4 An Outline of Ontological Design

> The empire consists of postulating that the hic et nunc [place-based, face-to-face existence] is in the past and that only interactivity remains.
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> · **Paul Virilio,** *The Administration of Fear*

> The idea of ontological designing is gathering momentum, yet, to date, it has not been addressed front-on.
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> · **Anne-Marie Willis,** "Ontological Designing—Laying the Ground"

> We encounter the deep question of design when we recognize that in designing tools we are designing ways of being.
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> · **Terry Winograd and Fernando Flores,** *Understanding Computers and Cognition*

So you are holding a digital device in your hand, maybe even while you read these pages. Do you know what it is? How it un/does you in particular ways? How it un/does the world? Here is American rapper Prince Ea's passionate plea that we think about it deeply, one might say ontologically:[1]

Do you know the average person spends four years of his life looking down at a cell phone? Kind of ironic, ain't it? How these touch-screens can make us lose touch.
With so many iMacs, iPads, and iPhones, so many "i"s, so many selfies
Not enough "us"s and "we"s
See, technology has made us more selfish and separate than ever
'Cause while it claims to connect us, connection has gotten no better . . .
Reclassify Facebook for what it is, an antisocial network . . .
We sit at home on our computers measuring self-worth
in terms of numbers of followers and likes . . .
What about me? Do we not have the patience to have a CNVRSTN *without* ABBRVTN*?*
This is the generation of media over stimulation
Chats have become reduced to snaps, the news is 140 characters, videos of six seconds at high speed, and you wonder why ADD *[attention deficit disorder] is on the rise faster than* 4G LTE *. . .*
This one, my friends, we cannot autocorrect, we must do it ourselves.
Take control or be controlled, Make a decision . . .
I am so tired of conforming . . . to this accepted form of digital insanity . . .
I imagine a world where we smile when we have low batteries,
'Cause that will mean we'll be one bar closer—to humanity.

Let me reassure you at the outset that it is not a question of being for or against technology, or even of settling the score on the alleged battle between tradition and modernity, but rather of bringing to the fore the diversity of existential options open to us humans, the multiple ways of being in space/place and time, and of what technologies do to the Earth and to our communities. Prince Ea's slow, carefully worded rapping makes us aware of the anthropological narrowing of existential choices fostered by things digital, paradoxically in the name of freedom, the carefully regulated freedom of neoliberal self-improvement schemes, of the seductive "Be All You Can Be" slogan, which translates as "maximize your interactions, your connectivity, the information you upload into your devices so as to download it again when useful." But it is in so striving to be free that we are, paradoxically, most programmed, most

effectively compelled to be and act in particular ways, to conform to the norm of being "free."

What would it mean, then, to be "one bar closer to humanity"? The question is not as simple as it seems; it demands digging deep into the cultural and material background of the seemingly simple act, but actually complex cultural-historical fact, of using a digital device. The media discourse about the digital era is perhaps the best place to start the digging, for it is deeply rooted in modern technological society. According to popular understanding, what's most exciting about our increasingly ubiquitous digital devices is the revolution of sorts in communication, information, and interactivity they brought about.[2] Unpacking fully the meaning of *communications*, *information*, and *interaction* is beyond the scope of this short introduction, but it should be clear by now to the ontologically minded reader that the background for understanding these notions involves fundamental assumptions about the nature of language, the individual, progress, and life itself. In other words, underlying these constructs there lies the Cartesian/Euclidean onto-epistemology of independent entities that preexist any interaction, of information as made up of discrete and truthful accounts of an objectively existing real, of a world made up of objects that language only denotes but does not help to construct, of rules of logic and forms of rationality benignly intended to make the world a decent and livable place (which are not the result of the mind-set of hyperracist white wealthy politicians with their repeated calls for "security" and "law and order").

This is not to forget that the data on your computer or slick mobile phone depend on the bits of cobalt, gallium, indium, tantalum, platinum, palladium, niobium, lithium, germanium, and so forth lodged in them; that, more than fancy-sounding Latin names, these materials are bits of Africa for sure, sometimes from South America, perhaps from eastern Congo with its bloody wars and brutal forms of eviction of locals to secure a steady supply of these "conflict minerals"; and that these wars create thousands of victims, including through the abuse of young women, and that they are connected to the devastation of forests and rivers, not to speak of the e-waste created by hundreds of millions of discarded screens, mobile devices, and computers that thousands of poor people in China or elsewhere scavenge for any bit of value left in them, under the most hazardous conditions, because the waste of some is the opportunity of others, right? And let us not overlook either the fact that these minerals are housed in geological strata, in a "metallic materiality" that summons capitalists to perform patriarchal alchemy at ever-higher levels, since corporations have come to believe that they can bend the Earth into any form or shape, so

that even the geological time of our planet, embedded in deep layers of rock, comes to be disturbed, a resource at the service of our small but powerful machines.[3] What this means is that we impose the Judeo-Christian linear time (of salvation and progress) on allegedly inert geological strata, which perhaps explains why the Earth is screaming, as Brazilian liberation theologian Leonardo Boff has been telling us for decades, most purposely in his book *O grito da Terra, o grito dos pobres* (*Cry of the Earth, Cry of the Poor*; 1997).

Of course, we can venture farther back in order to recall that today's digital devices rely on those discoveries in solid-state physics that gave rise to transistors, semiconductors, microchips, and integrated circuits at the dawn of the digital revolution, to the steady miniaturization that made Silicon Valley explode with possibilities and unbridled celebrations, bubbles, hype, and disappointments, so that slowly but surely we awaken to the ineluctable realization of the colonialist, bloody links among Silicon Valley, Africa, and dramatically underpaid Chinese workers (surely part of Steve Jobs's much-celebrated "genius"). We end up with the complex geo-ontological formation that Benjamin Bratton (2014) calls the Stack, wherein rests the entire political geology of contemporary media and information and communication technologies, and it should make us ponder what are we doing, really, with our fanciest tools, which many of us have come to think we can no longer live without.

There is more. Also implicit in Prince Ea's narrative is the displacement of copresence by telepresence, of face-to-face relations by relations with distant others. But you might say: doesn't life become more exciting this way? Fair enough. Nonetheless, as the philosopher-architect Paul Virilio—by his own acknowledgment not a prophet of doom but a true lover of new technologies (1999, 13)—asks, "How can we really live if there is no more *here* and if everything is *now*? (1997, 37).[4] Surely being free from place and time represents human progress, one might argue. Yet as we plug in to our various interfaces and engage in tele-existence, as we become citizen-terminals of sorts, our bodies are deterritorialized, as in the cyberpunk fantasies of the 1980s, when cyberspace became a metaphor for anything that was cool.[5] Alienated from place, our only recourse is to maximize speed under the tyranny of real-time transmission, trapped in the utopia of the annihilation of duration, of being involved in as many things as possible at the same time, all the time. Corresponding to these changes at the level of subjectivity there are transformations at aggregate levels, including the temporal homogenization of the planet, the imposition of the infosphere on the biosphere, of bytes over bio, a new cybernetics of control that even WikiLeaks can never hope to diffuse. And so we

succumb, too, to a global environment of fear (the fear of the terrorist, or of natural disasters) propagated by real-time media, to the "synchronization of emotion on a global scale" (Virilio 2012, 30), and that's how our emotional territories get occupied. Yet, "So what?," you might still ask. And I respond: would the losses caused by all these technocultural changes not outnumber the gains? How would one even know? And one might add: are the rematerialization of the body and the reterritorialization of place still possible? Or are they already historically foreclosed possibilities?

