

A dense botanical illustration on a black background. It features a variety of plants: a large red flower in the top left, a Bird of Paradise flower in the bottom left, a red flower with a dark center in the bottom right, and various green and yellow leaves and ferns scattered throughout. The style is detailed and scientific.

EMANUELE COCCIA

The Life of Plants

A Metaphysics
of Mixture

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The Life of Plants

A Metaphysics of Mixture

Emanuele Coccia

Translated by Dylan J. Montanari

polity

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Matteo Coccia (1976-2001)
in memoriam

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signs of stammering from my French and allowed the manuscript to come into its own.

This book is dedicated to the memory of my twin brother Matteo: it is with him by my side that I began to breathe.

Author's Preface

From the age of fourteen to the age of nineteen, I was a student in an agricultural high school in a small isolated town in the farmland of central Italy. I was there to learn “a real job.” So, instead of devoting myself to the study of classical languages, literature, history, and mathematics, like all of my friends, I spent my adolescence immersed in books on botany, plant pathology, agricultural chemistry, market gardens, and entomology. Plants, with their needs and illnesses, were the privileged objects of all study that took place in this school. This daily and prolonged exposure to beings that were initially so far away from me left a permanent mark on my perspective on the world. This book is the attempt to revive the ideas produced by those five years spent contemplating their nature, their silence, and their apparent indifference to everything we call “culture.”

It is therefore manifest that there is but one substance, not only of all bodies, but also of all souls, and that substance is nothing other than God himself. The substance from which all bodies are made is called matter; the substance from which all souls are made is called reason or mind. Therefore it is manifest that God is the reason of all souls and the matter of all bodies.

David de Dinant This is a blue planet, but it is a green world.

Karl J. Niklas

I Prologue

1

On Plants, or the Origin of Our World

We barely speak of them and their name escapes us. Philosophy has always overlooked them, more out of contempt than out of neglect.¹ They are the cosmic ornament, the inessential and multicolored accident that reigns in the margins of the cognitive field. The contemporary metropolis views them as superfluous trinkets of urban decoration. Outside the city walls, they are hosts—weeds—or objects of mass production. Plants are the always open wound of the metaphysical snobbery that defines our culture. The return of the repressed, of which we must rid ourselves in order to consider ourselves as “different”: rational humans, spiritual beings. They are the cosmic tumor of humanism, the waste that the absolute spirit can’t quite manage to eliminate. The life sciences have neglected them, too.* “Current biology, conceived of on the basis of our knowledge of animals, pays no attention to plants”—“the standard evolutionary literature is zoocentric.”² And biology manuals approach plants “in bad faith,” “as decorations on the tree of life, rather than as the forms that have allowed the tree itself to survive and grow.”³

The problem is not just one of epistemological deficiency: “as animals, we identify much more immediately with other animals than with plants.”⁴ In this spirit, scientists, radical ecology, and civil society have fought for decades for the liberation of animals;⁵ and affirming the separation between human and animal (the anthropological machine of which philosophy speaks)⁶ has become commonplace in the intellectual world. By contrast, it seems that no one

ever wanted to question the superiority of animal life over plant life and the rights of life and death of the former over those of the latter. A form of life without personality and without dignity, it does not seem to deserve any spontaneous empathy, or the exercise of a moralism that higher living beings are capable of eliciting.⁷ Our animal chauvinism⁸ refuses to go beyond “an animal language that does not lend itself to a relation to plant truth.”⁹ In a sense, antispecies animalism is just another form of anthropocentrism and a kind of internalized Darwinism: it extends human narcissism to the animal realm.

Plants are untouched by this prolonged negligence: they affect a sovereign indifference toward the human world, the culture of civilizations, the succession of domains and ages. Plants seem absent, as though lost in a long, deaf, chemical dream. They don't have senses, but they are far from being shut in on themselves: no other being adheres to the world that surrounds it more than plants do. They don't have the eyes or ears that may have allowed them to distinguish the forms of the world and to multiply its image through the iridescence of colors and sounds that we give it.¹⁰ They participate in the world in its totality in everything they meet. Plants do not run, they cannot fly; they are not capable of privileging a specific place in relation to the rest of space, they have to remain where they are. Space, for them, does not crumble into a heterogeneous chessboard of geographical difference; the world is condensed into the portion of ground and sky they occupy. Unlike most higher animals, they have no selective relation to what surrounds them: they are, and cannot be other than, constantly exposed to the world around them. Plant life is life as complete exposure, in absolute continuity and total communion with the environment. It is for the sake of adhering as much as possible to the world that they develop a body that privileges surface over

volume: “In plants, the very high proportion of surface to volume is one of the most characteristic traits. It is through this vast surface, literally spread in the environment, that plants absorb from the space the diffuse resources that are necessary to their growth.”¹¹ Their absence of movement is nothing but the reverse of their complete adhesion to what happens to them and their environment. One cannot separate the plant—*neither physically nor metaphysically*—from the world that accommodates it. It is the most intense, radical, and paradigmatic form of being in the world. To interrogate plants means to understand what it means to be in the world. Plants embody the most direct and elementary connection that life can establish with the world. The opposite is equally true: the plant is the purest observer when it comes to contemplating the world in its totality. Under the sun or under the clouds, mixing with water and wind, their life is an endless cosmic contemplation, one that does not distinguish between objects and substances—or, to put differently, one that accepts all their nuances to the point of melting with the world, to the point of coinciding with its very substance. We will never be able to understand a plant unless we have understood what the world is.

Notes

- * Translator’s note: Unless otherwise specified, all the translations of quotations (French or otherwise) have been made by the book’s translator, Dylan J. Montanari, from Coccia’s French original. Material in square brackets has also been added by the translator.
- 1. The only great exception in modernity is the masterpiece by Gustav Theodor Fechner, *Nanna oder über das Seelenleben der Pflanzen* (Leipzig: Leopold Voss, 1848).

Against this great silence, the voice of a small number of researchers and intellectuals has begun to rise, so much so that one hears talk of a “plant turn.” See Elaine P. Miller, *The Vegetative Soul: From Philosophy of Nature to Subjectivity in the Feminine* (Albany: SUNY Press, 2002); Matthew Hall, *Plants as Persons: A Philosophical Botany* (Albany: SUNY Press, 2011); Eduardo Kohn, *How Forests Think: Toward an Anthropology of the Human* (Berkeley: University of California Press, 2013); Michael Marder, *Plant Thinking: A Philosophy of Vegetal Life* (New York: Columbia University Press, 2013); Michael Marder, *The Philosopher’s Plant: An Intellectual Herbarium* (New York: Columbia University Press, 2014); and Jeffrey Nealon, *Plant Theory: Biopower and Vegetable Life* (New York: Columbia University Press, 2015). With a few exceptions (more or less), this literature insists on finding the truth about plants in purely *philosophical* or anthropological research, without having any truck with contemporary botanical thought—which, on the contrary, has produced remarkable masterpieces in the philosophy of nature. Here are only those that have influenced me most: Agnes Arber, *The Natural Philosophy of Plant Form* (Cambridge: Cambridge University Press, 1950); David Beerling, *The Emerald Planet: How Plants Changed Earth’s History* (Oxford: Oxford University Press, 2007); Daniel Chamovitz, *What a Plant Knows: A Field Guide to the Senses* (New York: Scientific American / Farrar, Straus & Giroux, 2012); Edred John Henry Corner, *The Life of Plants* (Cleveland: World, 1964); Karl J. Niklas, *Plant Evolution: An Introduction to the History of Life* (Chicago: University of Chicago Press, 2016); Sergio Stefano Tonzig, *Lecture di biologia vegetale* (Milan: Mondadori, 1975); François Hallé, *Éloge de la plante: Pour la nouvelle biologie* (Paris: Seuil, 1999); Stefano Mancuso and Alessandra Viola, *Verde brillante:*

Sensibilità e intelligenza nel mondo vegetale (Florence: Giunti, 2013). Attention to plants is also central in contemporary American anthropology, starting with Anna Lowenhaupt Tsing's masterpiece *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins* (Princeton: Princeton University Press, 2015), which is indeed centered around a mushroom, and with the works of Natasha Myers, who is also preparing a book on the subject. See especially Natasha Myers and Carla Hustak, "Involutionary Momentum: Affective Ecologies and the Sciences of Plant/Insect Encounters," *Differences: A Journal of Feminist Cultural Studies*, 23.3 (2012): 74-117.

