

Medializing the generic. A path out of the technological and economical excesses in contemporary architecture. A book on research and education in architecture and information technology, conceived of as philosophical interplay between two species similar in kind: neither of them is in the least disciplinal, both affect everything, and both are arts of structuring. The one 2,500 years old and dignified, the other just fifty years of age and impatient.

This book shifts the frame of reference for today's network- and structure-oriented discussions from the applied computational tools of the twentieth century back to the abstractness of nineteenth-century mathematics. It rereads George Boole, Richard Dedekind, Hermann Grassmann, and Bernhard Riemann in a surprising manner. *EigenArchitecture* argues for a literacy of the digital, displacing the role of geometrical craftsmanship.

The book comprises a programmatic text on the role of technology in architecture, a philosophical text on the generic and on algebraic articulation, and seven exemplary projects by post-graduate students in 2012 at the Chair for Computer Aided Architectural Design at ETH Zurich, Switzerland.

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Cultivating the generic

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¹ Vitruvius, *The Ten Books on Architecture*, trans. Morris Hickey Morgan (New York: Dover, 1960), bk. 1, chaps. 1–3, pp. 5–17.

The Selection, the Body, the Play

On education, architectural machines, the generic and the deadlock, social media, about theory, about mastership, about learning, the centered void, cultivating the paradox, where we are today, oscillations, the name, the word, the project, projectivity, the product, productivity, the article, the quantum, infrastructures and functionalism, eigen-vector, matrix, Riemann, Turing, morphogenesis, simulation, brain, chaos, Markov, self-organizing map.

Introduction

ON EDUCATION IN ARCHITECTURE AND COMPUTING

This Book

This is a book about research and education in architecture and information technology—an interplay between two species similar in kind, neither of them being in the least disciplinary: both affect everything, both are arts of gathering things. The one, 2,500 years old and dignified, and the other, just fifty years of age and impatient. You will acquaint yourself with that interplay at our chair at the department of architecture at the Swiss Federal Institute of Technology, ETH Zurich. While we teach both the bachelor and master curricula here, the one most interesting, challenging, and of particular promise is our post-graduate program, a Master of Advanced Studies in *Architecture and Information*—a full-time one-year class of about sixteen students. We embarked upon this program in 2000. Thus this book introduces it, and presents the research completed by the class of 2012.

Over the past twelve years, we looked into a broad array of IT applications, and ways of using it in architecture. We were scanning for new ideas of what might be done, being always already curious for the next thing. We were impatient, fast, and did not concentrate much on any particular application, nor take any to maturity. That was left to several spin-off companies. In-house we were constantly given to roaming this wide new field of research—explorations summed up in *Beyond the Grid: Architecture and Information Technology; Applications of a Digital Architectonic* (Hovestadt, 2009).

About five years ago, we ran into a substantial problem: everybody had begun using computers. The wide and open field was increasingly getting populated. Since the advent of social networks in particular, everybody was now feeling an expert, and our comprehensive and fundamental work quickly found itself out of date, and engulfed in a flood of rough and easy sketches. While the past had been about comfortably explaining to an interested few how computers might work for architecture, we abruptly ended up exhaustingly expounding to the uninterested many that were busy with computing in architecture that there were much better ways of doing things than the ones they stuck to. Very unsatisfactory. Many of my colleagues escaped into highly specialized research in far-off lands. As for us, we chose to go into abstraction, into thinking about the principles of architecture and those of information technology.

This book now presents that new complexion of our outfit, and a harvest of the first promising results by our students.

On Tradition and Architectural Education

In a disciplinary world compartmentalized into education and research, we do often forget what architecture is about. Therefore it may be well to recall—disregarding it is a cliché—that, according to Vitruvius, architecture's foremost reference, the well-educated architect should be "skilful with the pencil, instructed in geometry, know much history, have followed the philosophers with attention, understand music, have some knowledge of medicine, know the opinions of the jurists, and be familiar with astronomy and the theory of the heavens." And even as it is not possible for an architect to be an expert in all these various disciplines, it is nevertheless desirable that he or she be acquainted with them all; for all these studies "have a common bond of union and intercourse with one another," and "a liberal education forms, as it were, a single body made up of these members."¹ Today, an architect will find it difficult not to be treated as an expert, and to escape disciplinary. And yet, architecture is, along with philosophy, one of the very few professions that were never disciplinary ... are there any others? It is worth remembering that today's disciplines, along with the experts, made their appearance in the nineteenth century. And that, ever since, experts always know better. Let them be no experts. They are great knowers of whatever is around. But do they know where to go? Are they capable of engendering universal bodies of thinking (BoTs)? Not bodies in the congealed sense of "corpus," but universal bodies that are alive, quick, and motional?

The Beauty of Information Technology

Computers seem to be as universal as architecture, at least as long as they are thought of as abstract machines. But if, due to an improper notion of abstraction, they are perceived as mere—albeit fast—machines, they are frightening, having by now become superfast: just listen, e.g., to Paul Virilio in his *War and Cinema* (1989), *Speed and Politics* (1986), or *The Information Bomb* (2000), and you cannot help get scared. Or to Jean Baudrillard in *Carnival and Cannibal*, or the *Play of Global Antagonisms* (2010), or asking *Why Hasn't Everything Already Disappeared?* (2009). Why not, indeed? Trying to slow them down? Not a chance. Is that a satisfying scenario, one we'd want to play in? Or are we, conversely, not so much scared as fascinated by the power of computers as machines (i.e. not as abstract machines) and desirous to use that power for our projects? Then we are in for trouble: from resources, and from machinically driven competition by projects of the same kind. Once more there will be serious struggles about scarcities on a planet grown too small for us. How then to overcome such deadlock as seemingly besets our ways with computers? The simple answer is: by discovering that the beauty of computers lies precisely in their being not just machines. They are *abstract* machines.

As architects, as masters of architectonics, i.e. the art of putting things together, we therefore ask: What then are these new things, these computers, like? How are they talking to one another? How are they talking to us?

How to Read This Text

This text is fast, sketchy, and a bit intricate. However, we find it suitable to communicate our ideas in this form, today, rather than to shelve them until some fully fledged book, possibly a few years hence. Yet, sketchiness does not mean simplification, or stripping the topic; rather than being exhaustive, we mean to convey a reasonably complete overview of what—from our vantage point today—the future of architecture and information technology might look like. The text should be both challenging and promising. It does not lend itself to being “understood” in a classical sense, nor is it, in that sense, “consistent.” It lacks an explicitly coherent storyline. It is not a detailed analysis. And what might surprise: it is not, in the traditional sense, an authority-claiming doctrine or theory. It does not adduce other texts. All that would prove inadequately slow for its scope. The text does not explain, does not follow a solid historical line. But it does try to be a masterly articulated house of indexes. It is a contemporary piece of architecture-cum-philosophy. If you enter it, be welcome!

Read the text Sudoku-fashion. In the beginning, there will be few anchor points for you to understand. There will be a field of interdependent indexes. But that, we promise, will provide you some stability in the overwhelming amount of data around. Much better than solid in-depth analysis might do. You will comprehend much of the specific power of symbolic algebra, and its bearing. The power and speed that information technology is made of. It is super-abstract. This text is an evocative

MIRO ROMAN

FOUR CHAIRS AND ALL THE OTHERS

A THREE-DIMENSIONAL NARRATIVE

The *EigenChair* project ponders strategies and concepts of designing by using information technologies. What are the potentials of data-driven design? How can we think about objects once their materiality is diffused into indexical sets of data that need to be articulated in order to take on a manifest reality? How can we engage with objects once their models take an abstractly modular form that is open for infinite manipulation and endowment with capacities? For such an understanding of design, the emphasis is no longer on the creation of physical objects, but on conceiving meta-objects in the possibility space of abstract symbolic forms, and in placing them within narratives. Furthermore, data-driven design enables us to manipulate an abstract object's “resolution” rendered as an entire population of its instances. We no longer have to deal with one ideal object that is thought to represent, as pure typicality, its own original specificity. Yet how do we get such systems of abstraction to relate to the real world? Information technologies have opened up a number of new ways of thinking about the world and the object, and these novel ways of thinking have by far surpassed the formally simplified or parodied manner of expression in modern and postmodern design and architecture. Based on the intellectual heritage of history and culture in its symbolic richness, design by information technologies can explore a twenty-first-century notion of the object by instigating new circulations within this intellectual heritage, and by accumulating new ways of animating the “building blocks” of that with which we have grown familiar as a stale and common basis in the past.

talk. Therefore it is abstaining from reasoned judgments seeking consensus. It lays no claims to whatever truths. But you may find following its indexes attractive, as pointers into the wide world of architecture, philosophy, and information technologies. It tries to make you sense the beauty of a certain BoT.

If you are out for something similar in scope and gesture but with more detail, try the 2,000 or so pages of Eric Voegelin's *Order and History*, or, if you are looking for maximum contrast, the 1,500 pages of Manuel Castell's *The Information Age*.

ARCHITECTURAL MACHINES

Everybody an Expert. 1948: Cybernetics

Let us start by indexing computing's origin around the end of World War II, e.g., Norbert Wiener's *Cybernetics: or Control and Communication in the Animal and the Machine* (1948) or Claude Shannon's *A Mathematical Theory of Communication* (1948). There was cybernetics, claimed to be the “study of systems, such as mechanical, physical, biological, cognitive, and social systems,” as by the MACY conferences, intended to lay the foundations for a general science of the workings of the human mind (1946–53), or as



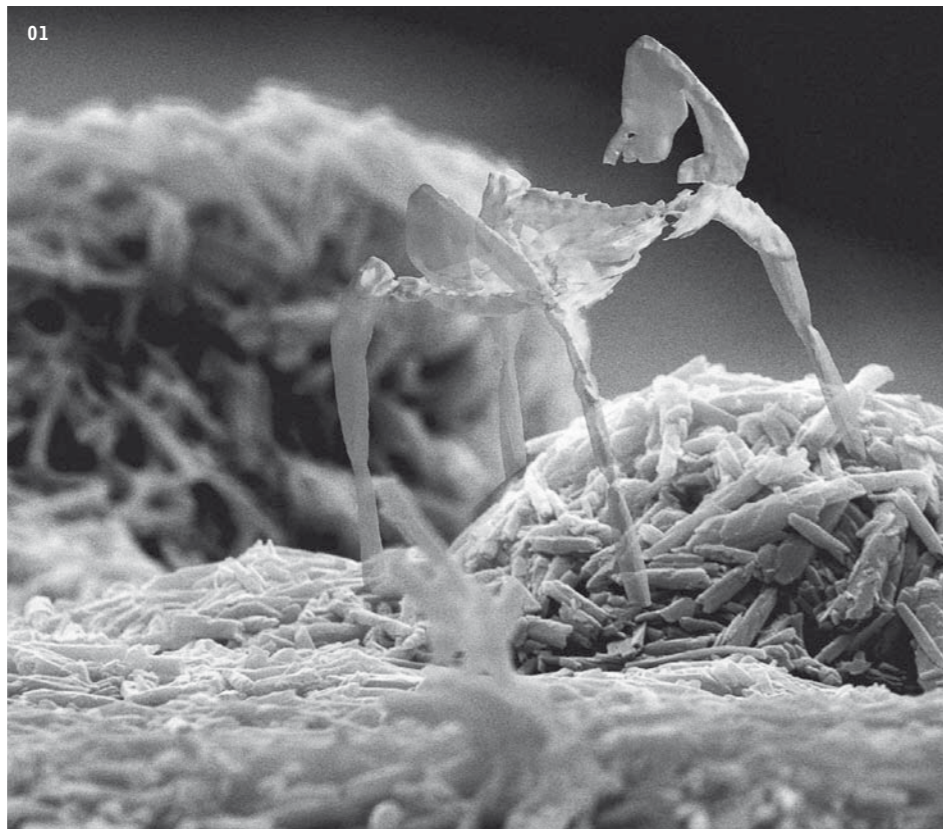
per Norbert Wiener, *God & Golem, Inc.: A Comment on Certain Points Where Cybernetics Impinges on Religion* (1963); or, escalating it a bit, by offerings with slightly uninhibited names such as *World-Systems Analysis* (Immanuel Wallerstein, 1987). There was also the military defense system called Semi-Automatic Ground Environment (SAGE, 1958), as the first network, and its civilian successor or counterpart ARPANET (1969), opening up onto the Internet, which in turn hosts the WWW (1990) today ... All this may be read up on elsewhere. We especially suggest a look at Lutz Dammbeck's film *Das Netz* (2004), about the origin of the Internet, and the story of Theodore ("Ted") John Kaczynski, the so-called Unabomber, infamous, and one of the film's lead protagonists.

To us architects, it may seem of interest to confront two contrasting attitudes taken vis-à-vis these developments. On the one side there is, e.g., Nicholas Negroponte's *Architecture Machine: Toward a More Human Environment* (1973), especially the experiment SEEK, a cybernetic habitat for gerbils, arranged and controlled by a robot through simple feedback loops. **That setup's architectural elements are simple blocks, their configuration controlled by simple rules, executed by the robot. The architecture is controlled as both to form and structure, internally and externally.** This we

The project *Four Chairs* and all the others opens up the possibility of an alternative understanding of design. Rather than offering yet another thesis in support of linear design development, it emphasizes design's polysemantic nature by understanding its processes in terms of an open field of possibilities. Design processes not only explore physical limitations of space, but also react to contemporary social and cultural phenomena. In order to explain the idea, specific techniques are used to replace simple design concepts with a series of parallel narratives, thus provoking new and unexpected situations. The primary interest of this project is to explore the intersection of different domains of human insight, especially regarding architecture, culture, and information sciences.

EigenChair is a concept that results from the effort to design a chair that continues the genealogical orders of designed chairs, and yet is carrying as a potentiality also all the chairs that might once be created in the future [FIGURES 01, 02]. *EigenChair* is not an *ideal* chair in the sense of pureness or prototypicality. It is *real* (and not *ideal* in the sense that it has a history, it originates and becomes, it must be regarded in the context of populations of chairs from which it evolves, and in the sense that it can be modeled by empirical experimentation by observing and testing). So it is a *real* chair, and yet it is an *abstract* chair! The project *Four Chairs and all the others - EigenChair* invents an investigative design process that proceeds by what might best be called "a partial summation of the reality-contents of ideas-as-models."

The prefix *Eigen* is commonly used in linear algebra, in compounds such as *eigenfunction*, *eigenstate*, *eigenvector*. It comes from the German word *eigen* which means "one's own, proper." The basic tool for the design of the population of chairs to be investigated in such a way—i.e. "all the others"—is the *Principal Component Analysis* algorithm (Abdi and Williams, 2010). It is a standard tool for contemporary data analysis that has been adapted in various applications according to diverse needs,



00 « Rendering to reality 3-D printed chair
01 *EigenChair* seen from an electronic microscope
02 *EigenChair* in the Vitra Design Museum Gallery

from neuroscience to computer graphics, and begins now to be applied in the field of design (Sirovich and Kirby, 1987; Turk and Pentland, 1991). *Principal Component Analysis* reduces a given data set to a set of *principal components*, i.e. *eigenvectors*. The key feature of this algorithm is the intersection and interconnection of all data, whose result adapts and changes according to the required point of view, i.e. according to interpretation attributed to the problem.

The interest of this project is to show strategies and concepts for designing with the use of information technologies. My research questions involve: how can we engage with objects once they take an abstractly modular form, and their manifest materiality is diffused into a set of data? What are the potentials of data-driven design?

ALTERNATIVE UNDERSTANDING OF DESIGN

DESIGN APPROACH

Radical views of the world and of society are today mediated through advanced technological systems. Thanks to—or perhaps due to—such circumstances, design seeks new ways of thinking and conceptualizing, as well as of producing objects and inciting feasibility. The "informationalization" of societal orders and the scope of applicability of computer-aided design tools are opening up a whole range of new manners of how to perceive the temporality and spatiality we inhabit. Algorithmic design is based on new parameters: design of ideas, narratives, procedures, populations, digital production, and new understandings of materiality. Generative design methods drive us to create and modify rules and systems, such that we are generating abstract machines: the products of such industriousness are not items of a set, but instances of a population that are one in kind, that of an abstract object. The designer

call a tyrannical setup, with no escape. And the gerbils, indeed, died soon of stress, and needed frequent replacement. We shall symbolize this constellation, of an internal necessity embedded in an external necessity, by (N)N.

On the other side, a little left out these days, the pedagogics of Itten, Kandinsky, or Klee, at the Bauhaus in the 1920s, which also uses few elements but opens them up to free negotiation: a constellation of internal necessity embedded in external contingency, to be symbolized by (N)C. We find this combination in the LEGO system (1949)—rather kits than system, because system creation happens subsequently based on the kits—or in the first electronic version of a kit, called Lectron by braun | Egger in 1967. As will be seen later, these kits are inversions of the Fröbel Gifts, designed before 1850, which throw open individual contingency, within a framework of external necessities (C)N, and that today, correctly and interestingly, ought to be called a system rather than a gift. But more of these discussions about the contingencies-and-necessities interplay later on. Suffice it for now to grasp a fundamental difference of approach toward systems, as in *Architecture Machine* on the one hand, and in the Bauhaus, LEGO, or Lectron on the other hand.

therefore does not manipulate the "artifact" itself, but rather the rules and systems that allow for generating and producing it. The emphasis is no longer on the creation of physical objects, but on conceiving meta-objects in the possibility space of symbolic forms.

