging impartial movements or changes is undue, for it does not activate the attention suited to finding more. A prime example is the extreme partiality implied in efforts to attain impartiality.

Thus, in each case, vigilance is needed with respect to analogies and the modes of abstraction they promote. Through the question of due attention, the plurality of societies with which we pragmatically relate comes into question, as does the plurality of practices likely to find more, notably those that are about "learning from." Here we take leave of nature, but without forgetting the practices of "learning with," for I will address them later.

Learning, of course, is what scientists do all the time, yet when their success communicates with the verification of a theoretical representation, the necessity of learning is often set aside. Physicists like to repeat, with respect to chemistry, that chemistry learns while physics understands. Indeed, chemists "learn from" the dizzying variety of chemical compounds to characterize what their ingredients are capable of. They may need, for instance, to take into account the possibility that a compound relies on the presence of a catalyst: even the separation between a possible operation and an impossible operation is relative to the circumstances. Intelligibility, when it occurs, is obtained after the facts: chemists *render intelligible.* And the intelligibility that they obtain is always relative to trials, to the ever partial manner in which a chemical body is likely to make its environment matter, to affect it and to be affected by it. "What is gold?" asked the ancient chemists, and their answer was that gold is what resists all acids, with the exception, since the eighteenth century, of *aqua regia*. Other answers followed that multiplied the whys and wherefores, but always relative to new trials, to the development of new manners of affecting. Chemists render intelligible what they learn, and today they do so especially thanks to quantum theory, yet they do not apply this theory; they use it and tinker with it to interpret what they have learned from what chemical bodies prove capable of.

For Whitehead, all knowledge is relative to the thing as finite, to this and not to that, but what is finite is not for that reason an object of definition. Whitehead himself tells us that there is "infinitude" in the finite.[15] "We can never fully understand," he writes, but then adds, "we may increase our penetration."[16] Thus, as the means of paying attention is geared toward what chemical *agents*[17] can do and what they are sensitive to, the way toward a veritable ethology is paved that reveals the fine interdependence between "molecular individual" and its milieu. Heraclitus said there are gods even in

the kitchen, and chemists might well agree, were they to think "in the laboratory." To render intelligible, then, is not to define; it is to complicate all definition, to learn to be astonished by what seemed explicable, to find more with respect to what enters into the characterization of a finite thing. They learn from the manner in which it detaches itself from an environment with infinite entanglements but cannot be isolated, extracted from this environment that it implicates within its own limit.

The notion of increasing penetration may also refute analogies that might otherwise seem persuasive. It was necessary to dissociate the sun from the idea of a power exerted on planets, for instance, to accept that the sun does not attract the earth without the earth attracting the sun as well, and with the same force: the difference between the star and its satellite depends solely on their respective masses. Similarly, when one pinpricks an inflated balloon and hears it deflate with a pop, the obvious analogy is that the air rushes outside, as if it had regained its freedom stifled by its confinement within the balloon. Since the nineteenth-century triumph of what we now call statistical mechanics, an increased penetration leads, however, to denial that the air "escapes." The behavior of a gas is understood as the result of a multitude of radically irregular individual motions of molecules colliding with each other. The air does not escape. Molecules are defined as indifferent to the way out offered. A molecule crosses the breach if its fundamentally erratic motion leads it to do so, and that's all.

A regular, reproducible behavior can thus result from sheer irregularity. What seems to obey mathematical laws may be understood not in terms of obedience, but as the manifestation of the indifference of an aggregate of societies to the individuality of these societies' adventures of change throughout time and space. What can be described mathematically are statistical "average values" that express the fact that, in such "crowd societies," individualities may be averaged out or smoothed over. They correspond to a simple noise with no measurable consequence. The notion of nature lifeless would then make sense where science need not take into account individual aims.

Are the erratic motions of the molecules really all, however? When those erratic, aimless motions create a vortex, when a tornado goes its own way, destroying all in its path, do such phenomena not

call for physicists to learn more? Does it not seem that the erratic motions of molecules composing a tornado take on a kind of togetherness, as if a new "sociality" had emerged from the crowd of molecules?

If the emergence of a tornado were not happening empirically, the event would be deemed impossible. Still, for physicists, the fact of its occurrence does not give it the power to refute the erratic character of the molecular motions that constitute it. Researchers would unanimously reject any explication of the tornado implying that molecules suddenly feel each other mutually in such a way that their individuality starts to count so that they can move together, self-coordinating like a flock of birds or a school of fish, for instance. Nor would they be wrong: asserting that the motion of a molecule may suddenly cease to be erratic would kill the problem. The tornado requires physicists to find more on the subject of crowd sociality, such that they *learn from* the possibility of a tornado how to complicate the notion of crowd. The tornado's intelligibility should not require new roles assigned to individual molecules, but a problematization of the characterization of a crowd by statistical mechanics specialists.

