

SEVEN OBJECTIONS AGAINST LANDING ON EARTH

As everyone learned in school, when our idea of the position of the Earth in the cosmos is modified, a revolution in the social order may ensue. Remember Galileo: when astronomers declared that the Earth moves around the Sun, it felt as though the whole fabric of society was under attack.¹

¹ Bertolt Brecht, *Life of Galileo* (Harmondsworth: Penguin, 1980). Originally written in German as *Leben des Galilei* in 1938/39.

Today, again, four centuries later, the role and the position of the Earth is being revolutionized by new disciplines: human activities have seemed to push the Earth to react in unexpected ways. And once again, the whole organization of society is being subverted. Shake the cosmic order and the order of politics will be shaken as well. Except that this time, the question is not one of making the Earth move around the Sun, but of moving it somewhere else altogether! As if we had to learn anew how to land on it.

“LANDING ON EARTH? WHY WOULD ANYONE ATTEMPT TO LAND THERE? AREN’T WE ALREADY ON EARTH?”

Well, *not quite!* And that’s the circumstance this book tries to present to the inquiring reader: it seems that in the past there has been some misinterpretation of what it means to be *earthly*. If you believe it means “practical,” “mundane,” “secular,” “material,” or even “materialist,” you’re in for a surprise.

Members of modern industrial societies had long prided themselves on being “down to earth,” “rational,” “objective,” and above all “realist,” but now suddenly they have discovered that they need an Earth to continue to live — and live well (see Stengers, this volume, xxx–xxx). Shouldn’t they have carefully surveyed the span, size, and location of the very land on which they were supposed to reside and spread out? Wasn’t surveying and mapping what they were doing when they engaged for centuries in what they still celebrate as “the Age of Discovery”? How odd that, after having assembled so many maps of so many foreign lands, collating so many views from so many landscapes, drawing so many versions of what they called “the Globe,” they now appear to be taken aback by the novelty of this newly emerging Earth (see Schaffer, “Beware of Precursors,” this volume, xxx–xxx)? Of all people, shouldn’t they have been the best prepared for such a discovery?²

And yet — should we really be surprised? — the intrusion of the Earth strikes them as a shock. It appears that the Globe they expected to list, register, locate, enclose, and gobble up was no more than a very provisional rendering of what there remains to discover; that the Globe they claim to travel through so effortlessly is no more than a provincial view of the whole that is yet to be assembled; that even this materialism they promoted with such enthusiasm might have been in effect a rather ideal version of what *materiality* really implies (see Chakrabarty, this volume, xxx–xxx). In the end, at the beginning

of the twenty-first century, the Earth again appears — to the stupefaction of the rich enlightened portion of the human race — as *terra incognita* (see Gaillardet, this volume, xxx–xxx).

Such is the juncture from which this publication takes its departure: The intrusion of an Earth with a surprising shape, size, contents, and activity that triggers a triple feeling of *disorientation*; first, in *space* — where are we located?; then, in *time* — in which period do we find ourselves?; finally, in *identity* — who are we, what sort of agency do we possess, how do we cope with such novelty, how do we make sure we don’t behave too badly? This historical moment — rendered earlier by euphemisms such as “ecological crisis” or “climate change” — now would best be taken as an existential crisis, a matter of life and death.

“IF YOU WANT US TO GET READY FOR SUCH A MAJOR UPEHAVAL, WHY DO YOU ADVERTISE YOUR PROJECT WITH AN EXPRESSION LIKE ‘CRITICAL ZONE,’ WHICH HAS NO MEANING IN PUBLIC DISCOURSE?”

But that’s exactly why we like the term! “Zone” is well chosen precisely because it has no settled meaning! It designates something of uncertain status, unclear delineation, unsettling atmosphere. It is exactly what you need to redirect attention *away* from “territory,” “*Heimat*,” “land,” “soil,” “homeland,” or “landscape”; and above all, from the Earth viewed from the outside as can be seen in countless atlases or clicked on in so many GPS devices. To underline that the place to land is alien, there is no better way, it seems, than to call it a zone. Does the word not perfectly stress its *Unheimlichkeit* (see Etelain, this volume, xxx–xxx)?