Let me insist that it is really not a question of making value judgments about what's better or worse, but of conveying a sense of why it is critically important that we ask the questions. I do not have a Facebook account; I don't tweet, and I don't even own a smartphone (sometimes I say, jokingly, that my old-fashioned cell phone is the smartest since it doesn't let me get text messages I don't want to read, beeps I don't want to hear, "connections" I'd prefer not to have). I do not claim in the least bit to be a better person than those spending four hours a day on their cell phones. That would be hypocritical of me, for after all I've spent countless hours at a screen just writing this book. At the same time, what difference does it make in terms of my style of being human, or posthuman? This question is part and parcel of the historical ontology of ourselves, of what makes us who we are at present.

So, do you now see why ontology—actually, political ontology—is important? Can design contribute to fulfilling the historic, perhaps vital, task of catalyzing forms of collective intelligence that attend to the kinds of choices confronting us, including design's own role in creating them?

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Recasting the question concerning new technologies ontologically is certainly not an issue of total rejection but a redirection of the cultural tradition from which they stemmed. Modern societies are already thoroughly theoretically driven. By this I mean that expert knowledges have a profound influence on how we live our lives. In so many domains of life, from eating our food (mediated by nutritional knowledge, including our food fears) and child-rearing practices (mediated by the pediatric, psychological, and health establishments with their battery of experts) to thinking about the economy, we make daily choices based on rational judgment mediated by expert discourses. Our daily reality is textually mediated and produced by all kinds of expert categories, including their unfailing deployment by the media. How this tradition shapes design practice will

be further developed in this chapter by taking the ontological argument proposed by Terry Winograd and Fernando Flores as a point of departure.

The first section introduces the notion of ontological design as originally outlined by Winograd and Flores. We then move in the second part to discuss recent ontological approaches to design, particularly the work of Tony Fry and his collaborators. While he does not engage with Winograd and Flores directly, Fry's approach is consistent with these authors' formulation, as they share some sources, particularly Heideggerian phenomenology and analysis of technology. Together, these works constitute a foundation for evolving approaches to the ontology of design. The last part of the chapter deals with another important question posed by Francisco Varela in the third lecture in his short book *Ethical Know-How: Action, Wisdom, and Cognition* (1999): whether nondualist attitudes can be fostered in Western cultures. This reflection will open the way for a discussion of transitions and design for transitions, to be discussed in the following chapter.

What Is Ontological Design?

Why should design be considered "ontological"? The initial answer to this question is straightforward: "We encounter the deep question of design when we recognize that in designing tools we are designing ways of being" (Winograd and Flores 1986, xi). Understood as "the interaction between understanding and creation" (4), design is ontological in that it is a conversation about possibilities. One more way to get at the ontological dimension of design is by addressing "the broader question of how a society engenders inventions whose existence in turn alters that society" (4–5). Digital technologies are of course dramatic cases of radical innovations that opened up unprecedented domains of possibilities (as were printing, the automobile, and television earlier); they transformed an entire set of daily practices. Thus, every tool or technology is ontological in the sense that, however humbly or minutely, it inaugurates a set of rituals, ways of doing, and modes of being (Escobar 1994). It contributes to shaping what it is to be human.

A second sense in which design is ontological, already hinted at by Winograd and Flores, is that, in designing tools, we (humans) design the conditions of our existence and, in turn, the conditions of our designing. We design tools, and these tools design us back. "Design designs" is the apt and short formula given to this circularity by Anne-Marie Willis; "we design our world, while our world acts back on us and designs us" (2006, 80). This applies to the entire range

of objects, tools, institutions, and discourses of human creation, no matter how neutral we consider them. Can there be anything more seemingly neutral than a space of habitation, a container for the body? I often give the example of the Amazonian indigenous *maloca* (indigenous longhouse) versus the archetypical nuclear-family house in suburban America. The maloca can house several dozen people under a single roof, even if the act of habitation obeys certain rules of behavior and spatial distribution. As I jokingly say, paraphrasing, "give me a maloca, and I will raise a relational world" (including the integral and interdependent relations between humans and nonhumans); conversely, give me a suburban home, and I will raise a world of decommunalized individuals, separated from the natural world. Design thus inevitably generates humans' (and other Earth beings') structures of possibility.

It is Winograd and Flores's contention that the pervasive way in which we think about technology, coming from the rationalistic tradition, not only constitutes *the implicit understanding of design* but makes it difficult, if not impossible, to come up with new approaches to the design of machines that are better suited to human purposes; it also becomes an obstacle to the creation of the open domains of possibility enabled by computer-mediated networks of human interaction. The rationalistic tradition traps our imagination through constraining metaphors such as that of computers as brains or mere information-processing devices, and that of language as a medium for the transmission of information (see Dreyfus 1979 for a critique of artificial intelligence from this perspective). In unconcealing that tradition, these authors aim at a redirection rather than a debunking of the tradition, but the goal of the redirection is substantial: "to develop a new ground for rationality—one that is as rigorous as the rationalistic tradition but that does not share the presuppositions behind it" (Winograd and Flores 1986, 8).[6]

To this end they weave together theories of biological life (Humberto Maturana and Francisco Varela 1980, 1987), phenomenological frameworks about knowledge and human action (Martin Heidegger 1962, 1977; Hans-Georg Gadamer 1975), and philosophy of language (the theory of speech acts). From these fields come the conceptual pillars of their framework: the notion that cognition is not based on the manipulation of knowledge about an objective world; that the observer is not separate from the world she or he observes but rather creates the phenomenal domains within which she or he acts; and that the world is created through language (again, language is not a mere translation or representation of reality "out there" but is constitutive of such reality, a point underscored by semiology and poststructuralist theory). Similar to the

Indian critics of science discussed earlier, Winograd and Flores find a deep connection between the rationalistic tradition and organized science, a fact that mars understanding in a host of domains, from cognitive science to policy making and even citizenship, entrepreneurship, and activism (Spinosa, Flores, and Dreyfus 1997). The mind-body dualism that posits the existence of two separate domains—the objective world of physical reality and the individual's subjective mental world—is of course one of their targets. Against such a dualism, they uphold the fundamental unity of being-in-the-world, the primacy of practical understanding, and the idea of cognition as enaction.

The background is thus the space of possibilities within which humans act and express their "care" for the world. "This world is always organized around fundamental human projects, and depends upon these projects for its being and organization" (Winograd and Flores 1986, 58). The Cartesian notion of modern subjects in control of an objective world, as much as that of the "flexible" postmodern subject surfing the web, does not, in their view, provide a good basis for the ontological skill of disclosing new ways of being (see Dreyfus and Kelly 2011 for a similar point). This ontological skill of history making—engaging in conversations and interventions *that change the ways in which we deal with ourselves and things*—can be enlivened, as Flores and coauthors Charles Spinosa and Hubert Dreyfus examine in detail in a subsequent work (Spinosa, Flores, and Dreyfus 1997). Rather than the proverbial detached deliberation or desituated understanding characteristic of the public sphere, the skillful disclosing of new worlds demands intense involvement with a collectivity. It requires a different sort of attitude that comes from dwelling in a place and from a commitment to a community with which we engage in pragmatic activity around a shared concern, or around a disharmony. In these notions we can already sense the idea that the designer might be a discloser in this sense; moreover, the designer shows awareness that she or he is a discloser. It is also these authors' contention that while this kind of history making has declined in the West, it is by no means completely lost—again, it is a capacity that needs to be retrieved, and I contend that design is a means to this retrieval (Dreyfus and Kelly 2011; Dreyfus 2014).