In this case, to put it briefly, what is problematized is the pertinence of the notion of average value, the bridge built by statistical mechanics between the "law" the gases seem to obey and the crowd of molecules composing gases. The notion of average value implies that the overall behavior results from behaviors indifferent to one another. But what does this notion of indifference depend on for its validity? Specialists in statistical mechanics relate this notion to the possibility of dividing a system into microregions that should be "uncorrelated," which means that a local deviation relative to the average has no, or only negligible, repercussions on other regions. In contrast, the emergence of strong, long-range correlations marks the appearance of a form of social sensibility that does not imply agents being affected by one another in a new way. It implies agents in crowds behaving differently. Posed through the notion of correlation or of repercussion, the question now bears on the crowd as such: does what happens here make a difference there? The analogy of the crowd is enriched. Instead of being an answer, the crowd has become a problem: what can a crowd do?

This may lead to yet another manner of dramatizing the difference between the intelligible world of laws and the "finite things" that the sciences seek to *render intelligible,* from which they seek to learn. The tornado has the power to intrigue physicists (and frighten us), but it has not been offered a direct explanation through ad hoc capacities lent to molecules. Instead, what takes on meaning, what becomes pertinent, is the notion of *circumstance.* In what circumstances can a crowd become "sensitive to itself"? The explanatory power of laws is not supposed to depend on circumstances, but as soon as intriguing cases arise, circumstances intervene. When it is a matter of learning from, due attention bears on what is particular to this case.

When it is a matter of sciences, the gods that Heraclitus placed in the kitchen are well placed. The kitchen is a place where laws do not demand obedience, but participate in an art of composition to be negotiated and flavors to be obtained. When declining to explain technicalities, scientists often speak indeed of "kitchen" problems, and this often designates the operations through which they bend their theoretical representations to the exigencies of cases that are intriguing in relation to theory. These operations aim to render intelligible that which they address, implying a double, correlated transformation: there is the transformation of the scientist who, instead of applying his theory, questions it; and there is the transformation of that which scientists characterize, which must obtain, depending on the circumstances, the capacity to participate in the intrigue.

The fact that scientists speak of the "kitchen" also signals that these transformations, through which general laws are separated from their claim to authority, should not concern the consumers. The distance to be maintained from a public deemed unable to understand commits scientists not to give too much publicity to practices that tamper with laws to make them pertinent to facts. Such practices do not enshrine a knowable nature, but they give full importance to the question "what *here* is due attention?"

I do not aim to relay Whitehead by diminishing the grand success of the Galilean-Newtonian paradigm. I prefer to leave such success to its beautiful solitude and fragility. Its realization of the coincidence between intelligibility and submission is relative to a rarified milieu, purged to the utmost of what can never be entirely

eliminated, *friction.* I prefer to think with cases in which intelligibility is gained, where tension suffuses the way in which scientists understand what they study. To be sure, such scientists never attribute aims or values to what intrigues them. Still, they put in place agents that raise questions about how they are to be characterized, what they are defined as capable of, what they are defined as sensitive to, through the always partial manner in which they act and interact according to circumstances.

Caring for Analogies

When Heraclitus's gods are in the kitchen of models instead of the scene of evidence, it is sometimes difficult to know whether a researcher speaking of an experiment speaks about an actual one or a computer simulation. In the kitchen of models, nature is not required to make science possible, to give authority to definitions. The model enables negotiation with agents that are put into action to see what they can do together. A model does not have general authority. The model translates a situation in such a way that everything is placed on the same plane: laws constraining action, if there be any; particular circumstances; and agents as they have been hypothetically characterized.

Scientists today study a nature that is populated with agents, and multiagent models are typically used to simulate intriguing behaviors. Each agent is characterized in terms of what it does, and in so doing, what it makes others do, or permits or prohibits them doing. The agent here is not a purely fictional construct. It is conceived in terms that allow its behavior to be understood as a hypothetical function of what are called laws of nature: it "behaves" without an aim or a capacity for self-determination. Nonetheless, the relation to the law has changed. The actions of the agent no longer demonstrate its submission, but matter from the point of view of their consequences on other agents. Always in a particular milieu, these actions put the law into action, so to speak. The agent actively deals with the milieu it "perceives" and "experiences."[18] In other words, rather than being considered subject to the laws of nature, agents are characterized as answering to a situation. Models thus put to work an un-

derstanding by analogy. What is more, depending on the case, they provide means of discussing whether an analogy is well-founded: if characterized in this way, can the staged agents render intelligible the emergence of the intriguing collective behavior in which the model supposes they participate?

Thus in some situations a car may be seen as the instrument for a dream of individual autonomy: going where I want, if I want, when I want. When motorists are stuck in a traffic jam, however, everyone stopped or inching forward, the will of each motorist, whatever it might have been, finds itself frustrated. The cars' motions now depend on one another. If the traffic jam has a cause, such as an accident, there is nothing intriguing about that. Sometimes, however, congestion happens without an external cause. The so-called multiagent model can show how, based on a threshold of density, a certain regime of stop-and-go traffic may arise, marked by transitions between the regime of fluid, laminar circulation in which cars are instruments of individual (human) will (that is, are driven fairly independently of one another, each with its own individual speed) and the regime where everything bottles up, in which individualities are flattened out and individual aims become insignificant. Cars are still driven by humans, of course, who, in rage or serenity, keep their individuality, but the question of the model is that of the transition between situations that allow some to drive as fast as possible without any overall consequence, even if others are forced to slow down, and situations in which the reasons for speeding up and slowing down no longer count and the dependency of each on the others prevails.