For us, anyway, the Critical Zone is the invention of a few scientists, mostly from the Earth sciences and geochemistry, as a way to bring different disciplines together in order to refresh the study of the thin skin of the living Earth (see Dietrich, this volume, xxx–xxx). To be sure, the adjective “critical” has many meanings, as you will see in this volume. Each scientist has a different take on it: “far from thermodynamic equilibrium,” “fragile,” “water chemistry,” “interface,” “what should be protected,” what could abruptly cross “a tipping point,” and many others. What all those meanings have in common, however, is to stress that planet Earth — in its astronomical or geological sense — is not sufficient to define where we reside, and that we need *another frame* to situate all the phenomena critical for us — that is, we humans and all the

² Ayesha Ramachandran, *The Worldmakers: Global Imagining in Early Modern Europe* (Chicago: University of Chicago Press, 2015).

other life forms!

The fact is that taking the planet as a globe obliges you to squeeze the Critical Zone to nothing. Haven't you ever worried that when you say that the Earth is a planet, that it is a globe, you actually have to mentally position yourself as if you were considering it *from out in space*? To be sure, a few dozen astronauts have been there, in a few noisy tinkered space machines, and they took a few pictures, but humans don't live there and it's not what they see in front of their eyes. This is why "Critical Zone" is such a useful term: it helps us to free our imagination from the attraction of the too-famous Blue Marble. We are not space aliens. We reside inside a thin bio-film no thicker than a few kilometers up and down, from which we cannot escape — and, "Critical Zonists" would add, whose *reactions* (chemical alterations and geological mechanisms, as well as social processes) are still largely unknown.

The reason we get enamored with the term "Critical Zone" in this publication is not only because it breaks down the *cartographical* view of planet Earth, but also because it complicates and interrupts the *legal* and *political unity* of any global view. The professional disease of looking too long at physical globes or clicking too often on digital maps causes people to end up believing that because data are projected on a sphere, they are, for this reason, as if by a magic wand, unified, continuous, and homogeneous. We should never forget that a globe is never bigger than the screen (or piece of paper) on which it is spread. The figure of a globe doesn't unify what it registers: it simply points at some dataset.³

So, the great advantage of speaking of the Critical Zone instead of planet Earth is to resist the temptation of confusing tiny, fragile, and provisional *models* of the Earth system with the scientific endeavor and, especially, with the *political work* of unifying the said planet for good. This confusion has until now been the bane of many ecologically minded people paralyzed by their imagery of global views. In the hands of Critical Zonists, on the contrary, zones appear patchy, heterogeneous, discontinuous. As you will see in this book, there is nothing *more divisive* than those patches. This is why, in the layout of this publication, we have done our best to reject the use of any balloon form, any pumpkin-sized Mother Earth, any Blue Planet, or any "green stuff," and multiplied the observatories to capture the Earth's diversity. Our colors are darker — or at least dappled!

If you desire politics to settle an issue, don't count on a unified "Nature" to do the composition for you; you'll have to compose the Critical Zone, bit by bit, element by

element. No short cuts allowed.

"IF THE SITUATION IS AS YOU CLAIM, WHY WOULD YOU CALL YOUR BOOK 'THE SCIENCE AND POLITICS OF LANDING ON EARTH'? CERTAINLY, THE LAST THING YOU WANT WOULD BE TO MIX THE FACTS OF SCIENCE WITH POLITICAL PASSIONS, CORRECT?"

Yes, of course, it would be nice if we could keep them apart, but it's rather unrealistic in times of sudden revolutions in thinking about how the Earth moves, as occurred on a similar scale when the Earth, in the seventeenth century, was set in motion after millenarities of keeping still. What a fuss they made out of this expulsion of planet Earth from the center of the cosmos, to let it swing and veer around the Sun. What drama they later staged around what they used to call "the scientific revolution." And how proud they have been, ever since, of having extirpated the roots of all past beliefs, disproven the ancient cosmologies, and transformed all religious attachments into mere mythologies. Most enlightened people today still believe that this play is not a staged drama but the real movement of history! So much so that they find themselves today landless, as if suspended in midair, searching for a solid Earth to relocate their lives.