RECYCLING INFORMATION

The postmodern condition equips us with a set of critical, strategic, and discursive practices which, as their main tools, use concepts such as *difference*, *repetition*, *simulacrum*, and *hyperreality* in order to destabilize modernist concepts such as *identity*, *linear progress of history*, or *unambiguity* (Aylesworth, 2013). In contrast to such a reactive point of view, an emerging condition which we call "pre-specific" ceases to focus on the representation or identification of existing "truths," and instead guides its interest to the filtration of attractive and promising approaches out of the plenitude of information. In order to avoid postmodernist tautological nihilism, the "pre-specific" paradigm approaches the abundance of information in an active manner. This paradigm also operates within the field of design. But it puts no longer the object into the focus of its investigation and research, but an object's characteristics, features, relations, ratios, structures, and its indexical context. The information age enables a redefinition of postmodern techniques such as *collage*, *assemblage*, or *bricolage*, all of which define an object by collecting and reassembling various aspects and fractal components. The newly created abstract object is now a fusion of different objects' constitutive data, but it is also completely unique and independent in the forms it can take from any one object in particular. The project *Four Chairs and all the others - EigenChair* is an example of digital recycling: it brings information and data of chairs into new manners of circulating, accumulating, integrating. [FIGURE 03]

ELITISM AND EXCEPTIONALISM OF SINGULAR OBJECT VS. INDIVIDUAL POPULISM OF GENERIC OBJECTS

So far, design understood its practices as dealing with individual objects, their

typicality, their specificity. Design was interested in the paradoxical invention of "ideal objects," which are to be original, and yet specific. Such an approach was closely related to the modernist paradigm. Today, however, the emphasis is moving from designing ideal objects to designing the ideality of real objects—the ideality in reference to which an object can be designed as *singular* and *generic* instead of *original* and *specific*. The new paradigm changes the designer's relation to an ideally static reference for his objects that are to be original, by putting an emphasis on conceptualization, interaction of the components, systems, and processes within the referential framework of an object's ideality. What was once the design of a perfect, unique object featuring specific materiality is today the design of a population of objects featuring (potentially) *any* materiality. Instead of a specific object, the designer creates an algorithm. Elitism and exceptionalism associated with the idea of an object's originality is replaced by "individual populisms" associated with the reality of *generic* objects, and the attractiveness they are capable of unfolding. The key role in design is taken over by generative systems (syntaxes and grammars) that offer evaluable methodologies and theoretical worldviews (the "contents" of ideologies—literally the "logics of ideas") as frameworks that instigate dynamisms that distribute processes by multiplication, rather than by unification. The design process becomes an abstract definition of algorithms. Hence in this project, the focus was not on designing a "perfect" chair, but on engendering a whole population of chairs. Instead of creating a parametric master model, indexes of all objects are correlated to a framework of a possibility space—to a Pre-specific mode.

IMPOSED MATERIALITY

In generative object design, the particular materiality of an object is not a precondition for its final manifestation. The choice of materials to work with has so far served as the basis for determining the design process, defining the expected execution of

1989: From Expansion to Connectivity

Cybernetics expansion reached its global limits, and ended with the demise of the Soviet Union and the end of the Cold War (1989). Arguably, information technology found new bearings in the wake of the so-called dotcom bubble in 2000. From then on, computers were no longer understood as “symbolic machines” but increasingly as an infrastructure for applications, called the “global network.” Mobile computing, services, and social networks emerged, combining toward a new basic order.

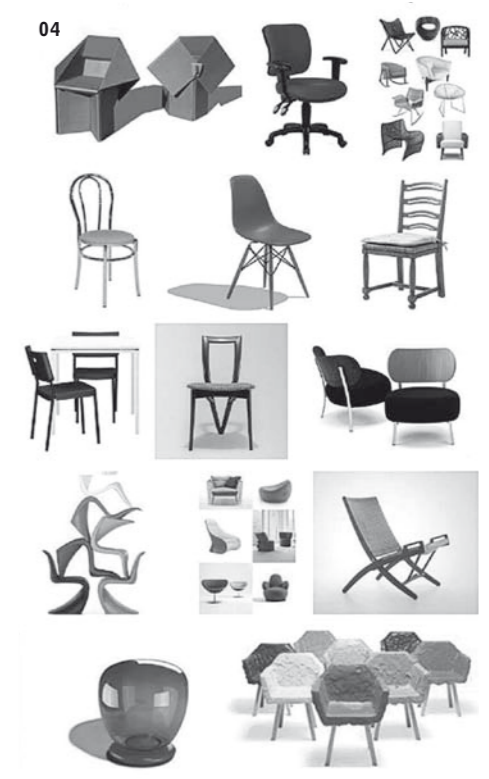
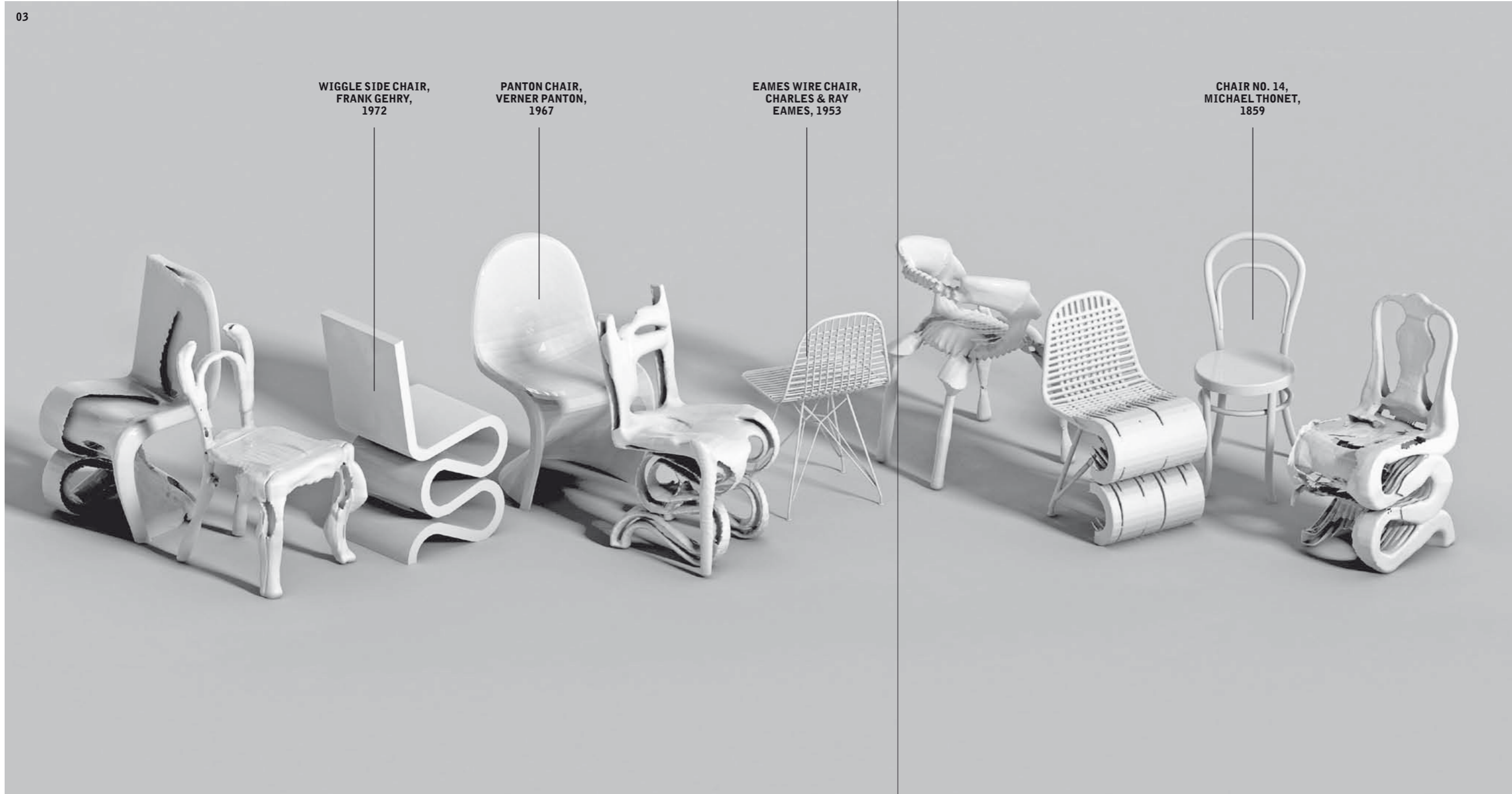
There is a very illustrative metaphor of the change undergone by the notion of technics and our look upon our world. In 1969, Apollo 11 gave us the first picture of our planet seen from another planet, the moon. The total world within one technical picture. A one-shot reflection of the complete world, from an outside perspective. An internal and external necessity (N)N. In contrast to that, only forty years later, in 2009 the lot of us are rendering our world: using Google Earth. The single Apollo picture is replaced by a symbolic surface of trillions of indexes for all things used for explicating our world. The 1969 single outside *reflection* produced by one man, in 2009 gets replaced by an inside *projection* produced by everyone. And today’s Google-perspective-induced question

² Vera Bühlmann. *Inhabiting Media. Annäherungen an Herkunft und Topoi medialer Architektur* (PhD diss., 2009), published online: <http://edoc.unibas.ch/1354/>.

would be: is there still an internal as well as external necessity, as was the case with the Apollo view? An (N)N? Or may we abstract from our Apollo view, and cultivate the ground prepared by Google, in a free and open way, by negotiating the contingencies in an (N)C setup?

Indeed. Following the break marked by the advent of social media, we are drastically shown how everybody and everything feel themselves experts. Which is great, because we do need political articulations, identities that take responsibilities, dealing competently with the contingencies of our world. But sympathy toward all co-experts in social media still does not mean everyone is indeed navigating the depth of serious applications. Or playing masterly. Whereas our own subject is in-depth cultivation of the new symbolic ground. Or, put figuratively, and quite down architects’ alley: How to settle down? Or: *How to inhabit media?*²

With such queries in our mind, there arises the question about the actual state of mainstream computing in architecture. We would say, tentatively, it is at least twenty years behind times—which is something every generation might throw at the younger generation. We ourselves were caught up in that phenomenon: as researchers in 1990,



03 Four Chairs and their fusions
04 Four Chairs and all the others

we were up against the mainstream-architecture bias alleging that to us computers were machines. They were not; we worked on abstractions, but that's how we were perceived. Today the coin has flipped: in 1990 architecture denied computers were machines, today it vehemently affirms they are. Therefore our diagnosis is: even as the new field of architecture-cum-computing is so built-over today, the same, unchanged absence of abstraction still prevails, the same lack of basic insight into the "nature" of computers, which then makes cultivating the "Google planet" difficult, as it does staying out of the functionalistic game of implementing the necessities-driven global economical infrastructures.

THE GENERIC AND THE DEADLOCK

Back to the architectural discourse. As one of a very few, Rem Koolhaas acknowledges this situation (1995): "The great originality of the Generic City is simply to abandon what doesn't work—what has outlived its use—to break up the blacktop of idealism with the jackhammers of realism, and to accept whatever grows in its place. In that sense, the Generic City accommodates both the primordial and the futuristic—in fact only these

details, connections, and textures. Today, generative system design enables the imposition of materiality to each instance of an abstract object. The form, no longer complementary to certain materials, can now be attached to it by mere use of intellectual control. Therefore, the objects, previously described by *fixed* geometries, can now be variously described by relative geometries that can be rendered into reality in any materiality. If one wishes to fully automate the entire production chain, the abstract object can materialize through 3-D printing.

DESIGNING NARRATIVES

By rethinking the notion of "good design," one comes to the conclusion that design is just a tangible fragment of reality, which narrates one of the many stories that surround us. Design never appears in silence. What we call "good design" nowadays is imbued with a series of narratives constructed by different discourses: formal, ideological, psychological, and theoretical. It is only one part of the design process that is constituted by the object's material and formal aspects, while most of it is built upon stories that describe the object, and upon the individuals who transfer the stories or identify with them. Therefore, besides designing an object, it is also necessary to design a narrative that defines the object's ambition in terms of how it will become meaningful.

The research focus of the project *Four Chairs and all the others* is the design of a chair that does not carry on the heritage of originally iconic or functional pieces of furniture, but a generic heritage that cultivates information about "all chairs ever created". For this, the term *EigenChair* is used—to describe partial summations of the embodied realities of ideas-as-models, i.e. the "realities" of particular chair designs that are elected as actors in the design narrative. The algorithm database contains a large amount of "other chairs." Their fusions enable an infinite variety of possible results. In order to achieve a certain control over the results, out of "all other chairs" we have chosen four particular chairs that will provide the basis of



two. The Generic City is all that remains of what used to be the city. The Generic City is the post-city being, prepared on the site of the ex-city." Far from throwing up a theory, or claiming to have a way out, Koolhaas is dealing with the paradoxical situation where things are made worse by trying to make them better, or by thinking up well-intended projects, doing deficit analyzing, letting oneself be guided by empathy, and carefully avoiding making mistakes. Yet, that does not mean that acting less, not at all, or even mistakenly might be more helpful, let alone be a way out of the paradox. Some jam. Koolhaas's tone is sarcastic, but he owns up to the problem like no other prominent architect. The planet gets balanced, entropic, generic ... with necessities-informed global economical infrastructures, (N)N.

That's it, within the Generic City, we might say. And as you are stepping out, you step into another game. The way out of it is abstraction. *Simply start to cultivate* the Generic City, Junk Space or—less sarcastically—the natural order, and begin to negotiate our cultural sediments, celebrate contingency, and engage in politics. We should refrain from thinking of ourselves as living in some given nature. Rather, instead of gathering beneath some overarching absolute world spirit, some *Weltgeist*, or indeed Nature, i.e.,

recognizability in the dramatization of the object in the particular narrations. Fusions of characteristic parts of those four chairs with all the others are defined by user-made maps that define the transformations, upgrade the performance of the *Principal Component Analysis* tool, and enable the control of the result [FIGURE 04]. The project *Four Chairs and all the others* has elected four iconic chairs: Thonet's *Chair No.14*, *Wire Chair* by Charles and Ray Eames, *Panton Chair*, and Ghery's *Wiggle Side Chair* (Vegeasack et al., 1996). Their main mutual link is specificity and uniqueness of the materials, and the respective technological innovation in the context of which they had been designed. It is the richness of meaning and historical references of these examples that are responsible for enabling us the further creation of analogies, stories, and narratives, which, in turn, fertilize the viewer's active participation in the process of visual representation [FIGURE 05].

MULTI-DIMENSIONAL VECTOR

TECHNICAL APPROACH

The project *Four Chairs and all the others* deals with options of manipulating data, and thereby engenders new objects. It takes a whole library of chairs as its starting point; that is, their geometric and spatial characteristics along with their historical importance and their narratives. By using open-source 3-D models of chairs from the Google warehouse, their geometry is appropriated through a set of algorithms, on which the *Principal Component Analysis* algorithm is applied to calculate fusions, mergings, and manipulations from the input information, from which new objects can be generated and produced. The result is a population of objects that are over-coding cultural and historical space-time relations

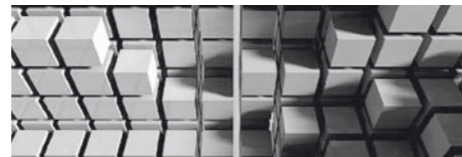
under the primacy of space and time, we find ourselves expelled, and thrown to the primacy of our intellect—in circumstances symmetrical, but in abstraction toward, those of the likewise expelled Greeks, or the Renaissance man. As they did, we also step out onto a new stage, the one of generic infrastructures. Rather than dwelling in generic cities, we can now perform new, abstract, masterly plays on our new stage.

Thus flips our self-perception. We no longer ask, as does Koolhaas: “What is left after identity-stripping? The generic?” Rather, we see ourselves as intellectuals, as beings bored after three days. Which is just the opposite of the emptiness of Natalini & Toraldo di Francia’s Superstudio, or Kubrick’s *Odyssey*. We suddenly awake in a jungle of primary intellectual abundance, with the whole wealth of all the masterpieces of our ancestors around to engage with.

The Skeleton

This text argues in a mathematically inspired algebraic way. We do know that we are not able fully to comprehend the masterworks of the world around us. On principle,

06



HIGH-RESOLUTION ISO SURFACE MESH

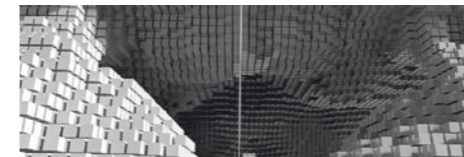
sizeOfVoxels	-4.5
numberOfVoxelsX	-125
numberOfVoxelsY	-111
numberOfVoxelsZ	-201
numberOfVoxels	-2788875

LOW-RESOLUTION ISO SURFACE MESH

sizeOfVoxels	-30
numberOfVoxelsX	-18
numberOfVoxelsY	-16
numberOfVoxelsZ	-30
numberOfVoxels	-8640

LOW-RESOLUTION VOXEL MESH

sizeOfVoxels	-30
numberOfVoxelsX	-18
numberOfVoxelsY	-16
numberOfVoxelsZ	-30
numberOfVoxels	-8640



HIGH-RESOLUTION VOXEL MESH

sizeOfVoxels	-4.5
numberOfVoxelsX	-125
numberOfVoxelsY	-111
numberOfVoxelsZ	-201
numberOfVoxels	-2788875

05 « *EigenChair* in *Alice in Wonderland*—Tim Burton’s movie (2010)
06 *EigenChair* potential for geometrical manipulation

we are convinced we can’t. And we know there are lots of such masterworks, of all times, and of all cultures. Thus, instead of analyzing just one, or a few of them, in depth, we try to establish our own skeleton of thinking, by working out axes of symmetry between masterpieces. Thereby we can find invariances, and gain stabilities for our BoT, from nothing but the masterpieces themselves. Stability no longer depends on any external reference. Such external references, and their use as anchor points, would perforce entail a certain blindness. With the help of our skeleton, however, we are free to move within the richness of our world. Algebra lets us create the identity of our own BoT, and thus unshackle ourselves from the constraining logic imposed by some allegedly natural order. So let us slowly work out how a skeleton may be built.

SOCIAL MEDIA

First some introductory remarks, using again Google as an example, because it has a lot to do with the approach we mean to establish. As may be inferred from the introductory argumentation, this implies first media-izing, and then cultivating the social media. So,

through the imposition of logistic networks. The final objects are entirely a product of mathematical and logical thinking, designated according to a particular aesthetic sensibility (mine). The identity of the object is engendered by pure intellect, and contingently rooted in historical and cultural legacies. The main algorithm, which technically organizes the whole project, is the *Principal Component Analysis* algorithm.

LOGICAL STEPS

The initial step was to normalize and prepare the data of all the chairs. In this case study, due to computational limitations, a total of twelve chairs were used as a testing data set. All data had to fit in the same bounding box, and mesh vertices were equally distributed throughout the mesh.