- [2.](#) François Hallé, *Éloge de la plante: Pour une nouvelle biologie* (Paris: Seuil, 1999), p. 321. Along with Niklas, Hallé is a botanist who has made the great effort to transform the contemplation of the life of plants into a properly metaphysical object of study.
- [3.](#) Niklas, *Plant Evolution*, p. viii.
- [4.](#) W. Marshall Darley, "The Essence of Plantness," *American Biology Teacher*, 52.6 (1990): 354-7, here p. 356.
- [5.](#) Among the most famous examples, see Peter Singer, *Animal Liberation: A New Ethics for Our Treatment of Animals* (New York: HarperCollins, 1975) [reissued several times], and Jonathan Safran Foer, *Eating Animals* (New York: Little, Brown, 2009). But the debate is very old: see the two great works of antiquity, one by Plutarch, *On the Intelligence of Animals* [*De sollertia animalium*], the other by Porphyry, *On Abstinence from Killing Animals* [*De abstinentia*]. On the history of the debate, see Renan Larue, *Le Végétarisme et ses ennemis: Vingt-cinq siècles de débats* (Paris: PUF, 2015).

The debate over animals, which is strongly marked by an extremely superficial moralism, seems to forget that heterotrophy presupposes the killing of other living beings as a natural and necessary dimension of life.

- [6.](#) Giorgio Agamben, *The Open: Man and Animal*, trans. by Kevin Attell (Stanford: Stanford University Press: 2003) [originally published as *L'aperto: L'uomo e l'animale* (Turin: Bollati Boringhieri, 2002)].
- [7.](#) The debate over the rights of plants exists in a very minor form—at least since the famous chapter 27 in Samuel Butler, *Erewhon, or, Over the Range* (London: Trubner & co., 1872) until the classic article by Christopher D. Stone, “Should Trees Have Standing? Toward Legal Rights for Natural Objects,” *Southern California Law Review*, 45 (1972): 450–501. On these questions, see the useful summary of philosophical debates in Marder, *Plant Thinking*, as well as the position expounded in Hall, *Plants as Persons*.
- [8.](#) Darley, “Essence of Plantness,” p. 356. See also J. L. Arbor, “Animal Chauvinism, Plant-Regarding Ethics and the Torture of Trees,” *Australian Journal of Philosophy*, 64.3 (1986): 335–69.
- [9.](#) Hallé, *Éloge de la plante*, p. 325.
- [10.](#) On the question of the *senses* of plants, see Chamovitz, *What a Plant Knows* and Richard Karban, *Plant Sensing and Communication* (Chicago: University of Chicago Press, 2015). The limitation of these works resides nonetheless in the stubborn attempt to “rediscover” organs “analogous” to those that make perception possible in animals without trying at all to imagine—starting from plants and their morphology—another

possible form of the existence of perception, another way of thinking the relation between sensation and body.

[11](#). Darley, "Essence of Plantness," p. 354. The question of the surface and of exposure to the world is central to Fechner, *Nanna* and to Hallé, *Éloge de la plante*. On the matter of the relation to the world, see Marder, *Plant Thinking*, which represents the most profound philosophical work on the nature of plant life.

2

The Extension of the Domain of Life

They live at astral distances from the human world, like nearly all other living beings. This separation is not simply a cultural illusion; it is of a much deeper nature and its root can be found in metabolism.

The survival of the near totality of living beings presupposes the existence of other living beings: every form of life requires that there be life in the world already. Humans need the life produced by animals and plants. And higher animals would not survive without the life they exchange among themselves, thanks to the process of nourishment. To live is essentially to live the life of another: to live in and through the life that others have been able to construct or invent. There is a sort of parasitism, a universal cannibalism, that belongs to the domain of the living: it feeds off itself, without realizing that it needs other forms and modes of existence. As though life in its most complex and articulated forms is never anything but an immense cosmic tautology: it presupposes itself and produces nothing other than itself. This is why life seems impossible to explain other than starting from itself. As for plants, they represent the only breach in the self-referentiality of the living.

In this sense, higher life seems never to have had immediate relations with the inanimate world: the first environment of any living being is that of the individuals of its own species or of other species. Life seems to *have to be its own environment, its own site*. Plants alone break this topological rule of self-inclusion. They have no need for the mediation of other beings in order to survive. Nor do they

desire it. They require nothing but the world, nothing but reality in its most basic components: rocks, water, air, light. They see the world before it gets inhabited by forms of higher life; they see the real in its most ancestral forms. Or rather they find life where no other organism reaches it. They transform everything they touch into life, they make out of matter, air, and sunlight what, for the rest of the living, will be a space of habitation, a world. Autotrophy—the name given to this Midas-like power of nutrition, the one that allows plants to transform into nourishment everything they touch and everything there is—is not just a radical form of alimentary autonomy; it is above all the capacity that plants have to transform the solar energy dispersed into the universe into a living body, [to transform] the deformed, disparate matter of the world into a coherent, well-ordered, and unified reality.

If it is from plants that we ought to enquire what the world is, this is because they are the ones who “play the world” [*font le monde*]. For the vast majority of organisms, the world is the product of plant life, the product of the colonization of the planet by plants, since time immemorial. Not only is it the case that “the animal organism is constructed entirely and simply from the organic substances produced by plants,”¹ but “higher plants represent about 99% of the eukaryotic biomass of the planet.”² All the objects and tools that surround us come from plants (nourishment, furniture, clothes, fuel, medicine). Most importantly, the entire higher animal life (which has an aerobic nature) feeds off the organic exchange of gases between these beings (oxygen). Our world is a world of plants before it is a world of animals.

It was Aristotelianism that, before any other philosophy, took into account the liminal position of plants, describing them as a universal principle of animation and ensoulment [*psychisme*]. For the Aristotelianism of antiquity and the

Middle Ages, vegetative life, *psuchē trophukē* (literally “nursing/feeding/vegetative soul”), was not simply a distinct class of specific forms of life or a taxonomic unity separated from others, but rather a place shared by all living beings, regardless of the distinction between plants, animals, and humans. It was a principle through which “life belongs to all living things.”³

For plants, life starts by defining itself as *circulation* of living beings and, because of this, constitutes itself in dissemination of forms, in difference between species, realms, and modes of life. They are not always intermediaries, agents of the cosmic threshold between the living and the non-living, spirit and matter. Their arrival on firm ground and their proliferation have made it possible to produce the quantity of matter and organic mass of which higher life is composed and from which it nourishes itself. But also—and this in the first place—they have transformed for good the face of our planet: it is through photosynthesis that oxygen came to feature so heavily in our atmosphere;⁴ it is thanks to our plants and their life that higher animal organisms can produce the energy necessary for survival. It is through them and with their help that our planet produces its atmosphere and makes breath possible for the beings that cover its outer skin. The life of plants is a cosmogony in action, the constant genesis of our cosmos. Botany, in this sense, has to rediscover a Hesiodic register and describe all the forms of life capable of photosynthesis as inhuman and material divinities, domestic titans that do not need violence to found new worlds.

From this point of view, plants challenge one of the pillars of the biological and natural sciences of the past few centuries: the priority of the environment over the living, of the world over life, of space over the subject. Plants, in their history and evolution, demonstrate that living beings produce the space in which they live rather than being

forced to adapt to it. They have modified the metaphysical structure of the world for good. We are invited to conceive of the physical world as a collection of all objects, the space that includes the totality of everything there was, is, and will be: the definitive horizon that no longer tolerates any exteriority, the absolute container. In making possible the world of which they are both part and content, plants destroy the topological hierarchy that seems to reign over our cosmos. They demonstrate that life is a rupture in the asymmetry between container and contained. When there is life, the container is located in the contained (and is thus contained by it); and vice versa. The paradigm of this mutual overlap is what the ancients called “breath” (*pneuma*). To blow, to breathe—means in fact to have this experience: what contains us, the air, becomes contained in us; and, conversely, what was contained in us becomes what contains us. To breathe means to be immersed in a medium that penetrates us with the same intensity as we penetrate it. Plants have transformed the world into the reality of breath, and it is starting from this topological structure, which life has given to the cosmos, that I will attempt to describe, in this book, the notion of “world.”

Notes

- [1.](#) Julius Sachs, *Lectures on the Physiology of Plants* (Oxford: Clarendon, 1887), p. 600.
- [2.](#) Anthony J. Trewavas, “Aspects of Plant Intelligence,” *Annals of Botany*, 92.1 (2003): 1–20, here p. 16. See also his major work *Plant Behaviour and Intelligence* (Oxford: Oxford University Press, 2014).
- [3.](#) Aristotle, *De anima* 2.4, 415^a24–5.

- [4.](#) T. M. Lenton, T. W. Dahl, S. J. Daines, B. J. W. Mills, K. Ozaki, M. R. Saltzman, and P. Porada, “Earliest Land Plants Created Modern Levels of Atmospheric Oxygen,” *Proceedings of the National Academy of Sciences*, 113.35 (2016): 9704–9.