Multiagent models may serve to problematize the modes of abstraction suitable for characterizing the behavior of agents in situations of interdependence. Each agent is characterized in terms of what it makes others do in doing what it does, rather than in terms of the aim its action pursues or does not pursue. This is why such models tend to cross the boundary between phenomena we call social and phenomena we call natural. We can certainly denounce the perverse enjoyment of transgressing the difference that must be respected between conscious human agents and the others (that is, almost everything else). Modelers do not cultivate this enjoyment, however, except when it serves to shock common sense. What

preoccupies them instead is to avoid endowing their agents with capacities that would explain in an immediately intelligible manner that which it is a matter of *rendering* intelligible.

The agents put into action by such models must not be confused with the "really real" things (*res verae*) of Whiteheadian metaphysics. Neither natural sciences nor the sciences of the mind have ever dealt with actual occasions. The actual occasion does not have the power to render intelligible, nor does it have power over anything whatsoever. It has but the power of becoming itself. In other words, that with respect to which we can eventually find more, what it is a matter of trying to render intelligible, only ever concerns societies. In analogy with a Whiteheadian society, agents staged by a model respond in their manner, in their own partial mode, to the solicitations of their milieu. They are defined by this partiality, determined by what matters to them, and how. But they do not define themselves or aim at their own definition. If there is an aim in play, it is that of modelers. When they define how an agent acts on and is acted on by others, modelers test whether the resulting collective behavior offers a reliable analogy with the kind of observed behavior they wish to render intelligible. Nonetheless, its assigned definition must not serve the ideal of an explanation that would lead to forgetting the intriguing character of the observation—that would be to find less.

Recall, for instance, how Whitehead characterized the living body in terms of centers of expression. If researchers characterized such centers by their role in the service of bodies, they would find less. But neither should they accept that the body may be reduced to an ensemble of processes ruled by general laws but that they are assembled, like a clockwork mechanism, in a way designed to ensure the functioning to be explained. Intrigue would be replaced by mystery. This is also the modelers' concern when they conceive their agents: to find more, they must avoid all trivial or circular explanations. The analogies they resort to for characterizing them must not lend their agents too much, but just enough.

In other words, when scientists protest, "but that would be anthropomorphism!," their reaction is not necessarily a fearful knee-jerk response. It does not necessarily mean that they are in the grip of the bifurcation of nature. In *Facing Gaia,* Latour speaks of the bifurcation of nature as fundamentally anthropocentric, since it leads

to "deanimating certain protagonists called 'material' by depriving them of their activity and overanimating others called 'humans' by entrusting them with admirable capacities for action."[19] Scientists who protest about anthropomorphism are not necessarily rejecting models that involve a degree of "animation" of their nonhuman agents. What makes scientists protest and evoke anthropomorphism is the fear of "overanimation." But it may be that they accept for themselves this overanimation against which they protect what they seek to render intelligible. Why make anthropomorphism a sin? Why tolerate overanimated anthropocentrism?

As we have seen, overanimation is in evidence when the centers of expression evoked by Whitehead are characterized as animated by the aim of serving the body. But the political source of this analogy, a citizenry supposed to serve the well-being of the city, is also a typical case of rhetorical overanimation.[20] As soon as agents are attributed with powers of action or passion from which directly derive what is to be rendered intelligible, there is nothing to problematize: the answer kills the question. So many pseudosciences function in this manner. Consider, for instance, the "rational" economy, which provides agents dubbed "economic subjects" with perfect information and a limitless power of calculation, but devoid of memory and blindly egotistical in aim: this series of traits precisely allows them to be enrolled in the service of that abstract *prêt-à-porter* christened the market.

In *Facing Gaia,* Latour considers how to attribute animation to agents, speaking of transactions intervening in metamorphic zones for the renegotiation of both the competencies lent to agents and the researchers' mode of due attention.[21] In light of such transactions, so-called anthropomorphic analogies are no longer a sin, but a risk. Such transactions free scientific approaches from a methodology inherited from Newton, Hume, and Kant that, for Whitehead, condemned science to superficiality. But they do not agree with Whitehead's opposition between the superficial and the deep. They do not demand that a scientist be an explorer of depths, but rather an essayist, like the tailor who essays the fabric and the draping that are best suited to the body she must dress and who finds more to this body through her essays. If we enter the kitchen and cultivate an appreciation for transactions and the manner in which intelligibility is

gained, it becomes possible to engage with scientists diplomatically, honoring their capacity to become (gradually) intrigued.