Whatever your view of the scientific revolution might be, you must admit that it *reallocated* in a major way what certainty could be expected from science, how the material world had to be conceived, what should be the place of religious beliefs, the function of the arts, the role of morality, the skills necessary for politics, the solidity of legal ties, and how a free subject is supposed to behave. Were we to enter a period of similar turmoil with the Earth once again destroying our contemporary ways of life, then you'd better prepare yourself for such a major upheaval. Surely more than one new drama would have to be re-staged (see Ait-Touati, this volume, xxx-xxx).

Well, is this not exactly what's happening with the new intrusion of an Earth moving out of its orbit and communicating, to the horrified view of its participants, that it has a *behavior* in addition to its celestial motion? And that it reacts to the actions of humans in ways that are quicker and more widespread than everything they previously expected from the material world they had intended to dominate (see Zalasiewicz, this volume, xxx-xxx)? Suddenly we realize that the first moving Earth of Galilean times, in spite of its celestial motion, offered in fact a solid, stable, taken for granted, immutable, and in a way, yes, fixed and immobile ground compared to the quick

³ Bruno Latour with Christophe Leclercq, eds., *Reset Modernity!*, exhib. cat., ZKM | Karlsruhe (Cambridge, MA: The MIT Press, 2016).

pace of the *new* moving Earth — a pace even faster than that of human history! If *Erdkunde* means “the tidings of the Earth,” then the messages it carries are even more troubling (see Koerner, “Geognosy,” this volume, xxx–xxx). The Earth is moving yet again, and indeed it makes everything else move at once, as if on the back of a wild horse.

Sorry, but the idea of keeping science and politics in well-separated compartments works only for peaceful periods, not when there is simultaneously an acceleration in the trajectory of the Earth and a sort of paralyzing inertia in how humans react to the reacting Earth. Just as at the time of the first “scientific revolution,” every statement of fact will necessarily be taken for an alarm, a call for action, a policy statement, an unbearable intrusion on someone else’s beliefs, values, and interests. Witness the widespread denial of climate science. The cosmic order is being shaken too much for the distribution of social powers to remain the same. In this book, we try to dramatize those links between science and politics as freely as possible, not to feign that it is possible to escape from a new settlement.⁴

“EVEN IF READERS SWALLOW YOUR ‘CRITICAL ZONE’ AND ITS NEW MIXTURE OF SCIENCE AND POLITICS, YOU HAVEN’T A CHANCE, ALTHOUGH YOU CLAIMED IT’S YOUR STARTING POINT, TO CONVINCING THEM THAT THEY LIVE ESTRANGED FROM THEIR OWN ABODE AND ARE IN URGENT NEED OF BEING SHIPPED SOMEWHERE ELSE.”

On the contrary, that’s not very much of a challenge, at least if by “readers,” you mean members of the *modern* or *modernized* section of the audience.

It would actually be a fairly good definition of “modern” people to say that they live off a land that *they don’t inhabit*. At least, they live in between two worlds: one is where they have their habits, the protection of law, their deeds of property, the support of their State, what we could call the *world they live in*; and then, in addition, a second world, a ghostly one, often far remote in time and space, that benefits from no legal protection, no clear delineation of properties, and no State to defend its rights: let’s call it the *world they live from*. It is out of this second world that modernizers have always extracted the resources necessary to maintain their illusion that they live *only* in the first, in benign ignorance of the second one (see Charbonnier, this volume, xxx–xxx). Moderns have always behaved like *absentee landlords*.

If you find this too dramatized as a definition of modernity, then it might be a good idea to look at the famous

“hockey stick” graph, popularized by scientists accumulating data on the new climatic regime.⁵ What it represents, over a few years, is what people now call the “great acceleration” in climate change, and, at a longer time scale, the brusque shift from what geologists have named the *Holocene* — the almost straight horizontal line for the last 12,000 years — to the *Anthropocene* — the other straight but vertical line, that keeps drilling through all those charts scientists are so tired of commenting on and their audience so terrified to look at. Remember how, in the 1950s, a country was on the path to development when it was “taking off”? Well, this is a perfect illustration of what can only be defined as a “lift off.” Modernizers, from wherever they live, have cut all ties between the world they live in and the one they live from: they have escaped gravity. All those drawings with a long horizontal line, a blip, and then an almost perfectly vertical line are as many signatures of the manic *Zeitgeist*.