The whole procedure consists of three main parts. The first part is the *Algorithm for Voxelizing Polygon Meshes*. This algorithm transforms each mesh into a voxel-based object defined by a one-dimensional numerical array list, i.e. a multidimensional vector. In case of the highest resolution, each chair is represented by 2,788,875 values. Each value marks the distance between the given voxel and the closest mesh vertex. Values for each chair are exported as separate txt files, in order to reduce computing time of the main application.

The second part is the *Algorithm for Morphing Chairs*. The base of this algorithm consists in the multidimensional vectors generated by the *Principal Component Analysis*. The goals of *Principal Component Analysis* are (1) to extract the most important informational aspects from the dataset, (2) to compress the size of the data set by keeping only the important informational aspects, (3) to simplify the description of the data set, and (4) to analyze the structure of the observations and the variables. In order to achieve these goals, *Principal Component Analysis* computes new variables, called *principal components* or *Eigenvectors*, which are obtained as linear combinations of the original variables. The *first principal component* is required to have

the largest possible variance. The second component is computed under the constraint of being orthogonal to the first component, and thus needs to have the second largest possible variance. The other components are computed likewise. [FIGURE 06]

According to the size of the initial bounding box, a voxel-based space is created. Each voxel receives values from txt files exported in the first step. With the use of *Principal Component Analysis* we can represent each chair by using only a set of so-called *eigenweights*, e.g. (-5673, -85184, 50, -25533, 31594). By changing the values of the *principal components*, i.e., the *eigenweights*, we are able to achieve linear transformations between all the chairs.

The third part is the *Algorithm for Mapped Morphing*. It is an upgrade from linear *Principal Component Analysis* transformations to mappings of nonlinear transformations. An RGB map, in which each color represents a particular chair, is projected onto the voxel-based space. This enables us to define and control the nonlinear transformations and fusions of three different chairs into a new one. Thus created, chairs can be used again as input chairs for the second step, and achieve a new nonlinear variability.

The rest of the algorithms served to prepare the data for *Principal Component Analysis* and to help with their final visualization. Furthermore, an important role was played by a series of open-source libraries, especially the *Marching Cubes Algorithm* (Lorenson and Cline, 1987), responsible for generating watertight mesh objects ready for 3-D printing. All codes were written in the Java programming language.

Bearing in mind the thoughts presented in an earlier part of this text regarding re-entailment and recycling, it is important to note that the algorithms used in the project, e.g., the *Principal Component Analysis* algorithm and *Marching Cubes Algorithm*, are already and widely in practice. They are thoroughly adapted, functionally redirected, recycled, to fit the needs of design in this particular project. [FIGURE 07]

how does Google work? It's about how to get onto one single screen the world's complete knowledge relating to any particular question. The principle for doing it is strikingly radical and simple, and may be explained in a rather elegant but—we must warn you—slightly unusual way.

1. Defer understanding it all. The established dichotomy of signifier and signified doesn't wash. Indexes are pointers without significance. Forget about content. Indexes are what you care about, and through them you deal with whatever content. Content is with the questioner.
2. Renounce answering questions. Just tender indexes surrounding that question. It's up to the questioner to work out the answer to his question. He has the content, whatever it is. He must compete with the masterpieces, articulating is up to him, whatever it is. And the simplest and most sketchy way of articulating the answer is by selecting a certain index. Or the questioner goes fishing by throwing out some circumscribing indexes. Google recognizes these answers, and shifts its whole world of indexes a little in their direction.

ARTICULATING INDEXES

THEORETICAL APPROACH

INFORMATION

The key term that best describes and corresponds to what characterizes, overall, contemporary society and science is information. Information technologies are entering all spheres of society: from the ways in which we organize our everyday life, to the ways in which we think about natural sciences and humanities. This view suggests the inadequacy of understanding human environments in predominantly material terms and physical relations between energy and matter; in order to create a more comprehensive worldview, analysis must take into consideration also information as a quasi-material category. At the same time, being surrounded by excessive amounts of information, any analysis requires a stable environment, which enables its observations and uses.

REFLECTIONS ON THE REAL

It is impossible to comprehend or examine exhaustively what is to be considered as "real," because such consideration depends upon the quantization and formalization of ideas. Hierarchies and the relations between originals and their copies, which is the key concern of materially oriented societies, have become almost completely irrelevant in an age in which virtual realities dominate human lives. Depending on the ways of our understanding and capacities of accepting the "unfamiliar," we comprehend and legitimize what is to be considered as real. Brian Massumi is perceptive to this in a multifaceted way, by comparing Baudrillard's interpretation of the reality-simulation, in which there is no division between the real and the virtual, with Deleuze and Guattari's negation of the linear approach to the real. Such a non-linear approach to reality is supported by the vanishing of boundaries, and the influence of the virtual on the real.

"Baudrillard sidesteps the question of whether simulation replaces a real that did indeed exist, or if simulation is all there has ever been. Deleuze and Guattari say yes to both. The alternative is a false one because simulation is a process that produces the real, or, more precisely, more real (a more-than-real) on the basis of the real. 'It carries the real beyond its principle to the point where it is effectively produced.' Every simulation takes as its point of departure a regularized world comprising apparently stable identities or territories. But these 'real' entities are in fact undercover simulacra that have consented to feign being copies."

MASSUMI, 1987

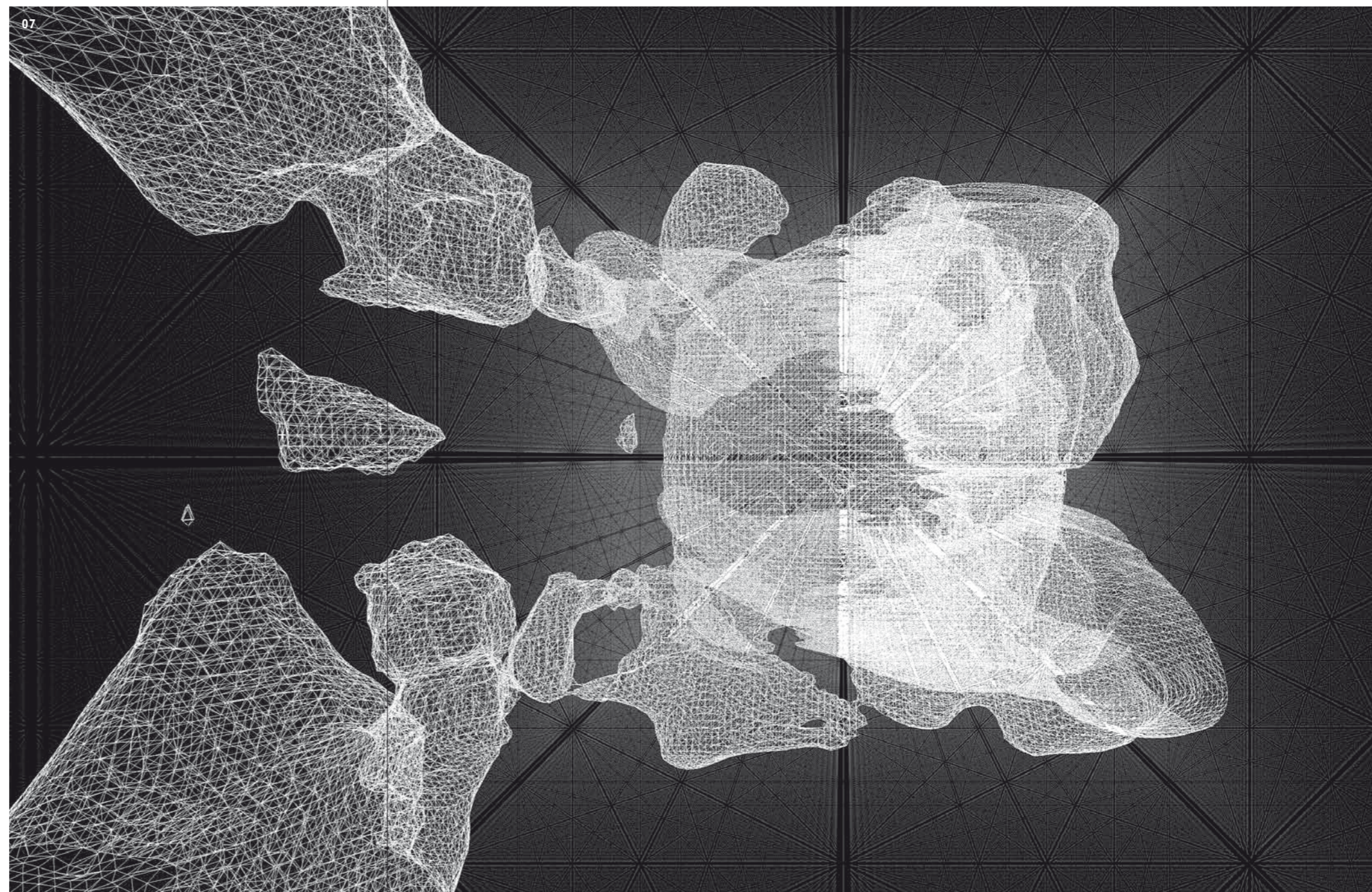
ABSTRACTION

The "Internet age" is exactly such a condition, in which immaterial information is part of what we call reality. In other words, there is a peculiar reality proper to models, even if they are, necessarily, idealizations. In such a condition, the only way of dealing with information is abstraction, and it can be adequately used only by those who are, in a mass of information, able to define their contexts as flexible, adjustable fields of possibilities with polyvalent, and ultimately undecidable, meaningfulness. The project *Four Chairs and all the others* considers the creation of abstractions of objects to a degree that multiplies the manners in which objects can be manipulated beyond any definite bounds, and by this, it considers how new meanings can be provoked from the abundance of information. If objects—chairs, or entire populations of objects—are assigned an abstract expression, as multidimensional vectors (i.e. as a series of numbers in a line, as indexes to what can be linearized) they become very potent and can be manipulated in manifold manners. Such abstract objects, which consist of nothing else but indexes, are placed in a meta-space that contains the summation of the potentials of all the objects which are constitutive for this meta-space. FIGURE 081 Governed by the *Principal Component Analysis* algorithm, meta-space is able to correlate indexes of all objects, creating

In this step-by-step way, social media build the contentless index of the world's content. It is all about infinity, inversion, and negation, and so the BoT characterized by signifying and *functioning* is shed, and one of indexing and *operating* is being taken on. I dem with Wikipedia. Of course! Let's give it a try: a Wiki presents indexes around questions, instead of answers. And instead of selecting, as in the case of Google, you will write, encircling the answer. The answer, on principle, it not there. That's it. No meaning. No answer. Therefore Wiki contains *anything*, instead of *everything*. You are complaining about insufficient or faulty content? Great! Be welcome! Contribute! That's the game. Today, in 2013, one might—pushing it perhaps a bit—characterize Wikipedia as the "consensus" of the second league in its attempt to understand the first league, the masters, who in principle elude full explication. Which is great! But in clear contrast to the encyclopedists, who "defined" the first league of their time, in the eighteenth century.

ABOUT THEORY

So, let us give it a try with Wikipedia, on a question about the meaning of theory. According to the English Wikipedia (en.wikipedia.org, June 2013), "Theory is a contemplative



and rational type of abstract or generalizing thinking, or the results of such thinking. Depending on the context, the results might for example include generalized explanations of how nature works"—or even how divine or metaphysical matters are thought to work in philosophy and theology. Wow! A "generalized explanation of how nature works." Theory as a manual for putting together a toolbox useful even on metaphysical stuff. Among those toolbox appliances, generalization seems to be of particular interest. It is prominently used three times in the introductory paragraph, and obviously tries to reduce the contrast to one of our most important concepts: abstraction. Our algebraic approach maintains that abstraction refers to that which is common to several entities without being part of any, as opposed to "general," meaning parts that are common to some entities. To sum it up, English Wikipedia tries to keep the notion of "something that has no common parts" out of the game of theory, by jumbling it together with generalization.

Hereafter comes German Wikipedia, presenting a striking contrast: "Eine Theorie ist ein System von Aussagen, das dazu dient, Ausschnitte der Realität zu beschreiben, beziehungsweise zu erklären und Prognosen über die Zukunft zu erstellen." In this case,

thus an open logistic network, an abstract possibility space. This marks the level of how heterogeneous objects might be articulated as an abstractly engendered kind, and it allows for the generation of entire populations of singularly particular objects which all belong to the same generic "kind." By looking at objects through the levels of their abstractions, we realize the potency of information (in meaning and shapes, with which we can work), but at the same time we realize the sheer emptiness that is proper to abstraction, when we regard it on the symbolical level of indexes alone.

MEANING, CONTEXT, AND NARRATIVE

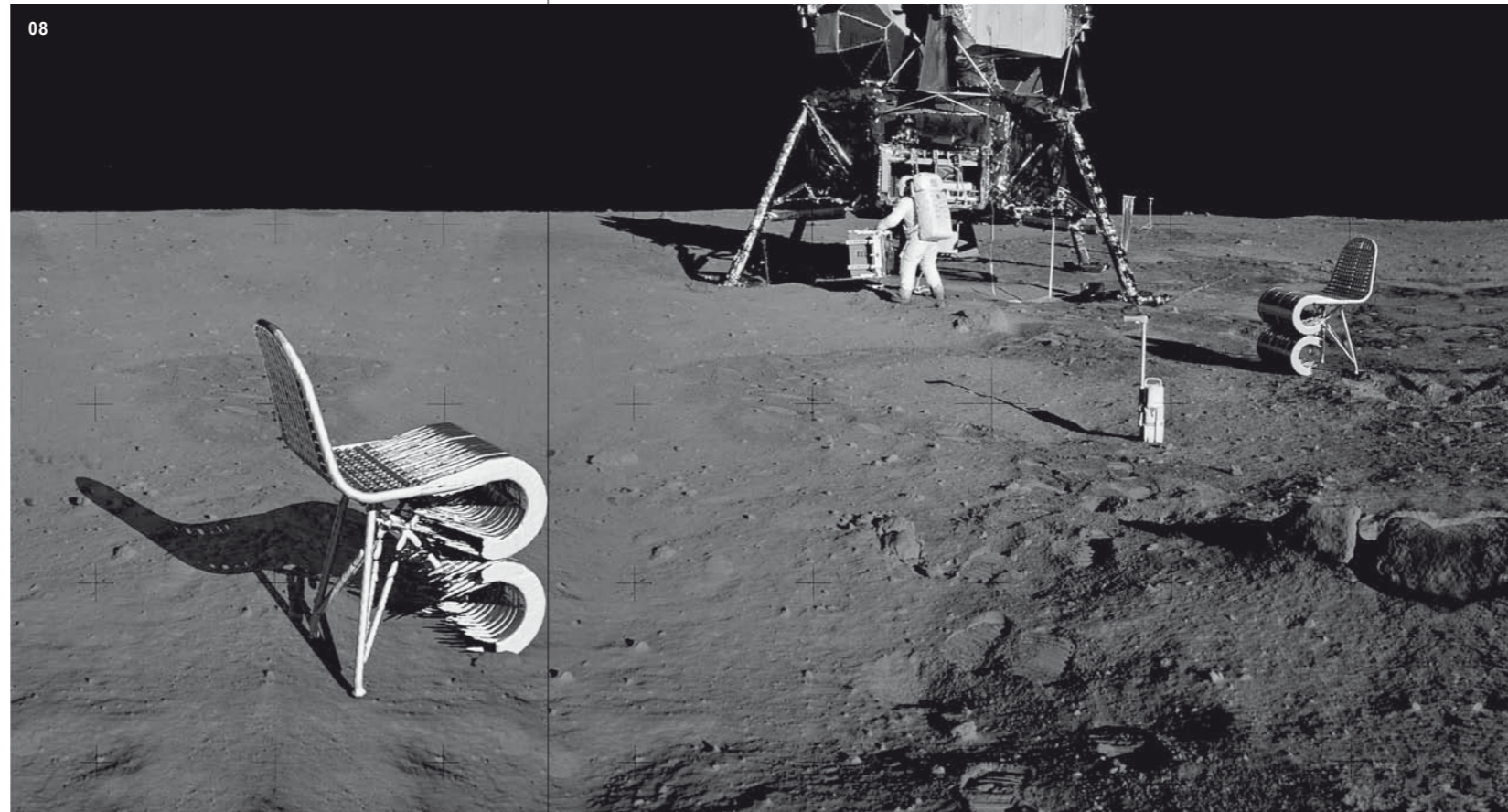
Post-traditional societies (societies that embrace modernization) offer new perspectives on old concepts to which new meanings are attributed, or which are judged critically, by negotiating their discursive contexts. The mass of information shapes our world: text, visual representation, music, money. However, the idea offered by the information-theory pioneer Claude Shannon, namely that "information does not itself carry meaning but transmits messages," has become rather liberating in the academic discourse: in carrying no meaning, information offers unlimited freedom of manipulation. It is important to emphasize that contextualization and the successive creation of narratives inevitably "fill in" the void of information (its constitutive meaninglessness). Contextualization and narration gain power by carefully gathering evidence (real data) for what they are meant to comprehend. At the same time, they take care that the larger contextualizations and stories in which they claim to be embedded rely on the collective reality and memory of culture and history. It is also important to note that in the process of contextualizing generic instances, by composing their proper narratives before they are actually generated and produced, there is a whole world of possibilities from which one actualizes only a fraction. Yet the effects of such "reductionism" are not to impoverish, but to maintain open the potential for novelty and for the unexpected. This project shows that

design is able to manipulate predetermined potentials, while filling them, at the same time, with narratives. Design is not a part of the endless evolutionary process aimed at creating the next new ideal object, but a part of a defined context with chosen references, and their respective genealogies. [FIGURE 09]

EIGENCHAIR: DATA-DRIVEN DESIGN

By using information manipulation and various spatial conceptions, algorithmic design approaches an object in a completely abstract manner, distancing it thus from its own immediate "reality". In making the object extremely flexible for different interpretations and contextualizations, algorithmic design also contributes to the instability of its design process: lacking the resistance of material constraints, designing an object could easily be reduced to a formalistic geometry exercise. Therefore, a key feature of such an understanding of design is not only the definition of algorithms, but also the construction of parallel narratives around the object. It seems therefore inviting to re/turn to the postulates of the pre-Socratic philosopher Empedocles, who claimed that "nothing comes out of nothing and nothing disappears into nothing." Such philosophical re/turn marks an effort to observe context and processes as more important factors for defining the object than those implicit in the Objectivism (Terzidis, 2012). The advantage of procedural design in our contemporary world is its ability to refer to partial summations of global knowledge, and to use it effectively.