3

On Plants, or the Life of the Spirit

They don't have hands with which to shape the world, yet it would be hard to find more capable agents when it comes to the construction of forms. Plants are not only the most subtle artisans of our cosmos, they are also the species that have given life to the world of forms—they are the form of life that has made the world itself a site of infinite figuration. It is in and through plants that the Earth has asserted itself as a cosmic laboratory, a space for the invention of forms and the making of matter.¹

The absence of hands is not a sign of lack, but rather the consequence of a restless immersion in the very matter they ceaselessly model. Plants coincide with the forms they invent: all forms are, for them, inflections of being, and not merely of doing and acting. To create a form means to traverse it with all of one's being, as one traverses ages or stages of one's own existence. To the abstraction of creation and technique—which are able to transform the forms only at the cost of excluding the creator and producer of the process of transformation—the plant opposes the immediacy of metamorphosis: to generate always means to transform oneself. To the paradoxes of consciousness, which does not know how to conceptualize forms without first distinguishing them from itself and from the reality of which they are models, the plant opposes the absolute intimacy between subject, matter, and imagination: to imagine is to become what one imagines.

It is not just a matter of intimacy and immediacy: the genesis of forms achieves, in plants, an intensity inaccessible to any other living being. Unlike higher

animals, wherein development stops once the individual has reached his or her sexual maturity, plants never cease to develop and grow, to construct new organs and new parts of their own body (leaves, flowers, parts of the trunk, etc.), which they previously lacked or had gotten rid of. Their body is a morphogenetic industry that knows no interruption. Plant life is nothing but the cosmic alembic of universal metamorphosis, the power that allows any form to be born (to constitute itself from individuals with different forms), to develop (to modify its form over time), to reproduce, thus differentiating itself (to multiply what exists, provided that it modifies it), and to die (to allow difference to overtake identity). The plant is nothing if not a transducer, one that transforms the biological fact of the living being into an aesthetic problem and makes of these problems a question of life and death.

This is also why, before Cartesian modernity, which has reduced the soul [*l'esprit*] to its anthropomorphic shadow, plants were considered for centuries the paradigmatic form of reason's existence, of a soul *whose exercise is self-fashioning*. The measure of this association resided in the seed. In the seed, vegetative life demonstrates its whole rationality: the production of a certain reality takes place starting from a formal model that is without error.² One sees here a rationality analogous to that of praxis or production—but one that is more profound and radical, since it concerns the cosmos in its totality and not exclusively a living individual: it is a form of rationality that engages the world in the becoming of a single living being. In other words, in the seed, rationality is no longer a function of ensouling [*psychisme*] (be it animal or human) or the attribute of a single being, but a cosmic fact. It is the way of being and the material reality of the cosmos. To exist, the plant has to merge with the world, and it cannot

do so other than in the form of a seed: the space in which the act of reason coexists with the becoming of matter.

Through the mediations of Plotinus and Augustine, this Stoic idea became one of the pillars of the Renaissance philosophy of nature. As Giordano Bruno wrote, the universal intellect

is that one and the same thing that fills everything, illuminates the universe and directs nature to produce her various species suitably. It is to the production of natural things what our intellect is to the production of the representation of things. [...] The hermeticists say that it is “most fecund in seeds” or yet that it is the “seed sower,” because it impregnates matter with all forms, which, according to their nature and manner of being, succeed in shaping, forming, and weaving matter in ways that are so remarkable and numerous that they cannot be ascribed to chance, nor to any other principle incapable of differentiation and arrangement. [...] Plotinus says it is the “father and progenitor,” because it distributes seeds in nature’s field and is the proximate dispenser of forms. As for us, we call it the “internal artificer,” because it shapes matter, forming it from inside like a seed or root shooting forth and unfolding the trunk, from within the trunk thrusting out the boughs, from inside the boughs the derived branches, and unfurling buds from within these. From therein it forms, fashions, and weaves, as with nerves, the leaves, flowers, and fruits, and it is from the inside that, at certain times, it calls back its sap from the leaves and the fruits to the twigs, from the twigs to the branches, from the branch to the trunk, from the trunk to the root.³

It is not enough to recognize, as the Aristotelian tradition did, that reason is the site of forms (*locus formarum*), the

warehouse of all the forms the world can host. Reason is also their formal and efficient cause. If a reason exists, it is the one that defines the genesis of each of the forms of which the world is composed. Conversely, a seed is the exact opposite of the simple, virtual existence of a form, with which it is often confused. The seed is the metaphysical space wherein the form no longer defines a pure appearance or the object of vision or the simple accident of a substance, but a destiny: at once the specific—but complete and absolute—horizon of existence for a given individual and what allows one to understand our existence and all the events of which it is made up as *cosmic* facts, not as purely subjective facts. To imagine does not mean to place an inert and immaterial image before one's eyes, but rather to contemplate the force that allows one to transform the world and a portion of its matter into *a singular life*. By imagining, the seed makes a life necessary, lets its body couple with the course of the world. The seed is only the site in which form is not a content of the world but the being of the world, its form of life. *Reason is a seed because, contrary to what modernity has insisted on believing*, it is not the space of sterile contemplation, not the space of the intentional existence of forms, but the force that makes it possible for an image to exist as the specific destiny of a given individual. Reason is what allows an image to become destiny, a space of total life, a spatiotemporal horizon. It is cosmic necessity, not individual whim.

Notes

1. This is why plants are an important inspiration in design. See Renato Bruni, *Erba volant: Imparare l'innovazione dalle piante* (Turin: Codice Edizioni, 2015). On engineering and plant physics, see the fundamental

works by Karl J. Niklas: *Plant Biomechanics: An Engineering Approach to Plant Form and Function* (Chicago: University of Chicago Press, 1992); *Plant Allometry: The Scaling of Form and Process* (Chicago: University of Chicago Press, 1994); and, with Hanns-Christof Spatz, *Plant Physics* (Chicago: University of Chicago Press, 2012).

- [2.](#) On the notion of the “seed” in the philosophy of nature in the modern period, see the beautiful book by Hiro Hirai, *Le concept de semence dans les théories de la matière à la Renaissance: De Marsile Ficin à Pierre Gassendi* (Turnhout: Brepols, 2005).
- [3.](#) Giordano Bruno, *Cause, Principle, and Unity*, ed. and trans. by Robert de Lucca; *Essays on Magic*, ed. and trans. by Richard J. Blackwell; introd. by Alfonso Ingegno (Cambridge: Cambridge University Press, 1998), pp. 37–8 [= a passage from the second dialogue of the treatise on cause].

4

Toward a Philosophy of Nature

This book aims to reopen the question of the world by starting with the life of plants. To do this means to revive an ancient tradition. What we, more or less arbitrarily, call “philosophy” was born as—and in the beginning took itself to be—an enquiry into the nature of the world, a discourse on nature (*peri tēs phuseōs*) or on the cosmos (*peri kosmou*). This choice was not by chance: to privilege nature and the cosmos as objects of thought meant to assert, implicitly, that thought does not become philosophy unless and until it confronts its objects. It is in front of the world, in front of nature, that the human being can truly *think*. This identity between world and nature is far from trivial, because *nature* was designating not that which precedes the activity of the human spirit, nor the opposite of culture, but what makes it possible for everything to be born and to become, the principle and the force that are responsible for the genesis and transformation of any object, thing, entity, or idea that exists and will ever exist. To identify nature and cosmos means first of all to make nature not a separate principle, but that which expresses itself in everything that is. Conversely, the world is neither the logical combination of all its objects nor a metaphysical totality of beings, but the physical force that traverses all that comes to be and that transforms itself. There is no separation between material and immaterial, or between history and physics. At a more microscopic level, nature is what allows the world to be; on the other hand, everything that ties a given thing to the world is part of nature.

For several centuries now, with rare exceptions, philosophy stopped contemplating nature: the right to speak of the

world of things and of nonhuman living beings befalls, mainly or exclusively, to other disciplines. Plants, animals, atmospheric phenomena, be they common or extraordinary, the elements and their combinations, the constellations, the planets, and the stars—these have all been definitively expelled from the imaginary catalogue of its privileged objects of study.¹ Starting from the nineteenth century, an immense part of the experience related to each of these entities has been the object of a kind of censure: since the time of German idealism, everything that goes under the name of *human sciences* has been a policing effort, at once desperate and despairing, to force the disappearance of any trace belonging to *the natural* from the domain of knowledge.

