

## SECOND LECTURE

# How not to (de-)animate nature

Disturbing “truths” • Describing in order to warn • In which we concentrate on agency • On the difficulty of distinguishing between humans and nonhumans • “And yet it moves!” • A new version of natural law • On an unfortunate tendency to confuse cause and creation • Toward a nature that would no longer be a religion?

How are we poor readers supposed to react when we come across a headline like this: “Highest level of CO<sub>2</sub> in the air in 2.5 million years,” with an even more disturbing subtitle: “The threshold of 400 ppm of carbonic gas, the principal agent in warming, is about to be crossed”? And the journalist explains:

*A symbolic threshold* is about to be crossed. For the *first time* since man appeared on earth. And even in the last 2.5 million years. The threshold of 400 parts per million (ppm) of atmospheric carbon dioxide (CO<sub>2</sub>) is expected to be reached in May, at the Mauna Loa station in Hawaii, the historic point from which the first measurements in the modern era were taken starting in 1958 by the American David Keeling.<sup>1</sup>

This is an actual fact, the result of a confirmed observation obtained with great difficulty thanks to Keeling’s persistence. As he tells the

<sup>1</sup>Stéphane Foucart, “Le taux de CO<sub>2</sub> dans l’air au plus haut depuis plus de 2,5 millions d’années” (2013), p. 4, emphasis added.

# Le taux de CO<sub>2</sub> dans l'air au plus haut depuis plus de 2,5 millions d'années

Le seuil de 400 ppm de gaz carbonique, principal agent du réchauffement, va être franchi

Un cap symbolique est en passe d'être franchi. Pour la première fois depuis que l'homme est apparu sur Terre. Et même depuis plus de 2,5 millions d'années... Le seuil de 400 parties par million (ppm) de dioxyde de carbone (CO<sub>2</sub>) atmosphérique devrait être atteint courant mai, au point de mesure historique de la station de Mauna Loa (Hawaï), où les premières mesures de l'ère moderne ont été menées, dès 1958, par l'Américain Charles David Keeling.

La concentration de CO<sub>2</sub> dans l'hémisphère Sud, plus faible que celle de l'hémisphère Nord, ne franchira cependant le même palier que dans plusieurs années.

A Mauna Loa, la concentration de CO<sub>2</sub> pointait, vendredi 3 mai, à 399,29 ppm. La veille, l'Organisation météorologique mondiale (OMM) rendait public son bilan climatologique pour 2012, notant l'abondance et l'intensité de phénomènes extrêmes : sécheresses, inondations, cyclones tropicaux, etc.

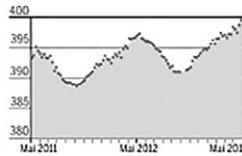
« La variabilité naturelle du climat a toujours donné lieu à ces extrêmes, mais les caractéristiques pluri-annuelles de ces phénomènes météorologiques et climatiques résultent de plus en plus du changement climatique », analyse Michel Jarraud, secrétaire général de l'OMM.

Celle-ci place l'année 2012 au neuvième rang des années les plus chaudes observées depuis la fin du XIX<sup>e</sup> siècle. La concentration atmosphérique de CO<sub>2</sub> n'exédait pas

## Accélération brutale

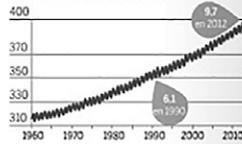
ÉVOLUTION DE LA CONCENTRATION EN DIOXYDE DE CARBONE... en parties par million

... DEPUIS 2 ANS (moyenne hebdomadaire)

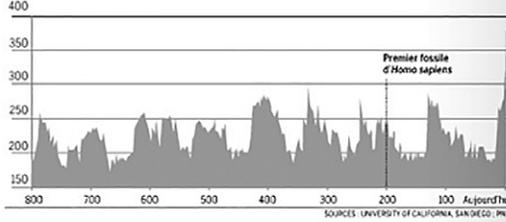


... DEPUIS 1960

● Emissions de dioxyde de carbone, en milliards de tonnes de carbone



... DEPUIS 800 000 ans



de gaz carbonique, il faut remonter à l'ère du pliocène, il y a 2,6 à 3,3 millions d'années. Les créatures les

té catholique de Louvain), vice-président du Groupe d'experts inter-gouvernemental sur l'évolution

du GIEC prévoit à cet horizon une élévation probable du niveau marin comprise entre 20cm et 60cm.

Figure 2.1 Reproduction of an article by Stéphane Foucart in *Le Monde*, May 7, 2013.

story in a book testifying to the daunting challenge of equipping the Earth with sufficiently sensitive instruments, if he succeeded in maintaining his measuring equipment over a long period of time, it was against the skepticism and indifference of the financing agencies and of a number of his colleagues as well.<sup>2</sup> But, at the same time, when a newspaper article mentions lines about to be crossed, symbolic thresholds, and a principal warming agent, the reader can't help but suppose that this piece of news is intended as a *warning*. This is certainly what one of the researchers cited by the journalist asks us to do:

Crossing the threshold of 400 ppm of CO<sub>2</sub> carries a powerful symbolic charge, according to climatologist Michael Mann, director of the Earth System Science Center of the University of Pennsylvania. This comes to remind us to what an extent the *dangerous experiment* that we are carrying out on our planet is *out of control*.<sup>3</sup>

<sup>2</sup>Charles David Keeling, "Rewards and Penalties of Recording the Earth" (1998), a stunning example of scientific autosociology.

<sup>3</sup>Foucart, 2013, emphasis added.

Here is one of the hybrid expressions that we identified in the first lecture. To say that a threshold has been crossed and that we are carrying out an out-of-control experiment is to cross the supposedly inviolable gap between pure description and vigorous prescription: we have to *do* something – but we are not told what to do.

Michael Mann, the author of a famous curve in the form of a hockey stick, would be the last to deny that it is a matter of politics as much as of morality.<sup>4</sup> In the history of the sciences, no diagram has been subject to more attacks than this one (there is a simplified version in figure 2.1). The climate skeptics, astute devotees, as we have seen, of a strict distinction between what is and what must be, attacked it so viciously that Mann had to give the book in which he related his adventures a telling subtitle: *The Hockey Stick and the Climate Wars: Dispatches from the Front Lines*. Nothing has improved since 2013, either in the out-of-control and “dangerous experiment that we are carrying out” or in the attacks renewed daily on the “front lines” that are intended to make this inconvenient truth disappear from the face of the Earth. If it is true that “the first victim of war is truth,” then the second is certainly axiological neutrality, which is quite unable to resist the unbearable tension between description and prescription that has been created by the New Climate Regime. What Mann discovered, and what we are going to explore in depth throughout these lectures, is that we really are encountering a situation of war – and not only a “climate war.”<sup>5</sup> How else can we explain why in 2007 the Intergovernmental Panel on Climate Change (IPCC), itself a diplomatico-scientific body, was awarded the Nobel Peace Prize rather than the prize in physics or chemistry?

The tension is all the stronger in that, as Michael Mann adds with false innocence at the end of the piece in *Le Monde*: “There is a real possibility that with the current levels of CO<sub>2</sub> *we have already crossed* the threshold of a dangerous influence on our climate.” Not only do we find ourselves placed at a historic moment without any known precedent (“To find such levels of carbonic gas, we have to go back to the Pliocene, 2.6 to 5.3 million years ago. The creatures nearest to humans that walked the surface of the Earth at the time

<sup>4</sup>Michael Mann, *The Hockey Stick and the Climate Wars: Dispatches from the Front Lines* (2013). The link between description and warning is perfectly explicit in the opinion piece Mann published in the *New York Times*, “If You See Something, Say Something” (2014) – impossible to be more explicit.

<sup>5</sup>Harald Welzer, *Climate Wars: Why People Will Be Killed in the Twenty-First Century* ([2008] 2012). The link between climate and war considerably predates today’s geo-engineering, as James Rodger Fleming shows in *Fixing the Sky: The Checkered History of Weather and Climate Control* (2010).

were Australopithecenes!”); not only have we crossed a threshold – a term that is at once legal, scientific, moral, and political; not only is humanity responsible for this truly revolutionary transformation (this is implied by the well-known association between CO<sub>2</sub> emissions and the industrial way of life); but in addition we have probably already passed the moment when we could still do something about it.<sup>6</sup> The revolution was started by us, but without us, in a terribly recent past of which we are becoming aware too late! And to make the picture all the more dramatic, the diagram that accompanies the latest series of measurements underlines, with a detail that can be read as black humor, the moment when this history began: “First *Homo sapiens* fossils” – waiting for the last... Between the Australopithecenes and the *Homo oeconomicus* of the “modern era,” the reader is treated to a lightning-fast summary: a brief history divided between what has happened to the Earth and what has happened to the humans who, in former times, inhabited it without having much influence on it.

I was not exaggerating, then, in saying that the climate question is driving us crazy. Everything in these reports is dizzying: they offer a sense of the immense complexity of the scientific arrangements capable of establishing reliable measures over such vast distances in time, not to mention the extraordinary layering of disciplines – paleontology, archaeology, geochemistry – capable of converging on models that make it possible to predict at what precise moment we are crossing thresholds.<sup>7</sup> But the most vertiginous experience of all comes when we place the long history of the planet and the short history of humans on the same chart, not in order to stress the *insignificance* of humanity in the face of the Earth’s vast history, as we used to do, but, on the contrary, in order to put the burden of unprecedented *geological power* abruptly on that same humanity’s shoulders.<sup>8</sup> And

<sup>6</sup>While the idea of the Anthropocene may flatter humans because it means they have finally won power over the planet, it is much less agreeable to learn that this power to influence may well have already been lost! See what Wallace Broecker has to say: “The paleoclimate record shouts out to us that, far from being self-stabilizing, the Earth’s climate system is an ornery beast which overreacts even to small nudges” (“Ice Cores – Cooling the Tropics,” 1995). It is the strangeness of this phenomenon that justifies the title of Timothy Morton’s book *Hyperobjects: Philosophy and Ecology after the End of the World* (2013).