This project tries to show—by conceiving and shaping the idea of a chair for the early twenty-first century—the necessity of perceiving design through three equally important, interdependent aspects: design, theory, and technology. Design is now data driven. [FIGURE 10]



"a theory is a system of propositions, which serves to describe or explain clips of reality, and to build predictions about the future." Theory is not thought of as a toolbox, but as an environment for negotiations.

The contrast couldn't be greater: generalization of parts of things vs. partless abstraction of things. The "English" theory evolves around an inner necessity, the "German" one within an environmental or external necessity. In physics, the English notion of theory may be found, e.g., with Newton, the German one, e.g., with Lagrange. Mechanics and Dynamics.

Our approach is aimed at applying abstraction to the "English" and inversion to the "German" theory concept. Whatever it may be. To start with, that's what we think cultivation of the global generic infrastructures turns upon. That approach encompasses generalization in a manner the "German" theory notion is blind to, as it does abstraction, which the "English" notion taboo-izes. Rather than mechanical or dynamical lines, we'll follow quanta, or points of probabilities (more about this later).

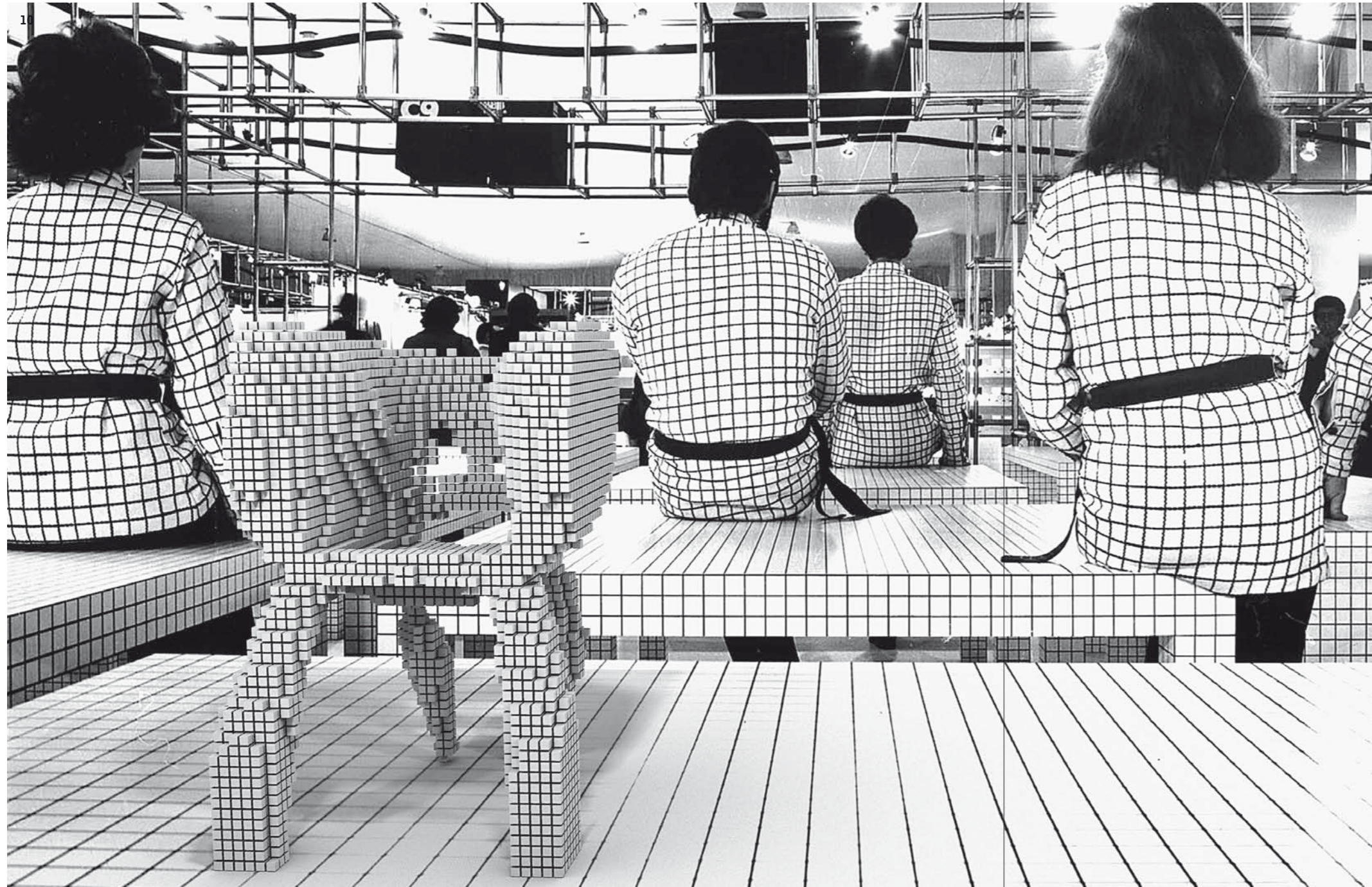
It is important to remember that our object is not establishing a new definition of theory. It is the working out of contrasts, and learning from what such contrasts

- 07 « *EigenChair* in meta-space—possibility of interconnection and interrelation of all active data
- 08 *EigenChair* in Apollo 11 Mission (1969)—Aldrin unpacks experiments
- 09 Rendering to reality—3-D printed chair—simulating decomposition
- 10 » *EigenChair* with Superstudio (1966)

may tell us. There is no dearth of other interesting language games comparing theory definitions in different sciences, for sure. But these two shall suffice for our present purpose.

ABOUT MASTERSHIP

In a similar vein, we shall now address the concept of technics. We'll then discover it presents an interesting morphological turnabout: with the pre-Socratics of the fifth century BCE, *technitēs* relates to the *mastery of the craftsman*; with the near-contemporaneous sophists *tektainomai* relates to *mastery of convincing talk*. Plato, in the 4th c., oriented the game toward *téchnē*—which addresses the skills around the purposes of an object—in a predominantly theoretical sense. And Aristotle, in the 3rd c., uncouples the *mēthodos*, the controlled procedure, from the *téchnē*, the ability to create an artifact. What interests us is the inversion from—putting it succinctly—the “mastery in creating objects” (5th c.) to “objects presenting mastery” (3rd c.). In the 5th c., “mastery” is necessary and objects are contingent, whereas in the 3rd c., “good objects” are necessary and mastery is contingent, which we would symbolize as: (C)N vs. (N)C.



Comparing that with the differing definitions of theory between English and German Wikipedia, one tends to assume that the “German” BoT is more comfortable with the 5th-c. notion of technics, and the English BoT more so with the 3rd-c. one. One directly finds this confirmed when, e.g., the English Wikipedia states that *téchnē* “was not concerned with the necessity and eternal a-priori truths of the cosmos, nor with the a-posteriori contingencies and exigencies of ethics and politics. ... Moreover, this was a kind of knowledge associated with people who were bound to necessity. That is, *téchnē* was chiefly operative in the domestic sphere, in farming and slavery, and not in the free realm of the Greek polis.” And here we are, *avant la lettre*, in the middle of the Koolhaasian Junk Space. Perhaps we can go along with the second part of the quote, but we take strict exception to the first: technics, theory, intellect are affine to the cosmos; technics plays its own part in the game of contingencies and politics, but it is not a reductionist, romantic story about freedom and slavery, as is associated with a criticism of *téchnē*. *Téchnē*'s playground must be elevated to a more abstract league, if we are to cultivate the Junk Space.

Such are the reductionisms we mean to oppose. The exemplary inversion from the pre-Socratics to Aristotle should not be read, as is usually done, as a progress story,

where one content of a concept is replaced by a better one. It should be read as a rotation, inclusion, and inversion, by which both the “mastery of the craftsman” and the “talk of good objects” and the “convincing method” are indexed by the algebraic symmetries, aforementioned. Just indexing; no tries for deciding, no need for judging. All we do need is stability, and with algebra's help we can preserve the richness.

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ABOUT LEARNING

Now, do you find all this unnecessarily complicated? It can't be otherwise, really: because people always were clever, because they always included the whole into their masterpieces, and because they always wanted to measure themselves against the masterpieces around. Indeed, the wide-spread fantasy of, and yearning for, a simple, easy-to-understand description of our world strikes us as a bit astonishing. In developing our masterpieces, we struggle, contend, and measure ourselves against the masterpieces of our species. Simplicity is for beginners.

So, what is a masterpiece? Masterpieces are achievements that are beyond what oneself, or oneself's environment, is capable of—achievements of which one doesn't know what it is that makes them better, or how that was accomplished. Thus no matter what the field, or what level your own mastery, in relation to that of others there is always blindness involved. There is no common reference nor common denominator. But how to go about learning, then? There is an “art of learning”—it's called mathematic(s). Mathematic(s) is not primarily about complicated forms, numbers, and formulas. Mathematic(s) articulates most explicitly what BoTs and what mastery are about.

For our purpose, it is interesting that there is a distinction in mathematic(s) between geometry and arithmetic on the one hand, and another between logic and algebra on the other hand. Geometry is *investigation of forms*. Which may be seen as the primacy of things in how they can be perceived, over the question of what they are. Arithmetic is “calculation with numbers,” which is an investigation “behind the scenes” where the question of “what things are” is primary, and supersedes their actual formal expression. So we may further stabilize our symmetry: geometry is on the (N)C side, arithmetic on the (C)N side. Any masterpiece needs at once geometry and arithmetic, whereby at times stability is on the geometric side, and at other times on the arithmetic one. With Euclid, e.g., stability is centered upon geometry—we are in the 3rd c. BCE—and the concept of technics, e.g., is one we discussed for Aristotle. We find the same setup in the 16th–17th c. CE, just as we did, in a preceding chapter, in today’s English Wikipedia. Stability centered upon arithmetic is found in pre-Socratic thinking relative to technitnēs, around the 5th c. BCE, with a corresponding appearance in the 18th–19th c. CE, or in today’s German Wikipedia.

All this sounds rather speculative, but let us take it one step further: *logic is investigation of correct conclusions*, while algebra is resolution of balances, or indeed “solution of equations.” Whereas logic may be assimilated to geometry of self-reference, algebra may so be to arithmetic of self-reference. Geometry and arithmetic are on the root level, logic and algebra on the transcendental level, of understanding masterpieces.

This manner of putting it is just ours, and most of today’s history-of-mathematics experts will contend that it is picking a wrong schema, and then oversimplifying it, to boot. This may be countered by the argument that most of today’s pertinent literature is geometrical and *logical*, and has achieved an enormous diversity and complexity. Particularly in the 20th c. Whereas, by contrast, our game as presented here is geometrical and *algebraic*. While admittedly not compiled by a mathematician, it draws great compactness and elegance from bringing in algebra. We’ll see what it will let us do.

Our question was, how can we learn from masterpieces around us, while acting from within our specific 21st-c. setup. As our discussion of the generic showed, there is no explicating foreign masterpieces through geometry and logics. Nor is there, our answer goes, through algebra and geometry. But algebraic self-reference can be used for stepping out of today’s geometrical generalisms, out of what Koolhaas called Generic City and Junk Space. And there is the hopefully reassuring observation that this situation is anything but new. Similar configurations prevailed around the 16th c. CE, and during the 5th–3rd c. BCE, and contrary ones did in the 18th c. CE, and the 3rd c. BCE

This is your wherewithal to learning from our masters.

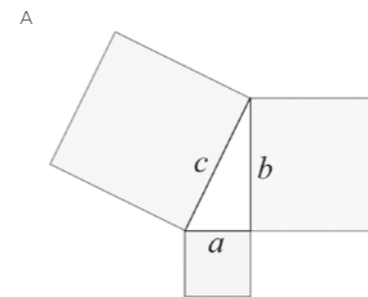
THE CENTERED VOID

Abstraction is one of our key concepts. Some idea of its power may be gained from a look at a simple object, the Pythagorean triangle, along with one at how the Greeks around 500 BCE managed to uncouple planes from objects, and turned planes, in lieu of objects, into their primary entity. Or, figuratively speaking, how they managed to retrieve the triangle from the pyramid solid as a new source of stability and truth.

Let us start with the primacy of objects, and the assumption that in Egypt, or in the Mesopotamian world, *numbers reflect series of things* (the meaning of which shall be explained later). On its strength, we think of the three lines of a right-angled triangle as “numbers reflecting the series of lines-of-the-triangle things.” This is working fine with the catheti of the triangle. It does not work with the hypotenuse, which can be reflected by whole numbers only in very few constellations (so-called primitive triples): if the legs are, e.g., 3 and 4, the hypotenuse is 5. In most other cases the hypotenuse is between whole numbers. If, e.g., the legs are 1 and 1, the hypotenuse is somewhere between 1 and 2. The hypotenuse, having no whole number, has—according to our hypothesis—no name and no identity. It is not a series of things. It is a not a thing.

The Greeks around 500 BCE, developed a new kind of thinking for this problem. How did they do it? As usual: by giving the established BoT an infinite dimension, and then symbolizing the negation of this infinity. Where the old notion of numbers *reflects a series of things*, the new number does not. The new number notion is a *self-reflection of not all the other series of things*.

On this assumption, two things are *identical* if they share the *same self-reflection*. Whereby they share the same number or the same name (for more details about this BoT, cf. the *Organon* of Aristotle). To stress the contrast: prior to this new way of thinking, things had been identical if they *were reflections of the same series of things*. Now things drop out of this equation. If two of these new numbers or names appear on stage, they are *not reflecting all the other series of things*, which means they project



their relation. A square then is a *self-projection uncoupled from any thing*, and no longer a *reflection of this series of things*.

[FIGURE A] And now watch this Pythagorean stage play: take the self-projection of one cathetus of a right-angled triangle, add the self-projection of the opposed leg, and there appears directly the self-projection of the hypotenuse: the hypotenuse has acquired a very interesting new stability, unneeded of any particular series of things for an anchor. The stability in describing the world is no longer provided by a *series of things to be reflected*, but by a *stage play of projective selves* symbolized by a new notion of names and numbers. In this example, these are, on the one hand, anchored through primitive triples (like 3, 4, 5), while on the other hand working with all the other triples as well. This particular stage play, this new notion of names and numbers as projective selves, is called Euclidean geometry; it opened up a whole new cosmos of thinking. The characteristic of this thinking is, as the right-angled-triangle act shows, the play around a centered void, projecting a *series of things to be reflected*. In that stage play, the hypotenuse is still a challenging character, but it is not a no-thing any longer, it is just an irrational self, interplaying with rational selves in a syllogistic stage play. But remember—and this is very important for what follows—the Pythagorean triangle as a plane is not as real a thing as the pyramid is a thing. The actors of the Euclidean geometry are self-reflected voids, constituted by a syllogistic interplay of projected planes organized to reflect a *pyramid which is not there*. And this now is how we would introduce the concept of media: an agent of the stabilities of the world left behind, as a new BoT is being acquired. As exemplified by the Euclidean geometry media-izing the mythical stabilities of the Egyptian pyramids.

CULTIVATING THE PARADOX

Pythagoras is a jumping board here, not a bedrock. There are plenty of similar BoTs around. Each of them packs the intellectuality of people of a specific time and region. And people, of any time and place, have always been our equals in intelligence. Needless to say that today we are living in a BoT different from the Greeks’, and we should not even think ourselves successors to their thinking. The thinking in historicity, and in predecessions and successions, is 19th-c. BoT, and might be characterized as arithmetic. In the 21st c. we are fitted with another, geometric constitution, with inverse implications. More about dealing with inversions later on.

But again, how to learn, in our 21st c. constitution, from an extraneous BoT? We argued for shifting from logical geometry to algebraic geometry in order to be able to step out of the generic. Western thought holds a prominent invariance, potentially helpful in establishing an algebraic symmetry across BoTs, and known as Diodorus Cronus’s (4th–3rd c. BCE) master argument. It consists of three statements about future contingents:

1. every past truth must be necessary
2. an impossibility does not follow from a possibility
3. something is possible which neither is nor will be true.

These statements’ fascination is that, taken singly, each of them looks reasonable, but any pair of them combined logically always contradicts the third. All major Western thinkers struggled with this paradox, trying to give different weight to this or that argument, but none was able to find a satisfactory solution. Jules Vuillemin gives a thorough discussion of the argument’s evolution in *Necessity or Contingency: The Master Argument* (1996). The master argument therefore is a useful access point to foreign BoTs, and an axis along which different BoTs can talk to one another.

Let us name and symbolize these arguments, so as to be able to work with them:

- The first argument is about necessities – N
- the second about contingencies – C
- and the third, we would say, about self-reference – S

This master argument shall be our principle on which to seat the algebraic build of our skeleton of thinking. So let’s take it from here, establish the symmetries between the BoTs belonging to prominent masterpieces, and check the kinetics of ours.

To that end, we associate geometry with the necessity N of the first argument, arithmetic with the contingency C of the second, and algebra and logic with the self-reference S of the third argument.

Applying that to our Pythagorean-triangle discussion, the rational catheti may be associated with N, the irrational hypotenuse with C, and the interplay itself, the triangle, or centered void, with S.

Now things are growing powerful. But the question arises, how are the paradox components brought into balance in our Pythagoras example? In his argumentation, Pythagoras starts with N and asks for C: in our parlance (N)C. Another question relates to the weight of self-reference within the correlation between C and N. Regarding Pythagoras, it might be said that to him self-reference is prior to the positive constellation of C and N; proof and establishment of self-reference are primary: in his case, the expression would be (N)CL. (For Aristotle, a few hundred years later, this type of thinking was established, and his main focus was therefore on explicating it in all applications. The corresponding expression would be (N)CA.)

That now establishes algebraic vectors as a skeleton, a framework for BoTs. Let us then take it one step further: an (N)C setup implies a BoT that is geometrically expressive while arithmetically impressed. A (C)N setup implies a BoT that is arithmetically expressive and geometrically impressed. An (N)CL one implies a logical geometrical expression, while a (S)CA one does an algebraic geometrical expression, and so forth.