But, when the researcher-tailor deals with what living beings are capable of, she is no longer the only one raising questions. Aims abound, human and nonhuman, and transactions become difficult to manage. Whitehead contrasted the punch made by an angry man aiming to knock down his neighbor with the indifferent laws presiding over the fall of a piece of rock. When what we call anger is in play, analogies multiply. Anger overcomes someone, like a river overflows its banks. Anger explodes, like the outcome of a chain reaction: petty words, petty barbs, mounting irritation, leading to the blow-up. Such analogies require critical discussion, however. When engineers seek to channel a river, for instance, they can certainly say that the river will "take advantage" of the least flaw or the smallest oversight to thwart their plans. Nonetheless, whether dealing with a river, a chemical explosion, or a nuclear explosion, they treat these "powers of action," as Latour calls them, in a manner that implies a character implacable to the point of indifference toward what matters for us. Faced with the rising waters, prayer may help, but she who prays will not refuse the sandbags that might protect her house. In contrast, like the angry man's fist, the leaping tiger who takes advantage (in the proper sense of the term) of the inattention of his tamer introduces an aim with consequences. Trying to tame a river by enclosing it within concrete embankments and trying to tame a tiger are different professions, and the attention proper to finding more will not be the same for the engineer and the tamer: the latter knows that the tiger, too, is attentive, waiting for his moment.

What about living beings, like the tree or the oyster discussed previously, whose aim, it seemed to Whitehead, is almost exclusively the business of survival, indifferent to the consequences of this business for anyone but themselves? What happens when a scientist devotes to such living beings the attention that he thinks is due? How about the microorganisms Pasteur learned to cultivate in his laboratory? And what are we to make of the pigweed (or more politely, *Amaranthus palmeri*) that became resistant to the herbicide Roundup, flourishing in fields of genetically modified soybeans and turning into a nightmare for farmers? Obviously, we can say that pigweed did not aim to become a superinvasive weed; it remains ignorant of the hu-

man aims it thwarts, even though it really and truly took advantage of the selective pressure that the massive usage of Roundup put on it to innovate. The recklessness associated with industrial monoculture calls for words other than those we could use for the engineer or the tamer.

When it comes to beings whose aims they cannot ignore, biologists often lose the intelligence needed to care for analogies. The notion of intrigue no longer suffices, for the contrast between normal and remarkable does not come into play in the case of living beings.[22] Living beings *are* remarkable, and so it is often a matter of showing that they are "less" remarkable, and that a general explanation can or should normalize them, an explanation in the order of *prêt-à-porter,* which in this case means natural selection acting on genetic transmission from generation to generation. Usually, resistant pigweed would not be taken as the subject of action, but rather as the site of an "accidental" genetic event that Monsanto scientists and experts, following orders, claimed to be impossible, or more precisely, too improbable to be taken into consideration. The proliferation of resistant plants was an accident deemed arbitrary, but which had highly meaningful consequences due to the intensive selection through the use of Roundup.

Nevertheless, we may also say that the possibility of modifications, which may be called, borrowing Deleuze and Guattari's turn of phrase, "popularizable,"[23] has nothing accidental about it, but is actively implied by the business of survival of living populations (and in particular those in which the rate of potential multiplication is elevated: while pigweed cannot compete with bacteria of course, each plant still produces some twelve million seeds per year). The possibility of pigweed acquiring tolerance to Roundup thus is consistent with an adaptation its population is capable of when its milieu has become toxic. Science made in Monsanto neglected what the aim of survival makes the pigweed people capable of, just as the unbridled use of antibiotics neglected the intriguing capacity of bacteria populations to swiftly produce resistance against what poisons them.

"You have only to adapt!" Violence lurks in this injunction as soon as it makes of the milieu that to which conformity is demanded. But such violence first expresses contempt for what adaptation requires. When the river escapes the embankments to which its currents were

supposed to conform, no one would dream of saying that it did not successfully adapt. A river does not adapt; in any circumstances, it does all it can do. In contrast, the indignant surprise of Monsanto scientists and experts that "it successfully adapted!" signals the major achievement of living societies, which Whitehead considers their very signature. Not to adapt to a milieu in which the massive usage of Roundup has become systematic is, for pigweed, synonymous with eradication, which is exactly what the use of herbicide aims to achieve. The resistant variety took advantage of the milieu ravaged by human intervention in order to proliferate. And it was able to do so only because it foiled the eradication aim, responding in a novel, *original* manner to what was supposed to be toxic for it.

For Whitehead, the possibility of an original response to what is socially given is what makes the difference between living and nonliving societies. And the possibility of this response requires, as we shall see, an irreducible reference to *res verae.* Nonliving societies lend themselves to an analogic characterization in the mode of "as if," to explanations reducing the individual fact to a simple result, abstracting it from its "relevance to potentialities beyond its own actuality of realization." In contrast, where there is life, the possible does not refer to speculations alone, or to human calculations alone. What we hold against so-called weeds is their capacity to transform the damage wrought by human intervention into opportunity.

With living beings, the importance of the possible is thus affirmed. To place the responsibility for adaptability on arbitrarily selected variations is to eliminate the real fact: adaptability requires agents capable of letting themselves be affected, at their risk and peril, by one aspect or another of their milieu that has till then been indifferent, and to attribute a new role to it. That is also to render irrelevant probability calculations that assume that what happens results from a closed ensemble of aspects of a situation retained as relevant.