This “physiocide”—to use the word coined by Iain Hamilton Grant²—has had far more harmful consequences than the simple distribution of [branches of] knowledge between the various learned bodies. At this point, it is completely normal for someone who calls him- or herself a philosopher to know the most insignificant events of his or her nation’s historical past, all the while ignoring the names, lives, or histories of the animal and vegetal species that provide his or her daily nourishment.³ But, apart from this form of illiteracy, the refusal to accord nature and the cosmos their philosophical dignity produces a strange form of bovarism: philosophy seeks at all costs to be human and humanistic, to be included among the human and social sciences, to be a science—even a *normal* science—like all others. By mixing false presuppositions, superficial pipe dreams, and a sickening moralism, philosophers have turned into radical adepts of the Protagorean credo: “Man is the measure of all things.”⁴ Deprived of its supreme objects, threatened by other forms of knowledge (be they the social or the natural sciences), philosophy has turned into a sort of Don Quixote of contemporary knowledge, engaged in an imaginary

struggle against the projections of its own spirit; or into a Narcissus who looks back at the ghosts of its past, now empty souvenirs in a provincial museum. Forced to study not the world, but the more or less arbitrary images that humans have produced in the past, it has become a form of skepticism—and an often moralized and reformist one at that.⁵

The consequences don't stop here. The sciences we call "natural" are the first to have suffered as a result of this banishment. By reducing nature to everything that precedes the soul [*esprit*] (and hence that qualifies as *human*) and that does not participate in any of its properties, these disciplines have taken it upon themselves to transform nature into a purely residual, oppositional object, one incapable of occupying the position of subject. Nature, on this view, is nothing but the empty, incoherent space of all that precedes the emergence of soul and follows the Big Bang, the lightless, wordless night that prevents any reflection and illumination.

This deadlock is the result of an obstinate repression: a repression of the living, of the fact that all knowledge is already an expression of being and life. It is never the case that we can immediately interrogate and understand the world, for the world is the breath of the living. All cosmic knowledge is nothing but *a point of life* [*vie*] (and not just *a point of view* [*vue*]), all truth is nothing but the world in the mediated space of the living. One will never be able to understand the world such as it is, without passing through the mediation of a living being. On the contrary, meeting it, knowing it, speaking it means always to live according to a certain form, starting from a certain style. To know the world, one must first choose the intensity of life, the height, and the form from which one wants to view it, and hence to live it. We need a mediator, a gaze capable of seeing and living the world where we cannot reach it. Contemporary

physics is no exception: its mediators are the machines it erects as supplementary and prosthetic subjects—only to hide them immediately afterward, refusing to recognize them as the projection of its own eyes and therefore as capable of observing the world from one single perspective.⁶ Microscopes, telescopes, satellites, and accelerators are precisely that: the inanimate, material eyes that allow physics to observe the world, to get a view on it. But the machines physics uses are mediators that suffer from some kind of long-sightedness, being always late, too far away from the depths of the cosmos: they see nothing of the life that inhabits them, the cosmic eye they themselves embody. Philosophy, after all, has always chosen myopic mediators, capable of concentrating only on the portion of the world that is immediately before them. To ask of humankind what being in the world means—the way Heidegger did, along with the rest of twentieth-century philosophy⁷—is to reproduce a very partial image of the cosmos.

Nor is it enough (as Uexküll taught us)⁸ to shift one's gaze toward the most elementary forms of animal life: the tick, the domestic dog, the eagle already have below them an infinite number of other observers of the world. Plants are the real mediators: they are the first eyes that appeared and opened themselves onto the world, they are the gaze that came to perceive it in all its forms. The world is, above all, everything the plants could make of it. They are the ones who *made* our world, even though the status of this making is quite different from that of any other activity of living beings. It is from plants, then, that this book will ask the question of the nature of the world, its extension, its consistency. What is more, the attempt to rebuild a cosmology—the only form of philosophy that can be considered legitimate—will have to begin with an exploration of vegetal life. I will posit that the world has the

consistency of an atmosphere and that the leaves are witnesses to this fact. I will ask the roots to explain the true nature of the Earth. Finally, it is the flower that will teach us what rationality is, when measured not as a universal capacity or power, but as a cosmic force.

Notes

1. One might object that this is not the first time. Tradition tells us that Socrates was the first to impose it on philosophy to “disregard the physical universe” and to “confine” its study to “moral questions” (*peri ta ēthika*; see Aristotle, *Metaphysics* 987^b). It was Socrates who “brought down philosophy from the heavens, placed it in cities, introduced it into families, and obliged it to examine into life and morals, and good and evil” (Cicero, *Tusculanae disputationes* 5.4.10, in C. D. Yonge’s translation). See also Cicero, *Academica* 1.4.15.
2. See, for example, Iain Hamilton Grant, “Everything Is Primal Germ or Nothing Is: The Deep Field Logic of Nature,” *Symposium: Canadian Journal of Continental Philosophy*, 19.1 (2015): 106–24.
3. The rise of specialization in the university system is based on a mechanism of reciprocal ignorance: to be a specialist does not mean to know more about a given subject, but rather to have obeyed a juridical obligation to ignore other disciplines.
4. [Protagoras, fr. 80 B1 Diels–Kranz. The sources of this famous dictum are Plato, *Theaetetus* 152a and Sextus Empiricus, *Adversus mathematicos* 7.60.]
5. In this respect, anthropology’s admirable attempts, after the fact, to repatriate nature within the human sciences by spying on any movement that may allow us to

humanize it again, or to *socialize* it, would seem the most naive expression of the *esprit d'escalier*. For in all these attempts nature represents the domain of the *nonhuman* when it has not been specified either what “the human” would designate (how can one have certainty on this matter, after Darwin?) or in what respect the nonhuman would oppose the human (reason? language? soul?). The nonhuman is nothing but a new, more sophisticated name with ancient associations: “beasts,” “the irrational,” “the insane” (*amens*). Plato had already warned us against this division (*Statesman*, 263d): “This kind of classification might be undertaken by any other creature capable of rational thought—for instance, cranes are reputed to be rational and there may be others. They might invest themselves with a unique and proper dignity and classify the race of cranes as being distinct from all other creatures; the rest they might well lump together, men included, giving them the common appellation of ‘the beasts.’ So let us try to be on the watch against mistakes of this kind” (J. B. Skemp’s translation, revised by Martin Ostwald, Indianapolis: Hackett, 1992, pp. 13–14). The Protagorean presupposition would seem also to inform and inspire the opposite movement of assimilation, which insists on assimilating animals to humans, so that attributes considered to be specifically human would belong to other species of animals. In this case, too, one has established the shape of the human in advance and has considered the natural as its residue, even if this means rushing next to deny this same dialectical partition. How, then, can we “be on the watch against mistakes of this kind”?

- [6.](#) This is one of the great lessons of Bruno Latour’s work, starting from his major works *Science in Action* (Cambridge, MA: Harvard University Press, 1987) and

We Have Never Been Modern (Cambridge, MA: Harvard University Press, 1991). On the question of technical mediation looked at from a moral point of view as well, see Peter-Paul Verbeek, *Moralizing Technology: Understanding and Designing the Morality of Things* (Chicago: University of Chicago Press, 2011).

7. On this question, see Walter Biemel's classic *Le Concept de monde chez Heidegger* (Paris: Vrin/ Louvain: Nauwelaerts, 1950). On the notion of "world" in philosophy, see Rémi Brague's major study *La Sagesse du monde: Histoire de l'expérience humaine de l'univers* (Paris: Fayard, 1999) [English version *The Wisdom of the World: The Human Experience of the Universe in Western Thought* (Chicago: University of Chicago Press, 2003)].
8. See Jakob von Uexküll, *A Foray into the Worlds of Animals and Humans, with A Theory of Meaning*, trans. by Joseph D. O'Neil (Minneapolis: University of Minnesota Press, 2010; originally published in 1934).

II

Leaf Theory

The Atmosphere of the World

8

The Breath of the World

It is at the heart of all our experiences. It is not a substance: it does not enclose in itself the nature of things. Nor is it a late echo, added once the experience is accomplished. It is a rhythmic movement, regular and tireless, a wave without noise that goes to the limits of the horizon and comes back to us, to brush against our bodies and to explode into our lungs.

Without it, nothing would be possible in our life. Everything that happens to us has to mix with it, to take place within its space. Breath is the first activity of all living beings, the only one that can claim to meld itself with being. It is the only work that does not tire us, the only movement that has no end other than itself. Our life begins with a (first) breath and will end with a (last) breath. To live is to breathe and embrace in one's breath all the matter of the world.

It is not only the most elementary movement of any human body, it is also the first and the simplest of the acts of living beings—its paradigm, its transcendental form. Breath is, quite simply, the first name of being in the world. Intellection is breath: the idea, the concept, and what we, ever since scholasticism, call an intentional species are all portions of the world in the spirit, before the word, design, or action may restore to the cosmos these intensities. Sight is breath: it is to welcome light, the colors of the world, it is to have the force of letting oneself be pierced by its beauty, of choosing a portion and a portion only, of creating a form, of initiating a life starting from what we have extracted from the continuum of the world.

Everything in the realm of the living is the articulation of breath: from perception to digestion, from thought to pleasure, from speech to locomotion. Everything is a repetition, intensification, and variation of what takes place in breath. This is why the most different kinds of knowledge—from medicine to theology, from cosmology to philosophy—have used it as the noun that characterizes life in its most different forms, in the most diverse languages (*spiritus*, *pneuma*, *Geist*). To recognize its status, people have made of it a substance separate from others through form, matter, and being—mind [*esprit*]. But the first, most paradoxical attribute of breath is its very lack of substance, its insubstantiality: it is not an object detached from others, but the vibration through which everything opens up to life and mixes with the rest of the objects, the oscillation that, for an instant, animates the matter of the world.