<sup>7</sup>For the general public, the best introduction to the everyday work of researchers remains a series of videos accessible at [www.thiniceclimate.org](http://www.thiniceclimate.org).

<sup>8</sup>The common-sense reflex of historians consists in saying that what appears unprecedented to us has already happened many times. The interest of the work of researchers focusing on the Anthropocene is precisely that it challenges the argument that there is nothing new under the sun. One example among hundreds: “The early-twentieth-century invention of the Haber–Bosch process, which allows the conversion of

it's not over: after turning the tiny creatures that we thought we were into a giant Atlas, they tell us very calmly at the same time that we're hurtling toward our doom if we do nothing – but that it's probably too late to do anything about it in any case.

How could we not be panic-stricken by such short-circuits, unimaginable earlier, between the rhythm of history and that of *geohistory*, as “full of sound and fury” as the earlier history?<sup>9</sup> We had heard about the acceleration of history, but the idea that this history could also accelerate geological history is what leaves us stupefied. It is not speaking ill of humanity to recall the extent to which we are all ill-equipped – emotionally, intellectually, morally, politically, culturally – to absorb such news. It would be much wiser, and even more rational, to ignore it altogether – if that weren't the surest way of giving in to real delirium!

That there is an enormous difference between responding to a threat under the auspices of politics and responding under the auspices of knowledge is easy to see when we compare the rapid, anxiety-ridden arms race set off by the Cold War with the sluggish pace of negotiations over the climate. Hundreds of billions of dollars were spent on atomic weapons in response to a threat about which the information acquired by spies was, at best, very slim, while the threat created by the anthropic origins of the “climate upheaval” is probably the best documented and the most objectively developed piece of knowledge on which we can rely before moving into action. And yet, in the first case, all the traditional emotions of wartime politics led, in the name of precaution, to the establishment of an arsenal that was *disproportionate* in the extreme; while, in the second case, we are expending a great deal of energy delaying, in the name of the same precaution, the knowledge needed to trigger *barely proportionate* expenses.

It suffices to compare the reception of George Kennan's secret “long telegram” on Soviet strategy in 1946 to that of Sir Nicolas Stern's public report in 2006 on the small sums that would have to be expended by the industrialized countries to avoid most of the

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atmospheric nitrogen to ammonia for use as fertilizer, has altered the global nitrogen cycle so fundamentally that the nearest suggested geological comparison refers to events about 2.5 billion years ago... [Human action] has increased ocean water acidity at a rate probably not exceeded in the last 300 million years” (Simon L. Lewis and Mark A. Maslin, “Defining the Anthropocene,” 2015, p. 172). On the question of the absence of precedents, to which I shall return in the fourth lecture, see Clive Hamilton and Jacques Grinevald, “Was the Anthropocene Anticipated?” (2015).

<sup>9</sup>The term “geohistory” sums up very nicely Dipesh Chakrabarty's 2009 article “The Climate of History: Four Theses” (2009).

deleterious effects of climate change.<sup>10</sup> In the first case, the clear presence of an enemy, of war and politics, gave the word “precaution” the sense of *rapid action*; in the second, the uncertainty as to the enemy, the war, and the politics gave “precaution” the calming connotation of “*let’s wait and see*, we can always sort things out later.” A *panic attack* in the first case, resulting in a general mobilization; in the second case, demobilization – and yet we are dealing with the great god Pan in person!<sup>11</sup>

In the face of such a gap in reaction time, the ecology activists are tempted to accelerate matters by appealing, they think, to the power of conviction of the sciences. “Since we now know for sure what is going on, you have to act. If you don’t, you’re behaving like criminals.” Thus they attribute to the inviolable laws of an indifferent Nature the highly political function of mobilizing the masses, which are indifferent to the threat – while adding a touch of moral indignation. This is a version of what has been called “strategic essentialism.”<sup>12</sup> One relies on the notion of incontrovertible certainty to achieve an effect of mobilization that could not be achieved otherwise. The danger of such a tactic is that it bypasses the hard work of politics by attributing to science an incontrovertible certainty that it is far from having – yet without mobilizing anyone at all.

As I showed in *Politics of Nature*, the ecologists have too often repainted in green this same grey Nature that had been conceived in the seventeenth century as a way of making politics if not impotent, then at least subservient to Science – the Nature to which the role of “disinterested third party” had been assigned, capable in the last analysis of serving as arbiter of all the other disputes; the Nature in whose bosom so many scientists still think they have to take refuge in order to protect themselves from the dirty work of politics; the Nature that has inherited, as we shall see later on, all the functions of the all-seeing and all-encompassing God of the old days, and who is just as incapable of bringing its Providence to have any effect whatsoever on the Earth! Ecology can be summed up not as politics

<sup>10</sup>Compare John Lewis Gaddis, *The Cold War: A New History* (2006), on the rapidity of the response to the Soviet threat, to Nicholas Stern, *The Economics of Climate Change*, to see how slowly mobilization occurs where the climate threat is concerned.

<sup>11</sup>*Trans.*: The English word “panic” is derived, via the French *panique*, from the Greek *panikos*, referring to Pan, the god of wild nature; Pan was credited with arousing terror in lonely travelers passing through woodlands.

<sup>12</sup>This controversial idea was introduced by Gayatri Chakravorty Spivak. Without believing seriously in the essential character of social identities, a “strategic essentialist” nevertheless uses the notion when it seems expedient in certain struggles, since it is the adversaries’ weapon of choice.

taking Nature into account but, rather, as the end of the Nature that served as the consort of politics.<sup>13</sup> This is why we have to choose between a Nature that hides its Politics and a Politics in which the role of Nature is explicit.

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It is not certain, even so, that the most troubling factor is the hybrid character of these statements, even if they seem very worrying to those who think that a strict separation must be maintained between science and politics. After a moment of surprise, we can readily understand how we should interpret the statements. If data like those in the shape of a hockey stick are no longer objective in the ordinary sense (detached from any prescription), they are indeed objective in the sense that those who prepared them have answered all the *objections* that could be raised against them (this is the only known way in which a statement can be transformed into a fact).<sup>14</sup> The only originality in these *data*<sup>15</sup> is that they concern us so directly that their mere expression sounds like an alarm to those who have to attend to them, a bit like the sound of the instruments that track a patient's heart rate and breathing for attendants in a recovery room.

In practice, the difference between *constative* and *performative* statements (to use the vocabulary of linguists), even though it has been of great concern to philosophers, has always been very slight.<sup>16</sup> If you are on a bus and you see that a passenger is about to sit down on a seat where you have put your baby, the statement that you won't fail to make – “There's a baby on the seat” – will certainly be a constative utterance (as self-evident as “the cat is on the mat”), but you hardly qualify as human if you are not making it also *in order to elicit a*

<sup>13</sup>Bruno Latour, *Politics of Nature: How to Bring the Sciences into Democracy* ([1999] 2004b).

<sup>14</sup>The virtues of objectivity have a long history (see Lorraine Daston and Peter Galison, *Objectivity*, 2007), which makes it possible not to confuse the final result – attributed to the known object – with the very complex institution through which the objections have passed one after another. Objectivity is neither a state of the world nor a state of mind; it is the result of a well-maintained public life.

<sup>15</sup>Instead of data (French *données*, or “givens”), we should speak of *obtenus* (elements “obtained”). In English (or in Latin), the term *data* would be more comprehensible if we were to speak of *sublata*.

<sup>16</sup>The vast literature in linguistics, sociolinguistics, and speech act theory has continually whittled away at the distance between description and prescription, a distinction already challenged in J. L. Austin's seminal book *How to Do Things with Words* ([1955] 1962).

*reaction* from the person to whom it is addressed (this is one of the uses of language we designate with the word “performative”). Don’t try to pretend that you are just saying “the baby is there,” nothing more. You are not simply stating an objective fact – all the passengers can verify that the baby is indeed on the seat; you are vigorously *objecting* to a behavior that would crush said baby under the bottom of said passenger. “There is a baby on the seat” is thus at one and the same time a constative and a performative utterance. And this is so whether you are making it in a calm, icy, tense, automatic, excited, or screaming tone of voice. The entire success of the good Mr Spock, that famous spokesperson for Reason, lies in the fact that, despite his mechanical voice, he actually tells Captain Kirk what *must be done* in order to take into account what *is*.

Earlier, one could ignore that self-evidence, by imagining that scientists had to remain as *external* to the phenomena they were describing as were those they were addressing. But from now on, if you speak of any part of the Earth to humans, whether it’s a question of geology, the climate, living species, the chemistry of the upper atmosphere, carbon, or caribous, we all find ourselves in the same boat – or rather on the same bus. This is why everything scientists say about this thin film of life sounds entirely unlike the indisputable old speech uttered from nowhere to talk about things that did not directly concern either those who were speaking or those who were listening. Only the climate skeptics are still trying to make us believe that objectivity must not lead to any form of action because, in order to sound scientific, one must remain disinterested with respect to what one is saying. But, in seeking to separate science from their interests, the skeptics are actually insisting on sheltering their interests from any objection. And now, it shows! It is on Earth, on the contrary, that people such as Keeling in Mauna Loa are producing utterances that are truly objective and interesting, because they have responded to the objections of their adversaries and, *consequently*, they make it possible to prepare their listeners to take an interest in what is happening to them.<sup>17</sup>

What doubtless explains in part the old idea that description entails no prescription is that these warnings obviously do not spell out *in detail* what has to be done. They are merely ways of putting

<sup>17</sup>The return to this so poorly understood notion of disinterestedness characterizes much of the philosophy of science of Isabelle Stengers, from *The Invention of Modern Science* ([1993] 2000) to *La vierge et le neutrino* (2005), and which led her, in *In Catastrophic Times: Resisting the Coming Barbarism* ([2009] 2015), to take up a position facing the intrusion of Gaia.

collective action *under tension*. Which is exactly what one asks of an alarm. Instead of a *difference* in principle between the world of facts and the world of values, a gulf that must never be crossed if one is to remain rational, we see that we have to become accustomed to a *continuous linkage* of actions that *begin* with facts that *are extended* into a warning and that *point* toward decisions – a process that goes in both directions. This double linkage is disallowed by the idea of axiological neutrality, which prematurely cuts off the first link from the preceding ones.<sup>18</sup> This claim of descriptive neutrality made it possible to forget that one never plunges into description except in order to act, and that, before looking into what must be done, we must be impelled to action by a particular type of utterance that touches our hearts in order to set us in motion – yes, to move us. Astonishingly, this type of utterance now comes not only from poets, lovers, politicians, and prophets but also from geochemists, naturalists, modelers, and geologists.