Stuart Kauffman, a theorist of complex systems, has stressed a generic contrast between the evolution of living beings and the evolution of systems conforming to what Whitehead called a rule of succession. Evolution conforming to a rule of succession is conservative in that it conserves the definition of what this rule retains as relevant. It is this conservation that allows a model, be it deterministic or probabilistic, to be a tool for forecasting. In contrast, a model

appropriate for evolutionary biology cannot be conservative. What the evolution of living beings forces us to think is an "expansive" dynamic in which the number of pertinent aspects of a milieu is not given but may gradually increase, in which the ways for a living being to make its milieu matter are likely to multiply and to become entangled.[24] In other words, the model requires the modeler to take interest neither in the given alone nor in actual relations between agents alone, but in that which the given can make possible, or "occasion," the opportunities it can offer to agents.

Kauffman thus affirms that histories of living beings require us to envisage a world in which the difference between actual and possible, between what is and what might be, is at stake for those beings for whom this difference matters: living beings. And we may characterize events like a becoming relevant, or the emergence of new ways for living beings to count with others and for others, as *original* in the sense of originating from agents for whom they matter.

> If I am right, if the biosphere is getting on with it, muddling along, exapting,[25] creating, and destroying ways of making a living, then there is a central need to tell stories. If we cannot have all the categories that may be of relevance finitely prestated ahead of time, how else should we talk about the emergence in the biosphere or in our history—a piece of the biosphere—of new relevant categories, new functionalities, new ways of making a living? These are the doings of autonomous agents.[26]

There is, to be sure, a great difference between the business of survival to which the oyster or pigweed is dedicated and the survival of humans, for whom it is about living for a "diversified worthwhile experience." Still, Kauffman's generic proposition—making a living—holds for both. Making a living, Kauffman writes, must last somewhat longer than the fleeting instant. This imperative, to have to make a living, recalls the difference Whitehead established between lifeless and living societies. The lifeless tornado is not self-sufficient; it must be fed by its milieu. But being fed is in the order of fact; it is not something it strives for. The analogy about a tornado aiming at "destroying everything on its passage" does not withstand critical discussion. In contrast, a living being actively "valorizes" its

milieu, extracting from it what it needs to sustain its life. For a living society to make a living demands the destruction of others, and this is also true, maybe especially true, for living societies that are in need of a diversified worthwhile experience, at the risk of attributing to themselves the very experience of worth, of taking themselves as the source of all values. "Life is robbery," writes Whitehead.[27]

Is there robbery when a river, "valorized" by the concrete walls that enclose it, is deprived of its peaceful banks? The question is undoubtedly poorly posed. Because posed abstractly, the question is condemned to transforming the distinction between living and nonliving into an opposition, thus highlighting the indifference of the river to the embankments that would constrain it. But this indifference makes an abstraction of the fact that the river is not only a flow of water in the hydrodynamic sense. It also forms a milieu for a multitude of living beings, including human beings who valorize it, each in their manner: there are those who lay the concrete, and others for whom the river is a site for relaxing on the banks, observing, fishing, boating, or dumping trash, or a site of memory or encounter, a nuisance, and so forth. As the "river" entangles a multiplicity of modes of valorization, it is far from being indifferent to the "robbery" reducing it to a flow of water to be tamed. "Not everything is alive, but there is life everywhere," writes Leibniz.[28]

For his part, Whitehead declares, "the robber requires justification."[29] His writings have no need for a fable celebrating harmonious coadaptation, a form of equilibrium in which the robber would be justified by the good he conditions. What justifies the thief is nothing other than the generic contrast underscored by Kauffman, which Whitehead dubs "originality," the emergence, for better or worse, of ways of valorizing, of making matter, or of bringing into relation that are ever more partial and diversified. From this point of view, the act of unilateral valorization of the river as an indifferent flow and the bias toward eradicating "weeds" put into action by Monsanto's Roundup are so many manifestations of originality, their sad commonality being that they present themselves as justified and they proclaim their innocence when things go wrong. "That's not what we intended" is the refrain of those who define their intentions as justifications.

It is impossible to repeat the point too often: aim is not intention-

ality. Intention is one of many stories humans tend to tell themselves, and it is one that often proves impoverished in comparison with the many other stories that we need to learn to tell, as Kauffman reminds us. Still, however impoverished or remarkable a story may be, none of them is innocent, nor can any of them claim absolution. Instead, to say that life is robbery implies what Donna Haraway dubs "response-ability," a capacity to respond for and respond to, foremost to open ourselves to questions about the "sacrifices" that are justified by our intentions.