At a more precise historical scale, however, the inherent ubiquity or duplicity of the modernizers is not so recent a phenomenon. It was long in coming. Should we choose 1610, 1789, 1945? It does not matter much. Because what is clear is that once it became possible, through the combined enterprise of colonization, slavery, transportation, and technology, to add to an economy of so many acres another virtual economy of many more “ghost acreages,” situated far away in another land, then the gap between the two worlds began to widen,⁶ not only in space but also in time (see Mitchell, this volume, xxx–xxx). Economy, the science of managing limited resources, has become an argument for forgetting all limits.⁷ This has especially been true for coal, oil, and gas, those true ghost acreages, hidden deep in the ground, that made economists feel they finally had access to infinity — finally, that is, before finding themselves coping with *finitude* again.

What gives the present tragedy its particular violence is that, because of the way the Earth has started to react to human actions, the two territories can no longer be kept quietly apart. Suddenly, modernizers find themselves cantilevered over an abyss: the world *they live from* irrupts in the midst of the world *they live in*.⁸ Hence, the present panic when faced with the irruption of all those entities, humans as well as more-than-humans: at once totally foreign — where do all those aliens come from? And terribly familiar — we always

⁴ See also Bruno Latour, *Facing Gaia: Eight Lectures on the New Climatic Regime*, trans. Catherine Porter (Cambridge: Polity Press, 2017). Originally published in French as *Face à Gaïa: huit conférences sur le nouveau régime climatique* (Paris: La Découverte, 2015).

⁵ Michael E. Mann, *The Hockey Stick and the Climate Wars: Dispatches from the Front Lines* (New York: Columbia University Press, 2012).

⁶ See Kenneth Pomeroy, *The Great Divergence: China, Europe, and the Making of the Modern World Economy* (Princeton, NJ: Princeton University Press, 2000).

⁷ Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (New York: Verso, 2011).

⁸ Pierre Charbonnier, *Abondance et liberté* (Paris: La Découverte, 2020).

suspected that we were depending on them. The face of those two collapsing planets is not pretty to look at.

That's what we mean by the intimation of landing on Earth: the task is to reconcile two definitions of territories that have been diverging wildly; or, to stay with the metaphor of flight, the goal for the modernizers is to try to land without crashing! So, you see, in the end, it shouldn't be too hard to interest readers in reconnoitering the land where they are bound to settle.

“BUT IF YOU ARE RIGHT, THE COLLAPSE OF THOSE TWO TYPES OF PLANETARY BODIES MEANS THAT YOU WANT TO PLUNGE THE READER INTO THE MIDST OF MULTIPLE CONFLICTS. THE LAND YOU WANT THEM TO MOVE INTO IS NOTHING IF NOT A WAR ZONE!”

Well, yes and no. Yes, because there is indeed an existential crisis where the fights are over life and death; and no, because not one of the ancient patterns of war and revolution can be employed to make sense of those conflicts. That's the shift in attitudes this volume tries to register.

First, there is no well-defined front line where conflicting nation states could be recognized by their flags, its combatants easily spotted by their bright uniforms. To say that these are unconventional wars would be quite an understatement. Each nation state is divided inside itself and none of the issues to be tackled fits inside its borders. In addition, although people constantly argue that it is a global war, there is no unified enemy, each warrior having a different axe to grind, triggering a state of generalized guerrilla warfare. So, are we faced with civil wars? No, with something much worse, because each combatant is divided *inside itself* as well.

We have to admit it: there is not one single issue — about what to eat, how to build a house, how to move in space, what clothing to wear, how to heat or cool a space, which resource to rely on, which production to favor, which plant to grow, which animal to defend, where to settle — not one issue that is not the source of a controversy with dividing lines crisscrossing each of the participants. And we cannot forget the long tail of unwanted consequences each decision is bound to trigger. You're never sure whether you're betraying the cause. These are conflicts where distinguishing friends and allies, and even deciding what to fight for, where, and for how long, is itself a major achievement (see Coccia, this volume, xxx–xxx), to the point that war metaphors often morph into moral puzzles, agonizing scruples, and dizzying dilemmas.