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How are we to explain that the sciences are multipliers of *agency*<sup>19</sup> even as they purport to speak only of agents that come to be transformed into presumably inert “material beings”? To approach this question, I would like to compare different types of narratives in order to give a sense of the way characters are endowed with a capacity for action, however these characters may be represented in other respects; some of them clearly belong to the repertory of humans, others to that of “beings of nature.” I hope to show that what characterizes the so-called scientific ways of expressing oneself is not the fact that scientists’ objects of study are *inanimate* but only the fact that our *degree of familiarity* with these objects or “actors” is *very slight*; the inanimate “actors,” or *actants*,<sup>20</sup> thus need to be presented

<sup>18</sup>The recommendations made to the writers of the IPCC reports insist that what is “policy relevant but not policy descriptive” must be distinguished (IPCC, “Statement on IPCC Principles and Procedure,” 2010). See Kari De Pryck, “Le groupe d’experts intergouvernemental sur l’évolution du climat, ou les défis d’un mariage arrangé entre science et politique” (2014).

<sup>19</sup>Even though the word “agency” in English often refers to persons, and most of the time to human entities, I take it, following the insight of semiotics, as a concept that precedes the attributions of humanity and personhood. I have pursued this argument with some obstinacy in “Agency at the Time of the Anthropocene” (2014a, used in part in this lecture) and, more recently, in “How Better to Register the Agency of Things” (2016b).

<sup>20</sup>For an introduction to the notion of actant, see Algirdas Greimas and Joseph Courtés, eds, *Semiotics and Language: An Analytical Dictionary* ([1979] 1982).

at greater length than the characters we call anthropomorphic, with whom we believe we're better acquainted.

I am going to compare three short excerpts: one from a novel, one from a newspaper story, and one from an article on neuroscience. As we listen to them in turn, let us try to be sensitive not to the obviously distinct genres to which they belong, but to the multiplicity of modes of action that they are capable of intermingling. I am asking you, in other words, to suspend the usual reading grid that makes us tend to contrast human and nonhuman actors, for example, subjects and objects; I'd like you to remain attentive to what constitutes their common repertory. It will then become clear that to say of an actor that he/she/it is inert – in the sense of having no agency – or, conversely, that he/she/it is animated – in the sense of “endowed with a soul” – is a *secondary* and *derivative* operation.

One feature of a great novel is that its characters do not conform to repertoires of predictable actions; they avoid the clichés we use to simplify our stories as if we were playing “Clue”: for example, the Butler, the Detective, the Lost Girl, or the Villain. This is certainly the case in the well-known passage of Tolstoy's *War and Peace* that narrates Marshal Kutuzov's (non-)decision on the eve of the famous Battle of Tarutino on October 12, 1812. The Marshal thinks that launching a battle to defeat Napoleon is pointless:

The Cossack's report, confirmed by horse patrols who were sent out, was the final proof that events had matured. The tightly coiled spring was released, the clock began to whirr and the chimes to play. Despite all his supposed power, his intellect, his experience, and his knowledge of men, Kutuzov – having taken into consideration the Cossack's report, a note from Bennigsen who sent personal reports to the Emperor, the wishes he supposed the Emperor to hold, and the fact that all the generals expressed the same wish – could no longer check the inevitable movement, and gave the order to do what he regarded as useless and harmful – *gave his approval, that is, to the accomplished fact.*<sup>21</sup>

As readers of the novel surely remember, in what follows this passage Kutuzov does everything he can to postpone the engagement, which he will nevertheless win in the end because he will have managed to remain almost immobile in the face of the advances and counter-advances of Napoleon's Grand Army! If there is one system of commandment in which we believe it possible for the supreme leader to make sure he is obeyed, it is certainly the case of an army at war. Yet, in this battle narrative, exactly the opposite happens: the human subject who should be in full control and able to achieve

<sup>21</sup>Leo Tolstoy, *War and Peace* ([1865–6] 1996), p. 879, emphasis added.

his intentions is precisely the one who *is made to act* by objective forces that he cannot “check.” Certain of these are “natural” – the “events had matured,” the “tightly coiled spring” is released; others are clearly human and social – the report of the Cossack scouts, the betrayal of Kutuzov’s aide-de-camp, Bennigsen, the wishes of his generals; still others, finally, might be called cognitive – “experience” and “knowledge of men,” the wishes imputed to the Emperor. All this obliges Kutuzov to give “the order to do what he [regards] as useless and even harmful,” since he can do nothing but give “his approval to the accomplished fact.” He ought to have goals; but he is so powerless in his power that he does not even manage to define them.

One can hardly pretend that this is a story dealing exclusively with human actors; we see that a novelist, as soon as he becomes attentive to the ins and outs of the human soul, multiplies the forms of action that make it difficult to say exactly where the *anthropomorphic* aspect of his characters resides. Kutuzov is given his *form* – this is the meaning of the Greek root “morphic” – by forces that have entirely different characteristics. This is what specialists in literary analysis mean when they distinguish figuration from agency: Kutuzov indeed has the figure of a human being, but what makes him act comes to him from elsewhere, from forces Tolstoy spells out in detail.<sup>22</sup>

Someone will object that novelists are paid to probe the depths of the human soul and that it is hardly surprising that they delight in complicating the lives of philosophers who would prefer to see the subjects of the “human world” radically opposed to the objects of the “material world.” It is true that, in the example of Kutuzov, there is no agent that can count as a truly credible natural force. Despite the metaphors of the “maturing” situation, of the “spring [that] was released,” and the “chimes [that] began to play,”<sup>23</sup> we remain from start to finish, and for our maximum pleasure, within the human comedy.

Let us now take an excerpt from a best-seller with a very modernist title: *The Control of Nature*.<sup>24</sup> John McPhee’s book is a series of remarkable stories about the way heroic humans stand up to

<sup>22</sup>The difference between actants and actors is an essential principle of the semiotics inspired by Greimas; see Jacques Fontanille, *The Semiotics of Discourse* ([1998] 2006).

<sup>23</sup>Curiously, throughout the appendix to the novel, Tolstoy uses a technical metaphor for a Providence that acts with such necessity that the characters’ freedom of maneuver, though it has been amply deployed throughout the novel, completely disappears. Here is evidence that the discourse of causality can multiply or reduce agency at will without any change in composition. The *attribution* of causes is always a secondary process with respect to the primary process of the *composition* of forces.

<sup>24</sup>John McPhee, *The Control of Nature* (1989).

invincible natural agents – water, landslides, and lava flows. In one chapter, he describes another battle, the one that hydraulic engineers carry out against the tendency not of a hostile army but of a river, the Mississippi, to let itself be captured insidiously by the course of a much smaller and much less well-known river with the wonderful Indian name Atchafalaya. Its course is situated *below* the Mississippi's.

If the Mississippi continues to flow to the east of New Orleans, it is thanks to a rather small and quite fragile work of craftsmanship constructed upstream in a bend in the river, a dam that protects the massive current from being captured by the bed of the Atchafalaya, which is much narrower but several meters lower. If this dam should break (as it threatens to do almost every year, making the whole region tremble), the entire Mississippi, after devastating the Atchafalaya valley and carrying off the town of Morgan City, would come out, through a shortcut of several hundred kilometers, to the *west* of New Orleans, causing massive flooding and destroying a major part of the huge Mississippi delta toward which a quarter of the American economy flows. It is a question no longer of generals, war, treason, wishes, or presumed intentions but of two rivers, and a collective character rather than an individual like Kutuzov, a character that McPhee describes as acting “like a single man”: the Army Corps of Engineers. This institution is charged with conducting the battle to “control nature” under the supervision of a commission responsible for infrastructure projects – the River Commission.

Thus here we are truly facing a *natural* actor. But whoever has felt the presence of a stream, a tributary, a river, and especially a river like the Mississippi, will react as Mark Twain did:

One who knows the Mississippi will promptly aver – not aloud, but to himself – that ten thousand *River Commissions*, with the mines of the world at their back, cannot *tame* that *lawless* stream, cannot curb it or confine it, cannot say to it, “Go here,” or “Go there,” and make it obey...the Commission might as well *bully* the comets in their courses and undertake to *make* them behave, as try to *bully* the Mississippi into right and reasonable conduct.<sup>25</sup>

A force of nature is obviously just the opposite of an inert actor; every novelist and poet knows this as well as every expert in hydraulics or geomorphology. If the Mississippi possesses anything at all, it is *agency* – such powerful agency that it imposes itself on the agency of all the bureaucrats. But the least one can say is that the Army Corps of Engineers did not follow Mark Twain's intuition. On the contrary, it decided to make the “lawless stream” obey, to “curb”

<sup>25</sup>Mark Twain, *Life on the Mississippi* ([1883] 1944), p. 168.

and “confine” it, to “bully” it to the point of keeping it, for two centuries now, from abruptly modifying its meanderings, as it had been doing for millennia, and ordering it to “go here and not there.” As the tragedy of Katrina has reminded us,<sup>26</sup> the entire Mississippi basin, completely artificialized, is attempting to protect itself behind the fragile front line of its dikes. The agents we are dealing with here are so mixed that the extent of the technical and legal responsibility of the Corps is a function of both the power of the Mississippi and the level of the Atchafalaya, which stubbornly continues to dig down. The whole business is ultimately concentrated in the little artisanal construction that a slightly stronger than anticipated surge could carry away. And what is the consequence of these exchanges of capacities? A situation of negotiation – almost a contractual relation – between anthropomorphic beings (the Corps of Engineers in particular) and others, which can logically be called *hydromorphs*.