The summarizing of the changes in the concept of technics, introduced above, will illustrate the power of these symbolizations: in the 3rd-c.-BCE view, of technics as a *controlled procedure*, or *methodics*, uncoupled from the object, in abstraction to the object (*enérgeia*) and prior to it (*dýnamis*), there is internal necessity and external contingency: (N)C. In the 6th-c.-BCE "mastership of the craftsman," trust is put into the craftsman, and the artifact left to negotiation: (C)N. And so forth: other times, other concepts. As we see, with these skeletons thinking becomes capable of increasingly higher speed.

And now just imagine the boost to our thinking from ingesting the following statement: *Within one same period and region, masterpieces of whatever discipline are of one and the same BoT.*

With this, we are going to find attractive and challenging symmetries everywhere. Our world will get fast, rich, and interesting.

WHERE WE ARE TODAY

Dialectics

Let's get our hands on such a BoT, and play around a bit with the symmetries and invariances of which it consists, just to get the hang of it—by focusing on two important notions. What we are proposing is neither critiquing nor dialectic. The German Wiki: "In classical antiquity and the Middle Ages, dialectics denoted a method of discourse or argumentation, as well as the area that is called logic today." We directly see the symmetry to the 3rd-c.-BCE play: (N)C. And further: "Since the 18th c., a new signification of this word gained acceptance: the theory of contradictions in things, or ideas, and the identification

STANISLAVA PREDOJEVIC

HARD-BOILED WORLD WIDE WEB AND THE END OF DISTANCE

Hard-Boiled World Wide Web and the End of Distance is a conceptual and experimental design proposal for reading, mapping, and rearranging conditions and complexities of the city and our urban environment. This research is open for different media and strategies not only from architecture and urban design, but also from technology, literature, and philosophy.

The proposed design approach is provoked by the transformations of urban environments and interpersonal interactions within these environments we experience collectively today, but it is also driven by many personal choices, perceptions, and variously distinct points of view. All of this together initiates a broad spectrum of artistic, architectural, and socially relevant questions and tasks, and allows for an open-ended process which engages "form" and "content" within higher levels of decoupled independence, and hence within vaster spaces for interpretation and variation. The proposed design approach assumes that by radically multiplying the amount of predefined rules, it is possible to increase and differentiate also the power of critical stances toward questions that are related to the contemporary city transformation processes.

The proposed method works in terms of an abstract documentary, but at the same time also in a generative way by means of extracting many indexes for the invention of new concepts of organization. These indexes are meant to feed back—projectively—in the documentary side of the procedure. The proposed design approach proceeds within a self-referential space. Input information is always related to the given state, and to what we assume could be important in any one such state. In computational mappings, these states are clustered according to measures extracted from activities and physical properties. Such mapping and clustering afford to "manipulate" the information by interpreting it toward virtually any direction.

[of thesis and antithesis] and sublation [*Aufhebung*] of such contradictions." This corresponds to (C)N, is a strikingly straight inversion of the preceding setup, and symmetrical to the pre-Socratic "craftsman's-mastery" play. As upheld by Marx (1845) talking about Feuerbach: "The question whether human thinking be possessed with concrete verity is not theoretical, but practical. It is in practice that man must prove verity, i.e. reality and power, materiality of his thinking. The dispute about reality or non-reality of thinking—as cut from practice—is purely scholastic in nature." This flies clearly in the face of the Aristotelian separation of theory and practice (which we symbolized by (N)C), and represents therefore a (C)N game, as introduced and symbolized earlier when talking of the "difference of things." Interestingly enough, Marx's piece is not about things-related (3rd-c.-BCE), but thinking-related (19th-c.) craftsmanship.

These quotes point up that Kant, Hegel, and Marx are performing a (C)N play on a stage inverse to Socrates's, Plato's, and Aristotle's (N)C stage. Today, in the 21st c., we'd argue that the play again takes place on the (N)C stage, as opposed to the 19th-c. (C)N one. Yet, our play, while on the same stage, unfolds on a different level of abstraction: in the 3rd c. BCE things turn upon "syllogistic," in the 15th c. upon "logic," and in our

00

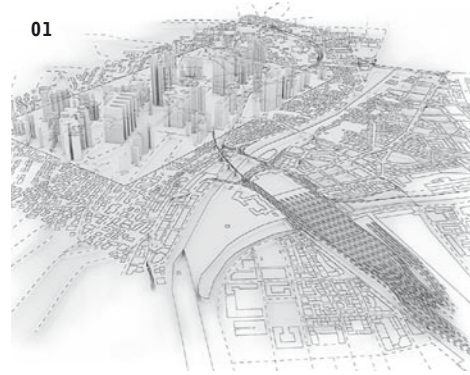


time, in the 21st c., they revolve around “logistics.” And once more: no reason for particular pride today; all these different BoTs are of equal richness, independently of their abstraction, because people, especially the masters of their epoch, were at all times as bright as we think we are.

Structuralism

Having had a glance at the 19th c. with a (C)N setup, we now step onto the 20th-c. (N)C stage and give it a closer look, by entering “structuralism” into English Wikipedia: “Structuralism is a theoretical paradigm emphasizing that elements of culture must be understood in terms of their relationship to a larger, overarching system or structure.” Or in German Wikipedia: “Structuralism is a collective term for interdisciplinary methods and research programs that investigate structures and relationships within the mostly unconsciously functioning mechanisms of cultural symbolic systems.” Once more there is symmetry with the 3rd-c.-BCE (N)C setup, but instead of playing with the *syllogistic of object-names*, we are doing so with the *logistics of cultural elements*.

01



ON READING THE CITY META-FORM

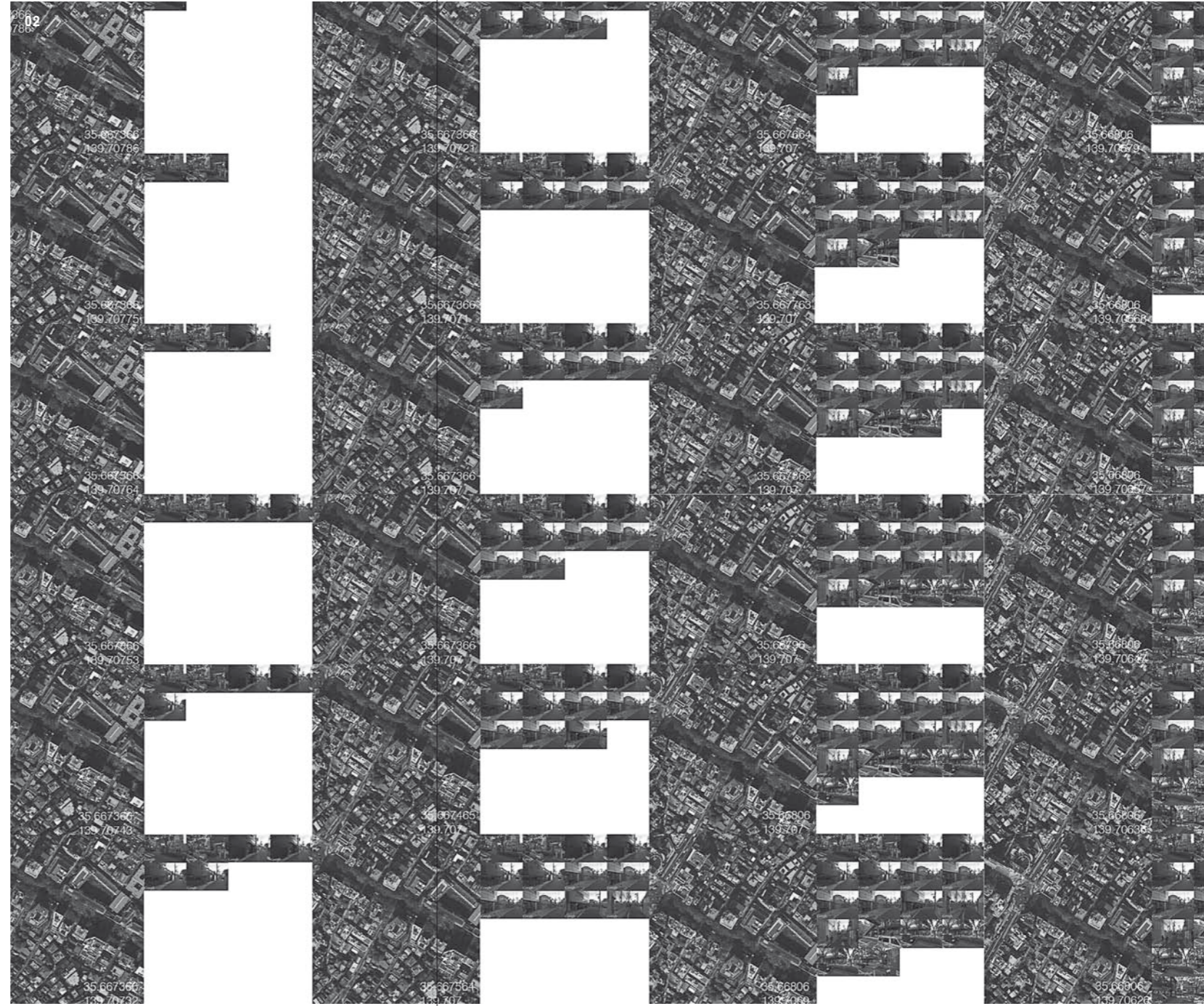
“The city is not a closed determined system of signs. Nevertheless, the urban has the ability to appropriate signs, to produce them. Reading space, then, is interpretative work that understands experience as a learning process. In this way, the city itself becomes a learning organization.” [FIGURE 01]

CHRISTOPHER DELL, *REPLAYCITY. IMPROVISATION ALS URBANE PRAXIS* (BERLIN: JOVIS VERLAG, 2011); MY TRANSLATION.

Starting from the postulate that “the environment as we perceive it is our invention” (H. v Förster, 1973), the project sets out from personal experience. Experience, as a collection of our memories, is stored in symbols, personal maps of existing places, gathered, fragmented, rearranged, and re-puzzled by different sets of rules. Like this, experience can trigger reflections on the world’s unity, and such reflection produces a vivid sketch of momentary spaces, real and unreal at the same time; countless diversification of concepts, contexts, and desires. Mapping different moments of possibilities, playing with specific locations in terms of density, complexity, and topology on the one hand, and on the other with our perception and memories, we are able to create new arrangements of our experience depending on the “directions” we desire and chose to face.

Similar to the Situationists’ interest in mapping cities in terms of experience—fragmented, subjective, temporal, and cultural—this project also assumes that the city is dynamic and changing, and that such maps would need to be updated and changed. This research proposes an open-ended design process for mapping, understanding, and cultivating “memory” and “experience” in relation to “the city.”

How do we understand and navigate space? How to locate oneself? Regarding scale, what is the smallest and what is the



biggest unit we deal with? Furthermore, what would be an appropriate reference allowing for comparison? Can artifacts help us in orientation? Artifacts embody our aesthetic and ethic criteria and our way of thinking about urbanized space—for instance, a building: any one we may have passed by, been in, seen, or engaged with in any way.

TAG BUILDING

Let us take such a building as our semiotic “interpretant” (C. S. Peirce) of which we know that it contains within itself names, places, situations, full of immanent contradictoriness and complexity. We might begin by asking, what is the function, shape, or role of this building? What are the actions incited and supported by it? We can encode this real, physical environment which surrounds us and affects our senses, and use it to construct new possible scenarios, new ways to interpret different layers of the city.

TOWARD PRODUCING “NEW MULTIPLICITY”

Self-organizing maps [SOMs] is an algorithmic procedure which offers a new manner for rendering complexity by mappings. It is capable of taking into account large amounts of multidimensional data and transforming it into easily graspable low-dimensional fields, each composed of multiple boundaries, constraints, and thresholds. The more intensely we make all virtually possible connections, boundaries, and distances disappear from the maps, the more we grow aware of the coexistence of all these places in the same time. There are many ways of combining these fragmentary orders and to organize them locally. Maurice Merleau-Ponty has given a vivid description of the primacy of perception:

“The object of perception is immanently tied to its background; to the link of meaningful relations among objects within the world; each object reflects the other [...] much in the style of Leibniz’s monads. [...] Through involvement in the world—being in the world—the perceiver tacitly experiences all the perspectives upon that object

- 00 « Map of properties: different places, clusters of information, activities, interests, perception
- 01 Hard-Boiled World Wide Web and the End of Distance
- 02 Geocoding. Mapping Tokyo: orientation, choice making, relation to the environment, perception (Google Maps, processing)

Post-Structuralism

Our focus now turns upon the 1960s stage play (German Wikipedia, June 2013): “The term ‘post-structuralism’ denotes different scientific approaches in humanities and social sciences that originated first in France toward the late 1960s, and dealt in various ways with the relationship between performative language and social reality. Key tenet is the realization that language not only *represents reality*, but indeed *creates* it through categories and distinctions. Typically this perspective is accompanied by the turning away from an objectivistic view of society that considers social facts as necessary; in its place, the varying possibilities (contingencies) of societal developments are being stressed.” There is remarkably straight symmetry between the “craftsman’s mastership” of the 6th c. BCE and the 1960s’ “creation of varying realities,” or the “contradiction in things” (19th c.) and the 1960s’ “contingency of societal developments.” In the second half of the 20th c. there takes place an obvious inversion of the first half’s setup. The first we associate with (N)C, the second with (C)N.

But, to our mind, structuralism, post-structuralism, and all the other -isms populating the 20th c. are not fully evolved BoTs. We would describe them as a diversity of

characters secondary to the lead one, the dominant BoT, an (N)C setup on the level of abstraction around “logistics,” “points of probabilities,” “quanta,” or “indexes.” In this logistical setup, structuralism would seem to index the (N)C stages of prior BoTs, while post-structuralism indexes their (C)N stages. Hence the different levels of the body-of-thinking setups, and one possible explanation of the inflation of -isms in the 20th c.

The whole of the 20th c. seems to be an (N)CL setup expressing logical geometry in an arithmetical environment. We met that setup around the 4th c. BCE, and again in the 1500s (Renaissance). Hypothetically, with the 21st c. we are entering an (N)CA setup: the introduction of geometrical algebra within an arithmetical environment, as seen in the 3rd c. BCE, and in the 17th c. (Baroque). More of this later.

TYRANNICAL NATURES

We are now going to take this argument to the health of BoTs, as it were. Like any body, a BoT has many organs, some good and some bad experiences, many moods, and reflects all of the diverse worlds of cultures and times—i.e. that a BoT, if said to

coming from all the surrounding things of its environment, as well as the potential perspectives that object has upon the beings around it. Each object is a mirror of all others. [...] Our bodily involvement with things is always provisional and indeterminate, we encounter meaningful things in a unified though ever open-ended world.”

MAURICE MERLEAU-PONTY, “ON CONSCIOUSNESS” IN *THE PRIMACY OF PERCEPTION* (1964).

In the maps produced by the SOM procedure, buildings are reconstituted into a new abstract entity which now consist not only of representations of concrete objects, but also of events, ideas, activities; they are discretized and rendered available to design new systems of networks, boundaries, borders, constraints. Playing with different levels of dependency, exploring relationships between physical objects and the flows around them, we are able to construct a new system of relations, a kind of new infrastructure.

With this approach using artifacts for orientation (in our case a building), one artifact can be considered as the smallest city unit (later we call it Basic Unit of Information, in short: BIT). But at the same time, this unit can contain—in its fragmentary scale with all the loose ends—entire networks of streets, roads, paths, squares, patterns of movements, usages of space, and all the information proper to experiencing cities. Such an artifact is to give orientation, while allowing for new heterogeneity in terms of scale, role, connections, or the character, the expression of the certain intensity of a personal experience.

DESIGN STEPS: EXPOSE YOURSELF TO A RANGE OF POSSIBILITIES

The input data with which SOMs work are based on statistical, written, and visual sources, as well as, through the data selected, on personal impressions and memory. Mapping the experience of cities in the proposed manner implies to work with references, images, Google Maps, and Open Street Maps, and to morph them further in

Grasshopper, Rhino, Processing, Eclipse. We start with an image, as a symbol of our perception, which we take as an initial and undetermined variable. Then the process is run by several following steps, conceived and oriented around modes of sign production as Umberto Eco distinguishes them: recognition, ostension, replica, invention (U. Eco, 1978); to orientate our steps of the design process around these modes of sign production allows for emphasizing a state of impermanence, and makes room for “invention.” The link between experience, cognition, and computation is based on the reflection and learning from social relations and existing urban situations, and “the urban as sublated, absolute form develops from actions, decisions, surface, volume” (H. v Förster, 1973). This approach is inspired by Heinz von Förster’s question “*what are the consequences of all this in ethics and aesthetics,*” and it takes his two maxims, one for an ethical imperative: “to act always so as to increase the number of choices,” and one for an aesthetic imperative: “if you desire to see, learn how to act” (H. v Förster, 1973) as guidelines for further development of the proposed design process.

Hence the proposed procedure assumes: In order to increase the number of choices, followed by city rhythm, complexity, connections, and relations, there is an action to be taken and an experience to be articulated. To develop a theory of composition as an improvised choreography, we are asked by Förster’s two maxims to imagine an absence of gravity as the precondition for producing multiplicities out of formal arrangements, of existing places and common perception.

RECOGNITION: AN IMAGE

The first step of the design process is what Umberto Eco calls “recognition” and it should be related to the imprints, symptoms, and clues to which we respond. It starts with the exposure of oneself to a range of possibilities in order to create an image as a symbol of our perception, which contains a whole set of not strictly related information regarding our interests. For example,

as an initial variable in the process of delineating a specific place and its geo-coordinates we can use randomly picked images from Flickr, and present them together with the tags of different activities that we have used as first search criteria.