This explains the strange mixture of total mobilization leading to a state of paralysis that transforms many of our contemporaries into moral wrecks.

You might say that you are prepared to defend your territory against incursions (pollutions, extractions, invasions, expulsions),⁹ but it remains a pantomime if the last thing you are able to do is to *describe* your territory in some plausible way. How can one expect relevant political reactions from people who ignore where they reside and what land they thrive from? Hence the importance we give in this publication to the apparently innocuous task of mere description (see Schultz, “New Climate, New Class Struggles,” this volume, xxx–xxx). It's not some sort of luxury but the preliminary requirement for any landing on Earth. If there is any sense in building Critical Zone observatories, it is to condense and rematerialize what it means to stand on a piece of land and to multiply the characters that will play parts in the plots to come.

Which leads to the second reason that renders moot the classical patterns of war that humans are so well trained to impose on any dispute: these conflicts are in no way limited to *human agents*. Each of them entangles, in many counterintuitive ways, entities which had played no recognized role earlier, except as sites for military campaigns. We have had some ideas of waging wars against insects, but no idea of what it is to fight with them and even *for* them (apart from Hayao Miyazaki's film *Nausicaä of the Valley of the Wind*). We knew that weather was important for waging wars, but what does it mean to win wars against some humans *for* the climate? We have long had experience in felling trees for fortifications, but how to cope with the novelty of fighting with and *for* the continuation and prosperity of trees, against some other humans yet to be named, spotted, and defined? It doesn't seem possible to maintain even the appearance of war aims when the agents that are going to gain or to lose are no better defined than the front lines.

And yet it's a war for good, a war of extermination, no question about that — and of planetary dimensions. What in the twentieth century were called World Wars — and there was no lack of them — appear, by comparison, like so many limited conflicts. They did not engage the Planetary as such.¹⁰ Earth was the board on which conflicts were waged, not a party to those conflicts — and the one with the biggest stakes. But Earth is not a unified party either. It's a multiplicity resisting any sort of unification (see Stengers, this volume, xxx–xxx). No wonder that right now people are at a loss to decide what to attack and what to defend.

And it's not very surprising that some wealthy

⁹ Saskia Sassen, *Expulsions: Brutality and Complexity in the Global Economy* (Cambridge, MA: Harvard University Press, 2014).

¹⁰ Dipesh Chakrabarty, “The Planet: An Emergent Humanist Category,” *Critical Inquiry* 46, no. 1 (2019): 1–34.

members of the human race choose to secede entirely and to move to another planet altogether — “Ciao, you poor people! See you from Mars!” Right now, the urgent task for the rest of us who have been, so to speak, left behind, is not to simplify the front lines; the task is to equip future participants with skills to draw them. The moment of description cannot be skipped.

“LET THEM GO TO MARS, THEN. BUT, CERTAINLY, YOU HAVE NOTICED THAT POLITICAL PARTIES EVERYWHERE ARE CLAMORING FOR A RETURN TO THE LAND OF OLD, PROTECTING THEIR IDENTITY BEHIND CLOSED BORDERS. IS THIS REALLY THE RIGHT MOMENT TO INSIST ON ‘SETTLING ON LAND’ AND ‘DEFENDING YOUR HEIMAT’? THIS SEEMS PERILOUSLY CLOSE TO REACTIONARY BLUT UND BODEN.”

Thanks for being so blunt. Although the critique doesn’t bode well for our project, to be “perilously close” is our main point. If you think going to Mars is unrealistic, going back to the plot of land where the bones of your ancestors are buried might be even less so, after all! The reactionary turn to the comfort of the nation states, the present move back to “blood and soil,” might be as unrealistic as the temptation of escaping into outer space, but there is a logic in wanting to be protected. Now that the dream of living globally has vanished, you can’t reject people because they refuse to live *spaceless*. So, the question of what it means for a people to live *in space, on land, from a soil* is wide open all over again. Wanting to escape the divide between a *world you live in* and a *world you live from* cannot be morally condemned. Something else is at stake. That’s what we want to explore under the heading of *Earthly Politics*.