The Corps was not in a *political or moral* position to *kill* the Atchafalaya. It had to *feed it* water. By the *principles of nature*, the more the Atchafalaya was given, the more it would want to take, because it was the *steeper* stream. The more it was given, the deeper it would make its bed. The difference in level between the Atchafalaya and the Mississippi would continue to increase, magnifying the *conditions* for *capture*. The Corps would have to *deal with* that. The Corps would have to *build* something that could *give* the Atchafalaya a portion of the Mississippi and at the same time *prevent it from taking all*.<sup>27</sup>

Let us note that the expression “by the principles of nature” does not *withdraw* agency from the conflicts between the two rivers featured by McPhee any more than the “accomplished fact” mentioned by Tolstoy is capable of eliminating any will in Kutuzov’s decision (as the general in charge, he still has to “give his approval”). Quite to the contrary, there is a will here – that of the competing rivers. But the author represents what it means to “will” quite differently in this case: the connection between a smaller but deeper river and another much bigger but higher one is what supplies the *goals* of the two protagonists, what gives their action a *vector*. It hardly matters that one is evoked as having intentionality or will and the other as simply a force, because it is the *tension that makes the actor*, and not the way actors have been endowed with a more or less plausible set of attitudes.<sup>28</sup>

How can we doubt that the Atchafalaya “wants to capture” the Mississippi? It is a manner of speaking, yes, but one that justifies

<sup>26</sup>Hurricane Katrina devastated New Orleans on August 29, 2005.

<sup>27</sup>McPhee, 1989, emphasis added.

<sup>28</sup>See Algirdas Greimas and Jacques Fontanille, *The Semiotics of Passions: From States of Affairs to States of Feeling* ([1991] 1993).

using legal terms, the vocabulary of battle – “give,” “supply,” “take into account,” “prevent” – to give the sense, the direction, the movement of a river that is indeed dangerous. Or rather that has been *made dangerous* by the will of the Corps to bully the Mississippi by introducing a corset of dikes. If this is violence against violence, how can we be surprised that behavioral features shift from one repertory into the other? If you want to avoid anthropomorphisms, the Corps would have had to avoid anthropomorphizing the Mississippi delta! What moralists tend to ignore is something engineers know: on the side of the subject, there is no mastery; on the side of the object, no possible deanimation.<sup>29</sup> As one of the engineers says, “It is not a question of whether or not the Atchafalaya will end up capturing the entire river, but a question of *when*.” And he calmly asserts: “Up to now, we have been able only to win some time.”<sup>30</sup> “Win some time”: there is an expression that Kutuzov would have understood very well!

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All this is very amusing, you may well say, but journalists are journalists, just tale-tellers, just like novelists, we know how they work; they always feel obliged to *add* a bit of action to what, in its essence, ought to be *deprived* of any form of will, goal, target, or obsession. Even when they take in interest in science and nature, they cannot keep from adding some drama to what contains no drama. Anthropomorphism is the only way they know to tell stories and sell their newspapers. If they had to write “objectively” on the subject of “purely objective natural forces,” their stories would be significantly less dramatic. The concatenation of causes and effects – and isn’t that, after all, what the material world consists in? – must not lead to any dramatic effects, precisely because – and herein lies its beauty – the consequences are *already there* in the *cause*: there is no suspense, nothing to wait for, no sudden transformation, no metamorphosis, no ambiguity. Time passes *from the past toward the present*. In these stories (which are in fact *not* stories), then, nothing happens, in any case no *adventure*. Isn’t this the salient point of rationalism? That no one should create any drama, and no one should tell any more stories.

<sup>29</sup>This is the origin of the principle of symmetry introduced into sociology by Michel Callon in “Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St Brieux Bay” (1986); it is the basis for actor-network theory. Instead of a distinction between subject and object, one obtains nuances along a gradient in which human and nonhuman figures are mixed.

<sup>30</sup>McPhee, 1989, p. 55.

Such at least is the conventional way in which scientific reports are supposed to be written, or so the experts claim. That convention may be insisted on endlessly in classrooms, but even a superficial reading of the first scientific paper that comes to hand will suffice to call it into question. Let us take for example the beginning of an article published by my former colleagues at the Salk Institute in San Diego.<sup>31</sup>

The *ability* of the body to *adapt* to *stressful* stimuli and the *role* of stress maladaptation in human diseases has been intensively *investigated*. Corticotropin releasing factor (CRF) (1), a 41-residue peptide, and its three paralogous peptides, urocortin (Ucn) 1, 2, and 3, *play important and diverse roles* in *coordinating* endocrine, autonomic, metabolic, and behavioral responses to stress (2, 3). CRF family peptides and their receptors are also *implicated* in the *modulation* of additional central nervous system functions including appetite, addiction, hearing, and neurogenesis and *act peripherally* within the endocrine, cardiovascular, reproductive, gastrointestinal, and immune systems (4, 5). CRF and related ligands initially *act by binding* to their G protein-coupled receptors (GPCRs).<sup>32</sup>

Once we've taken care of the acronyms (CRF, Ucn, GPCR), which are convenient for the experts but off-putting for neophytes, and once we've replaced the passive forms (a stylistic obligation of the genre) by the actions of the scientists who have "intensively investigated" the question, we confront – here again, here as always – an actor whose agency is the very object of the article: the factor that releases corticotropin. How can we pretend that CRF is inert when it "plays an important role" and is "implicated in the modulation" of a dizzying number of functions? Having a function is its way of having goals, or in any case of being defined as a vector, and thus as an agent.

To be sure, this introduction doesn't lend itself to reading with the same pleasure as *War and Peace*! But there is no doubt that by following CRF we penetrate into the twists and turns of an action that turns out to be even more complex than the intricacies of Kutuzov's decision or the meanderings of the Mississippi. Imagine, moreover, how a Tolstoy of today, clever enough to add CRF to his cast of characters, would have depicted Kutuzov on the eve of a crucial battle.<sup>33</sup>

<sup>31</sup>Some context is offered in Bruno Latour and Steve Woolgar, *Laboratory Life: The Social Construction of Scientific Facts* (1979).

<sup>32</sup>Christy Rani R. Grace, Marilyn H. Perrin, Jozsef Gulyas, Michael R. DiGrucchio, Jeffrey P. Cantle, Jean E. Rivier, Wylie W. Vale, and Roland Riek, "Structure of the N-Terminal Domain of a Type of B1 G Protein-Coupled Receptor in Complex with a Peptide Ligand" (2007), emphasis added.

<sup>33</sup>This is most likely what the novelist Richard Powers would have done; it is what he has attempted to do for example in *The Echo Maker* (2006), or even more directly in *Gain* (1998), and it is what accounts for the entirely new aspect of his characters; on this point, see Bruno Latour, "The Powers of Facsimiles: A Turing Test on Science and Literature" (2008a).

Is there anything more stressful than a battle situation? The CRF would have spread in his intestine, would have modified his hearing, modulated his response to the microbes; and how could we doubt that Bennigsen, stressed by his betrayal, and soon the whole general staff, not to mention the poor soldiers sent up as cannon fodder, would not all be transformed by the flow of CRF? When it is a matter of understanding what it means to act and to be acted upon, novelists, journalists, and scientists are engaged in one and the same fight, and they steal from one another incessantly.

There is of course a difference between this last example and the two earlier ones, but, as I discovered many years ago in that same laboratory at the Salk Institute, the difference does not arise from the fact that the first two stories deal with “human” agents endowed with goals, while the last one deals with objects of “nature” that have no goals or wills.<sup>34</sup> The only real difference – at least as far as the story is concerned – comes from the fact that the readers of Tolstoy’s masterpiece or of McPhee’s story can easily endow the characters with a certain consistency on the basis of their past experience, whereas they cannot do the same thing for the case of CRF – unless they are specialists in neurotransmitters, of course. What makes scientific reports so propitious for studying the multiple character of agency is that the character of the agents mobilized cannot be described except through the *actions* by means of which they have to be slowly pinned down.

Unlike generals such as Kutuzov and rivers such as the Mississippi, the *competences* of these agents – that is, what they *are* – are defined only *through their performances* – that is, after observers have succeeded in recording how they *behave*.<sup>35</sup> For a marshal or a river, you can act as though you started from their essence to infer some of their properties. Not for CRF. If you know nothing about it, you will necessarily – whether you are its discoverers or readers of the article cited – begin by exploring what it does. And, since there is no prior knowledge of CRF, since what justifies publishing an article about it is its novelty, every feature has to be produced by a certain experiment, a specific trial, and these have to be listed, line by line.<sup>36</sup> What is CRF? It is what releases corticotropin. What is corticotropin? It is what releases corticostimulin in the pituitary gland. And so on.

<sup>34</sup>See Bruno Latour and Paolo Fabbri, “The Rhetoric of Science: Authority and Duty in an Article from the Exact Sciences” (2000), and especially Françoise Bastide, *Una notte con Saturno* (2001).

<sup>35</sup>See the entries “performances” and “competences” in the bible of semiotics: Greimas and Courtés ([1979] 1982).

<sup>36</sup>This is the crucial point of the classic article by Harold Garfinkel, Michael Lynch, and Eric Livingston, “The Work of a Discovering Science Constructed with Materials from the Optically Discovered Pulsar” ([1981] 2011).