Ontological Design as Conversations for Action

It should be stressed that, as for Varela, for Winograd and Flores the entire process is deeply practice oriented. Sensing and holding on to a disharmony in one's disclosive space is not effectively achieved by stepping back from the

problem in order to analyze it; on the contrary, when meaningful change is needed, "then disharmonies will be of the non-standard situational kind that is usually passed over by both common sense and [abstract] theory," and in these cases what is required is intense engagement and involved experimentation (Spinosa, Flores, and Dreyfus 1997, 23–24).[7] This resonates with a design philosophy that emphasizes the engaged, experimental, and open-ended practices of design research, including prototyping and scenario building. Winograd and Flores convey this same idea by talking about "breakdowns" rather than "problems," at least in the way the latter are discussed in the rationalistic tradition. Breakdowns are moments in which the habitual mode of being-in-the-world is interrupted; when a breakdown happens, our customary practices and the role of our tools in maintaining them are exposed, and new design solutions appear and are created; we can intuitively feel the appropriateness of this notion for the myriad cases of ecological breakdown in contemporary situations.

It should be emphasized, at the risk of being repetitive, that these authors insist that both the disclosing activity and the act of dealing with breakdowns imply going beyond the commonly held idea that the world functions in terms of individual mental representations of a problem, toward a social perspective of patterned, embedded interaction—that is, a perspective that highlights our active participation in domains of mutual concern. Moreover, all of this takes place through language: "To put it in a more radical form, we design ourselves (and the social and technological networks in which our lives have meaning) in language" (Winograd and Flores 1986, 78); or, to return to Maturana, "languaging" is the fundamental manner of existence of human beings; not only that, but language is intimately connected with the flow of emotions, as languaging and "emotioning" together provide the basis for the recursive coordination of behavior through the creation of consensual domains. Maturana calls "the consensual braiding of language and emotions, *conversation*" (1997, 9; see also Maturana and Verden-Zöller 2008).

It should be made clear that these authors are not saying that we need to get rid of detached modes of knowing in toto, nor that representations are not important. As they put it, "human cognition includes the use of representations, but it is not based on representation" (Winograd and Flores 1986, 99). Similarly, Varela, in stressing the importance of "know-how" (which he says has predominated in the wisdom traditions, such as Buddhism, Taoism, and Confucianism), as opposed to the Cartesian "know-what," is not minimizing the importance of rational analysis but highlighting the salience of concrete,

localized forms of ethical expertise based on nondual action for ordinary life, which moderns usually disregard. These notions reveal the assumed one-to-one correspondence between language and reality, representation and the real, which takes us back to the questions of, Which "world"? What "design"? What "real"? The answer, as should be clear by now, points well beyond the objectivist, dualist, and detached understandings of world, design, and real. How can we rethink design on the basis of the reformed understanding of these notions?

For Winograd and Flores, the answer to this question necessitates a rethinking of organizations and their management. True, while a great deal of what managers do conforms to well-known rational decision-making routines as described in systems analysis, remaining at this level narrows the field of possibilities. To start with, a great deal of what managers do daily is to respond actively and concernfully to daily situations in order to secure effective cooperative action. In doing so, managers can be seen as activating networks of commitments; from this perspective, more generally, organizations constitute conversations for action; there is a certain degree of recurrence and formalization in these conversations, which Winograd and Flores characterize in terms of distinct linguistic acts. Organizations are networks of commitments that operate through linguistic acts such as promises and requests. In the end, the central feature of organizations and their design is the development of communicative competence within an open-ended domain for interpretation in ways that make commitments transparent:

> Communicative competence means the capacity to express one's intuitions and take responsibilities in the networks of commitments that utterances and their interpretations bring to the world. In their day-to-day being, people are generally not aware of what they are doing. They are simply working, speaking, etc., more or less blind to the pervasiveness of the essential dimension of commitment. Consequently, there exists a domain for education in communicative competence: the fundamental relationships between language and successful action. People's conscious knowledge of their participation in the network of commitments can be reinforced and developed, improving their capacity to act in the domain of language. (1986, 162)[8]

It could be argued that this approach leans on a rationalistic understanding of reflection, and to some extent this is the case. However, it is also a departure from it based on the implication of cognition as enaction, as spelled out

by Maturana and Varela: "Since all cognition brings forth a world, our starting point will necessarily be *the operational effectiveness of living beings in their domain of existence*. . . . [Effective action] enables a living being to continue its existence in a definite environment as it brings forth its world. Nothing more, nothing less" (1987, 29–30; emphasis added). There are two corollaries of importance here for an ontological approach to design that will be explored more fully later on: first, the need to make explicit our de facto ontological commitment to a modernist epistemology and ontology of subjects and objects (made up, to reiterate, of discrete "individuals" operating on the basis of "true (detached) knowledge" about "really existing" economies, and so forth); and, second, the question of whether different ontological commitments, based on a relational understanding, are possible.

Operational effectiveness is of course a key issue for the design of tools, including computers; it is conveyed through the concept of transparency of interaction, and interfaces are crucial in this regard. Here again Winograd and Flores warn that interfaces are not best achieved by mimicking human faculties but that tools' "readiness-to-hand" requires thinking more complexly about the right coupling of user and tool within the space of relevant domains. A sort of interface anthropology is at issue here (Laurel 1989; Suchman 2007). Building on the work of Mexican designer Tomás Maldonado, the Argentinean designer Silvia Austerlic (1997) speaks about the ontological structure of design as made up of the interrelations among tool, user, and task or purpose, all of which are brought together by the interface. The German-Chilean design theorist Gui Bonsiepe (2000) has coined the term *audiovisualistics* as a way to point at the cognitive complexity involved in interface design from the perspective of operational effectiveness.

Breakdowns are central to Winograd and Flores's notion of design. As a situation of "nonobviousness," a breakdown is not something negative but provides the space of possibility for action—for creating domains where new conversations and connections can take place. Breakdowns can be anticipated to a certain extent, but they mostly arise in practice, calling for a back-and-forth between design and experience; the building of prototypes can facilitate this task by helping to generate the relevant domains for anticipating breakdowns and dealing with them when they emerge (1986, 171). This also means that a key aspect of design is the creation through language of the domains in which people's actions are generated and interpreted. This is a main principle of user-centered design, and today it would include taking into account the design of context, and the user's own design, as discussed in chapter 1. If we think about

the ecological crisis as characterized by a recurrent pattern of breakdowns, what is at stake is the creation of systematic domains where definitions and rules can be re/defined in ways that make visible interdependencies and commitments (or the lack thereof). This is different from the concept of expert systems as the design of professionally oriented domains, which are unlikely to foster the kinds of conversation for action that are needed to face the crisis. In designing changes in people's space of interactions, the goal of the ecological designer is to trigger changes in individual and collective orientations, that is, changes in the horizon that shapes understanding, a point to be discussed further when we take up the notion of sustainability again.