It is a vibration that touches, simultaneously, the living being and the world that surrounds it. In breath, for the duration of an instant, the animal and the cosmos are reunited; and they seal a different unity from the one marked by being or form. It is, however, with and in the same motion that living being and world consecrate their separation. What we call life is only this gesture, through which a portion of matter distinguishes itself from the world with the same force that it uses to merge with it. To blow is to make the world, to fuse with it and to redesign our form, in a perpetual exercise. To breathe is to know the world, to penetrate and be penetrated by it and its mind [*esprit*—to traverse it and to become for an instant, with this same impetus, the place in which the world becomes an individual experience. This operation is never final: the world, like the living being, is only the return of breath and of its possibility. Mind [*Esprit*].

Breath does not limit itself to the activity of the living: it defines the consistency of the world, too, and especially

that. The space it traces coincides with the world milestones that one experiences. We reach out as far as our breath does. On the other hand, a world without breath would be nothing but a confused mass of objects in the process of decomposition. If it is thanks to breath that we are in the world, it is in and through breath that we have understood and fashioned the world. It is of breath that we have to enquire about the nature of the world: it is in breath that the world reveals itself, it is in breath that the world exists for us.

The innumerable beings that populate the cosmos, the most different and incomparable things, the most faraway moments and spaces, the most incompatible realities draw their unity from the infinite forms of breath. They melt into a world. As a superior unity of everything that is different—a supreme and unsurpassable unity of what is and what is not—it does not exist other than in and through breath.

The metaphysical space of breath is, above all, contradiction: breathing precedes every distinction between soul [*âme*] and body, between mind [*esprit*] and object, between ideality and reality. It is not enough to proclaim the facticity of sense and its primacy over existence. Sense and existence always live as breath and in breath: they are its specific vibrations. The world is breath and all that exists in it exists in this form. The existence of the world is not a fact of the logical order: it is a pneumatological matter. Only breath can touch and feel the world, giving it existence. One can only breathe the world.

The ancients are not the only ones to have made breath into [*sc.* a principle of] the transcendental unity of the world and into the proof that, in this capacity, it is a living reality. In an unpublished fragment, Newton wrote: “Thus this Earth resembles a great animall or rather an inanimate vegetable, draws in aethereall breath for its dayly

refreshment & vitall ferment & transpires again with gross exhalation.”¹

But one has to wait for the more recent debate around the Gaia hypothesis to recognize that atmosphere constitutes the living unity of the world, the proof that the planet is determined by life. One of its first formulations, in an article that Lovelock and Margulis published in 1974 in the journal *Icarus*, asserts that the existence itself of atmosphere is proof of a “homeostasis on a planetary scale”² and of the fact that “life has modulated the flow of energy and mass at the planetary surface.”³ Atmosphere is the vital breath that animates the Earth in its totality.

The idea is quite old. Lamarck was, without a doubt, the first to define atmospheric and climatic space as the site of a dynamic interconnection between matter and life, between world and subjectivity. The treatise he dedicated to the science of this liminal space—a science he called *hydrogeology*—opens with this question: “What are the general effects of living organisms on the mineral substances which form the earth’s crust and external surface?”⁴ The possibility of conceiving of the most superficial layer of matter in the terrestrial crust and of the ensemble of gaseous and liquid materials that hang over the planet as an immense fluid for the circulation of being arises from the discovery that “the various *compound mineral substances* occurring in the earth’s external crust in isolated accumulations, veins, and parallel beds, and so on, as plains, hills, valleys, and mountains are exclusively the product of the animals and plants that lived in these areas.”⁵ According to Lamarck, this unity is engendered by the state of aggregation; and the forms of any matter at surface level have the organic faculties of living beings as direct and indirect causes of the existence of that matter. As he had already written in his *Mémoires*,

all the compounds one observes on the globe are due, be it directly or indirectly, to the organic faculties of living beings endowed with life. In effect, these beings form all materials, having the faculty of composing their own substance, and, to compose it, a part between them (plants) having the faculty of forming first combinations that they assimilate to their substance.⁶

This is not simply a matter of influence on the chemical composition. The presence of living beings does not limit itself to determining the aggregation of matter; it also defines its status. The world exists only in those places where there are living beings—while the presence of life, for its part, transforms the very nature of space.

What we see here is a movement that operates contrary to the one described by Lamarck in his *Philosophie zoologique*: it is no longer the living being's responsibility to adapt to environmental circumstances—the *circumfusa* of neo-Hippocratic medicine;⁷ rather the environment in its entirety has to become echo, halo, aureole for the mass of living beings—in other words, their atmosphere.

The opposite is also true. If we are atmospherically connected to what surrounds us, this is also because the atmosphere is what constantly engenders the living. This is the conclusion reached by one of the first analyses of the chemical relations between living beings and the environment: the *Essai de statique chimique* by Dumas and Boussingault, published in 1844. The authors start from the assertion that plants function “in every particular, inversely or in opposition to animals”: “If the animal kingdom constitutes an immense apparatus of combustion, the vegetable kingdom, in its turn, constitutes an immense apparatus of reduction.” Their perfect integration is not just the simple supernumerary effect of a preestablished

harmony, nor is it just the result of divine government expressing itself in the natural economy, but the consequence of the fact that the life of plants and animals depends entirely on the atmosphere:

What the one gives to the atmosphere, that the other takes from it; so that, surveying these facts from the loftiest point of view, and in connection with the physics of the globe, it would be imperative on us to say that, in so far as their truly organic elements are concerned, plants and animals are the offspring of the air, that they are but condensed or consolidated air [...] Vegetables and animals, therefore, come from the atmosphere, and return to it again; they are true dependents of the air. Vegetables, then, assume from the atmosphere the elements which animals exhale into it.⁸

We do not inhabit the Earth, we inhabit the air through the atmosphere. We are immersed in it exactly as the fish is immersed in the sea. And what we call breathing is nothing but the agriculture of atmosphere.

To try and join the two movements—the one that goes from living beings to the environment and the one that goes from the environment to living beings—means to think of the atmosphere as a system or a space for the circulation of life, matter, and energy. This is the radical approach of the Russian naturalist Vladimir Vernadsky. He recognized that “atmosphere is not an independent region of life”⁹ but is also an expression of life. In effect, green plants have created a new, transparent medium for life—atmosphere:¹⁰ “Life creates both the free oxygen in the Earth’s crust, and also the ozone that protects the biosphere from the harmful short-wavelength radiation of celestial bodies.”¹¹ At the other end, life constitutes itself starting from atmosphere: “Living matter builds bodies of organisms out of atmospheric gases such as oxygen, carbon dioxide, and

water, together with compounds of nitrogen and sulfur, converting these gases into liquid and solid combustibles that collect the cosmic energy of the sun.”¹² Vernadsky calls the biosphere “the exterior crust of the Earth,” considering it not only as a material region but especially as “a place of transformation of the planet by external cosmic forces. These forces mold and transform the faces of the earth and, as a result, the history of the biosphere is sharply distinguished from that of the rest of the planet.”¹³

The principal source of this region is what Vernadsky calls living matter: the collection of organisms and living bodies that are responsible for the creation of new compounds¹⁴ and that “exert a powerful permanent and continuous disturbing effect on the chemical stability of the surface of our planet.” It is living matter that

creates the colors and forms of nature, the associations of animals and plants, and the creative labor of civilized humanity, and also becomes a part of the diverse chemical processes of the Earth’s crust. There is no substantial chemical equilibrium on the crust in which the influence of life is not evident and in which chemistry does not display life’s work. *Life is therefore not an external or accidental phenomenon of the Earth’s crust.* It is closely bound to the structure of the crust, forms part of its mechanism, and fulfills functions of prime importance to the existence of this mechanism. Without life, the crustal mechanism of the Earth would not exist.¹⁵

In this living mass, plants play a major role: “All living matter can be regarded as a single entity in the mechanism of the biosphere, but only one part of life, *green vegetation*, the carrier of chlorophyll, makes direct use of solar radiation. [...] The whole living world is connected to this green part of life by a direct and unbreakable link.”