Table 2.1

Actants	Actors
Performances	Competences
Names of action	Names of thing
Attributes	Substance
Before	After
Unstable	Stable

If we aren't specialists in this unknown object, we struggle, of course, but the procedure is exactly the same as the one we engage in every day when we consult the Internet for information about a person, place, event, or product that someone has mentioned in passing. We begin with a name that at the outset "means nothing to us"; then we unfold, on screen, a list of situations; later, after we have become familiar with them, we invert the order of things, and we get in the habit of starting from the name to deduce or summarize what it does. In the same way, CRF was initially a list of actions, well before it was, as they say, "characterized." From that moment on, its competences begin to precede and no longer to follow its performances. If we read as much scientific literature as we read novels, CRF would be as familiar to us as Pierre Bezukov and Natasha Rostov – as familiar as endorphins are today, thanks in part to work done at the same Salk Laboratory. In the little chart I have drawn up (table 2.1), the last feature is particularly important: it is through stabilization that a substance acquires its consistency.

I wanted to compare these three examples briefly in order to bring out the gap that separates the common-sense assumption that one can easily distinguish between the objects of the natural world, on the one hand, and the subjects of the human world, on the other, from the extreme difficulty of making this distinction in practice. The actors, with their multiple forms and capacities, never stop exchanging their properties. One sees quite well how the so-called anthropomorphic representations are as unstable as those qualified as *hydromorphic*, *biomorphic*, or *phusimorphic*, since what counts is not the initial snapshot but the *metamorphoses* that Kutuzov, the Atchafalaya, or CRF undergo in the course of the story.<sup>37</sup> Kutuzov does not resemble the traditional human subject ("master of himself and of the universe") any more than the Mississippi or CRF resemble the "objects"

<sup>37</sup>I am using terms that are much too crude – *phusis* for nature, *bio* for biology, and so on – simply to point out the importance of the term *morph* to which they are apposed.

of material nature, as we are used to calling them when we want to make them the simple background for human subjects. We must not confuse the perceptions enacted by subjects and objects with what the world is made of. If it is the world that interests us – and no longer “nature” – then we must learn to inhabit what could be called a *metamorphic zone*, borrowing a metaphor from geology, to capture in a single word all the “morphisms” that we are going to have to register in order to follow these transactions.<sup>38</sup>

In the final analysis, the distinction between humans and nonhumans has no more meaning than the Nature/Culture distinction. It would be just as artificial a distinction as putting Kutuzov and the Army Corps of Engineers in one box and the Mississippi and the CRF in another, as though the first were characterized by a form of soul or consciousness or mind and as though the second were, if not inert, then at least lacking in goals and intentions. The distinction between humans and nonhumans and the difference between culture and nature have to be treated the same way: to be sure that we are not using them as resources but rather as objects of study, we have to go a level deeper, to the common concept that distributes the figures into separate parts.<sup>39</sup> To believe that these terms describe anything at all about the real world amounts to taking an abstraction for a description.

When we claim that there is, on one side, a natural world and, on the other, a human world, we are simply proposing to say, after the fact, that an arbitrary portion of the actors will be *stripped of all action* and that another portion, equally arbitrary, will be *endowed with souls* (or consciousness). But these two secondary operations leave perfectly intact the only interesting phenomenon: the exchange of forms of action through the transactions between agencies of multiple origins and forms at the core of the metamorphic zones. This may appear paradoxical, but, to gain in realism, we have to leave aside the pseudo-realism that purports to be drawing the portrait of humans parading against a background of things.

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<sup>38</sup>According to the dictionary, metamorphism is an internal process of the terrestrial globe in which extreme heat or pressure produce a solid structure by altering the texture and mineralogical composition of a rock formation.

<sup>39</sup>This is the same displacement of a term used as an analytical tool transformed into an object of study (the shift from *resource* to *topic*) that I presented in the previous lecture.

Displacing our attention toward this zone common to writers and scientists may allow us to understand differently the idea that the Earth “retroacts” in response to what “we” do to it. Michel Serres had already addressed these delicate questions in the early 1990s, at the very moment when nonchalant humanity had inadvertently crossed the dangerous CO<sub>2</sub> threshold.<sup>40</sup> In a bold and singular book, *The Natural Contract*, Serres proposed, among many innovative ideas, a fictional reformulation of Galileo’s famous line: “*Eppur si muove!*”<sup>41</sup> Serres starts with an episode from the potted history of science: after having been forbidden by the Holy Inquisition to teach anything at all in public about the movement of the Earth, Galileo is said to have muttered: “And yet it moves.” Serres calls this episode Galileo’s *first trial*: a “prophetic” scientist grappling with all the authorities of his time silently reaffirms the objective fact that will eventually destroy those same authorities.

But in our day, according to Serres, we are witnessing *Galileo’s second trial*.<sup>42</sup> In the face of all the assembled powers, another equally prophetic scientist (let’s say James Lovelock, or Michael Mann, or David Keeling),<sup>43</sup> after being condemned to keep silent by all those who deny the behavior of the Earth, begins to mutter to himself “*Eppur si muove!*,” but this time giving it a new and somewhat worrying twist: not “And yet the Earth moves!” but, rather, “And yet the Earth is moved!” in the sense of manifesting an emotional reaction.

Science won all the rights three centuries ago now, by appealing to the Earth, which responded by moving. So the prophet became king. In our turn, we are appealing to an absent authority, when we cry, like Galileo, but before the court of his successors, former prophets turned kings: “the Earth is moved.” The immemorial, fixed Earth, which provided the conditions and foundations of our lives, is moving, the fundamental Earth is trembling.<sup>44</sup>

<sup>40</sup>As Foucart says in the article cited at the beginning of this lecture (Foucart 2013): “According to American climatologist James Hansen, the former director of the Goddard Institute for Space Studies (GISS), the concentration of CO<sub>2</sub> that must not be exceeded is around 350 /m. A limit that was reached shortly before 1990.”

<sup>41</sup>Michel Serres, *The Natural Contract* (1995) extended in part in *Retour au contrat naturel* (2000).

<sup>42</sup>The situation is all the more piquant in that the figure of Galileo, standing up for what is right all by himself against everyone else, is invoked by the climate skeptics every time they set out to attack the “consensus” of the climatologists.

<sup>43</sup>Serres does not mention Lovelock, but this character, whom we shall meet in the next lecture, is just right for the role.

<sup>44</sup>Serres, 1995, p. 86.

We should not be surprised that a new form of agency (“it is moved,” “it reacts”) is just as startling for the established powers as the old one (“it moves”). If the Inquisition was shocked by the announcement that the Earth was nothing more than a billiard ball turning endlessly in the vast universe (remember the scene in which Bertolt Brecht showed young monks making fun of Galileo’s heliocentrism by turning in pointless circles in a room in the Vatican),<sup>45</sup> the new Inquisition (henceforth economic rather than religious) is shocked to learn that the Earth has become – has become again! – an active, local, limited, sensitive, fragile, trembling, and easily irritated envelope. We would need a new Brecht to show how, in the climate skeptics’ talk shows, a whole gang (for example, the Koch brothers, numerous physicists, many intellectuals, a good number of right-wing politicians, and also some pastors, preachers, gurus, and advisors to princes) makes fun of this new as well as very old animated and fragile Earth.

To depict this first new Earth as a body in free fall among all the other bodies in free fall in the universe, Galileo had to strip it from all forms of movement except one, abandoning all the prevailing notions of climate, animation, and metamorphoses. Thus he freed us from the so-called prescientific vision of the Earth as a cesspool, marked with the sign of death and corruption, from which our ancestors, their eyes fixed on the incorruptible spheres of the suns, the stars, and God, had no chance of escaping except by prayer, contemplation, and knowledge. Now, to discover the new Earth, climatologists are again conjuring up the climate and bringing back the animated Earth to a thin film whose fragility recalls the old feeling of living in what was once called the *sublunary zone*.<sup>46</sup> Galileo’s Earth could revolve, but it had no “tipping point,” no “planetary frontiers,” no “critical zones.”<sup>47</sup> It had a *movement*, but not a *behavior*. In other words, it was not yet the Earth of the Anthropocene.

<sup>45</sup>Bertolt Brecht, *The Life of Galileo* ([1945] 2001).

<sup>46</sup>In the old “pre-Copernican” system, there was a difference in substance between the zone under the Moon (sublunary) and the zone above the Moon (supralunary): the higher one climbed above the corruptible Earth, to the planets and then to the fixed stars, the higher one went in perfection. On the history of this cosmos and its destruction, the classic book by Alexandre Koyré, *From the Closed World to the Infinite Universe* (1957), remains the best introduction, unless one prefers the more novelistic but still very effective version by Arthur Koestler, *The Sleepwalkers: A History of Man’s Changing Vision of the Universe* (1959).

<sup>47</sup>It is this agitation on the part of the Earth that makes for the strangeness of books such as Fred Pearce’s *With Speed and Violence: Why Scientists Fear Tipping Points in Climate Change* (2007) or Stephen M. Gardiner’s *A Perfect Moral Storm: The*

Today, through a sort of counter-Copernican revolution, it is the New Climate Regime that compels us to turn our gaze toward the Earth considered once again with all its processes of transformation and metamorphosis, including generation, dissolution, war, pollution, corruption, and death. But, this time, it is useless to try to escape by means of prayer. Here is a dramatic rebound: from the cosmos to the universe, then back again to the cosmos!<sup>48</sup> Back to the future? Rather, forward to the past! Isn't it precisely radical reversal that the dancer presented in the introduction had marked with her steps? Isn't it embodied in the figure I had glimpsed and given the bizarre name Cosmocollusus?