If “Critical Zone” is scientifically as well as politically such an appealing term, it’s because it makes you realize how little is understood when it’s claimed that a land is “your” land (see Vanuxem, this volume, xxx–xxx).

How many partners do you include in the production of your land? How thick do you calculate it has to be? 20 centimeters? 3 meters? 3 kilometers? What about the way water circulates through it all the way down to the deep rock beneath? Have you thought about its porosity and granularity? Are you sure you did not forget earthworms? When you say it’s “yours,” do you include the red sand blowing from the Sahara or the acid rain from Chinese factories? How would you react if you were told that it takes 100,000 years for a soil to be generated and, by some estimates, that there are only about 40 years left

before it is depleted? Obviously, the soil you claim your ancestors are buried in is not exactly the same as the one revealed as the Critical Zone (see Richter and Billings, this volume, xxx–xxx). The latter is much thicker, denser, older, and more populated than the first. Thus, they don’t generate the same *identity crisis* and, thus, don’t draw the same front lines either.

As you can see, it’s one thing to celebrate your roots and quite another to learn from botany! Being earthy means that we have to be much more realistic about every item that was thought to make up “nature” in an earlier period. It requires another encyclopedic survey. For climate, it’s easy, since it has entered politics with much fracas. What was earlier the atmosphere above your land now requires a major struggle if you wish to keep it as it was in the olden days. But this is also true of rivers. They don’t flow effortlessly through a landscape. They are just a moment in the water cycle, whose vagaries are poorly understood. Don’t count too much on glaciers, either; they have entered the furious path of history. Plants? Don’t bet on their local origin. To follow any one of them, you will be led to complex geopolitics and you might have to visit most of the world. Microbes and viruses? They have mutated so much because of medicine that it is hard to decide, between bugs or boards of directors, which one is more threatening.¹¹

So, you see that if anyone wishes to defend his or her land and to be deeply in his or her territory, then many more foreign participants have to be included to compose the identity of the place. That’s actually how the *Critical Zones* exhibition at ZKM is being designed and the publication laid out: one after the other, *bona fide* members of the natural world are given a barely recognizable shape. Well, isn’t this the price to pay if you want to promote *grassroots* politics?

At a more speculative level, landing on Earth requires a different view of the material world than has been framed, delineated, and entrenched since the modern period (see Schaffer, “On the Difficulty of Animating the Earth,” this volume, xxx–xxx). Materiality appears to be way more complex than the rather ideal notion of matter and space imagined earlier. In this book, in addition to the concept of the Critical Zone we offer two more concepts to make sense of that shift: Gaia and the Terrestrial.

One way to explore earthly politics is to say that we are expelled from nature and pushed toward Gaia (see Lenton and Dutreuil, this volume, xxx–xxx and xxx–xxx). However, Gaia is not taken here to be the popular idea that “the Earth taken as a whole is alive,” but rather as the occasion to redefine what both *life* and *whole* could

¹¹ Hannah Landecker, “Antibiotic Resistance and the Biology of History,” *Body and Society* 22, no. 4 (2016): 19–52.

signify. When biologists think of life, they think of organisms. But Gaia is not a big organism. It is Life, with a capital L, that, to be sure, includes as *some of its copartners* animals, plants, bacteria, but also *many other participants* not usually counted in its balance sheet — atmosphere, soil, rocks, seas, clouds, minerals, continents — that have been transformed, mobilized, generated, inhabited, engineered by life forms over eons of time. That is, all the ingredients that make up the Critical Zone as well as those disputed territories claimed by some people as “theirs” (see Dutreuil, this volume, xxx–xxx).