Toward the end of their book, Winograd and Flores summarize these principles:

> The most important design is *ontological.* It constitutes an intervention in the background of our heritage, growing out of our already-existent ways of being in the world, and deeply affecting the kinds of beings that we are. In creating new artifacts, equipment, buildings, and organizational structures, it attempts to specify in advance how and where breakdowns will show up in our everyday practices and in the tools we use, opening up new spaces in which we can work and play. Ontologically oriented design is therefore necessarily both reflective and political, looking back to the traditions that have formed us but also forwards to as-yet-uncreated transformations of our lives together. Through the emergence of new tools, we come to a changing awareness of human nature and human action, which in turn leads to new technological development. The designing process is part of this "dance" in which our structure of possibilities is generated. (1986, 163)

"In ontological designing," to quote them one final time, "we are doing more than asking what can be built. *We are engaging in a philosophical discourse about the self—about what we can do and what can be.* Tools are fundamental to action, and through our actions we generate the world. The transformation we are concerned with is not a technical one, but a continuing evolution of how we understand our surroundings and ourselves—of how we continue becoming the beings we are" (179; emphasis added). In subsequent chapters we will prod this perspective into a nondualist path by focusing explicitly on the communal and pondering how to transition beyond the rationalistic tradition whose pervasiveness Winograd and Flores do so much to unconceal.

Becoming Human by Design

Most people would intuitively reject the idea that we humans, too, are designed in some fashion. Yet this is one of the most direct and consequential lessons of the ontological approach to design. To paraphrase, in modern societies we design ourselves, although not under conditions of our own choosing. From the resulting allegedly universal but specifically modern notion of the human now emerges the imperative to transcend its anthropocentric, androcentric, and rationalistic foundations, which has yielded an entire spectrum of posthumanist approaches, some of which were discussed at the end of chapter 2.

Fry's design ontology (Fry 2011, 2012, 2015; Fry, Dilnot, and Stewart 2015) can be considered a special case within the posthumanist landscape, for several reasons: first, it is to my knowledge the first and only approach to systematically link posthumanism and design; and, second, concomitantly, it makes a decided effort at crafting a posthumanist notion of the human, one that tackles systematically the consequences of living under structured unsustainability as a civilizational condition. What, Fry asks, "has been lost in the rise of the hegemonic category 'the human'?" (2012, 12). Fry reminds us that the human is the result of three great forces: natural selection, self-organization, and design.[9] This evolutionary view allows Fry to signal the uniqueness of the leap toward unsustainability entailed by modernity. This is a third important feature of the work of Fry and his collaborators, namely, their willingness to imagine beyond modernity, and to do so decolonially, that is, with a profound awareness that one of the most important design consequences of modernity has been the systematic suppression, and not infrequently destruction, of nonmodern worlds. "Writ large," Fry states, "[modernity] did not just take the future away from the peoples it damaged and exploited but set a process in motion that negated the future, and defutured both the born and the unborn" (2015, 23). Thinking decolonially indicates a critique of the notion of a world made of One World and, conversely, upholds the notion that "while the planet is singular, world is plural—for it is formed and seen in difference—as are we" (21). The sensitivity to difference is crucial here, since it refers to the pluriverse and contributes to the argument that what needs to be sustained is precisely the pluriverse.[10]

For Fry, one of the most serious effects of modernity is what he calls *defuturing*, understood as the systematic destruction of possible futures by the structured unsustainability of modernity. *Futuring*, in contrast, is intended to convey the opposite: a future with futures. The tension between defuturing

and futuring is one way used by Fry to suggest a move from the Enlightenment to the "Sustainment," a new imaginary for an age (in the Heideggerian sense of *age*) where different ways of thinking, being, and doing become possible. For Fry, this transition is akin to that from the ancient to the modern world. The imperative for the move toward Sustainment stems from the need to counter the defuturing effects inherent in the economies, cultures, and institutions of the contemporary world, primarily their unquestioned attachment to economic growth. The Sustainment is prefigurative, as was the Enlightenment with its belief in universal reason and the imperative of order and progress, no doubt the civilizational dream that is unraveling under our eyes.

The pervasive conditions of unsustainability and defuturing inherent to the reason-centered culture that became entrenched with the passage to modernity must be destroyed as part of the reestablishment of futuring conditions. This dialectic of destruction and creation is part and parcel of Fry's framework. Moving toward Sustainment calls for an explicit ethics of what to destroy and what to create, materially and symbolically. This is one of the principles for the kinds of designing that need to go on under the dialectic of Sustainment; it involves destroying that which destroys (the unknowing and unthinking that produces unsustainability) and, at the same time, embracing the project of founding a new tradition capable of carrying the Sustainment forward. The former supposes an entire range of actions properly understood as "elimination design." The latter requires disclosing the possible ways of being-in-the-world that do not reenact unsustainability but rather enable acts of imagining, designing, and re/making that are auspicious for Sustainment. Unlike sustainable development, the green economy, or the liberal ethic of saving the planet—all of which continue to function within the defuturing ontology—the Sustainment challenges us moderns to secure futures for the kinds of relational forms of being capable of countering the still-pervasive conditions of defuturing and unsustainability.

The Posthuman Human and the Artificial

The world modern humans have created is "deworlding" under the pressures of globalized capitalism, population, and technology. The project of "reworlding" is thus necessarily ontological in that it involves eliminating or redesigning not just structures, technologies, and institutions but our very ways of thinking and being (Illich 1973). Perhaps one of the most daring, and puzzling, aspects of this task is Fry's unapologetic call for redesigning the human.

Simply put, if it is (certain) humans who are causing unsustainability, we have to redesign the human. Many modern thinkers will reasonably sense in the notion of redesigning the human the ugly ghosts of social engineering, sociobiology, or Foucauldian biopower—a hypermodernity at its worst. Yet Fry is careful to make clear that what he means is a posthuman and postrationalistic idea of the human. As he says, "We are travelling toward a point at which we will have to learn how to redesign ourselves. This is not as extreme as it sounds, for we have always been a product of design—albeit unknowingly. . . . In essence, what is being suggested here is action towards the relational development of a new kind of 'human being' " (2012, 37). The implication is that we need "to consider the ontologically designing forces that constitute subjects with diminished agency and the reverse: an ontologically designed subject beyond the subject" (162). As Cameron Tonkinwise ([2014?]) has explained, this goal does not mean that we are masters of our destiny, nor that we are able to design our existence at will. What it means is that we are historically thrown into our designedness, with particular acuity at present. This might actually be another connotation of the anthropocene. What Fry has in mind, to follow Tonkinwise's argument, is in fact the opposite of "human-centered design" with its "timid [liberal] version of the human," most often concerned with consumer desires and instrumental rationality (Tonkinwise 2014, 7). But "being by design" is not instrumental; it points at the fact that we exist in the space of our designing. Human-centered design should thus not be confused with Fry's idea of becoming human by design.

Equally important, Fry is adamant that, as the planet is confronted with the dramatic consequences of unsustainability and defuturing, such as climate change, the resources at hand—whether afforded by modernity or by traditions of any kind—are no longer appropriate to the task. No amount of evolutionary adaptation or natural design will do. On the contrary, what is required is the design of novel ontologically futuring practices that take us decidedly into the dialectic of Sustainment, beyond the "world-within-the-world" of modern colonialist making, by means of re/makings that radically transform humans' tendency toward the unsustainable. This implicates an anthropogenesis that rearticulates the relational assemblages of the biological (humans' animality), the sociocultural, and the technical. Fry makes clear that for him humans today are constituted within a naturalized artificial ecology created through design and technics; this means that nature becomes a "standing reserve" to be appropriated, thus unknowingly making the world we create a negation of the biophysical world of our absolute dependence. This rate of change, he

concludes (2012, 61), "has come to override evolutionary time," thus "the need for humans to adapt has become ever more urgent. But now the only available option is to adapt by artificial means. Survival will thus now become a biosocial ontological design project. . . . Rather than pose the adaptation in the human/animal frame, we must place it in the context of the relation between the human and the artificial." In this way Fry takes us back to the brief discussion in the introduction about design and the future. It would be pertinent to ask whether Fry succeeds in articulating a view of the future different from that of the techno-fathers of geoengineering, synthetic biology, the great singularity, and the like; in other words, whether his proposal gains sufficient distance from the ontology of appropriation and control that so naturally inhabits the techno-futurist visions related to the artificial. While, for Fry, humans became prosthetic beings with the invention of the first tools, from the rise of modernity onward the ontological designing of the body/tool/mind assemblage has resulted in a "world-within-the-world" that has naturalized the artificial dimension of human evolution. For Fry, this means that modern humans are inescapably anthropocentric.