In establishing a parallel between two trials, two Earths, two climate regimes, Serres's goal is not to move us by asking us to weep for Mother Earth or to go into ecstasy over the fact that she has a soul. It is precisely not a matter of *adding* spirit to what is, alas, deprived of any, in order to make ourselves feel better in a world that would be a little less disenchanting, or, conversely, to make ourselves feel more anxious in a less infinite world. Quite the contrary: Serres directs our attention toward the astonishing *connivance* between formerly distinct agencies – as opposed to one another, as were the old figures of object and subject – that are now so mixed.

For, as of today, the Earth is quaking anew: not because it shifts and moves in its restless, wise orbit, not because it is changing, from its deep plates to its envelope of air, but because it is being *transformed by our doing*. Nature acted as a reference point for ancient law and for modern science *because it had no subject*: objectivity in the legal sense, as in the scientific sense, emanated from *a space without man*, which did not depend on us and on which we depended *de jure* and *de facto*. Yet henceforth it *depends so much* on us that it is shaking and that we too are worried by this deviation from expected equilibria. We are disturbing the Earth and making it quake! Now it *has a subject once again*.<sup>49</sup>

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*Ethical Tragedy of Climate Change* (2013). On the controversial question of planetary frontiers, see Johan Rockström, Will Steffen, et al., "Planetary Boundaries: Exploring the Safe Operating Space for Humanity" (2009). On the network of critical zones, see Susan L. Brantley, Martin B. Goldhaber, and K. Vala Ragnarsdottir, "Crossing Disciplines and Scales to Understand the Critical Zone" (2007), and the report by S. A. Banwart, J. Chorover, and J. Gaillardet, *Sustaining Earth's Critical Zone: Basic Science and Interdisciplinary Solutions for Global Challenges* (2013), as well as Bruno Latour, "Some Advantages of the Notion of 'Critical Zone' for Geopolitics: Geochemistry of the Earth's Surface" (2014d).

<sup>48</sup>Émilie Hache tries to capture this unanticipated rebound in the title of her book *De l'univers clos au monde infini* [From the closed universe to the infinite world] (2014), in opposition to Koyré's.

<sup>49</sup>Serres, 1995, p. 86, emphasis added.

Even if his book does not invoke the name “Gaia” and was written before the term “Anthropocene” came into its own, what Serres is registering is this same subversion of the respective positions of subject and object. Since the time of the “scientific revolution,” the objectivity of a world without humans had offered solid ground for a sort of uncontested natural law – if not for religion and morality, at least for science and law.<sup>50</sup> In the era of the counter-Copernican revolution, when we turn toward the old solid ground of natural law, what do we find? The traces of our action, visible everywhere! And not in the old way in which the Western Masculine Subject dominated the wild and impetuous world of nature through his courageous, violent, sometimes disproportionate dream of control, in the style of the Army Corps of Engineers. No, this time, just as happens in prescientific and nonmodern myths,<sup>51</sup> we encounter an agent that takes its label, “subject,” from the fact that it can be *subjected* to the whims, the bad moods, the emotions, the reactions, and even the revenge of another agent, which also takes its quality as “subject” *from the fact that it is equally subjected to the action of the other.*

Being a subject does not mean acting in an autonomous fashion in relation to an objective context; rather, it means *sharing* agency with other subjects that have also lost their autonomy. It is because we are confronted with these subjects – or rather quasi-subjects – that we have to give up our dreams of control and stop fearing the nightmare of finding ourselves once again prisoners of “nature.”<sup>52</sup> As soon as we come close to nonhuman beings, we do not find in them the inertia that would allow us, by contrast, to take ourselves to be agents but, on the contrary, we find agencies that are *no longer without connection* to what we are and what we do. Conversely, on its side (but there are no more “sides”!), the Earth is no longer “objective,” in the sense that it can no longer be kept at a distance, considered from the point of view of Sirius and as though it has been emptied of all its humans. Human action is visible everywhere in the construction of knowledge as well as in the generation of the phenomena to which the sciences are called upon to attest. It is impossible, from now on, to play at dialectically opposing subjects and objects. The spring that worked for Kant, Hegel, and Marx is now completely stretched out: there is no longer enough object to oppose to humans, not enough subject

<sup>50</sup>I shall come back to this question in the sixth lecture.

<sup>51</sup>See Eduardo Kohn, *How Forests Think: Toward an Anthropology beyond the Human* (2013).

<sup>52</sup>The terms quasi-object and quasi-subject were introduced by Michel Serres in *The Parasite* ([1980] 1982).

to oppose to objects. It is as though, behind the phantasmagoria of dialectics, the metamorphic zone were becoming visible once more. As if, under “nature,” the world were reappearing.

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What is troubling in the hybrid statements proposed by so many researchers about the actions, emotions, movements, and behaviors of the Earth is not their way of establishing continuity between what is and what must be but, rather, the always ambiguous way in which they treat matters of fact. Sometimes it is a question of causal chains that seem to imply no form of action in response to what has been said; sometimes it is just the opposite, with these same researchers unfolding a proliferation of action scenes, some of which inevitably push those who are caught up in the stories to act. This double language is the source of the idea of an infinite distance between description and prescription: if one follows a causal chain in which nothing is supposed to happen – no surprises, in any case – then the gulf separating this chain from the terms used to describe moral, political, or artistic action on the part of humans looks immense. But the situation is entirely different when a scientific description sets forth a profusion of actions, many of which resemble those with which humans are accustomed to being credited: in this case, the distance between the various forms of action that continually engage actors with multiple repertoires looks minuscule. Consequently, the question becomes the following: why do those who describe the Earth’s actions sometimes assert that nothing is taking place in these actions but “strict chains of causality” and sometimes that a great deal more is happening? This amounts to asking why, if the Earth is *animated* by countless forms of agents, we have sought to conceptualize it as essentially inert and *inanimate*.

To reach an understanding of what the idea of an Earth that would react, retroactively, to our actions can mean, it becomes clear that one must not simplify in advance the distribution of agency between so-called human and nonhuman actors. What Serres explores in *The Natural Contract* is this congenital weakness of natural law, which consists in saying simultaneously that there is indeed law in nature – the prescriptive dimension that we recognized earlier – and that, nevertheless, law, true law, is found only on the other side, in culture. Hence the seemingly absurd idea of a contract with nature, even though everyone recognizes at the same time that nature orders, because it “dictates” to us what must be done through the intermediary of what is. The failure of efforts to define natural law arises not

from the desire to seek an order that makes it possible to legislate but from the tendency to act as though there were *two parallel series*, and only two, one belonging to “nature” and the other to law, and trying to figure out which is the copy of the other.

In dramatizing the idea of a contract with nature, an idea borrowed from Rousseau’s equally mythical social contract, Serres explores an entirely different solution: if one can neither keep from drawing an order from nature nor discover that order, it is because, even in our Western tradition, there have never been two parallel series, but always this proliferation of exchanges between figures that I have called the metamorphic zone.

What language do the things of the world speak, that we might come to an understanding with them, contractually? But, after all, the old social contract, too, was unspoken and unwritten: no one has ever read the original, or even a copy. To be sure, we don’t know the world’s language, or rather we know only the various animistic, religious, or mathematical versions of it. . . . In fact, the Earth speaks to us in terms of forces, bonds, and interactions, and that’s enough to make a contract.<sup>53</sup>

What difference is there between a force – a physical force – and a bond – a legal bond? Let us not forget that *The Natural Contract* is first of all a book of legal philosophy, and that it seeks to take seriously what the word “laws” means in the expression “laws of nature.” The book’s title notwithstanding, the natural contract is not a deal between two parties, humanity and nature, two figures that cannot be unified in any case,<sup>54</sup> but rather a series of transactions in which one can see how, all along and in the sciences themselves, the various types of entities mobilized by geohistory have exchanged the various traits that define their agency. *Trait* is precisely the technical term, borrowed from law, geopolitics, science, architecture, and geometry, that Serres uses to designate these transactions between the aforementioned subjects and the aforementioned objects. To make himself clear, he offers the most improbable of examples, that of universal gravity.

Moreover the word *trait*, in French, like *draft* in English, means both the material bond and the basic stroke of writing: dot and long mark, a binary alphabet. A written contract obligates and ties those who write their name, or an X, below

<sup>53</sup>Serres, 1995, p. 39.

<sup>54</sup>This is what we shall see in the lectures to come: neither nature nor humanity can grasp itself as sufficiently unified (and now as sufficiently distinct) to be able to establish a contract between the parties. This is a way of measuring how much the situation has changed between the years in which Serres was writing his book and the period in which we are obliged to confront the Anthropocene.

its clauses. . . . Now the first great scientific system, Newton's, is linked together by attraction: there's the *same word again, the same trait, the same notion*. *The great planetary bodies grasp or comprehend one another and are bound by a law, to be sure, but a law that is the spitting image of a contract, in the primary meaning of a set of cords*. The slightest movement of any one planet has immediate effects on all the others, whose reactions act unhindered on the first. Through this set of constraints, the Earth *comprehends*, in a way, the *point of view* of the other bodies since it must reverberate with the events of the whole system.<sup>55</sup>

Serres is not proposing to *animate* the Earth by claiming that it would benefit from a form of comprehension, sympathy, or sovereignty. Quite the opposite: he proposes to take the force of attraction itself as a *bond* that would allow us to understand what is meant by the *force* of law and the *power* of understanding. To understand is to grasp, to apprehend something; is there a better way to apprehend something than to be subjected without any obstacle to the resounding echoes of all the other bodies? This is not anthropomorphism – in that case, the metaphor would go from the human to the physical – but rather a phusimorphism – the metaphor goes from force to law. Serres means that, in the last analysis, we indeed speak the language of the world, provided that we learn to translate “the animist, religious, or mathematical versions” from one to another. *Translation*, Serres's great project, becomes the way of understanding by what we are *attached* and on what we *depend*.<sup>56</sup> If we become capable of translating, then the laws of nature begin to have a spirit.