Think of it: No other habitat has ever been experienced except Gaia. To live *in Gaia* cannot mean the same thing as to be humans living in nature. Gaia is a *sui generis* phenomenon, not only in the usual sense of being unique — at least until another exemplar is found — but in the literal sense of having *generated itself* against all odds and, more importantly, without any superior model or direction. And yet it ended up with some sort of self-regulation. The more you dive into the originality of Gaia, the more you might devise original forms of politics that are also “without superior model and direction” (see Coccia, this volume, xxx–xxx). As for self-regulation? Well, it’s literally a work in progress.¹²

To live at the time of the Anthropocene cannot possibly put the same demands on humans as to live in the Holocene. This is why, if the Earth on which to land is so different from the Globe imagined earlier, it’s even more remote from the heavily fortified domains to which so many people are tempted to retire.

If Gaia is such an original concept, it’s because it was codeveloped by two scientists who took the question of what is a whole and what is a part, at opposite ends: James Lovelock from the big and Lynn Margulis from the small. The small — the bacteria — holds the big — the atmosphere — while the big also resides inside the small. Their discovery made it impossible to retain the Russian dolls models that earlier allowed us to move up and down the scale. We use “Terrestrial” as a code word to underline such a shift. Its most relevant trait is that it’s not made of entities sitting next to one another and *then* entering into some sort of relation, be it competitive or cooperative (see Stengers, this volume, xxx–xxx). To begin with, bacteria, animals, and plants are not easily divided into chunks or units. What is a part and what is a whole is everywhere thrown into doubt: cells, societies, as well as climates.

This new metric transforms what it means to have an identity, to belong to a place, to share competences with other beings, to be entangled with other “companion

species” — indeed, what it is to be *animated* and what it is to be an *animal* (see Despret, this volume, xxx–xxx). As to what it means to *own* some piece of land, that is a complete puzzle. The shift in the conception of materiality requires another understanding of what it is to have a body — and, as a consequence, what it could possibly mean today to imagine a Body Politic (see de Vries, this volume, xxx–xxx). Laws of nature are up for grabs again. An assembly of “holobionts” won’t resemble an assembly of individual organisms (see Flower, this volume, xxx–xxx). The call isn’t the same, nor will the result be.

So, yes, we can’t avoid it: wishing to land on Earth instead of expanding globally requires taking seriously why so many people are tempted by reactionary politics. The project is indeed to focus again on *people* and *land*, but also to be prepared for a complete reassessment of the composition of soil and of people.

“WELL, THIS IS FOR SURE A HIGHFALUTIN’ PROJECT... HOW CAN YOU IMAGINE FOR ONE SECOND THAT IT COULD FIT INSIDE A SHOW AND UNDER THE ROOF OF AN ART INSTITUTION — OF ALL PLACES! — WITH, FOR GOOD MEASURE, A LOT OF WORKS OF ART THROWN IN?”

Being limited is exactly what we strive for! We wish to squeeze the visitors into the museum, to make them experience their entry *inside* the Critical Zone, with no way to escape and no way to simplify their entanglements with other beings (see Haraway, this volume, xxx–xxx). Isn’t the narrow space of a museum ideal to give an inkling of another politics of *limited space*? Let’s take the show and this publication as tutorials for rehearsing future landings.

An exhibition offers a perfect *scale model* to test ideas which, as you said, are much too vast to be treated head on. It’s a good habit to consider that exhibitions offer an equivalent of what scientists call a “thought experiment”: when you cannot test a theory because it is too farfetched, you test it in your head and intuition — or sometimes discover! — what the result could be. Similarly, if it’s totally mad to pretend to land on Earth, a *Gedankenausstellung*, or “thought exhibition,” provides the occasion to test ideas that are impossible to experience at scale one.

In a quieter period, it might make sense for scientists to reject the collaboration of artists, or to limit their help to decoration and popularization. Not in a time of crisis such as that of the newly moving Earth. In these periods, what is true of the impossible divide between science and politics is even truer of their divide with the art worlds. Faced

¹² Timothy Lenton and Bruno Latour, “Gaia 2.0,” *Science* 361, no. 6407 (September 14, 2018): 1066–68.

with the task of landing on *terra incognita*, we realize how little equipped we are to cope with its novelties. We don't have the right imagination nor the psychological makeup to metabolize the flood of terrifying news pouring in every day. How to cultivate emotional resources without the arts? Changes in cosmology cannot be registered without changes in *representation* — in all tenors of the word (see Hache, this volume, xxx-xxx).