The atmosphere is not something that is added to the world: it is the world as reality of mixture within which everything breathes. If the natural sciences have trouble conceiving of immersion and mixture as the authentic nature of the cosmos, the human sciences stubbornly keep trying to understand this nature, for instance the climate, on the one hand as a *purely natural fact, and thus excluded from their domain*, and on the other hand as a purely human reality or as an exclusively aesthetic fact, which thus no longer relates to anything that comes from the nonhuman world. Thus, starting from the famous Hippocratic treatise *De aere, aquis et locis*,¹⁶ a vast tradition began to develop that runs from Aristotle to Montesquieu¹⁷ and from Vitruvius to Herder¹⁸ and was to nourish the political geography of Ratzel as much as the metaphysical geography of Watsuji Tetsurô.¹⁹ Throughout the extraordinary diversity of approaches, doctrines, and historical contexts, this tradition concentrates on two ideas. First of all, it is important to recognize, as Abbé Jean-Baptiste Dubos would write, that “the human machine is not much less dependent on the qualities of the air, on the changes to which these qualities are liable, and, in short, on all the variations which may obstruct or favor what we call the operations of nature, than the very fruits themselves.”²⁰ Climate is here synonymous with the nonhuman. The human sphere—culture, history, the life of the mind—is not autonomous, it has a foundation in what is not human; the apparently nonspiritual elements—air, water, light, winds—do not engender mind but can influence the human being, his or her behaviors, attitudes, and ideas. Climates engender and set up the majority of humans in their physical aspect and, even more, in their social mores. As Edme Guyot wrote, “the nature of the earth, the quality of its fruits, and the difference between climates have contributed to the variety of colors and to the

diversity of figures and temperaments among all humans.”²¹ The nonhuman is the cause of the multiplicity of life forms—not only in space but also in time and history.

In radicalizing the Herderian approach, which makes of history, as Kant would say, a kind of “climatology of intellectual and sensory powers of man,”²² Simmel’s sociology made of the concept of atmosphere an absolute medium of social perception: “the atmosphere of someone is the most intimate perception of him.”²³ The idea of atmosphere as the originary dynamism of all sociability would have great success. For example, Peter Sloterdijk conceived of atmosphere at once as an original product of human coexistence and as the paradigm of all cultural life qua cultural life. “The symbolic airconditioning of the shared space is the primal product of every society. Indeed humans create their own climate; not according to free choice, however, but under preexisting, given and handed-down conditions.”²⁴ This shared environment is what Sloterdijk calls “sphere,” the geometrical figure of absolute interiority.

Spheres are by definition also morpho-immunological constructs. Only in immune structures that form interiors can humans continue their generational processes and advance their individuations. Humans have never lived in a direct relationship with “nature,” and their cultures have certainly never set foot in the realm of what we call the bare facts; their existence has always been exclusively in the breathed, divided, torn-open and restored space.²⁵

Humans thus “flourish only in the greenhouse of their autogenous atmosphere.” To live in society means to participate in the construction of these atmospheres; at the other end, the atmosphere is always a cultural fact. What is more, it embodies the impossibility of a state of nature: for

Sloterdijk, climatization means the impossibility of getting access to the natural world. But plants demonstrate, on the contrary, that climatization—air-designing—is the living being’s simplest act of existence, its most elementary nature.

Cultural reductionism is proper to a long tradition that makes of atmosphere “the fundamental concept of a new aesthetics.” The atmosphere would be “the shared reality of the perceiver and the perceived. It is the reality of the perceived as the sphere of its presence and the reality of the perceiver insofar as he or she, in sensing the atmosphere, is bodily present in a particular way.”²⁶ This interpretation, which goes back to Léon Daudet, makes of atmosphere “knowledge of the skin, which is as tangential as knowledge of the mind [*esprit*] is and uses epithelial cells in the same way in which knowledge of the mind uses the roots of words.”²⁷ This faculty of synthetic knowledge

envelops space and time; it emanates at once from the universe and from us; and it is in us—consciousnesses, persons, populations—as an inclusion of the universal, as that something that connects after having specified, which is neither quantitative nor qualitative but participates in both at the same time and has, in life, a life of its own, dissimulated yet capable of being exposed, analogous to that of radium or the waves at the cryptoid heart of inanimate nature.²⁸

This emanation, “at once moral and organic—under its moral aspect tied to the whole of being; under its organic aspect tied to epithelial and endothelial tissues”²⁹—is based on a cosmic accord. “The entire cutaneous surface makes us participants in a universal equilibrium, us, the adapted of outer and inner (*adaequatio rei et sensus* [‘the conformity between thing and sense’]).”³⁰

This psychological and gnoseological reduction of atmosphere seems to forget that atmosphere is fundamentally an *ontological* fact that concerns the status and mode of being of things, and not the manner in which they are perceived. If every act of knowledge is, by itself, a fact of atmosphere because it is an act of mixing between subject and object, the extension of the atmosphere's domain goes well beyond any act of knowledge.

Notes

- [1.](#) Manuscript from the Dibner Collection, MS 1031 B, Dibner Library of the History of Science and Technology, Smithsonian Institution Libraries, c.3v.
- [2.](#) James E. Lovelock and Lynn Margulis, "Biological Modulation of the Earth's Atmosphere," *Icarus*, 21 (1974): 471-89, here p. 471; see also their "Atmospheric Homeostasis by and for the Biosphere: The Gaia Hypothesis," *Telus*, 26 (1974): 2-10. On the history of the Gaia thesis, see the detailed work by Michael Ruse, *Gaia: Science on a Pagan Planet* (Chicago: University of Chicago Press, 2013).
- [3.](#) Lovelock and Margulis, "Biological Modulation," p. 495.
- [4.](#) Jean-Baptiste de Lamarck, *Hydrogeology*, trans. by Albert V. Carozzi (Urbana: University of Illinois Press, 1964), p. 4.
- [5.](#) *Ibid.*, pp. 122-3: "the remains of living organisms and of their products continuously undergo decomposition, are deeply modified, and eventually are no longer recognizable. From these organic remains, moreover, rain water removes various integrant molecules which it further degrades, transports, and eventually deposits in their new state."

- [6.](#) Jean-Baptiste de Lamarck, *Mémoires de physique et d'histoire naturelle, établis sur les bases de raisonnement indépendantes de toute théorie; avec l'explication de nouvelles considérations sur la cause générale des dissolutions; sur la matière de feu; sur la couleur des corps; sur la formation des composés; sur l'origine des minéraux, et sur l'organisation des corps vivans, lus à la première classe de l'Institut national dans ses séances ordinaires, suivis de Discours prononcé à la Société Philomatique le 23 floréal an V* (Paris, 1797), p. 386.
- [7.](#) See the quite beautiful text by Jean-Baptiste Fressoz, "Circonvenir les *circumfusa*: La chimie, l'hygiénisme et la libéralisation des choses environnantes (1750–1850)," *Revue d'histoire moderne et contemporaine*, 56.4 (2009): 39–76.
- [8.](#) Jean-Baptiste Boussingault and Jean-Baptiste Dumas, *Essai de statique chimique des êtres organisés* (Paris: Fortin Masson, 1842), pp. 5–6 [English version *The Chemical and Physiological Balance of Organic Nature: An Essay*, ed. by D. P. Gardner (New York: Saxton & Miles/Boston: Saxton, Peirce & Co., 1844), pp. 19–20].
- [9.](#) Vladimir I. Vernadsky, *The Biosphere* (New York: Copernicus, 1998), p. 122. On Vernadsky's position in the history of ecological thought, see Jean-Paul Deléage, *Une histoire de l'écologie* (Paris: La Découverte, 1991), ch. 9.
- [10.](#) Vernadsky, *The Biosphere*, p. 76.
- [11.](#) Ibid., p. 120.
- [12.](#) Ibid., p. 87.
- [13.](#) Ibid., p. 44. See also p. 47: "The biosphere may be regarded as a region of transformers that convert cosmic

radiations into active energy in electrical, chemical, mechanical, thermal, and other forms. Radiations from all stars enter the biosphere, but we catch and perceive only an insignificant part of the total; this comes almost exclusively from the Sun.”

[14.](#) Ibid., p. 50.

[15.](#) Ibid., pp. 57-8 and 58 [for this and the next quotation].

[16.](#) See *Airs, Waters, Places* in volume 1 of the Loeb edition of the Hippocratic corpus (Cambridge, MA: Harvard University Press, 1984), in W. H. S. Jones’s translation.

[17.](#) See Charles de Montesquieu, *The Spirit of Laws*, ed. by Anne M. Cohler, Basia C. Miller, and Harold S. Stone (Cambridge: Cambridge University Press, 1989), Part III, Book 14, ch. 10: “The different needs of differing climates have formed differing ways of living, and these differing ways of living have formed the various sorts of laws.” On the history of the doctrine, see Roger Mercier, “La théorie des climats des *Réflexions critiques* à *L’Esprit des lois*,” *Revue d’histoire littéraire de la France*, 58 (1953): 17-37 and 159-75.

[18.](#) Johann G. Herder, *Ideen zur Philosophie der Geschichte der Menschheit*, in idem, *Werke*, vol. 6 (Frankfurt: Deutsche Klassiker, 1989).