We mustn't see this bond between gravity and law as a matter of poetic license. Simon Schaffer has shown in a magnificent article how Newton must have drawn out of his own culture a set of features for the new agent that later imposed itself as “universal attraction.”<sup>57</sup> Newton was obsessed by all forms of action at a distance, as much by that of God acting in matter as by that of credit acting in the economy, or the government acting on subjects.<sup>58</sup> A theologian with a whiff of heresy about him, an expert in alchemy as well as optics, he would have seen no point in “strictly distinguishing” between the world of spirits and that of matter. If he had done that, he would never

<sup>55</sup>Serres, 1995, pp. 108–109, emphasis added.

<sup>56</sup>Michel Serres, *Hermès III: la traduction* (1974).

<sup>57</sup>Simon Schaffer, “Newtonian Angels” (2011).

<sup>58</sup>“At exactly the same time, Isaac Newton pursued active work on the spiritual agents evident in alchemical processes, on the proper interpretation of angelic messages in the scriptural prophecies and the Apocalypse, started to compose a scholarly genealogy of idolatry and heresy, discussed the material and spiritual effects of cometary motion and solar vortices and drafted a provisional history of the Church” (Schaffer 2011, p. 92). See also Simon Schaffer, *The Information Order of Isaac Newton's Principia Mathematica* (2008).

have been a physicist. Still, it was not to anthropomorphism that he turned to understand how one body manages to act on another, but to angels. His physics is thus first of all *angelomorphic*!

In fact, to avoid Descartes's whirlwinds (another quite astonishing mix of properties and traits), Newton had to discover an agent capable of instantly transporting action at a distance from one body to another. At the time, there was no character available to him who could transport an instantaneous movement without any obstacle – except angels. Through several hundred pages of angelology, Newton gradually managed to trim their wings and transform this new agent into a “force.” A “purely objective” force? Of course, because it had answered the objections, but it was still charged, upstream, by millennia of meditations on an “angelic system of instant messaging.” As we know quite well, purity would sterilize the sciences: behind the force, the wings of angels are always beating invisibly.

The problem is that the *aspect* of a human subject like Kutuzov or the Army Corps of Engineers is no better known at the outset than the *aspect* of a river, an angel, a factor in hormone release, or a force such as universal gravity. That is why it makes no sense to accuse novelists, scientists, or engineers of committing the sin of “anthropomorphism” when they attribute “agency” to “something that should not have any.” Quite to the contrary: if they have to deal with all sorts of contradictory “morphisms,” it is because they are trying to explore the form of these *actants*, which are initially unknown and then gradually domesticated by as many figures as are needed in order to approach them. Before these actants are supplied with a style or a genre – that is, before they become widely recognized as *actors* – they must, if I can put it this way, be ground up, kneaded, and cooked in a single vessel.<sup>59</sup> Even the most respectable entities – characters in novels, scientific concepts, technical artifacts, natural phenomena – are all born from the same witch's kettle, for it is literally here, in this metamorphic zone, that all the *tricksters* and all the *shapeshifters*<sup>60</sup> reside.

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<sup>59</sup>It is this kneading and then the slow decanting that Frédérique Ait-Touati addresses in *Fictions of the Cosmos: Science and Literature in the Seventeenth Century* (2012) on the gradual invention of the difference, now naturalized, between fictional and scientific narratives.

<sup>60</sup>This is Donna Haraway's favorite term for designating the many bifurcations through which agencies exchange their properties in the most unexpected ways; see Donna Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century” (1991).

The language of the world thus articulates multiple agencies by translating one repertory into another (one morphism into another) in order to incorporate the new actors that are discovered at every step of the way. But, when I say “language of the world,” I still need to make it clear whether I am talking about language or about the world! In fact, the arguments in this lecture will seem improbable and even shocking to scientists and the public alike as long as I fail to pin down this small detail. The scientists will probably think that these exchanges of properties among rivers, forces, neurotransmitters, marshes, and engineers are not metamorphoses but simple *metaphors*. “It is the weakness and the limitation of language,” they will say, “that force us to talk about CRF as an actor, of the Atchafalaya as a being to which one has to ‘give’ water, or of gravitational force as an angelic spirit. If we could express ourselves in *truly scientific terms*, we would put away all these metaphors and speak in a way that would be strictly...” There follows a moment of somewhat embarrassed silence. In fact, this is the point at which things get complicated, for, to “speak in strictly scientific terms,” according to them, they would obviously have to avoid speaking at all! And we are left to imagine a rather comical scene in which a mute researcher designates a phenomenon that expresses itself silently on its own while imposing itself without any sign or intermediary on a totally passive human being...clearly not a very realistic situation.

Still, the lack of realism does not prevent this scene from serving as the origin of the very distinction, which the public takes as a matter of good sense, between the “material world,” on the one hand, and that of “human language,” on the other. It is the material world that we have rendered mute in order to avoid answering the questions “Who or what is speaking? Who or what is acting?” It is in order to understand this strange situation that I must introduce, in addition to the zone of transactions that I have called metamorphic, an entirely different operation through which, *in language and by means of language*, some characters are deprived of any form of agency. This operation is going to *deanimate* some of the actors and give the impression that there is a gulf between inanimate material actors and human subjects endowed with soul – or at least with consciousness. The argument may appear convoluted, but I need it to explain through what *effect of language* people have set about constructing scenes in which language would be only one part, the other part being reserved for the mute presence of the inert things over which language has no hold!

It takes just a few moments’ reflection, however, to notice that the idea of an inert world is itself *an effect of style*, a particular *genre*, a

certain way of muting the agencies that we cannot prevent ourselves from proliferating as soon as we begin to describe any situation whatsoever. Speaking in a mechanical voice is still speaking. Only the tone is different, not the linking of words. Similarly, the idea of a deanimated world is only a way of linking animations *as if* nothing were happening there. But agency is always there, whatever we may do. The idea of a Nature/Culture distinction, like that of human/nonhuman, is nothing like a great philosophical concept, a profound ontology; it is a *secondary stylistic effect*, posterior, derived, through which we purport to *simplify* the distribution of actors by proceeding to designate some as animate and others as inanimate. This second operation succeeds only in deanimating certain protagonists, called “material,” by depriving them of their activity, and in *overanimating* certain others, called “human,” by crediting them with admirable capacities for action – freedom, consciousness, reflexivity, a moral sense, and so on.<sup>61</sup>

How can one possibly produce the impression that nothing is happening in a narrative in which events, adventures, exchanges of properties, transactions among agencies are multiplied from one moment to the next? It is surely not in scientific literature that this kind of apparent inertia can be found.<sup>62</sup> No, we have simply to *add* to the unfolding of events something that *reverses* its course and thereby annuls its action. How is this possible? By transforming the concatenation of causes and consequences in such a way that all the action is – or at least appears to be – in the cause, and that there is no more agency left in the consequences. Obviously this is impossible; the consequences are always surprising and, in practice, in the history of discovery, as in the narrative of discovery, and even in the teaching of the most solidly established facts, the cause arrives a long time *after* the consequences.<sup>63</sup> For the same reason that ensures that competences emerge long *after* performances have been carefully registered, a strictly *causalist* narrative in which a single character, the

<sup>61</sup>What Whitehead called the bifurcation of nature is, as Didier Debaïse shows very well in *L'appât des possibles: reprise de Whitehead* (2015), above all a practical operation.

<sup>62</sup>There is now a vast literature dealing with the realm of “science and literature.” Especially pertinent to this book is Bruce Clarke, *Neocybernetics and Narrative* (2014). One striking example of the animation of scientific narratives, all the more interesting in that it was written by one of the people responsible for the term Anthropocene, is Jan Zalasiewicz’s book *The Planet in a Pebble: A Journey into Earth’s Deep History* (2010).

<sup>63</sup>Even if this appears counter-intuitive at first glance, the cause appears first only in the order of exposition; by definition, in the order of discovery it is always necessarily

sole actor, would be in the cause – and furthermore in the primary cause – is obviously impossible. By definition it would be impossible for anyone to produce such a narrative.

And yet it is possible, by using an appropriate philosophical approach, to act *as if* one could reverse the reversal and deduce all the consequences from the cause.<sup>64</sup> By proceeding this way, it is possible to *dedramatize* the dramatic course of time, to the point of acting as though the world flowed from the past toward the present. The hypothesis is implausible, I know perfectly well, but this is how it is possible to give the feeling of a material world subjected to a strict linking of causalities, as opposed to another world – human, symbolic, subjective, cultural, the terms hardly matter – that would then be defined as the empire of freedom. Curiously, the very distinction between the narratives – by implication, dramatic – and the material world – by implication raw, obstinate, inert, objective, and mute – does not coincide with a real distinction; rather, it originates in a very particular, historically limited way<sup>65</sup> to deanimate, through language, the distribution of what will henceforth play the role of agent – by implication, a human – and what will play the role of inert objects – by implication, the material setting of the human world.

The other hypothesis consists in proposing that what I have designated as a zone of common exchange – that is, the metamorphic zone – is *a property of the world itself* and not only a phenomenon of language *about* the world. Even if it is always difficult to keep this in mind, the analysis of meaning – the science of meaning, or semiotics – has never been limited to discourse, language, texts, or fictions. Signification is a property of all agents, in that they never cease to have agency; this is equally true of Kutuzov, the Mississippi, the CRF receptor, and the gravity through which bodies “comprehend” and mutually “influence” one another. For all agents, to act signifies bringing one’s existence, one’s subsistence, *from the future*

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second because it is always on the basis of the consequences that one goes back up the chain toward the cause. In other words, there is always, in a causal narrative, an effect of *montage*.

<sup>64</sup>Charles Péguy, in his *Note conjointe sur Monsieur Descartes et la philosophie cartésienne* ([1914] 1992), plays on Descartes’s audacity in *deducing* the existence of the heavens from his principles: “And he found not only the heavens. He found stars, an earth. I don’t know if you are like me. I find it prodigious that he *found an earth*. For finally, if he had not found it... we know perfectly well that he would not have found the heavens, the stars, and an earth if he had not heard of them” (Péguy 1992, p. 1279).