OSTENSION: GEOCODING

The second step is geocoding. It is about choice making, orientation, and our relation to the environment. The algorithm for converting the longitude and latitude values of the specific location into the city map and the corresponding street view is scripted in Java Processing. In this way, playing with Google Maps and purpose-made Processing scripts, we are able to project ourselves to any place in the world, instantaneously. We can also visit several places simultaneously, by choosing and combining different locations. The aim of this design step is to develop deeper understanding of the specific context and to engender a common perception image based on the extracted street views. [FIGURE 02]

REPLICA: REDRAWING

Readings of a specific city, or of parts of a city, allow us to extract indices and transform the multidimensional data into the low-dimensional data list we can use for training our computational procedure to produce what we call “a Basic Unit of Information.” This “Basic Unit of Information”—in short: BIT—is to be treated as the artifact mentioned in the beginning, an artifact which is to help us orientate while navigating the maps of how we experience cities. The data list with which we train our BIT takes the form of a matrix, and it includes different relations, vectors of transformation and combination. This step involves working with Open Street Maps, OSM XML files, Rhinoceros, Grasshopper, and the Elk plug-in. The various city layers are represented through classical two-dimensional drawings, but every element, either building, square, street, bridge, or part of the road, brings with it a set of information that is related to the specific location, area, perimeter, or ratio of physical properties, color, name, function, number of users, visitors, or passersby. [FIGURE 03]

have an (N)C setup, or to be on a certain level of abstraction, does not necessarily and narrowly follow some set scheme. Rather, a BoT describes a certain focal point, and balances out some substance of great intellectual hybridity.

With this in mind, we would say that a healthy BoT manages to keep the N, C, and S paradox in fruitful openness, while an ailing BoT is unable to keep its balance, and sacrifices the openness of the paradox to giving priority to one or the other pair. This happens especially when levels of abstraction are getting mixed, or inversions disregarded.

Abstraction means, as per above, that we gain more freedom at negotiating contingencies, while controlling the necessities at the same time requires more effort. Thus an abstract C' expends more energy in controlling N' than a less-abstract C does in controlling a less-abstract N. However, in the case of controlling an abstract C' through a concrete N, consistency will be lost, and a *terroristic* setup created, where everything is coerced into *meaningless excitement*. Conversely, when controlling a concrete C with an abstract N', differentiation will be lost, and a *tyrannical* setup generated where everything is forced into *meaningless entropy*.



03 Redrawing. Extracting layers of the city: city area, networks, paths, nodes, and constraints. Locations: Zurich, London, Tokyo
04 » An artifact: any building. Sequence of the catalogue of buildings from Zurich, London, and Tokyo
05 » Self-organized map: a new city plan. Location: ZurichLondonTokyo (SOM, Eclipse)

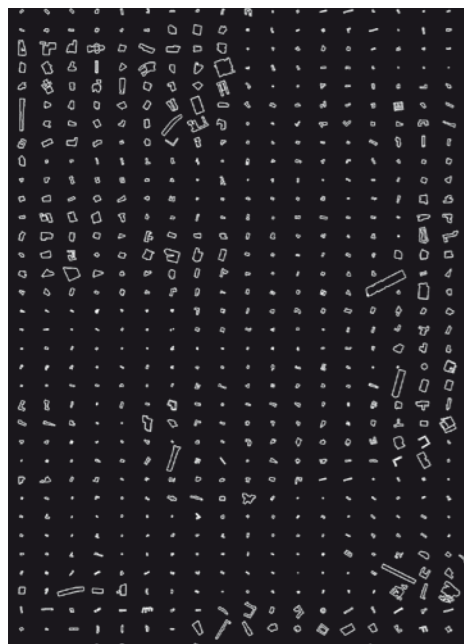
Similarly disturbing results are to be expected from disregarding inversion, and treating it, e.g., as negation: trying to balance an external C, not against an internal (N) but straight against an external N (necessarily of less abstraction) results in *ideological stagnation* (C'N—political politics, a potentially interesting approach to fascism), whereas the reverse ends up in pragmatic hyper-activism ((N')(C)—economical economy, which might be called *radical imperialism*). This argumentation has a sketchy and somewhat brusque feel to it, relative to its scope, and admittedly we are still a bit uneasy in it. In this respect, however, two points ought to be borne in mind concerning our method: we are very sure that it is always the whole we must deal with, which means we never know enough while we are still being held to articulating a position, even when the field is shifty. We are able to do that without recourse to sarcasm or fatalism, because we take the liberty not to judge.

Grasshopper

Now, without judging, let us look at artifacts in the field of architecture and computer science today.



ZURICH



LONDON



TOKYO

Our BIT, which is to be engendered into an artifact—in this case, a building—is no longer only an object, a physical property, but rather an articulated symbol with both physical and not-physical properties, social relations and conditions. [FIGURE 04]

INVENTION: EIGENPERCEPTION

As a final step, invention deals with the actions, actors, places, and their relations in real time. The SOM procedure, scripted in Java, Eclipse Juno, compares the artifacts with various sets of data and rearranges them in accordance with the prespecified rules and different criteria for choosing the Best Matching Unit (BMU) to compare and train what is to count as our BIT. Such training is an open-end process, and it makes use of the input examples and the competitive process of vector weighting or vector quantization, feeding back on itself and including all the newly produced input vectors.

The SOM procedure has the capability to produce numerous connections, to literally connect any aspect with any aspect. The mappings of such connectivity show multiplicities out of formal arrangements and existing places, and they follow the aim of creating a new scenario, a scene behind the scene, as an enacted result of what we have seen and what we think we have seen: an image as a symbol of one's EigenPerception in existing places.

With the intention to describe the most diverse relations and approaches for mapping perceptions of an urban environment objectively, and yet in terms of personal impressions, our case starts with a few simple and general activities and “takes place” in the three randomly chosen cities: Zurich, London, and Tokyo.

To move, to see, to search, to find, to discover... These activities can lead us anywhere, but coupled with the rules and design methods mentioned above, it is possible to create a series of rearrangements of a projective, and virtually existing, urban environment. Depending on whether our movement is linear or circular, or on the scope of our perception of the city, we are able to explore different reconfigurations of existing built structures, for instance in Tokyo.

The same set of criteria and design steps can be applied to a number of cities simultaneously, taking them into account at one and the same time; this latter option results in more personal maps of existing places, and they are more artistic and free in interpretation. [FIGURE 05]

To educate, to learn, to live, to work... these are the activities we followed in the context of Zurich. Considering the rearrangements of the ETH Centre and the ETH Hönggerberg Campus take into account, beside existing educational and residential facilities, also the identity of their specific locations. Such mappings allow us to investigate new urban scenarios in relation to the main ETH building, computed by the SOM as the best matching unit.

To pray, to search, to choose, to believe, to rule... these are the activities we followed when considering contextual aspects from

“Grasshopper (2007) is a visual programming language ... which ... runs within the Rhinoceros 3D CAD application. Programs are created by dragging components onto a canvas. The outputs from these components are then connected to the inputs to subsequent components. Grasshopper is used mainly to build generative algorithms. ... Programs may also contain other disbalanced types of algorithms including numeric, textual, audio-visual and haptic applications.” Making use of our skeleton, we see the symbolic ability of structuring the environment (an abstract C') being reduced to the capacity of negotiation through Euclidean geometry: a less abstract C, which is easy to use due to the lack of abstraction, yet powerful at controlling (an abstract N'). Which adds up to a disbalanced structuralistic (see above) BoT. The endemic result is a “tyrannical” (N')C setup, euphorically presented as: “Popular among students and professionals, McNeel Associate’s Rhino modelling tool is endemic in the architectural design world. The new Grasshopper environment provides an intuitive way to explore designs without having to learn to script” (English Wikipedia). Which is perfect for beginners, and an essential frustration-free first step toward computing in architecture. But for experts it is problematical, because negotiating results adequately is by



far not as easy and accessible. Consequently we increasingly risk churning out more and more meaningless entropic smooth lines, dross that smothers our heritages and intellectual negotiations under the instant fascinations of surprising geometrical phenomena. If we don't care.

Processing and Logo

With the programming languages *Processing* (2001) and its predecessor *Logo* (1967), we are faced with similar success and results but a contrary setup. "*Processing* is an open-source programming language, and integrated development environment (IDE) built for the electronic-arts and visual-design communities with the purpose of teaching the fundamentals of computer programming in a visual context. ... One of the stated aims of *Processing* is to act as a tool to get non-programmers started with programming, through the instant gratification of visual feedback." In this case the power of symbolic computing (N') is not controlled by Euclidean geometry, but by visual feedback from *intuition*. Intuition plays the role of geometrical impression of outside necessity, on the 19th-c. stage, with a vector of (C)N. Combining 21st-c. computing power, as the

internal necessity, with 19th-c. external necessity produces a (N')N setup, which we called "tyrannical." We are mindful that *Processing*, like *Grasshopper*, very successfully opens up information technology to architecture, thanks to its impressive learning curve. And, unlike *Grasshopper*, *Processing* even shows a path toward the full-fledged programming language *JAVA*—which allows coding of whatever is codeable—thus leaving the pathway to digital literacy unobstructed. Still, we observe that major imbalances and attendant difficulties exist in acquiring expertise, not only at creating results with *Processing*, but at negotiating them. Thus we'd tend to diagnose *Processing* as a case of ignorance of inversion, and *Grasshopper* as one of lack in abstraction. One can find the same constellation with the processor *Logo*, which "is a multi-paradigm computer programming language used in education. ... It was originally conceived and written as a functional programming language, and drove a mechanical turtle as an output device. ... *Logo* was created in 1967 for educational use, indeed for constructivist teaching, by Daniel G. Bobrow." Which lands us smack in the field of cybernetics, and aggressive infantilization, and naturalization of information technology in the second half of the 20th c.

history and culture in broad terms. Seeking manifestations of a common understanding of power, this map considers the areas and the churches of Zurich around Stadthausquai and Limmatquai, St. Paul's in London, and Imperial Palace in Tokyo. The resulting maps of our rearrangements are projectively placed in the context of London. [FIGURE 06]

THE END OF DISTANCE

This research proposes to investigate a number of strategies by using real-time data, and to organize this data into appropriate groups based on a predefined set of criteria. Such organization of data offers unlimited choices and combinations of different concepts and contexts. We can regard it as a kind of "speech" or "orality" that can be "voiced" by computational languages. Such "speech" articulates "the present" as the medium of ever-changing city conditions. At the same time, it treats such articulation as an expression of individual appropriation and interpretation. By choosing and formulating activities and locations to project ourselves into, we can keep asking about what kind of atmosphere and identity we are actually participating in. [FIGURE 07]



TOKYO: IMPERIAL GARDEN

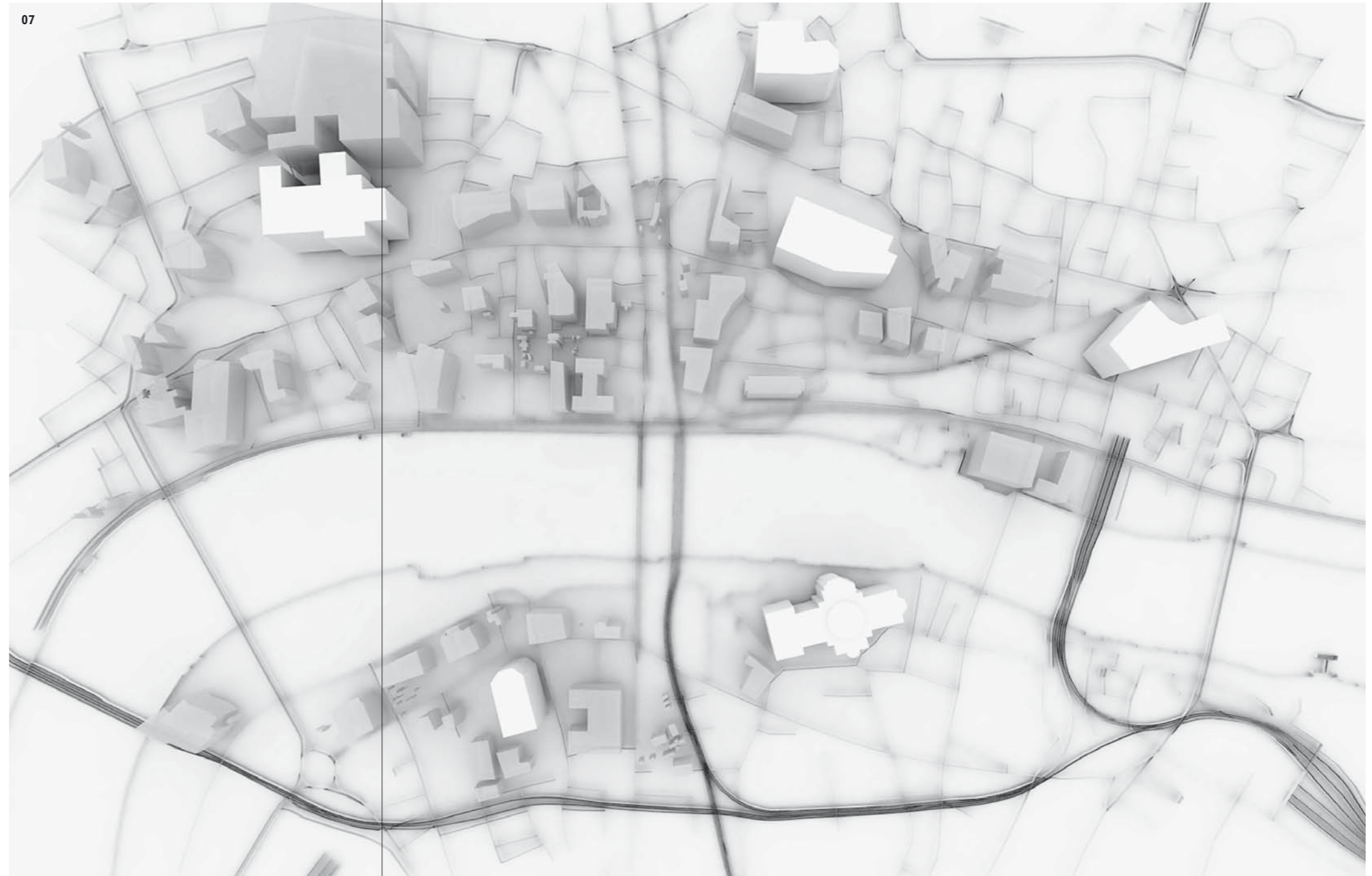


LONDON: ST. PAUL'S



ZURICH: STADTHAUSQUAI + LIMMATQUAI

- 06 Self-organizing maps rearrangement. Locations: Stadthausquai and Limmatquai Zurich, St. Paul's London, Imperial Garden Tokyo. (SOM, Eclipse)
- 07 Self-organized map: A new city plan. Rearrangement of the parts of three different cities, Zurich, London, and Tokyo in the context of London. (SOM, Eclipse)
- 08 Self-organized map: Sequence of the new city plan. Location: ZurichLondonTokyo. (SOM, Eclipse)



More ...

Some more indexes pointing to symptoms of such "tyrannical" talks that are crowding our field today: "I am not finished yet." Nobody will ever be finished. Infinity is always part of it, and is no excuse for not adjusting the vectors of a BoT. Insufficiency of technology is the C in the balance. Ignoring the C by saying "I know, but I am not finished yet" is propagating a tyrannical dominance of N. Nor may one say, "I am on the other side, I am on the good side," or "I don't want this or that." Even while negating N, you are still on the control side, not on the contingency side. Nor is there "I am concentrating on this small part, and will do this tiny thing well. The whole is too complex for me." Or as a popular German nursery song goes, "I am little, and pure of heart." Every serious cultural articulation, every masterpiece addresses anything. So does architecture, so does whatever technology. Self-reference is part of it. Especially radical constructivism and its fancy chaotic artifacts are mere renderings of structuralistic self-reference into Euclidean geometry, and therefore no major contribution to the actual cultural status quo.

Using randomization means establishing a mechanical version of a 19th-c. external control mechanism, a sprinkling of nature onto artifacts, with some direct entropic

08



impact upon intellectuality. Random is not opening up, it is always obturating. The same goes for the aesthetic argument of the "creative architect." It amounts to just saying good-bye to one's thinking, and handing control over to machines.

The Body

OSCILLATIONS

1. A body of thinking (BoT) is a cultural constitution indicating how relations between necessity, contingency, and self-reference are being maintained.
2. BoTs are not disciplinary.
3. BoTs are articulated by masterpieces.
4. The masterpieces of a certain time and region engender and articulate, evocatively, one same BoT.
5. Masterpieces cannot be fully explicated or perfectly reproduced.

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6. An imperfect reproduction of a masterpiece is an expression of its articulation.
7. Mathematic is the most explicit means of articulating a BoT.
8. BoTs are either expelled or gathered.
9. In an expelled BoT, geometry is the expression of necessities and the impression of contingencies (N)C.
10. In a gathered BoT, geometry is the expression of contingencies and the impression of necessities (C)N.
11. In an expelled BoT, arithmetic is the impression of necessities and the expression of contingencies.
12. In a gathered BoT, arithmetic is the impression of contingencies and the expression of necessities.
13. Architectonic is the interplay between geometry and arithmetic.
14. Logic as the "investigation of conclusions" is the explication of self-reference.
15. Algebra as the "resolution of balance" is the implication of self-reference.
16. As corporeal entities, BoTs oscillate between expulsion and gathering.
17. As intellectual entities, BoTs oscillate between logic and algebra.
18. Corporeal and intellectual oscillations of a BoT are mutually orthogonal.
19. Corporeal oscillations result in an inversion of BoTs.
20. Intellectual oscillations result in an abstraction of BoTs.
21. Architectonic incorporates the interplay between logic and algebra.

A remark about this schema. Mathematics, and especially geometry and logic, are not to be taken as referential constitutions, but as operational ones. We hold the idea that—unfamiliar as it may seem—there are a lot of geometries, arithmetics, logics, and algebras around. They are cultural articulations, they are masterpieces in their own right. They are not natural

phenomena, predetermined, pre-existent, innate, to be uncovered. It is just us: through our self-reflection within our masterpieces. And in each of these masterpieces we perceive a certain manifestation of the constellation of geometry, arithmetic, logic, algebra, whatever each of them be. So let us point out some symmetries of these constellations on the stage of temporality.

a) That manifestation is invariant to all masterpieces of all disciplines, and manifests itself in a manner that is consistent across all masterpieces within a given time and region (4, above).

Therefore, such invariance is available for mediating between masterpieces. On the strength of a relatively profound understanding of masterpieces in one field, e.g., medicine, one may be sure to encounter the same BoT at work in the masterpieces of architecture, economics, physics, etc., of that time. Such symmetry in the manifestations within a time and region, and across disciplines, is very helpful for achieving fast comprehension, and indeed a better understanding of our own original discipline. But it must be stressed that such symmetry mediates geometries, arithmetics, logics, and algebras, and there is no need for spelling out what each of those actually is. This text follows a self-reflective algebraic paradigm, not a projective or reflective logical one, such as they are popular these days.