[19.](#) Watsuji Tetsurô, *Climate and Culture: A Philosophical Study*, trans. by Geoffrey Bownas (Westport: Greenwood Press, 1961). See Robert N. Bellah, “Japan’s Cultural Identity: Some Reflections on the Work of Watsuji Tetsurô,” *Journal of Asian Studies*, 24 (1965): 573-94; Augustin Berque, “Milieu et logique du lieu chez Watsuji,” *Revue philosophique de Louvain*, 92 (1994): 495-507; Graham Mayeda, *Time, Space, and Ethics in*

the Philosophy of Watsuji Tetsurô, Kuki Shuzo, and Martin Heidegger (New York: Routledge, 2006).

- [20.](#) Jean-Baptiste Dubos, *Critical Reflections on Poetry and Painting*, trans. by Thomas Nugent (London: Nourse, 1788), pp. 176–7.
- [21.](#) Edme Guyot (nom de plume Sieur de Tymogüe), *Nouveau système du Microcosme ou Traité de la nature de l'homme* (La Haye: M. G. de Merville, 1727), p. 246.
- [22.](#) Immanuel Kant, *Political Writings*, 2nd edn., ed. by Hans Reiss, trans. by H. B. Nisbet (Cambridge: Cambridge University Press, 1991), p. 214.
- [23.](#) Georg Simmel, *The Sociology of Georg Simmel*, ed. and trans. by Kurt H. Wolff (New York: Free Press, 1950). On Simmel, see Barbara Carnevali, “Aisthesis et estime sociale: Simmel et la dimension esthétique de la reconnaissance,” *Terrains/Théories*, 4 (2016), available at <http://teth.revues.org/686>.
- [24.](#) Peter Sloterdijk, *Bubbles: Spheres I*, trans. by Wieland Hoban (Pasadena: Semiotexte, 2011), pp. 47–8.
- [25.](#) Ibid., p. 46 [for this and the next quotation].
- [26.](#) Gernot Böhme, “Atmosphere as the Fundamental Concept of a New Aesthetics,” *Thesis Eleven*, 36 (1993): 113–26, here 113. See, by the same author, the classic work *Atmosphäre: Essays zur Neuen Ästhetik* (Frankfurt: Suhrkamp, 1995). For a panoramic view on this concept, see Tonino Griffero, *Atmospheres: Aesthetics of Emotional Spaces* (Farnham: Ashgate, 2014). For a radical reading of the concept of atmosphere from the point of view of law, see the important work by Andreas Philippopoulos-Mihalopoulos,

Spatial Justice: Body, Lawscape, Atmosphere (London: Routledge, 2015).

[27.](#) Léon Daudet, *Mélancholia* (Paris: Grasset, 1928), p. 32. On Daudet, see Barbara Carnevali, "'Aura' e 'ambiance': Léon Daudet tra Proust e Benjamin," *Rivista di Estetica*, 46 (2006): 117-41.

[28.](#) Daudet, *Mélancholia*, p. 16.

[29.](#) Ibid., p. 86.

[30.](#) Ibid., p. 25.

9

Everything Is in Everything

If living is breathing, it is because our relation to the world is not one of being thrown or being in the world, and not even one of mastery—that of a subject over an object that lies before it: no, being in the world means experiencing transcendental immersion. Immersion—and breath is only its originary dynamic—defines itself as inherence or reciprocal imbrication. We are in something with the same intensity and same force as that something is in us. It is the reciprocity of inherence that makes breath an inescapable condition: it is impossible to liberate oneself from the environment in which one is immersed, and it is impossible to purify this environment of our presence.

To inhale is to allow the world to come into us—the world is in us—and to exhale is to project ourselves into the world that we are. To be in the world is not simply to find oneself *in* a final horizon containing everything that we are and will be able to perceive, live, or dream. From the moment we start to live, think, perceive, dream, breathe, the world in its infinite details is in us, materially and spiritually penetrating our body and our soul [*âme*], giving form, consistency, and reality to everything that we are. The world is not a place; it is a state of immersion of each thing in all other things, the mixture that instantaneously reverses the relation of topological inherence.

Anaxagoras was the first to give a rigorous definition of mixture as the form that characterizes the world: everything is in everything (*pan en panti*). Immersion is not the temporary condition of a body in another body. Nor is it a relation between two bodies. In order for immersion to be

possible, *everything needs to be in everything*. On the one hand, as we have seen, to be immersed in something is to experience being in something that is, in turn, in us. On the other hand, according to Anaxagoras, this absolute, reciprocal mixture that seems to make everything the site of everything else is not a condition limited in space and time, but the form of the world and of all being in the world. For there to be a world, the particular and the universal, the singular and the whole have to interpenetrate, mutually and completely: the world is the space of a universal mixture in which each thing contains and is contained by *all* other things. On the other hand, interiority (being in something, *inesse*) is the relation that ties each thing to *all* other things, the relation that defines the being of *worldly* things.¹

To say that everything is in everything, and thus that immersion is the eternal form and the condition of possibility of the world, means first of all to assert that every physical event is produced as immersion and from the starting point of immersion. In this way, the light that allows me to see the page I write is the sea in which I bathe. It is, in turn, in the switch, in the cable that ties it to the fixture, and—embryonically—in my hand, which activates it. And the hand that flicks the switch is contained in the light that now illuminates it. Everything is in everything. This mixture makes the world and space into the reality of a universal transmissibility and translatability of forms. But what we call transmission is only the echo of this reciprocal inherence of all things in all other things: the world is a perpetual contagion.

If everything is in everything, it is because, in the world, everything must be able to circulate, transmit itself, translate itself. The impenetrability we have often imagined as the paradigmatic form of space is an illusion: wherever there is an obstacle to transmission and interpenetration, a

new plane is produced that allows bodies to reverse the inherence from one to the other, in a reciprocal interpenetration. Everything in the world both produces mixture and is produced by mixture. Everything enters and exits from everywhere: the world is an opening, an absolute freedom of circulation—not side by side with, but *through* bodies and others. To live, to experience, or to be in the world also means to let oneself be traversed by all things. To get out of oneself always means to enter into something else, into its forms and its aura; to return to oneself always means to prepare oneself to encounter all sorts of forms, objects, images—the very ones that Augustine was surprised to find in his memory, generator of mixture and splendid evidence of this total compenetration.²

Science and philosophy have made every effort to classify and define the essence of things and of the living, their forms and their activity; but they remain blind when it comes to their *worldliness*, that is, to their *nature*, which consists in their capacity to enter into any other thing and be traversed by it.

The same goes for matter: it is not what separates and distinguishes things, but rather what makes possible their encounter and mixture. It is not simply reducible to the space of a form's inherence in the world. It is rather the case that, through it, everything is in everything, nothing can separate itself from the fate of the rest, and everything lets itself be traversed by the world and therefore can traverse it.

To make of the world the reality of this perpetual reversal of the inherence of everything in everything means to make space not only the name of a generalized exteriority, but that of a universal interiority: to have within itself everything that contains us. Extension—corporeality—is not the space in which being is external to all other things

(*partes extra partes*), with an intensity that coincides with its *conatus sese conservandi* [impulse toward self-preservation]; space is, on the contrary, an experience in which everything exposes itself to being traversed by all other things and strives to traverse the world in all its forms, consistencies, colors, and smells. Hence space and extension are forces that allow all things to breathe, to expand, and to intermingle within breath: to breathe is to let oneself be penetrated by the world in order to make, from the world, something that is *also* made from our breath. Everything breathes and everything is breath because all things interpenetrate.

Therefore a new geometry must be thought out; for the cosmos does not draw either a sphere or a plan. Cosmos as nature is not a horizon that contains in itself all other beings (the sphere), nor is it the totality of things (*ta panta*) or a totality that transcends its elements (the One, or God). But denying its transcendence in order to make it into an originary power, a *foundation*, or a *root* (ground, *Grund*), as imagined by a tradition that culminated in German idealism, is not enough—just as it is not enough to think of this foundation as *collapsed* [effondré] (an *Ungrund* [“unground”]).³ To affirm that *everything is in everything* (*pan en panti*) does not mean simply to imagine the existence of everything in a single substrate. The cosmos—that is, *nature*—is not the foundation of things, it is their mixture, their breathing, the movement that animates their interpenetration. Put otherwise, the concept of immanence is not enough for us either to think of the existence of the world or to radicalize this existence by making God coincide with world—as pantheism did—by imagining the inherence of all things in God (and by thinking of their coincidence only through God). True immanence is what makes anything exist inside anything else: that everything is in everything means that everything is immanent in

everything. Immanence is no longer the relation between one thing and the world, it is the relation that ties things to one another. It is this relation itself that constitutes the world.

In this manner, the totality defines a relationship of radical and absolute interiority, which nullifies any distinction between container and contained. Because, if everything is everything, not only does each thing contain all other things, but a thing has to find itself within no matter what other thing—what is more, in the things it contains. The fact of *being contained in something* coexists with the fact of containing this same thing. The container is also the content of what it contains. This identity is not logical, it is topological and dynamic. Every object is a site for every other object and, conversely, to be a place is to find one's world in every other thing. In a certain sense, any thing is a world—where the world is no longer the ultimate, unreachable horizon given only at the end of time and at the farthest extension of space, but the intensional identity with any of its objects. Being in the world no longer means finding oneself in an infinite space that contains everything else; it means being no longer able to experience being in a place without finding this place in yourself, and thus becoming the place of your place. The world is the force that reverses any inherence into its opposite, transforms any ingredient into a place, and any place into an element of the same compound.