Rather than posit a radical way out of this anthropocentrism, Fry calls for a self-conscious and responsible anthropocentrism that, by necessity, has to invent its own posthuman notion of the human. Evolution in the anthropocene thus needs to be properly understood in terms of natural selection, self-organization, and ontological design. This is partially at odds with those proposals in the ecological design field that give primacy to the organic integration of humans and nature but resonates with the calls to embrace critically the possibilities afforded by contemporary technology found among feminist scholars in the field of science and technology studies (such as Donna Haraway). Despite Fry's rejection of a strict biocentric ethic (e.g., 2015, 57), not anything goes, since design-as-adaptation nevertheless has to take into account the self-organizing dynamics of the Earth. In any case, it will remain pending until the conclusion of this book whether Fry (and this book itself) escapes the ontology of enframing and project orientation that today's rising ethic of the artificial seems to deploy with such force.

The results of the modernist ontological design journey, and the very complexity of the agency of what designs us, can be seen most patently in cities. We referred in passing (chapter 2) to "the question of finding futural modes of [urban] dwelling" (Fry 2015, 87), and we can now return to this notion to conclude this section. Fry locates this question within a large-scale history of earthly habitation, which shifted from nomadism to settlement with farming

about ten thousand years ago. In order to envision futures with a future, a third mode of human habitation has to be recognized and actively re/shaped, which Fry calls *unsettlement*. Despite the dramatic changes in urban habitation, settlement is still the default framework in city planning and in discussions of climate change adaptation, as if we were still dealing with the modernist city. But mass mobility and climate change have thrown the situation into an altogether different mode and scale. We can expect abandoned cities, pervasive riots and conflict related to food and the climate, mass deaths, fierce struggles for survival, and all kinds of human-induced disasters as that "world-within-the-world" par excellence that is the modern city unravels under the effects of climate change. Exposing the instability of this mode of habitation—including modernity's misformed and misplaced cities, and the homelessness and structural unsustainability characteristic of the afterlife of the modern city—is the first task of an ontological design strategy concerned with earthly habitation:

> We are "thrown" into these defuturing conditions as the future is sacrificed to the hollow gains of the present. . . . The continuity of this relation is at the heart of Sustainment—the conceptual and practical project beyond the Enlightenment, modernity, globalism, and sustainability (which so often sustains the unsustainable—be it industries, ways of life, products, institutions, built environments, modes of agriculture, and more). All of this adds up to the making of a world of being-in-difference. A post-human world (again in its difference) is demanded wherein the human is not abandoned but rather becomes in tune with the being of Sustainment, and so becomes a futural agent. (Fry 2015, 32)

The practical aspects of rethinking urban design and adaptation are huge and encompass all dimensions of the space and time of the city; Fry explores them at length in *City Futures in the Age of a Changing Climate* (2015).[11] Learning how to dwell in another way will bring with it a sharper recognition of what we (modern humans) actually are, so that we can be otherwise. Fry maps an entire cultural-political project that involves "embracing the ontological status of the city assemblage as post-natural environments of difference together with regimes of ordering and disordering (the formal and the informal, the informational and metabolic, the industrial and post-industrial, the spectacular and hidden). . . . It follows that a very different view of post-urbanism is now to be put forward here" (88), one that makes possible futural modes of dwelling.

Sustainability by Design?

This is a good point to bring back the question of sustainability, this time from an explicitly ontological perspective. Imbued with the major tenets of Heideggerian phenomenology and Maturana's biology, a recent approach to sustainability by John Ehrenfeld develops an ontological framework for ecological design.[12] Ehrenfeld (2009) starts by arguing that current proposals will at best amount to reducing unsustainability rather than creating true sustainability. For the latter to happen, a veritable reinvention of the collective structures that shape our lives and that define our humanness is required. Briefly, in Ehrenfeld's diagnosis, unsustainability springs from the cultural structure of modernity itself. Moreover, approaches intended to deal with environmental problems are based on a reductionist definition of the problem that in turn stems from the narrow understanding of reality, rationality, and technology inherited from the Cartesian tradition. This is causing tremendous breakdowns in not only ecological but also social life, which the author interprets in terms of addiction to consumption. From here he goes on to propose a framework for the redesign of tools, physical infrastructure, and social institutions as a means to foster changes in consciousness and practices based on an ontology of care. The framework revisits the intersection of three domains—the human, the natural, and the ethical—as the space for an alternative approach to sustainability.

From these initial steps follows the definition of sustainability as "*the possibility that humans and other life will flourish on the planet forever*" (Ehrenfeld 2009, 53; italics in the original). In this vision, flourishing, following various philosophical and spiritual sources, "is the most basic foundation of human striving and, if properly articulated, can be the strongest possible driver towards sustainability" (53). Flourishing, he goes on to propose, can be brought about only by shifting to a design mode that is effective at dealing with the culture of unsustainability—in other words, the way out can be no other than sustainability by design (76–77). This is one of Ehrenfeld's stronger contentions, the second being that what needs to be transformed first and foremost, given their overwhelming power, are the economic and technological domains that sustain the modern ontology. This does not mean that the key to sustainability is to be found in scientific breakthroughs or techno-fixes but rather that "the key to sustainability is the practical truths that each of us discovers in our daily life and that contribute to the collective activities of our culture" (95).

How, then, can one design a world that brings forth flourishing in everyday activities? Can cultural practices be changed by design? Echoing pragmatists' understanding (John Dewey and Charles Pearce), Ehrenfeld makes the bold claim that this can indeed be done—"devices" can be designed to gradually transform our primary mode of understanding and being. This conclusion comes close to Charles Spinosa, Fernando Flores, and Hubert Dreyfus's (1997) notion of history making and relies on a particular articulation of the notion of care (for self, others, and the world), arguing that care can be structured into the design of tools and equipment through "presencing." Key to presencing (a concept similar to the hoped-for "ready-to-hand" character of technological interfaces) is the incorporation into tools of ecological habits through design so as to transform routine actions into forms of ecological behavior; this is to be achieved by embedding "scripts" into product design. Designers, in this way, would need to go well beyond the goal of satisfying users' needs, to articulate the concerns of a collectivity in novel ways. New embodied routines slowly become collective, eventually transforming social consciousness and institutional structures.[13]

Generally speaking, what is at play in this proposal is the emphasis in recent design thinking on "making things effective and meaningful" through convivial solutions arrived at via the principle of use-centered effectiveness (Manzini 2015). As Tonkinwise likes to put it, "radical sustainable design just means designing little things a lot, all over" (2013b, 14); in other words, sustainability is such a huge challenge because it reveals the infinite number of small things that will need to change. More theoretically, thinking sustainability through design brings forth the challenging question, "How do you translate a new cognitive paradigm into material environments and everyday practices?" (10; see also Tonkinwise 2013a), which in turn requires a renewed attention to materiality from which there might emerge more sustainable mind-sets, attention to questions of scale, and the reconceptualization of materiality. This brings to the fore the repoliticization of sustainable design, especially if one considers that oftentimes the process takes place through grassroots innovation, calling on design activists to engage in the relocalization of making things and in the socially and culturally complex task of networking sustainable innovations.