Thus, even when scientists may justify what they do in terms of finding more and showing the relevance of original ways of understanding, no such justification should be considered to absolve them. It is not merely a question of the means they must mobilize or the ways in which their knowledge will be mobilized. Obviously, when they deal with living beings, the ambition of finding more is not innocent when they practice animal experimentation. But learning from an animal what it is capable of, as a representative example of its species, is not objectionable in itself. It is definitely not a matter of pronouncing the guilt of the ambition for finding more. It may be, however, a matter demanding utter vigilance toward our modes of abstraction. Never should the ambition to find more exclude the legitimacy of other kinds of questions. The questions posed in order to find more have to render themselves able to make room for other questions that engage she who poses them otherwise. In such cases where we should stop speaking about "nature," the possibility of a "we" is coming into existence: What might we be capable of, together, *this* animal and I?[30]

Living Beings and Life

Biologists will undoubtedly find more regarding how pigweed made itself resistant to Roundup. Whatever they find, a thorough reconfiguration of biology is currently underway. Even bacteria are no longer what they were assumed to be—our analogies about them were inspired by a case that today appears particular, their capacity to multiply in the abiotic milieu provided for them in the petri dish or other laboratory apparatuses. Today, biologists realize that approaching bacteria in this way was not paying due attention to

the fact that the great majority of bacteria cannot be isolated from the interdependent collectives they require to make their own living. Apparently, the central motif for the history of living beings is no longer the selectivist motif of individual lineages competing for survival. The central motif now would be that of the generation of collectives of interdependent and intertwined living beings, at all scales, each making a living in its own manner, yet with others and thanks to others. If, as Whitehead wrote, life is robbery, the originality that justifies this robbery would have less to do with individual societies and more with modes of composition between societies requiring one another for making a living.

"We have never been individuals," write Scott F. Gilbert, Jan Sapp, and Alfred I. Tauber, with the verve of biologists who understand how much their science has been constricted by the network of analogies that have been established between the individual lineages of biology and the entrepreneurial individuals of the so-called market economy.[31] A new flowering of analogies is now underway that enlarges the imagination of specialists. Known facts are being characterized otherwise. We have known for some time, for instance, that certain termites cultivate fungi that digest cellulose and lignin for them, but when this relation is more fully described and not dominated by the image of the active cultivator taking care of his field, it becomes equally possible to say that fungi cultivate the termites. At every scale, from the cell to the adventure of embryonic development and to the multiplicity of ecosystems, the facts they paid due attention to have led certain contemporary biologists to no longer associate living beings with organisms, or with a distinction between individual and milieu: "Nature may be selecting 'relationships' rather than individuals or genomes. What we usually consider to be an 'individual' may be a multispecies group that is under selection."[32]

The new flowering of analogies does not affect only what Whitehead called nature, however. These analogies can also weld common sense with new imaginations, freeing it from the individualism of "myself, in my opinion" that has poisoned it, and opening it to what it might mean to "make sense in common," *together,* with one another, thanks to others, at the risk of others.

To negotiate this passage among practices implying different types of attention and making different aims matter, I wish to en-

gage with an interspecies example that denormalizes what we have an unhappy tendency to take as a matter of course when we turn to humans: if we explain ourselves well, the other should understand.

When Haraway recounts the manner in which she trained her dog Cayenne in the agility sports they practice together, she knows quite well she will arouse indignation among many of her readers, who will see in it a typical abuse of power by the human over the dog. Indeed this sport involves the dog's capacity to respond to signals indicating to her which pathway to take through a particular course, a course along which she must execute a series of performances that put her to the test, because they are in conflict with any dog's way of making sense of a landscape it runs through. Is not Cayenne's performance demonstrating her blind obedience?

What Haraway recounts, however, is not a story of abuse, even if power is in play. It may be reminiscent of a teacher in mathematics who must transmit a procedure to a student to whom it feels like a perfectly arbitrary way of doing things: Haraway describes how she and Cayenne nearly went crazy, despairing, and losing faith in one other, because the human did not understand the self-discipline this sport would require *of her.* She had to unlearn the connivance and shared meanings involved in interhuman relationships, as well as in her everyday relations with Cayenne. The agility sport turned into traps all the "intuitive" understandings that weave together an everyday life structured through the interchange of habits and expectations. She had to learn not to count on Cayenne's capacity to "grasp" what she was trying to get her to do. She had to prevent herself from generalizations that "for us" are obvious—if Cayenne "knows" this, she should be able to do that. "And so I set about actually teaching what the release word meant instead of fantasizing that Cayenne was a native English speaker."[33]

It proved especially difficult, when a performance was imperfect, to refuse all approbation for the dog, not to offer her encouragement, as one would do with a child, because a child needs it. But Haraway insists: Cayenne is definitely not a furry child. She is adult and different. "I learn such basic things about honesty in this game, things I should have learned as a child (or before tenure in academia) but never did, things about the actual consequences of fudging on fundamentals. . . . Meanwhile, my over-the-top love for Cayenne has

required my body to build a bigger heart with more depths and tones for tenderness. Maybe that is what makes me need to be honest; maybe this kind of love makes one need to see what is really happening because the loved one deserves it."[34]

The performance, and what it demands of Cayenne, exposes the hidden economy of communication that prevails in daily life, by imposing a situation in which that economy no longer functions. Cayenne gains the power to assert herself as "other," another who "deserves" nonindulgence, for Haraway needs to address her in a mode that will let her become the competent partner the game requires. Cayenne has to take part in the game, to grasp its aims, and to make it matter for herself.