<sup>65</sup>See Simon Schaffer, “Seeing Double: How to Make Up a Phantom Body Politic” (2005), and Stengers, 2000.

toward the present: they act as long as they take the risk of filling the breach of existence – or else they purely and simply disappear. In other words, existence and signification are synonyms.<sup>66</sup> *As long as they are acting, agents signify.* This is why their signification can be followed, pursued, captured, translated, formulated in language. Which does not mean that “every *thing* in the world is merely a matter of discourse” but, rather, that every possibility of discourse is due to the presence of agents in quest of their existence.

Although the official philosophy of science takes the second movement of deanimation as the only important and rational one, the opposite is true: animation is the essential phenomenon; and deanimation is the superficial, auxiliary, polemical, and often defensive phenomenon.<sup>67</sup> One of the great enigmas of Western history is not that “there are still people naïve enough to believe in animism,” but that many people still hold the rather naïve belief in a supposedly deanimated “material world.”<sup>68</sup> And this is the case at the very moment when scientists are multiplying the agencies in which they – and we – are more and more implicated every day.

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With this second lecture, I hope to have prepared the ground for what follows. People who assert that the Earth has not only movement but also a way of being moved that makes it react to what we do to it are not all crazies who have invested in the strange idea of adding a soul to something that has none. The most interesting people, in my eyes, like the scientists who are working on the Earth System, are content simply *not to take away from it* the agency that it has. They do not say necessarily that it is “alive” but only that it *is not dead*. Or at least that it is not inert in the very strange form of inertia produced by the idea of a “material world.” A world evidently very remote from *materiality*. Between materiality and matter, it seems that we are going to have to choose.

<sup>66</sup>This theme is developed more fully in Bruno Latour, *An Inquiry into Modes of Existence: An Anthropology of the Moderns* ([2012] 2013b).

<sup>67</sup>See David Abram, *The Spell of the Sensuous: Perception and Language in a More-than-Human World* (1996).

<sup>68</sup>Hence the new interest in the question of animism, as we see in the work of Philippe Descola or Eduardo Viveiros de Castro, as if deanimation appeared from now on as a bizarre phenomenon that has to be explained anthropologically and no longer as the default position that makes all the others bizarre. See Eduardo Viveiros de Castro, *The Relative Native: Essays on Indigenous Conceptual Worlds* (2016).

To sum up too quickly an argument that I shall take up again later on, we obtain the apparent inertia of the material world as soon as we distribute agency among causes and consequences in such a way as to attribute everything to the causes and nothing to the consequences, except the property of being traversed by the effect without adding anything to it.<sup>69</sup> We gain access to materiality when we reject this secondary operation that eliminates agents and when we leave the consequences with all the *agency* of which they are capable. It is through the causalist narrative that this effect of deanimation is obtained, but always *after the fact*, once agency has been redistributed among the long series of consequences, once this series has been retooled, set up, and traversed *in reverse order*.

Strangely, and I shall come back to the point, this form of causalist narrative closely resembles the *creationist* stories through which one attributes to a first cause, to a creation deemed *ex nihilo*, the whole series of what follows.<sup>70</sup> Even if, in the wake of the scientific revolution, we are accustomed to opposing science and religion, the idea of matter – for it is in the first place an idea – participates in both realms. This is why, in seeking to shed the idea of “nature,” we shall also need to shed the theology that is pinned to it – without forgetting the politics that has been mixed up with it! Through the invention, in the course of lengthy battles during the seventeenth century, of the idea of a “material world” in which the power to act of all the entities that constitute the world has been wiped out,<sup>71</sup> a phantom world has been created to speak of the Earth, one that corresponds too often, alas, to what is called the “scientific worldview” and which is also a certain religious view of the nature of causes. Nothing, literally, *happens* any longer, since the agent is taken to be the “simple cause” of its predecessor. All the action has been placed in the antecedent. It hardly matters, then, whether the antecedent is called an omnipotent Creator or omnipotent Causality. The consequence might as well not be there at all; as we might say colloquially, it is there only “as an

<sup>69</sup>I have tried in earlier works to make this difference a technical one by emphasizing the opposition between *intermediaries* (which only transport force) and *mediators* (which cause their causes to bifurcate). This is another way of translating Serres’s argument on translation.

<sup>70</sup>This is the object of the fifth and sixth lectures, which will plunge us into “natural theology,” the theme of the Gifford Lectures on which this book is based.

<sup>71</sup>This link between scientific revolution, political organization, dematerialization of matter, and theology is the subject of the now classic book by Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life: Including a Translation of Thomas Hobbes, Dialogus physicus de natura aeris* by Simon Schaffer (1985).

extra.” We can go on stringing episodes one after another; the quality that made them “events” has disappeared.

The great paradox of the “scientific worldview” is that it has succeeded in *withdrawing* the *historicity* of the world for science as well as for politics and religion. And along with historicity, of course, goes the internal *narrativity* that allows us to be in the world – or, as Donna Haraway prefers to put it, to be “with the world.”<sup>72</sup> I am saying not that science has “disenchanted” the world by making us lose any connection with the “lived world,” but that science has always *sung a quite different song* and has always *lived fully enmeshed in the world*. Perhaps it might be of some use to offer, at last, a view of materiality that is no longer so directly and awkwardly politico-religious and that offers a pathetically inexact vision of the sciences. We could then get away from any and every “religion of nature.” We would have a conception of materiality that is finally worldly, secular – yes, non-religious, or, better still, earthbound.

We have known all this, of course, we who for a long time have been studying this curious obsession of the Moderns with deanimating the world in which they have nevertheless been causing unexpected and surprising agents to proliferate. We were well aware that the rationalizing style had no relationship with the sciences as they are practiced. This was even what had allowed me to assert, twenty-five years ago, that “we have never been modern.”<sup>73</sup> But everything changes as soon as we read news briefs like the one with which I began this lecture: “The threshold of 400 parts per million (ppm) of atmospheric carbon dioxide (CO<sub>2</sub>) is expected to be reached in May.” Here, it seems obvious *to everyone*, and not only to historians of science, that we are immersed in a *history* that can no longer be *deanimated*.

And yet we must not count on the approach of catastrophes to make us more aware – quite the contrary. In *The End*, one of the many terrifying books I read while preparing these lectures, the historian Ian Kershaw showed how Germany lost more soldiers and civilians during the final year of the war, when the Germans had given up any hope of victory, than in the previous four years combined. He shows that, in the most cataclysmic situation, when the Reich was doomed, the war was clearly lost and everyone, from generals to housewives,

<sup>72</sup>Donna Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (2016). This theme is developed at length in Bruno Latour and Christophe Leclercq, eds, *Reset Modernity!* (2016).

<sup>73</sup>Bruno Latour, *We Have Never Been Modern* ([1991] 1993).

was completely aware of this, the fighting went on, and the criminal dictatorial system remained almost intact until the final collapse.<sup>74</sup>

It is because the self-evident character of the threat will not make us change that we have to prepare ourselves to remake politics. If there is nothing agreeable, harmonious, or calming about facing ecological problems; if Lovelock can describe Gaia as being “at war” and “taking its revenge” on humans, whom he compares to the British army in June 1940, trapped in the dunes of Dunkirk, in total disarray, forced to leave its weapons lying useless on the beach,<sup>75</sup> it is because geohistory must not be conceived as a great irruption of Nature finally capable of suppressing all our conflicts, but as a *generalized state of war*.

As horrendous as history has been, geohistory will probably be worse, since what had remained quietly in the background up to now – the landscape that had served as the framework for all human conflicts – has just joined the fight. What was a metaphor up to now – that even the stones cried out in pain in the face of the miseries humans had inflicted on them – has become literal. Clive Hamilton asserts that the enemy of action is *hope*, the unalterable hope that everything will get better and that the worst is not always a sure thing.<sup>76</sup> Hamilton maintains that, before undertaking anything at all, we have to purge hope from our desperately optimistic framing of life. It is thus with many scruples that I am putting this series of lectures under Dante’s somber warning: “Abandon all hope.” Or, in a more modern style, this query by Dougald Hine, cited by Déborah Danowski and Eduardo Viveiro de Castro: “What do you do, after you stop pretending?”<sup>77</sup>

We were already trembling as we observed the acceleration of history, but how are we to behave in the face of the “great acceleration”?<sup>78</sup> Through a complete reversal of the favorite trope of Western philosophy, human societies seem to be resigning themselves to playing the role of witless object, while it is nature that is unexpectedly taking on the role of active subject! Have you noticed

<sup>74</sup>Ian Kershaw, *The End: The Defiance and Destruction of Hitler’s Germany, 1944–1945* (2011).

<sup>75</sup>James Lovelock, *The Revenge of Gaia: Earth’s Climate in Crisis and the Fate of Humanity* (2006), p. 150.

<sup>76</sup>Clive Hamilton, *Requiem for a Species: Why We Resist the Truth about Climate Change* (2010).

<sup>77</sup>Déborah Danowski and Eduardo Viveiros de Castro, *The Ends of the World* (2016), p. 79.

<sup>78</sup>Will Steffen et al., “The Trajectory of the Anthropocene: The Great Acceleration” (2015a).

that we are now attributing to natural history the terms of human history – tipping points, acceleration, crisis, revolution – and that to speak of human history we are using the words inertia, hysteresis, path dependency, as if humans had taken on the aspect of a passive and immutable nature in order to explain why they are doing nothing against the threat? Such is the meaning of the New Climate Regime: the “warming” is such that the old distance between background and foreground has faded away: it is *human* history that appears cold and *natural* history that is taking on a frenzied aspect. The metamorphic zone has become our common place: it is as though we had indeed ceased to be modern, and, this time, collectively.