The ontological concern with sustainability has been the subject of Mexican ecologist Enrique Leff's decades-long effort at developing an ontological and political framework for sustainability, mentioned in passing in chapter 3 (Leff 2002, 2015; see Escobar 2008, 103–106, 129–132, for a discussion of this

author's work). As Leff states, "political ecology constructs its theoretical and political identity in a world of mutation, driven by an environmental crisis: a crisis of being-in-the-living-world. . . . *Something* new is emerging in this world of uncertainty, chaos and unsustainability. Through the interstices opened up in the cracks of monolithic rationality and totalitarian thinking, environmental complexity sheds new light on the future to come. This 'something' emerges as a need for emancipation or a will to live" (2012, 32). For this something to be cultivated, there is a need for a new ecological episteme, one in which sustainability becomes the horizon for purposive living based on a dialogue of knowledges and cultures. Leff's vision, influenced by Heidegger and deconstruction, also signals an ongoing transition with open-ended futuring possibilities.

Ontological Design and the Question of Agency

None of the ontological design approaches discussed so far are very clear about the agency behind the reenvisioned design, and a more satisfactory discussion of this thorny issue will have to await the discussion of transition design and autonomous design, where there is a more explicit sense of agency. While the idea that everybody designs is taken seriously, the proponents of ontological design seem to reserve a special role for a kind of designer who has the necessary disposition and training to carry the ontological undesigning/redesigning project forward. Thinking about agency ontologically calls for a more nuanced understanding of "use," which Mark Titmarsh and Tonkinwise (2013) explore through a reinterpretation of the interrelations between art and design. The roles of research, technology, and the studio as well as the political economy of unsustainability are the subject of much debate from the perspective of the ontological framing, yet the agent who is carrying out these practices remains elusive. Fry comes close in his discussion of the types of people who will emerge in the wake of the radical changes brought about by unsustainability, defuturing, and unsettlement, and of course not all the characters he envisions in his posthuman fiction will play a constructive role toward Sustainment. How the "worldly rematerialization" capable of "enabling the 'being-otherwise' of these [new] beings" will take place is not explicitly discussed (Fry 2012, 208).[14]

The understanding of agency in contemporary theory has been transformed dramatically as a result of the ontological turn. With the arrival of objects, things, nonhumans, spirits, and so forth into theory's orbit, the ex-

planation of what life is and how it gets constituted into worlds has been significantly enriched. The concept of distributed agency—which suggests that agency is not the result of discrete actions by single subjects acting intentionally but largely the effect of complex heterogeneous networks of humans and nonhumans—has profound implications for design, and these will be explored in the next chapter (Manzini 2015). The key ontological design question of "how our tools are part of the background in which we can ask what it is to be human" (Winograd and Flores 1986, 163) thus becomes more complicated; it needs to be broadened at the very least by considering how the designers' understanding of humans and worlds changes when all kinds of nonhumans, and the heterogeneous assemblages of life they bring into existence, are brought into the picture.

One of the thorny issues in discussions about design agency is that of authorship. The emphasis on codesign, of course, takes direct aim at the reified and glorified notion of authorship, whether in product design, urbanism, or architecture. Yet the reliance on a strong notion of authorship is not so easily dispelled. As architectural historian Amy Zhang puts it well, "there is a crucial need in architecture to question the ontology of the designer before directing the attention towards any critical reflexivity on the practice's ontological effects" (pers. comm., July 17, 2015). In addition, she argues, notions of individual authorship are being dramatically eroded by the digital modeling to which architectural practice has become subservient, without even talking about financial dependence and compensation issues. Yet a certain dualism continues to remain in place: author/design (and potential correlates, such as nonauthor/nondesign). Also at stake here are entrenched divisions of labor and issues of race and gender, enabling the (often white and male) author-designer to act with total obliviousness to the material and economic dimensions of production. This type of objectified authorship is inimical to genuine practices of collaboration and design for and from relationality.

A phenomenologically oriented notion of agency is embedded in Otto Scharmer and Katrin Kaufer's concept of "leading from the emerging future" (Scharmer 2009; Scharmer and Kaufer 2012). Their foundational insight about "acting from the presence of what is wanting to emerge" (19) involves a robust notion of relationality and futuring. Their notion of presencing is proposed as a way to counteract the ontology of disconnection ("Ego-System") that is killing the Earth through consumption; it implies an expanded view of the self and might foster design thinking and prototyping that embody the new that is emerging or wants to emerge. This kind of presencing, as the authors

argue, is conducive to a transitional space where new kinds of "frontline practitioners" tap into emerging social-natural configurations in order to facilitate new communal connections. The frontline practitioner would realize that "the real power comes from recognizing patterns that are forming and fitting with them" (Scharmer 2009, 32). They would face head-on Varela's injunction that modern science does not understand experience—they will delve into (in principle, nondualist) experience as a veritable wellspring for design. Their framework comprises a series of shifts (from downloading, seeing, and sensing to presencing, crystallizing, prototyping, and performing) that involve "letting go," "letting come," enacting, and embodying the emergent. These shifts take place within a social space of collective creation (presencing) and destruction (absencing), requiring a significant personal transformation toward more relational modes of being. This proposal can be considered an ontological design framework, and to some extent is presented as such.[15]

Thinking about agency in the context of Sustainment and transitions brings with it its own challenges. In the last part of the chapter I would like to inquire into the possibility of design practices informed by nondualism and relationality; from this perspective, the question becomes that of whether nondualist action can be fostered under the conditions of deworlding and defuturing mapped by Fry and collaborators. We can lean on Varela once more in search for clues to answer this question, before returning to a final discussion of ontological design. I should make it clear, however, that this is one particular way to explore the practice and ethics of ontologically oriented design. Along the way, we will find some support for this inquiry in the pluralization of musics happening all over the world today.

Nondualism in Everyday Life? Varela's Question

In the third lecture in *Ethical Know-How* (1999), Varela deals with the absence of a self as we know it in the West, proposing the notion of a selfless or virtual self as an emergent property of a distributed system mediated by social interactions (52–63). For Varela, a key question arising from both of these conceptualizations is whether we can learn to embody the empty self, that is, to really develop *a practical way* to go beyond the assumption of the self-interested autonomous individual and the businesslike and ego-clinging features it commands.[16] This is what the Buddhist mindfulness tradition is all about; it aims to provide a means to nonduality as well as principles for groundlessness as compassion. This is not the place to discuss further the Buddhist part of Va-

rela's argument; suffice it to say that he concludes that the acceptance of the nonsolidity of the self brings about an authentic type of care; indeed, "here one is positing that authentic care resides at the very ground of Being, and can be made fully manifest in a sustained, successful ethical training. A thoroughly alien thought for our nihilistic Western mood, indeed, but one worthy of being entertained" (73).[17]