The creation of "making sense in common" via the game goes through a double transformation: Haraway testifies to both the transformation that makes her capable of loving with honesty and the empirically verifiable change she calls "transfer of authority." When Cayenne, all of a sudden, knows what she has to do and takes charge, it is Haraway who must learn to trust her: no longer guiding her, only giving her signals, which now are anticipated. The transfer of authority means that Cayenne is now in command. She is the one who teaches Haraway the place that is now hers: "Cayenne saw me coming, clipped her smoothly curving stride slightly, and dodged around me, all but shouting, 'Get out of my way!' "[35]

This double transformation is probably what gives its unique meaning to the art of training: the establishment of a relation of partnership whose success is lived as such by the partners who are each made capable of what the other demands. In its contrast with the entanglement of daily relations, training dramatizes this point: before the human comes to understand what the type of partnership needed for the sport of agility requires of her, they have nearly driven each other crazy. Now, however, they share the exultation aroused by the possibility they generated together: a good course, a course in which each in her own mode has felt a connection with the other.

Haraway did not learn by herself "the due attention allowing her to find more" with respect to Cayenne. They learned it together, with each other, through each other, at the risk of each other. What they learned rendered them capable of self-transformation, as partners during a course the composition of which Haraway characterizes

as an "ontological choreography," when she reintegrates it into the world of human analogies. In other words, what is dramatized here allows us to leave behind the ensemble of practices calling on nature, and not at all because this relation transcends nature, but because it aims at something other than finding more.

We have the exceedingly bad habit of thinking that "no longer doing science" means indulging in a form of mystic enjoyment. Haraway's account makes clear, however, that the experience of the course is not at all about the so-called oceanic feeling of being at one with the world. To be sure, Haraway evokes an experience of time suspended in a dilated and nondecomposable present, not "preoccupied" by projects born from the past or expectations bearing on the future. Such an experience may well be shared by the top-tier athletes when it is a matter of "giving their all," to evoke a phrase currently in vogue. But it is alien to the attainment of some truth "beyond appearances." It is positively relative to an entirely artificial apparatus, and its success is gauged in overtly conventional criteria. In this sense, it offers a remarkable example of the Whiteheadian difference between aim and goal. The defined goal is part of the definition of the apparatus, but it is not what "animates" the course lived together by Haraway and Cayenne. What animates the course, what the course aims at, is enjoyment of the partnership that the course supposes and provokes.[36]

Characterizing this relation has led me to use terms belonging to Whitehead's metaphysics instead of to his ontology or to societies as they maintain themselves in existence, as they "make a living." Each of the partners belongs to a different species, an Australian shepherd who is the product of years of breeding and a university professor, likewise selected for her excellence, and Haraway stresses that the ways in which each makes a living belong to entangled histories that have transformed the Great Turtle inhabited by Native peoples into the United States of America. And the agility sport also belongs to this colonial history. Nonetheless, the course is also the *occasion* for a kind of experience that, for Haraway, is not explained by these histories, even if these histories situate it: joy. Joy is tasted, it infects its surroundings, it is even addictive, but it is not social in the Whiteheadian sense of character being maintained through a society's adventures.

This is precisely the distinction that Whitehead proposes between "living societies" and "life" in *Process and Reality.* Take, for instance, the thief, who makes his living at the expense of other societies. If the thief were to ask for justification, such a justification cannot simply point out his superior abilities as a thief, even if these abilities are not entirely beside the point. The lineage of Australian shepherds has literally made a living thanks to selective breeding that has intensified its abilities to respond appropriately and enthusiastically to the shepherd's signals. But to successfully make a living does not provide a generic justification for living societies. Making a living is what conditions living societies.

As we have seen, a society, be it living or not, is nothing other than the proposition of a "milieu of belonging" addressed to new actual occasions in the process of becoming. This milieu proposes the actual occasion to determine itself in a mode that prolongs this belonging. These occasions are thus situated socially, but we should recall that this situation does not exert pressure on them to conform. Nevertheless, a society as such, Whitehead writes,[37] is guided in each of its occasions by an inheritance of its own past. It is binding its occasions to a line of ancestry. We may call it a tradition. What justifies a living being's need to make its living at the price of the destruction of other societies, in contrast with a crystal, for instance, is what living societies make possible. Whitehead says that living societies harbor "interstices" or "(socially) empty spaces," which are critical conjunctures where the manner of composing with what is socially proposed may be "original," not conforming to the tradition.[38] In other words, in the case of living societies, tradition is not maintained without opening spaces for originality, for heresy. A living society makes room for experiences "without the shackle of the reiteration of the past." It may give a chance to new manners of inheriting, then binding originality within social bonds, canalizing, or "socializing" it, and becoming itself able to explore new, original manners of enduring. The justification for living societies, Whitehead concludes, is the originality of which they are capable due to the life lurking in their interstices.[39]

Ontology opens into metaphysics here. What Whitehead calls life is not creative power. Originality or nonconformity constrained Whitehead to place the concept of actual occasion at the center of his

metaphysics, freeing societies from what characterized organisms: an intrinsic stubbornness whereby self-conservation has its own value. Societies, by definition, matter and make matter, but they may also risk novelty. The justification of the price they make others pay for their living lies in not condemning to insignificance the *causa sui* character of actual occasions, their self-determination of how they will be caused by what causes them. What lurks in the interstices of living societies is what Whiteheadian metaphysics allows Whitehead to think: everything that happens might have turned out otherwise than it has.