The proof that we lack even the simplest visualizing tools is that if we portray the Critical Zone by projecting it onto the Blue Planet, it becomes so thin as to be invisible!¹³ As soon as we wish to represent what it could mean for organisms to be entangled with one another, we are at a loss. So today, much as in other earth-shaking periods, we need *aesthetics*, defined as what renders one sensitive to the existence of other ways of life. Just as politicians are supposed to hear voices previously unheard and scientists to become attuned to phenomena so far invisible, artists are challenged to render us sensitive to the shape of things to come. In this volume, as well as in the exhibition, what could be called those three forms of aesthetics are meant to mix quite extensively (see Ait-Touati, this volume, xxx-xxx).

One choice for the book's layout is to play with Alexander von Humboldt's style and his innovations in data visualization as well as his extensive use of storytelling (see Walls, this volume, xxx-xxx, and Koerner, "Nature Painting," xxx-xxx). We chose Humboldt not only because of the celebration of his birth 250 years ago in 2019, but because we feel that his work marks the beginning of the same historical arc of which our exhibition signals the crepuscule. When Humboldt surveyed the land to be known, conquered, and mapped, the Globe was still very much an ideal horizon with none of the later conceptions of matter yet fully entrenched. The Earth, so to speak, was not yet globalized. Today, fortunately, it's being in many ways de-globalized.

One has only to read Humboldt's *Naturgemälde* to see that, although he was obsessed with measurements — gravity, magnetism, temperature, altitude, and so on — his cherished sets of data extracted at great pains remained isolated spots in the middle of a landscape that had to be described through the use of many other resources — stories, logbooks, paintings, memoirs of all sorts and styles. His world was *still* heterogeneous, pock-marked by yawning gaps in understanding. In his times, there was no GPS to smooth all discontinuities to give the appearance of one single metrics. Humboldt did not hide the *discontinuities* in a landscape he had to appropriate through great hardship, by actually *going there*

on foot or carriage. Strangely, but for exactly opposite reasons, this is just the situation, two hundred years later, that's revealed today by Critical Zone Observatories (see Brantley, this volume, xxx-xxx): heterogeneous, discontinuous, a leopard skin of data separated by large spans of ignorance, in the middle of fierce battles that thwart any simple dream of domination. Once again, no shortcut allowed. This is why, in each chapter, shorter pieces, by many different authors, are trying to multiply the access to the many particularities of the Critical Zones. Heterogeneity is the rule. Politics is not about searching for a unifying view, but about dispersion so as to explore as many sites and possibilities as possible.

We aren't deluded. The only thing curators can expect to offer is to add another episode to the long history of orientation maps, to "cosmograms" (see Tresch, this volume, xxx-xxx), thus revising earlier narratives, and allowing visitors and readers to articulate better ones (see Weibel, this volume, xxx-xxx). In brief, a show with a catalog...

The book begins with the *disorientation* in time, space, and agency — When, where, and who are the modernizing humans supposed to be situated once the moving Earth has been taken into account?

It then locates such disorientation in the *disconnection* between two different definitions of the land which modernizing humans are supposed to inhabit: the land we live in, and the land we live from. The result of this disconnection is that they are suspended in midair.

Hence the necessity of laying out the shape of the land which, at some point, they will have to inhabit. The great surprise is that such a land does not resemble the globe nor nature as imagined during the modern parenthesis. It's redescribed here as *Critical Zones*, as *Gaia*, and as being made of a completely different set of features that are defining, provisionally, the *Terrestrial*.

The great tragedy of the present situation is that there is no agreed-upon definition of which planet we're supposed to inhabit in common. Hence, *division* and war go to the heart of all definitions of politics.

Because of those "wars of worlds," it is of great urgency that we develop skills to *describe* how readers and visitors situate themselves in those conflicts in order to choose their fights.

A thought exhibition cannot do more than open a fictional space to explore life in the Critical Zone with the help of the various art forms and to let readers or visitors reside in a state of *suspension*.

13 Frédérique Ait-Touati, Alexandra Arènes, and Axelle Grégoire, *Terra Forma: Manuel de cartographies potentielles* (Paris: B42, 2019).