The corollary is stated as a genuine question: "How can such an attitude of all-encompassing, responsive, compassionate concerns be fostered and embodied in our culture?" (73). To be sure, the answer starts by restating that "it obviously cannot be created through norms and rationalistic injunctions," or just through new concepts or self-improvement schemes; on the contrary, "it must be developed and embodied through *disciplines* that facilitate the letting-go of ego-centered habits and enable compassion to become spontaneous and self-sustaining" (73), with each individual growing into his or her own sense of nonduality, authentic caring, and nonintentional action. This will surely sound too esoteric and spiritual to many modern readers (however, the notion resonates with how intellectual-activists from social movements speak about their activist skills for history making, as briefly discussed in chapter 2). We find a sustained answer to this question in the framework for "the work that reconnects" developed by Joanna Macy and colleagues from the perspective of systems thinking, ecology, feminism, and Buddhism (Macy and Brown 1998; Macy 2007; Macy and Johnstone 2012). Macy's goal is to provide an intellectual and practical path for moving from a self-destructive "industrial growth society" to a "life-sustaining" one. This epochal shift, a Great Turning, demands a profound change in our perception of reality, including surrendering our belief in a separate self and adopting an ecological self; abandoning anthropocentrism in favor of a life-centered paradigm; acknowledging the dependent coarising of all things, including the knower and the known, body and mind; fostering structural changes at the level of economic systems and technology; and cultivating shifts in consciousness through various means, such as nondualist spiritualities. Only then can one hope to be "in league with the beings of the future" (2007, 191), a concept that speaks to the concerns of sustainability.

Macy bravely addresses why we keep on failing to make these insights into effective forces in the real world, or how we can. Coincidentally, her most recent book, coauthored with Chris Johnstone, is dedicated "to the flourishing of life on this rare and wondrous planet" (Macy and Johnstone 2012)—another reference to sustainability as flourishing. We will encounter Macy's vision again in the discussion on transition narratives. For now, we can ask: are Varela's

question and Macy's insights useful for design? Can design be more attuned to these realizations? To inhabiting spaces of nonduality, nonliberalism, noncapitalism? To finding sources of the nonself in the most contemporary struggles and situations? These are questions for an anthropology and cultural studies of design that takes an ontological approach seriously.

With these questions, we are back within the critical analysis of modernity. Modernity is, indeed, the larger onto-epistemic formation within which the rationalistic tradition has thrived. I have deliberately eschewed in this work a substantial discussion of perspectives on modernity. It is important, however, to put modernity in its place, so to speak. Somehow we seem to have accepted the idea that some version of modernity is here to stay, globally, until the end of times. It is worth quoting Ashis Nandy once more to interrogate this assumption:

> The time has come for us to restore some of the categories used by the victims themselves to understand the violence, injustice and indignity to which they have been subjected in our times. . . . These neglected categories provide a vital clue to the repressed intellectual self of our world, particularly to that part which is trying to keep alive the visions of a more democratic and less expropriatory mode of living. To that other self of the world of knowledge, modernity is neither the end-state of all cultures nor the final word in institutional creativity. Howsoever formidable and permanent the edifice of the modern world may appear today, that other self recognizes, one day there will have to be post-modern societies and a post-modern consciousness, and those societies and that consciousness may choose to build not so much upon modernity as on the traditions of the non-modern or pre-modern world. (1987, xvii)

One could interpret Nandy's discussion as speaking about the futuring possibilities embedded within, and often articulated by, the most direct victims of modern defuturing. It is important to restate, however, that Nandy is not advocating for an intransigent defense of tradition. His reworking of the concepts of tradition and modernity is much more sophisticated than that; besides, he is interested first and foremost in the dialogue among cultures. Most movements in the South are not interested in a recalcitrant defense of traditions either, even if advocates of modernity on all ends of the political spectrum continue to corner them into such a slot in the name of one or another universalism or dualism. Nandy acknowledges the importance of excavating and fighting for a lost or repressed West (just as I have spoken of alternative Wests that might constitute sources of nondualist ontologies). Perhaps the

time has come to stop regarding any reference to tradition as pathological, romantic, or nostalgic. Care should be taken of course not to fall into an uncritical defense of traditions that might shelter one form of oppression or another (e.g., patriarchy). But one can legitimately ask, can some types of tradition not be used today as tools for criticism, futuring, and sustainment? "The choice of traditions I am speaking of involves the identification, within a tradition, of the capacity for self-renewal through heterodoxy, plurality, and dissent. It involves the capacity in a culture to be open-ended, self-analytic and self-aware without being overly self-conscious. . . . Fortunately, cultures are usually more open and self-critical than their interpreters" (Nandy 1987, 120).

Social groups in struggle, at their best, move in several directions at once: adding to, and strengthening, their long-standing practices, while mastering the modern world, its practices and technologies. Bolivian scholar Silvia Rivera Cusicanqui (2014) points at this feature with her notion of *sociedades abigarradas*, referring to the capacity of Latin American popular and indigenous cultures to define their own forms of modernity, more convivial than the dominant ones precisely because they also find nourishment in their own histories, intricately weaving indigenous and local practices with those that are not local, thus resulting in worlds made up of different cultural strands that affect each other without nevertheless fusing into one.[18] From this, in her view, stem more lasting intercultural entanglements because they find sustenance in the complementarities among diverse worlds without overlooking the antagonisms, articulating with market economies while anchored in indigenous knowledge and technologies. Here lies an entire novel view of modernities and traditions, a pluriversal framework.

Design and the Relational Ontologies of Music

Some genres in contemporary popular music are an apt model to describe what many groups and movements today are seeking to accomplish through their innovative cultural and political practices. Usually described as "fusion," these globalized genres involve features that seem utterly contradictory: a commitment to a place-based musical tradition but at the same time an opening up of that tradition more than ever to conversations with other world musics and to the use of a panoply of digital and nonconventional production technologies to achieve the best possible rhythms and sounds.[19] The results are oftentimes unique and original, powerful in the ways in which they engage people's bodies and consciousness, perhaps confirming Jacques Attali's (1985)

contention that music, more than theory, heralds the new cultural and political orders to come. Does this prophetic function of music suggest at the very least that some artistic practices such as music might be more attuned to relational being? Can contemporary fusions be considered in any way to be effectively interepistemic and pluriversal and, if so, a source of inspiration for the type of novel collaborative design practices envisioned by design thinkers such as Ezio Manzini (2015)? Are musicians engaging in ontological politics when they collaborate in the making of across-worlds musics? Do contemporary musics of a certain kind open up new possibilities for being-in-sound?[20]

Some of these questions are broached by music and cultural theorist Ana María Ochoa Gautier (2014) in her historical research on the relation between aurality and being. What she finds is that acoustics has been an intensive area of design innovation in the West since at least the nineteenth century. The acoustic collapses form and event, calling forth a rethinking of the relations among process, design, and materiality. Building on Stephen Feld's notion of acoustemology, Ochoa Gautier goes on to discuss how sound confounds the boundaries between epistemology and ontology, revealing the existence of relational regimes of aurality where the physics of sound, musical form, (im)materiality, sound technology, and sound perception all play a part. In her examination of nineteenth-century European accounts of native musics in Colombia, she unveils an entire political ontology of music surrounding these accounts. One of the lessons of her examination of acoustic ontologies is that "local sounds" are not static traits meant to represent a particular place; there has always been a kind of "sonic transculturation" (Ochoa Gautier 2006) that the new fusions bring to new levels of sophistication, thus setting in motion a pluriversal force. By bringing sound and aurality to the forefront, she hopes to redress the overwhelming focus of critical design studies on the visual.