Instead of communicating with the dramatization of an experience so familiar that we no longer feel surprised by it, such as the experience of having a body, Whiteheadian metaphysics communicates with what he calls individual concrete fact, which entails the experience of a fact that refuses being referred to reasons more general than itself. Such a fact calls for analogies other than those called upon by the social agents characterized by the sciences. Haraway provides an example of such a fact that makes her experience with Cayenne into a graceful experience in which living being does not (only) make a living, but manifests life—joy is *sheer disclosure.*[40]

We never catch life "in the act" or "red-handed." Life is always what is lurking, and when it becomes manifest, it does so in the mode of a moment that lets itself be recounted while resisting explanation. This is why Whitehead is not vitalist: he does not introduce an opposition between a finalized order proper to living being and an order of blind physical causes. The Whiteheadian concept of life does not propose any model of order. Quite to the contrary, it allows problematizing our usual modes of explanation. We often hear that "it is just a case of adaptation," as if someone had thus explained (away) something that seems new. In response, Whitehead says that a society that adapts is precisely what raises the question of originality.

We must be especially careful not to understand the distinction between "learning from" and "learning with" in terms of the sempiternal opposition between objective knowledge and subjective experience. We must be equally careful to avoid interpreting this proposition as a way to convey by other means Whitehead's proposition: a fusion of nature lifeless and nature alive. Because I wished to resist staging nature lifeless as the lot of science while nature alive

would exhibit features directly derived from the metaphysics of actual occasions, I took the path Whitehead had previously opened, linking the term "nature" to that about which we can find more.

Haraway's account of her adventures with Cayenne is nevertheless shot through with borrowings from a biology that never ceases to find more. But this biology is learning in a new way. It has abandoned the search for ready-made, general modes of explanation. Instead, to characterize an entanglement of intrigues, this mode follows and learns to recount it. The problem has changed. The task for biologists is no longer to put in place agents capable of explaining what is observed. The task is to make themselves worthy of what they observe, worthy of what they find.

To characterize the double metamorphosis experienced with Cayenne, Haraway develops an association between the creation of zones of contact, which she owes to colonial studies, and the reciprocal induction of tissues in the embryo, which she owes to Gilbert: "Contact zones are where the action is, and current interactions change interactions to follow. Probabilities alter; topologies morph; development is canalized by the fruits of reciprocal induction. Contact zones change the subject—all the subjects—in surprising ways."[41]

Instead of fusion, a notion like "contact zone" implies communication between disparate registers, all the way from the double transformation whereby Cayenne and Haraway became partners capable of making sense in common, right down to contact between already differentiated embryonic cells generating new types of cells, and passing through encounters between colonizers and indigenous peoples (which makes clear enough that not all encounters bring joy). The contact zone activates a web of analogies whose relevance does not bear on denying what they omit: analogies that enliven attention but do not capture it. Haraway's chapter "Training in Contact Zones" is the harbinger of a nonterritorialized cultural milieu populated with stories, and the harbinger of a sociality weaving exacting, always situated modes of relevance.

The same holds for relations of symbiosis. Instead of implying societies within a milieu, relations of symbiosis place the emphasis on how societies make themselves mutually capable of something

they cannot do on their own, thus making their living with one another and through one another. Carla Hustak and Natasha Myers refer to the now-famous case of the alliance between wasp and orchid,[42] which Deleuze and Guattari used as an example of "involution" in contrast with the logics of hereditary filiation that dominate the thinking of evolution.[43] The wasp and the orchid enter into relations of pseudocopulation with each another that defy this logic. This example has received selectionist explanations: the male wasp is said to be "deceived" by the orchid that mimicks the genital organs of the female wasp. The orchid is said to trick the wasp in the service of its own reproduction, engaging the wasp in relations that prove sterile for it. Yet, Hustak and Myers object, even if the wasp's relation to the orchid is nonreproductive, why would it not be attractive, enjoyable as such for the wasp? When Darwin experimented with orchids, did he himself not attest to an enjoyment somewhat alien to the unrelenting austerity claimed by the scientist?

While propositions to fuse disparate registers of learning from and learning with would ruffle scientists and render them vulnerable to the trick of evil, scientists may be less prone to deny that their aim, if it is to find more, does not exclude moments of partnership. Such moments are "gratuitous" in the sense that they do not give to what they propose a better capacity to resist objections, yet they subvert the separation between the active role of the one who tries to learn and the passivity required from the one about which learning occurs. At such moments, the articulation between two manners of learning, from and with, may well happen to pose practical and ethical problems for scientists. Biologists would readily attest to this possibility, while for anthropologists such problems are ongoing. Transversal connections—making sense in common—are possible through "life occasions," when distinct lines of inheritance intercompose and intersubvert, from lines of cells and tissues of the embryo and those of symbiotic partners, to the lines of human traditions and the ones that humans entertain with other inhabitants of their worlds. Thus, the solemnity of the world whose experience Whitehead wished to activate might be able to enter into our positive forms of knowledge. Life's justification may subvert the very analogy of the thief as an individual making a living on its own.