Another symmetry mediates between time complexes:

b) Over time the manifestation oscillates along an axis of necessity N and contingency C.

In the symbolization introduced above, over time a series of BoTs shows up as: --- (N)C --- (C)N --- (N)C --- (C)N ---. Again, this schema media-izes the notions of contingency and necessity, and is helpful in establishing the historicity (not history) of masterpieces. Cf. Eric Voegelin's *Order and History*: (N)C might be related to his concept of the ecumenical age, and (C)N to his cosmic age.

There is another symmetry that mediates over time:

c) Over time the manifestation oscillates along an axis of logic L and algebra A.

We can find such time series in how BoTs show up over time, such as: --- (L)A --- (A)L --- (L)A --- (A)L ---. For this now, a strong reference exists: G. R. Hocke's introducing, in 1957, a schema of cultural alternation between classical and manneristic phases. Hocke called the Renaissance (~16th c.) and Classicism (~18th c.) classical phases, and Baroque (~17th c.) and Romanticism (~19th c.) manneristic phases, going deep into details. Joining Hocke, we pursue the line "--- 16th c. --- 17th c. --- 18th c. --- 19th c. ---" as: "--- (L)A --- (A)L --- (L)A --- (A)L ---."

d) The two symmetries mediating over time are mutually orthogonal.

So we may write: --- (N)C(L)A --- (N)C(A)L --- (C)N(A)L --- (C)N(L)A --- (N)C(L)A --- (N)C(A)L --- (C)N(A)L --- (C)N(L)A --- (N)C(L)A --- (N)C(A)L ---, describing two and a half cycles that address roughly the following periods of Western culture: --- 5th c. BCE --- 3rd c. BCE --- 3rd c. CE --- 12th c. --- 16th c. --- 17th c. --- 18th c. --- 19th c. --- 20th c. --- 21st c.

Again: this schema does not describe recurrences, but cultural axes of symmetry. Nor is it—in contrast to Hocke, but in line with Voegelin—meant as a *periodization of history*, which we would describe as an articulation of a certain BoT, especially the 18th–19th-c. (C)N setup. Furthermore, BoTs often falter, as e.g. in medieval Europe. Incidentally, a change between BoTs is by no means an undivided panacea. It is mostly attended by substantial crises and catastrophes. With good reason BoTs are therefore equipped with strong immune defenses against change. Hence, being careful is an ethical imperative. In the 21st-c. context we would actually say that, as one indeed may be "outraged," one should definitely "not be engaged." The machines and their power and potential are extant and provide a generic and common ground. Nothing to worry about in a positive sense. Thus, while being afraid is legitimate, there is one—only one—way of overcoming it: learning to keep up with the mastership of the others.

THE NAME, 3RD C. BCE—(N)C

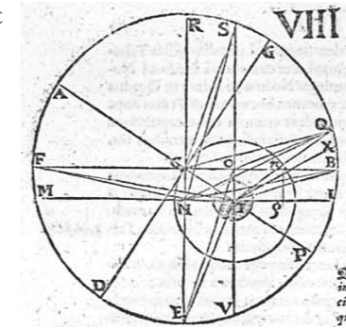
Now more closely to the modern-age Western BoTs. With the retrieval of the triangle from the solid manifestation of the pyramid, we characterized the

B



Thomas Chantimpré, *De natura rerum*, fol. 105, schematic representation of the "mundus." Aldersbach, ca. 1295.

C



The computation of planetary orbits in Kepler's *Rudolphine Tables* (1627).

Pythagorean-Euclidean space, and its particular constellation between geometry, arithmetics, logics, and algebra, as the *interplay of the self-reflection of a series of things, a talk of things* represented by *numbers*. If you have a wider interest in this BoT, you will find that Michel Serres describes it very interestingly in his *Hermes* books (1968–80).

THE WORD, 3RD C. CE—(C)N

[FIGURE B] An inversion of the Pythagorean-Euclidean BoT appears around the 3rd c. BCE, and lasts throughout the Middle Ages, where it evolves around the geocentric world view, as represented by the authorities articulating it, and where things are *entities animated within the cosmic order*. Whereas the Euclidean BoT was centered upon the *talk of things*, the cosmic order is centered upon the *thing of talks* again. From (talk)thing to (thing)talk to (talk)thing, yet now on a new level of abstraction: by the Euclidean inversion, we unhooked the talk from the *series of things* and established a new BoT centered upon the thing as necessary, and the talk as contingent—(N)C. With the new inversion starting around the 3rd c., we gathered or included all talks into a thing, and established a new BoT centered upon the talk as necessary, and the thing as contingent. Or, if we expand the *talk of things* to *talk of things* (= *not all the other talks*), ending up with talk of things (= *not all the other talks* = (*not all the other things*)), the abstraction becomes directly apparent: things are found on two levels. Abstraction is *not-all-the-others-implicated of not-the-others-explicated*. It is the thing expanded to the whole-world-included-in-one-thing.

This is the difference between an X and its abstraction, to be symbolized as X'. Normally we use different concepts for the thinking of similar things on different levels of abstraction. Therefore we easily overlook the abstraction itself, and its double-inversion character. We switch for example from *sylogistic*, via *logic*, to *logistic*. In our thinking, they are all stagings of the same invariance, on different levels of abstraction. Logic includes the whole syllogistic world, and logistic in turn does the whole logical one. Logic is syllogistic', logistic is syllogistic''. Or from *mystical order*, through *cosmic order*, to *natural order*. Or from *talking things*, via *animated things*, to *enlightened things*, and from *thing* via *object* to *article* ... from *naming*, through *calculating*, to *quantizing* ... Such are the kinds of invariances we are looking for, and from which, in the various BoTs (which we cannot know, as not being ours), the meanings that make sense of them are unhinged. However, studying the permutations in the ways invariances manifest themselves in the different BoTs, is then a source of stability for our own BoT.

Another line of abstraction: Prior to the Pythagorean-Euclidean BoT, we observe that thinking proceeds in *reflections of series of things*. In the 5th c. BCE, a new concept of *numbers* is projected, and uncoupled from these *series of things*. In the 3rd c. CE, reflective thinking in *series of numbers* is established. As may be thus summarized:

1. numbers are things
2. series are indicators of a (C)N setup
3. non-series are indicators of an (N)C setup.

And as architects we conclude:

4. in a (C)N setup, the void indexed by series reflects a thing
5. in an (N)C setup the things project a void.

In our BoT, the geocentric world of the 3rd c. CE must be read along the vector of thing of talks, and on the level of abstraction together with animation and cosmic order. The geocentric world therefore is an articulation of entities animated in a cosmic order. Mathematically speaking, this order is articulated as series of numbers to be read as thing of talks, or number animated in cosmic order, as symbolized by (C)N.

THE PROJECT, 16TH C.—(N)C

[FIGURE C] In Renaissance mathematics, this setup undergoes an inversion again: the establishment of "infinite series of numbers" (as, e.g., per Viete), the *interplay of not all the other series of numbers*, or the *interplay of the self-reflection of numbers* represented by a new number notion called *rational number*. Bodies of infinite series, and rational numbers, cease, geometrically, to be reflections of the cosmic order inasmuch as single specific constellations; they now project all possible constellations to form a geometrical entity, elevating its meaning from being the instantiation of one specific animation, to a range of potential variations of modes of animating it. Which means that such entity is no longer pointing to an animated element, but

to a geometrical line of movement. Therefore, in the Renaissance BoT, *geometrical element* means *not the other points of a movement*. Similarly for the rational numbers: “not the other ratios.”

Consequently the Keplerian heliocentric worldview is not just a replacement of the Earth by the sun as the center of the order. We are in the presence of a whole new BoT. Renaissance man, metaphorically speaking, managed to leave the stable Earth-centered cosmic order, managed to leave the geosphere by putting the lines of his own movements into his pockets, and, equipped with that knowledge, succeeded in entering the heliosphere, and moving around the sun. Thus becoming able to look at the cosmos with new, mechanical eyes, and to behold the self-projective interplay of moving entities. He even managed to detach himself from the centric circular movement, and to conceive of an elliptical movement based on a moving center. On stage, these interplays of lines of movements, or points-that-are-not-there, are able to project themselves as friends. This is how Kepler explains eclipses, this is how architectural geometrical models and perspective drawings emerged, e.g., Dürer's, or Palladio's. This is the mechanical worldview, on the same vector as, but in abstraction to the Euclidean geometry (N)C, and in clear inversion of the medieval cosmic order (C)N.

PROJECTIVITY OR THE CENTERED VOID, 17TH C.—(N)C

[FIGURE D] After detailed discussion, and pointing up the invariances and operations relating to BoTs, the pace will now quicken, leaving more ample details to hopefully coming publications.

In the 16th-c. BoT we are handling rational numbers as *infinite series of numbers* in a manner that treats them as *finite series of numbers*. This means that the *talk of things* on the 16th-c. stage is a *finite talk of infinite things*, to be called, as it were, an (N)C(L)A setup—i.e. that in a geometrical constitution we negotiate contingencies by following straight logical lines. A setup that fits a phase where a new BoT is expanding and exploring its new plateaus, which are opened up by inverting N and C. Stability is achieved by importing the logic from the previous BoT. But with time, familiarity with the new plateaus within the logical limits increases, and thinking turns toward self-reflection, shifting from logic to algebra. This is what we observe in the 17th-c. setup, symbolized by (N)C(A)L. Within this new BoT, thinking is now directed at self-reflective *infinite talks of infinite things*, establishing the rational numbers as *self-reflective infinite series of numbers*, and demanding projection of the projective self.

How is this articulated architecturally? In the Baroque's overload of *talks of things which are not there* we can observe the production of a centered void, projected by an overwhelming amount of things. Deleuze's *The Fold* (1988), about Leibniz and the Baroque, further develops this.

PRODUCT OR SYSTEM, 18TH C.—(C)N

[FIGURE E] Leibniz is the first to symbolize prominently these centered voids,



The church of San Carlo alle Quattro Fontane in Rome, by Francesco Borromini, 1636–40.

EKATERINA AGEEVA

HYBRIDITY

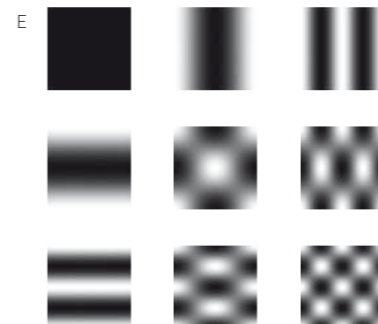
AS AN URBAN SPECULATION

“We are no longer ourselves”—but who are we, whom have we been, and what is our *Welt*? While humans are changing their own habitats and environments, humanity is changing as a species. Let us assume that this process did not start recently, but is ongoing since the beginning of time. This project talks about urban and social speculation through the prism of hybridity.

You will find four possible scenarios, each telling stories based on different theories: one, the story of a creature of various races and cultures; two, stories of mechano-biological species; three, stories of hybrids in terms of gender and socialization; and four, stories of hybridity that unfolds across the internality and externality of ourselves.

By parallel storytelling, similarities and affinities among different theories are projected into one single space. The scenarios are not to be taken as a prediction, but as a cloud of indexes that might expand, merge with others, or also dissolve. It is possible to extract from it unlimited sets of different combinations. Playing with combinations we are able to compose a perpetual puzzle, unstable collages that will constantly change by means of feeding in new information, and by changing the characterizations of the actors.

In the contemporary urban condition, we are confronted with an indefinite multitude of spaces, each one piled upon, or perhaps contained within, the next: geographical, economic, demographic, sociological, ecological, political, commercial, national, continental, global. Does the empowering of technical generalizations, which we are facing today, keep any creative potential next to its sheer productivity? Is there a “cultural” fertility proper to the generic masses that spring from the grounds all around the globe? Those questions are raised in the chapters of this work. In different acts of storytelling it zooms in from theoretical abstract notions to the level of specific cities and everyday urban artifacts, stages them through abstract actors and activities in collage form, and “re-encodes” these collages into other arrangements of abstract interrelations.



A pattern of waves à la Fourier.

establishing a new abstraction of arithmetic, or simply giving these voids new names. His monads are things that cannot be divided. One might say they are *fictitious things of rational talks, series of rational numbers*. They establish a new abstraction of the *thing of talks*, an abstraction of the *animated thing of syllogistic talks* pursuant to the 3rd c. Our BoT gets inverted from *projective to reflective*. Entities don't any longer have one name, but series of names made up of polynomial terms. Fictitious names, as yet undetermined, to be negotiated by way of their interplay with other polynomial terms, producing projections of *things that are not there*. Products negotiated within *systems* of other products. Productivity of a system. Geometrical *pragmatism* under arithmetical control. (C)N.

We call it the Cartesian space, and look at it as centered voids, as rational talks of arithmetic articulations for creating fictitious things. Those manifest themselves as stable points of an oscillating curve, or patterns of interfering waves: points of stability, balancing all the infinite movements of the elements around. There is no stability, no finding these points without integrating the total environment as a prerequisite to bringing them into balance—no finding stability without actually *doing* it.



However, there may be rational talk about these points, using arithmetics, without actually doing it. Such is the new notion of *models* in analysis, reflection, and construction. It is a clear inversion of the model of projection, as discussed for the 16th- and 17th-c. context. These dynamical models unfold the Baroque void, or infinite determinism, into specificity. This is analytical geometry. Surprisingly, we find that intuition is the specificity of the predetermined void. The necessary environment for the contingent elements. (C)N. Political entities embedded in an economics environment.

PRODUCTIVITY, 19TH C.—(C)N

What happens if not merely a limited but an infinite number of polynomials is to be constituted? Or, how to reflect the reflected self? Complicated question. So let us follow our symmetries: the 18th c. created its new BoT by inverting C and N, and kept stability by retaining the algebraic kind of self-reflection (A) from the preceding 17th-c. BoT (17th c.: (N)C(A)L --- 18th c.: (C)N(A)L). Following the expansion to this new BoT, time had come for explicating the self-reference logically (18th c.: (C)N(A)L --- 19th c.: (C)N(L)A).



00 « Hybridity Artifacts: perpetual infrastructure
01 Four scenarios: actors

By putting the question of reflection of the reflected self, the limits of 18th-c. Descartes or Leibniz analytical geometry are being challenged. In the 19th c. we observe, in an inversion of the 17th-c. setup, an emptiness of analysis surrounding a centered every-thing. The new thing as *not all the analysis*. The Eiffel Tower, e.g., as inverted, respectively as *not the other objects and not the other functions*. An abstraction of the 16th-c. object, and an inversion of the 18th-c. void of analytical objectivity. Which opens up onto the 20th-c. Or, taking psychology as an example: the "Ich" started out in the 18th c. as the necessary counterpart of the contingent individual, and ended up, by the late 19th/early 20th c., as *not all the analysis of the individual* (18th c.: (C)N(A)L --- 19th c.: (C)N(L)A --- 20th c.: (N)C(L)A).

THE ARTICLE, 20TH C.—(N)C

You may feel this argumentation to be a bit far-fetched or convoluted. Mostly it is unusual. It is an unusual algebraic-geometric approach, and we need it for finding stability against the logical-geometric BoT so pervasive today. By focusing on the specific setup of the 20th-c. masterpieces, we hope to sharpen our understanding of the present-day power of information technology. And following our symmetries, we have to argue our reasoning is two-pronged:

A SHORT PLAN FOR THE PRESENT WORK

This work is an offer for further interpretation. It is an excerpt from an open-ended act of storytelling, based on my own sensibility and on contingent choices I made. The storytelling takes theoretical and abstract notions as its coordinating framework, and then zooms in to everyday concrete urban artifacts in order to explore how to possibly make sense of what we can see when viewed through the lenses offered by the abstract notions. The aim is to render these explorations into pictures that capture various kinds of spaces, on different scales, while being attentive to the modality of their "genesis," and to the coexistence they all maintain within one single, comprehensive space. There are heroes (actors) in my storytelling—hybrid creatures—but they remain absent. All I "know" about them is that they inhabit certain spaces and participate in certain activities that take place in these spaces. Through indexical characterization of these actors, the scenarios attempt to participate in their perception. It comes in four chapters: (1) Actors, Activities, Space, (2) Cities, (3) City Grid, (4) Urban Artifacts.

The first chapter consists of four chosen scenarios that are based on notions from different works by Rem Koolhaas (chapter #1: Stripped Identity), Henri Lefebvre (chapter #2: The Wild Edge of Society), from Donna Haraway's text "A Cyborg Manifesto" (chapter #3: Cyborgian Emancipation) and from Michel Foucault's writings on the notion of Heterotopia (chapter #4: Otherness). These theoretical positions are not treated in a strictly parallel manner, but rather as streams of ideas and thoughts that overflow from one chapter to another. The common background for all scenarios is a fundamentally new understanding of the relationships between humans and their milieus, and an articulation of this new understanding by seeing in the idea of

hybridization a possible path for thinking in terms of openly multilayered and multi-connection interrelations.

In the scenarios, my heroes (actors) are represented by the characters of either real personas or by media creatures, those that seemed to be most suitable for designating their proper nuances of hybridity. My work attempts to view their theoretical stances by virtue of staged encounters with the actors. With this aim, the scenarios will personalize the stories, and suggest interpretations of the story lines that make explicit (by imagination) some of the individually implicated interpretations that are possible. Throughout the entire work, I follow a method that traces indexes of activities. I extract from the original texts of my actors entire lists of activities and transitions their notions seem to undergo, and those lists are treated as indexes that are to be meaningful. In playing with indexes, in composing and exploring different combinations of them, I seek to find similarities and affinities between the ways in which different story lines can be staged in the different scenarios.

The contingently chosen activities are visualized in a collection of images. To get more stability in this work throughout the chapters, the relations of space and activities are treated on different urban scales: that of the city, that of city grids, and that of urban artifacts.