Thus the cosmology of mixture is founded on a different ontology from the one traditionally taught. For all action is interaction, or rather interpenetration and reciprocal influence. Physics—the science of nature—should then be completely rewritten. If the world is in all its beings, this means that every being is capable of radically transforming the world. Universal mixture embodies the fact that the world is constantly exposed to the transformation brought

about by its components. One need not wait for the Anthropocene to encounter this paradox: it was the plants that, millions of years ago, transformed the world by producing the conditions of possibility of animal life. The “phytocene”⁴ is the clearest proof that the world is mixture and that every being of the world [*mondain*] is in the world with the same intensity with which the world is in it. In this universal mixture, the effect is always capable of modifying its cause, which always resides in the effect. In this sense, immersion is the destruction of the one-way process that puts totality before the individual, the “before” before the “after.” Causality in mixture is always bidirectional: mixture is always a hysteron proteron. Retroaction, which we have considered a property of life, is only the rhythm specific to breathing, the breath of mixture. It is for this reason, too, that the notions of environment and ambient world should be rejected: the living being is an environment for the world in the same way in which the remaining things of the world are the environment of the living individual. Influence always goes in both directions. Retroaction is an effect of immersion, and immersion is a cosmic fact: it constitutes the form and the condition of possibility of the cosmos, not the effect of some *human* actions. The notion of Anthropocene transforms what defines the very existence of the world into a single action, historical and negative: it makes nature a cultural exception⁵ and makes the human being an extranatural cause. Above all, it neglects the fact that the world is always the reality of the living beings’ breath.

From this angle, cosmology is a pneumatology—or, better, it is its higher form. To know the world is to breathe it, because each breath is a production of the world: what appears to be separate comes together in a dynamic unity. To breathe is to taste the world. And, for each living being and each object, the world is that which is given through

and thanks to breath. The world has the taste of breath. If every mind [*esprit*] makes the world, this is because each act of breath is not just the simple survival of the animal in us, but the form and consistency of the world of which we are the pulse.

There is nothing metaphorical or arbitrary about this coincidence between pneumatology and cosmology. To interrogate the world—its form, its limits, and its consistency with the breath that allows us to know it and to adhere to it—permits us to find evidence that classical cosmology will never be able to obtain. In the immanence of breath, the world appears to be something closer and extremely different from what we imagined. It is the unseen face that plants allow us to contemplate.

Notes

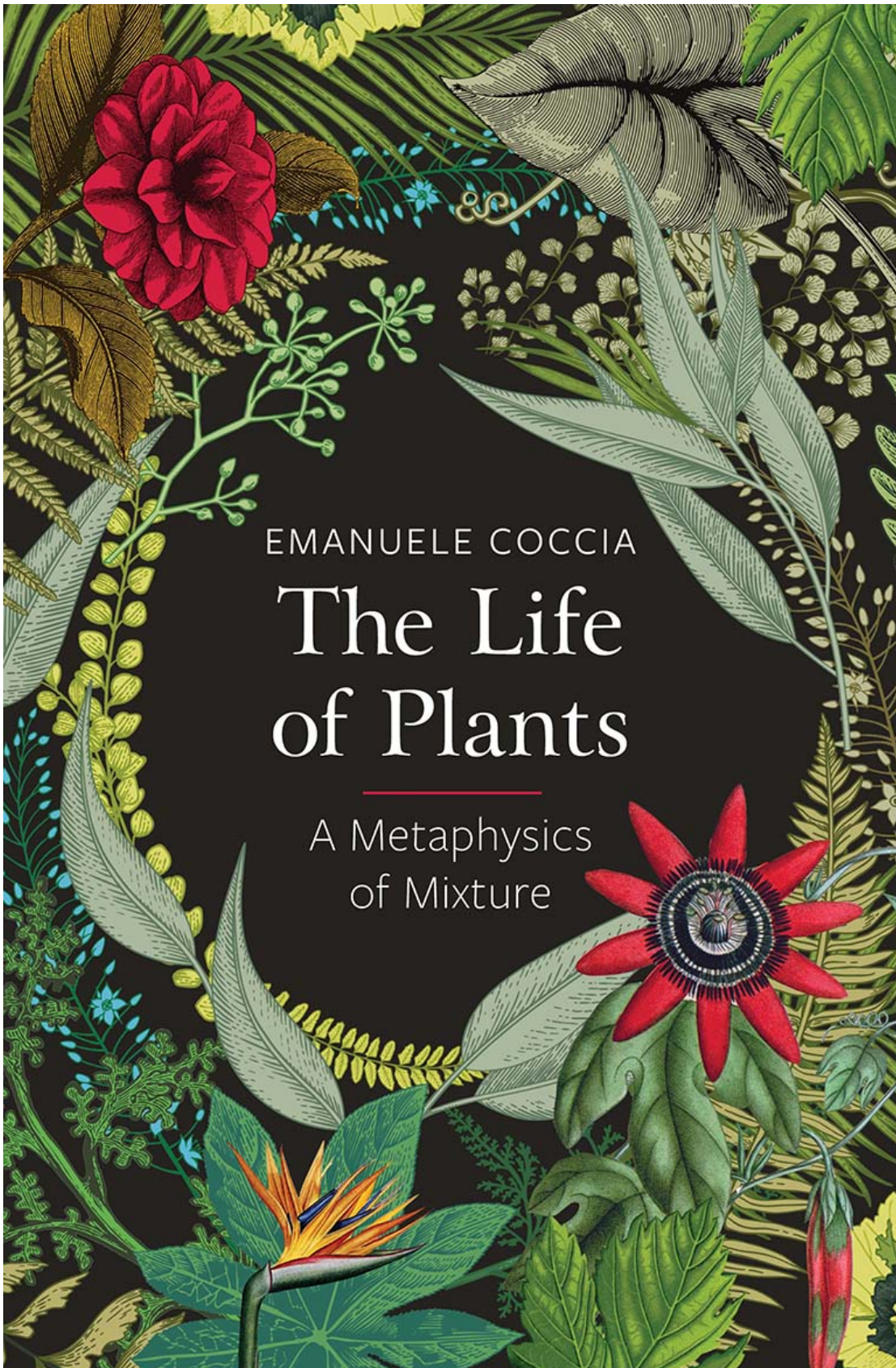
1. In *Bubbles: Spheres I*, Peter Sloterdijk uses the image of mutual imbrication (which he acknowledges as belonging in the lineage of Stoic philosophers of bodily mixture) but prefers to concentrate on the theological version—provided by Ioannes Damascenus—of the *perichōrēsis* of the three persons of the Trinity. This choice is heavy with consequences. First of all, in spite of what Sloterdijk writes, divine mixture is not “a repression-free, nonhierarchical interweaving of substances in the same section of space” (p. 591): on the contrary, first the whole Neoplatonic tradition, then the Christian one, too, will try to introduce hierarchical order into the concept of mixture (God the Father is not and can never be on the same plane as the spirit). What is more, both traditions are about limiting the possibility of mixture with spiritual substances, of making mixture into a property that is primarily related to souls and not to bodies qua bodies: Sloterdijk’s mixture is thus a purely anthropological (or

theological) space, the symbol of a spiritual relationship between acosmic subjects and not the ordinary physiology of any worldly being. This is also why he seems to overlook or neglect the importance of the reference to Anaxagoras. On the reception of the concept of mixture in Neoplatonism and in Christian theology, see the important pages devoted to the topic by Jocelyn Groisard, *Mixis: Le problème du mélange dans la philosophie grecque d'Aristote à Simplicius* (Paris: Belles Lettres, 2016), pp. 225–92.

- [2.](#) St. Augustine, *Confessions*, Book 10.
- [3.](#) In this sense, Schelling's approach is insufficient, too. On the philosophy of nature in Schelling and in German idealism, see the excellent volume by Iain Hamilton Grant, *Philosophy of Nature after Schelling* (London: Bloomsbury, 2006).
- [4.](#) Natasha Myers, "Photosynthesis," in *Theorizing the Contemporary*, special issue of *Cultural Anthropology*, 2016 available at <http://culanth.org/fieldsights/790-photosynthesis>.
- [5.](#) This is also the thesis of Christophe Bonneuil and Jean-Baptiste Fressoz's excellent study *The Shock of the Anthropocene: The Earth, History, and Us*, trans. by David Fernbach (New York: Verso, 2016).

III

**Theory of the Root
The Life of the Stars**



EMANUELE COCCIA

The Life of Plants

A Metaphysics
of Mixture