Another interesting attempt at linking design and music is the notion that design might be emerging as a fifth principle of radical musical practice at present. This idea has been suggested by Amy Zhang for the case of some contemporary musics (pers. comm., January 15 2012). She bases this suggestion on Attali's (1985, 20) identification of ritual, representation, repetition, and composition as the four main historical modes of music production from the perspective of the relations between society and power specific to particular historical periods.[21] For Attali, composition, unlike the previous modes, disrupts the dominant codes and political economy of music and inaugurates a real potential for relationality and collective experimentation. Attali quotes the Italian avant-garde composer Luciano Berio: "If we compose music, we are also composed by

history, by situations that constantly challenge us" (141); this can be seen as a rendition of the idea that design designs, challenging us into futuring kinds of design. To this Attali adds:

> Music is no longer made to be represented or stockpiled, but for participation in collective play, in an ongoing quest for new, immediate communication, without ritual and always unstable. It becomes nonreproducible, irreversible. . . . Music is ushering in a new age. Should we read this emergence as the herald of a liberation from exchange-value, or only of the emplacement of a new trap for music and its consumers, that of automanipulation? The answer to these questions, I think, depends on the radicality of the experiment. Inducing people to compose using predefined instruments cannot lead to a mode of production different from that authorized by those instruments. (141)

It could be added, following Zhang's insight, that contemporary music adds novel elements to Attali's compositional principle, including open-endedness, working across musical and cultural difference, collaborative creation, and so forth. If this is so, perhaps one can say that design is the compositional model appropriate to the pluriversal age. For Zhang, composition has fallen short of its promise, given its continued reliance on individual authorship and its immersion in commercial capitalism. Other practices are emerging. This is a trend that ontologically minded designers would do well to keep in mind as they reimagine design practices that avoid the traps of past design modes of operation.

Back to Ontological Design

Let's begin by highlighting some aspects shared by the ontological design conceptions summarized in this chapter. First is the rejection of Cartesianism, broadly speaking, whether in the form of John Law's "One-World World," Heidegger's "Age of the World Picture" (including the enframing effect of the world as object to be appropriated), or the notion of an ontology of autonomous subjects confronting discrete, self-standing objects that the scientist can study in isolation or the designer manipulate at will. This metaphysics is replaced by an ontology in which humans do not discover the world but constitute it, whether through enaction (Varela), language (Winograd and Flores), meshworks (Ingold), or the ineluctable thrownness and engagement with things (e.g., Fry, Willis, Tonkinwise). The various readings represent diverse attempts at

developing nondualist approaches to knowledge, cognition, and design. They go beyond critique to offer alternative formulations.

There is also agreement that ontological design is design after the "subject," and certainly after the subject/object divide. It favors modes of being-in-the-world beyond humanism, nihilism, and reason-centered anthropocentrism (Spinosa, Dreyfus, and Flores; Plumwood; Fry). Ontologically oriented design thus necessarily has a critical impetus. It involves "rethinking the way society is organized, shifting values, and significantly altering business models and economic thinking," as Tonkinwise (2012, 8) puts it. Does this mean that ontological design approaches become an integral part of critical design studies? It makes sense to claim that this is the case for several reasons. First, ontological design contributes to a relational understanding of the material, as it aims to dematerialize society through a new awareness of materiality and through the innovation of new ways in which society can "resource itself." This in turn implicates a transformed attention to practice (including the articulation of design and ethnography); a recovery of the agency of things, their "vibrant materiality," as opposed to the alleged inertness of "objects" (Bennett 2010); a resituation of the material within the metabolism of the economy (production and consumption), as ecological economics instructs; and a reintegration of design into larger assemblages stemming from place.

Ontologically oriented design thinkers share a belief in the radical innovative potential of design. Clearly, business-as-usual modes of designing and living have to be superseded. "I want 'business as usual,'" says Tonkinwise, "to just disappear because it's destroying the planet socially and ecologically. . . . Within design thinking there is an idealistic drive toward anti-capitalism, or at least anti-business-as-usual" (2012, 8, 14). The realization of this radical potential, to continue with this design theorist, requires a profound relational sensibility that links materiality, visuality, and empathy (via practice) in the creation of novel assemblages of infrastructures and devices, skills and know-how, and meanings and identities. Finally, there is a shared emphasis on the need to imbue design education with the tools for ontological reflection in ways that make designers conscious of their own situatedness in the ecologies for which they design.

As a Way of Concluding

The following are some features of the ontological approach to design, as a way to conclude this chapter. The list is purposely elaborated on the basis of the works presented in the chapter. Ontologically oriented design

- Recognizes that all design creates a "world-within-the-world" in which we are designed by what we design as subjects. We are all designers, and we are all designed.
- Is a strategy for transitions from Enlightenment (unsustainability, defuturing, deworlding, destruction) to Sustainment (futuring, reworlding, creation). It embraces ontologically futuring practices, particularly those involving the bringing into being of relational worlds and humans.
- Avoids defuturing into objects and reveals technology's contribution to unsustainability. It brings together imagination and technology ontologically, and it tackles head-on the anthropogenesis of technicity.
- Is postsubject and postobject; it goes beyond the techno-rationalism of the self (user, author) as intrinsically existing; it challenges the hegemonic category of the human while striving for a posthuman practice by raising the question of civilizational transitions.
- Is not a(bout) straightforward fabrication but about modes of revealing; it considers retrieving forms of making that are not merely technological, while embracing new creations. It may do so by looking at the entire range of design traditions (within the West and beyond) non-Eurocentrically and decolonially.
- Is not about "expanding the range of choices" (liberal freedom) but is intended to transform the kinds of beings we desire to be. In this sense, it is potentially noncapitalist or postcapitalist and nonliberal.
- Builds on life's and the Earth's immanent capacity for self-organization. It tackles head-on the question of artificiality but does so while being mindful of the complex webs of life that make up the pluriverse.
- It promotes convivial and communal instrumentations involving human/nonhuman collectives provoked into existence by ecological breakdowns or shared experiences of harm. It imagines designs that take seriously the active powers issuing from nonhumans, and it builds on the positive ontology of vibrant matter, realizing that design situations always involve encounters between human and nonhuman actants of all kinds.
- It involves the design of domains in which desired actions are generated and interpreted; it explicitly contributes to creating the languages that create the world(s) in which people operate. In the creation of domains of conversations for action, it necessarily moves from design to experience and back (through, say, prototyping and scenario analysis). It inquires about the extent to which the creation of new designs enables

better domains of interpretation and action to emerge, without overlooking power dynamics.

- It always entails reconnection: with nonhumans, with things in their thinghood, with the Earth (Earth-wise connections), with spirit, and of course with humans in their radical alterity (decolonially, considering the inclusion of multiple worlds, rather than exclusion). It contributes to dismantling dualisms and takes seriously all forms of nondualist existence. At its best, it discerns paths to (greater) mindfulness and enables ontologies of compassion and care.
- All design is for enactive use (not involving just users), produces operational effectiveness (but not narrowly defined utility), fosters the autopoiesis of living entities and heterogeneous assemblages of life, and is mindful of living in the pluriverse.

We shall revisit some of these features at the very end of this book, particularly after the discussion of autonomous design and the concept of the communal. For now, it is fitting to end this chapter with the following plea by Tonkinwise: "So we, especially we designers, must become much more steeped in ontological accounts of what design means, and what the human that is designed and so designs, is and can be" ([2014?], 7). Herein lies a constructive program for ontological design.