The second and the third chapters each are a series of collages that use the images of these activities from the first chapter. The collages symbolize how space can be envisioned through activities, and imagine practices related to these spaces. The series of collages are produced by "calculating" with the code of these images, a procedure that allows for creating an unlimited collection of collages. The chosen collages that are used here as an illustration cannot count as final ones, indeed, there can't ever be a final one. This is my way to engage with space by attempting to depart from the perception of a flux of phenomena.

The fourth chapter of this work is a series of artifact images where the meaning of the illustrated artifacts is intentionally

first against taboo-izing abstraction as evidenced by direct use of 16th-c. concepts of thinking, and then against the discarding of inversion by directly using 19th-c. concepts. For we must embrace both abstraction and inversion if we are to cope politically [C] with the abstract and strong necessities [N] attaching to our artifacts, viz. the information technologies of our 20th-/21st-c. setup. We are arguing for a comparable component of contingencies [C] or politics in the 20th-c.-(N)C setup. We are afraid of tyrannical (N)N constitutions.

And now, let us do one last inversion, toward the 20th c.: information technology is, as any masterly artifact of the 20th c., an *evocative talk of fictitious things*, establishing a new abstraction of the *talk of things*, which we visited as *rational talk of animated things* in the 16th-c. context. We thus invert our BoT from 19th-c. reflection toward projection again. It must be stressed, as important for understanding the 20th-c. setup, that these new talks from the analytical void are neither fictitious nor results of intuition, but talks of any fictitious things (not one of *every*), of any story, and any intuition. Fictions are not there yet, they take form through ongoing negotiation. Objects have become pre-specific. Inchoate products, still to be specified. By articulations. They are articles. To be put into one's pocket, for creating one's production wherever it's wanted. That's what logistics is

hypertrophied. The everyday urban artifact is the small entity of a global process; they represent common activities and manifest claims for identity. They should be understood not only as physical objects in the city, but as making up a historical, economical, political structure of the city. Historically, the individuality of urban artifacts comes from the qualifications they give to certain activities. But with the process that generalizes distinct cities into global urbanity, this historical richness is rather devaluated and a new approach is necessary for understanding them. As an attempt, the last set of collages seeks for identity not through analyzing qualities in terms of quantities, but quantities in terms of abstract qualities.



FRactal Space

ACTORS, ACTIVITIES, SPACE

"... they know everything about you except who you are..."
KOOLHAAS, 1995

"Like all men in Babylon I have been a pro-consul; like all, a slave; I have also known omnipotence, opprobrium, jail." [FIGURE 01] BORGES, 1949

STRIPPED IDENTITY

Stripped Identity resides where we find no standardization or rational order. Driven by the chaos of contemporary globalization, the overabundance of materials and information, cultural cacophony, mankind adapts into previously unseen forms of alienation: amoral and pragmatic multicultural hybrids, which move by instinct from individual differences toward generic similarities. Convergence is possible only at the price of identity.

The scope of such spaces is ubiquitously recognizable and easy to explore; one is guided by understandable symbols, within identical spaces, among activities



Topological Space

- 02 Stripped Identity/activities: to guide by symbols, by space, by activities, by action/fractal space: endless repetition of the same simple pattern
- 03 Wild Edge of Society/activities: to break up subordination, anonymity, homeliness, alienation/topological space: indefinite multitude and cross-section
- 04 Cyborgian Emancipation/activities: to extend milieu, capacity, body, mind/incomplete space: velocity as a concrete condition



Incomplete Space

about (necessities anchored in abstract ground, in infrastructures, in the global system), and what constitutes the new necessities (N), able to articulate or negotiate the new (N)C.

Movies might be a good illustration to the kind of stabilities to be established when describing the actual cultural constitution of our BoT: to start with, Shakespeare's Renaissance theater unhooks the play from the animated medieval humans, and stages them anywhere and anywhen as self-reflections, i.e. as projections of animated, contemplated reflections. The observer's vantage point is necessarily outside of the animated, cosmic order of necessities. He is expelled from the medieval order, puts *all the plays* into his pocket, and projects himself as *not the other plays*. Explicates his play, creates a certain mask, takes on a personality, acts politically.

Today's cinema paradigm is symmetrical to Shakespeare's: the cinema records analytical reflections in the natural order, and stages them anywhere and anywhen as self-reflections, i.e., as projections of analytical reflections. The observer is positioned outside the natural order of necessities. He too is expelled, puts *all the recordings* into his pocket and projects himself as *not the other recordings*. Explicates his recordings, creates a certain brand, takes on an identity, acts politically.

and designed actions that are commonly well known. Everywhere, we find the same repetition of simple movements and simple patterns. The space is endless and fractal, repeats itself on all scales. [FIGURE 02]

THE WILD EDGE OF SOCIETY

The Wild Edge of Society comprises anything and everything that undermines any and every schema of totality. By principle, it stages the opposite of what is at stake, and presents a place where what conditions daily conducts and norms of behavior will be ignored, where hierarchical orders will break down, where by principle, minorities will get power, and where all depends upon questions of volition.

Such spaces constitute the opposite of stability, and they feature as an end stage of any attempt to linearize social entropy processes. The political activism of minorities forms a new stream of activities which all aim to break up patterns of subordination, anonymity, homeliness, and alienation. The indefinite multitude that constitutes its spaces is immeasurable, but it is possible to capture points of extremes that then allow mapping space in topological terms. [FIGURE 03]

CYBORGIAN EMANCIPATION

The adaptations into new forms of alienation diverge in two directions, toward human "machinality" and human "animality." In both directions, we are dealing with a question of social reality and emancipation that aims at breaking up the structures of existing dualisms, binary oppositions, and their logic of domination. Hierarchies can be disempowered by actively exploring and mobilizing the blurring borders. We are not natural or artificial, neither objects nor bodies, neither mental nor physical; we are an assemblage of all these factors, among many many others.

We are constantly extending our milieus, capacities, the agility of our bodies and minds. The permanent technical sustenance of our environments charges them with power, and we learn to cope with new velocities. This, we could understand as a

It's Not Simple

None of this is simple. But why should becoming a master be simple? Simple things are for tyros. A master is a chap who surpasses what you are capable of, and whose ways of accomplishing that remain opaque to you—until you have yourself risen to his level of mastership. There is no external reference once we have stepped out of a framework and begin to act on a stage, such as today's (N)C setup. How then to decide whether a supposedly masterly performance is actually good or not? That's the C question of contingency. As it always has been. There is no certainty, nor right or wrong. There are certain ways of negotiating. But safety and control are on the N side of Diodorus's master argument. Therefore you need mastership for maintaining your balance on an appropriately high level of abstraction. Your thinking needs to become acrobatic.

Objective Knowledge

And at all that, we exert ourselves at making things simple, and controllable, rather than adequate. Take the popular 20th-c. concept of Karl Popper's *objective knowledge* for an example. Objective, in 16th-c. (N)C, stands in contrast to objectivity, which is

concrete condition. Such a notion of space is constantly in change and can't ever be empty or full. [FIGURE 04]

OTHERNESS

Otherness is the external condition that is capable of giving freedom to qualities that appear to belong intrinsically to one thing or another. This liberating freedom is born in a space of primary perception and dreams, a space of otherness, some sacred and forbidden zone. Yet beware—this zone is inhabited by stalkers, by the ones that are released from commonality and taboo, but who come back and participate in everyday routines. Such spaces form a diffuse and promiscuous condition of borders and “in-betweens”: where do we draw the line between sacred and profane, between legitimate and forbidden, between public and private?

The profanation of spaces (or practices) opens up an Otherness that is inevitably belongs to hierarchical regimes. The heterogeneous space that consists from gaps, discontinuity, and fragments hosts more values than any discreet zone that is clearly divided according to time or actuality. [FIGURE 05]

CITIES

We shape cities that shape us.
(PARAPHRASING EDWARD SOJA)

META CITY

What can be gained by projecting “city-ness,” the notion that contains any subsequent information and any multi-scalar ideas of “a city,” onto one meta-level, the Meta City? Not in order to find an ideality of the city as a reference, nor its generic quality in any referential terms. But as a domain that were to host any abstract potential we can attribute to cities, as a kind of platform for speculation. The scenarios in this chapter take the sophisticated logistic urban infrastructures as they are expanding today, seemingly beyond bounds, as a

starting point onto which we can render time-space fields of “specific” cities from what we know. [FIGURE 06]

The second chapter suggests a list of such “abstracted potentials” of cities we “know” (Singapore, Venice, Generic Venice, the Digital City, Jerusalem). They are explored and projectively staged in terms of their capability of providing relevant stages for our actors, or of developing into new actors, depending on our contextualization and perception of them. The staged projections of those cities are meant as “points in a moment,” as extrusions from the cityness potentiality of what we call the Meta City. They are meant to be interpreted in terms of bi-univocal units (in short: bits), relevant to each other as well as to a projective imagination of cityness at large.

SINGAPORE

Singapore is a city that is completely regulated by the state, planned and built almost altogether from scratch. As a result of such a tabula rasa approach, almost all of its colonial and precolonial history has been erased. Singapore lends itself for a study of a political system that is altogether different from what we are used to treating as “natural,” those political systems we call nation states. In Singapore, “There is remarkably little that is not the result of [...] carefully deliberated social policy” (Koolhaas 1995). By making use of the legacy of “Western” modernity, yet familiarity with its historical context—it seems—the state of Singapore has produced a new kind of city-creature, which seems to grow and develop as the heir of sheer “nothingness”: “But the city is not sterile—it has a style—the generic—which can count on a huge support. Artificiality of Singapore is more and more accepted by Western cities” (Koolhaas 1995). Singapore seems to act as a kind of semantic laboratory, where the perplexing issues that define our age—such as racial coexistence of heterogeneous origins—can be tested in different modalities, before they are imported to Europe, and to other places in the world. Paradoxically, undifferentiatedness is the genuine essence of the city that lives on in a



HETEROGENEOUS SPACE

05 The Otherness/activities: to desacralize observance, time, actuality, hierarchy/heterogeneous space: discontinuity, gaps, fragments
06 Meta City/Cities

constant cultural gray zone, importing citizens from abroad to sustain its own continuation. A lack of differentiation overpowers the entire environment, and is an outcome of industrial processes too vast and dynamic to be structured. Singapore constitutes a kind of space that is produced by duplicable instruments, which in turn were designed for duplication: repetitive space as a result of repetitive action. It remains resistant to the traditional tools for urban planning: “The most dangerous and most exhilarating discovery is that planning makes no difference whatsoever.” (Koolhaas, 1995)

VENICE

Let us say that Venice is the city that has been created by nature, and produced by society. Nature itself doesn't actually produce anything, but it affords means for production. Society uses those means to make a final product. Nature creates, but it does not labor. Production is human, based on intention and purpose. In the case of Venice, nature provided a unique area, a set of small islands. The city of Venice did not just appear from nowhere, it was rationalized into being—by people. Through collaborations among a collective. Venice was able to erect waterways to enable business, and consequently, to enable the city to progress. The conquest of land from water was both a “top-down” and a “bottom-up” process. The desires of the Doge of Venice, and those of the city's aristocracy more largely, coincided with the rest of the aspirations by the Venetian society to achieve benefits from the seaborne trade. Humans, as social beings, produce their own life, collective consciousness, including its political, religious, artistic, and philosophical artifacts. The production of spaces cannot be traced back to some specific events or objects. Rather, it results from a multiplicity of various works, and from a diversity of forms. Social space is not a thing among other things, nor is it a product among other products: it subsumes things produced, and interrelations established, in their coexistence and simultaneity—their relative order and/or relative disorder.

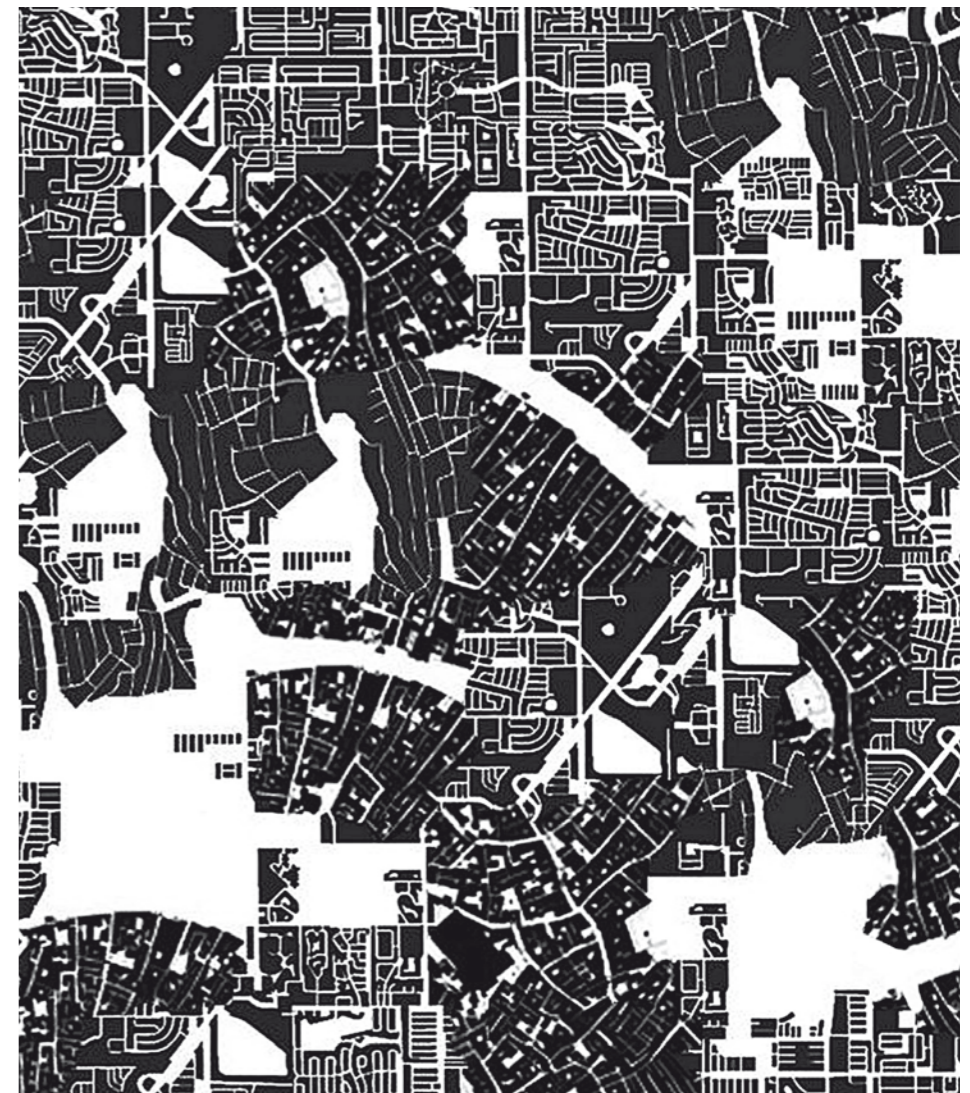


GENERIC CITY

SOCIAL PRODUCTION CITY

OPEN SOURCE CITY

HETEROPTOPIA CITY



an 18th-c. (C)N concept. Knowledge is the (C)N *explication* of mastership, as opposed to the concept of creativity as an (N)C *implication* of mastership. So, according our hypothesis, while being in a 20th-c. (N)C setup, *objective knowledge* is an interesting concept—lifted from the 16th-c. level of abstraction straight onto the 20th-c. level. As illustrated by this very typical—and for me as an architect and engineer rather astonishing—quote: “But the Fifth Symphony as such just does not exist; although, admittedly, we often use language in such a way that we speak of the Fifth Symphony as if it were one of the existing things” (Karl Popper, *Three Worlds*, 1978, p. 147). Hullo, what is this? Putting it very friendly, we'd say that from a 20th-c. (N)C perspective he intentionally, strictly, and correctly argues by using 16th-c. (N)C logic, which of course is blind to 18th-c. (C)N due to lack of inversion and abstraction. Consequently he fights 18th-c. (C)N, shunting ourselves to 16th-c. (N)C as a reference, while himself remaining on the 20th-c. (N)C position. As for himself, he holds onto the powerful 20th-c.-(N)C-“master-of-logistics” position, demoting us to, and controlling us as subordinated 16th-c.-(N)C “masters of logic”. And what's even worse: by blocking the access to 18th-c.-(C)N enlightenment, he eliminates contingency from the 16th-c. paradigm, and traps us in

a 16th-c.-(N)N, pure-logic BoT, something he explicitly called “Third World” in 1978. That’s what “objective knowledge” and “open society” actually seem to be about. To some, such argumentation may seem artless, summary, or unkind. It might be, if looked at from a formal 16th-c. or an analytical 18th-c. viewpoint, which is what Popper would want us to adhere to. Uncomplyingly, however, we are busy establishing a 20th-c. algebraic argumentation, which means we are staying away from either truth-claiming, or any kind of judging. All we do is articulating positions liable to engender mastership, which in the eyes of “objective knowledge” and “open society” is obnoxious and must be combated.

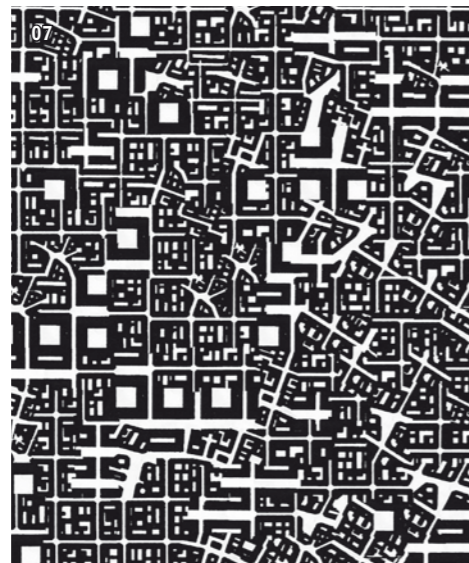
Popper does not stand alone. He is representative of the BoT of the 1950–80 period at least. Lewis Mumford and his influential views on architecture and technology provide another example, such as from *The Culture of Cities* (p. 142): “Versailles essentially was a child’s toy, precisely as their dynastic politics was, realistically considered, child’s play.” And p. 338: “If one can do without the others, it’s the country, not the city; the farmer, not the burgher.” Then p. 391: “Versailles, beheld on a large distance, is no more formidable than a horizontal factory unit.” (The retort of course

GENERIC VENICE

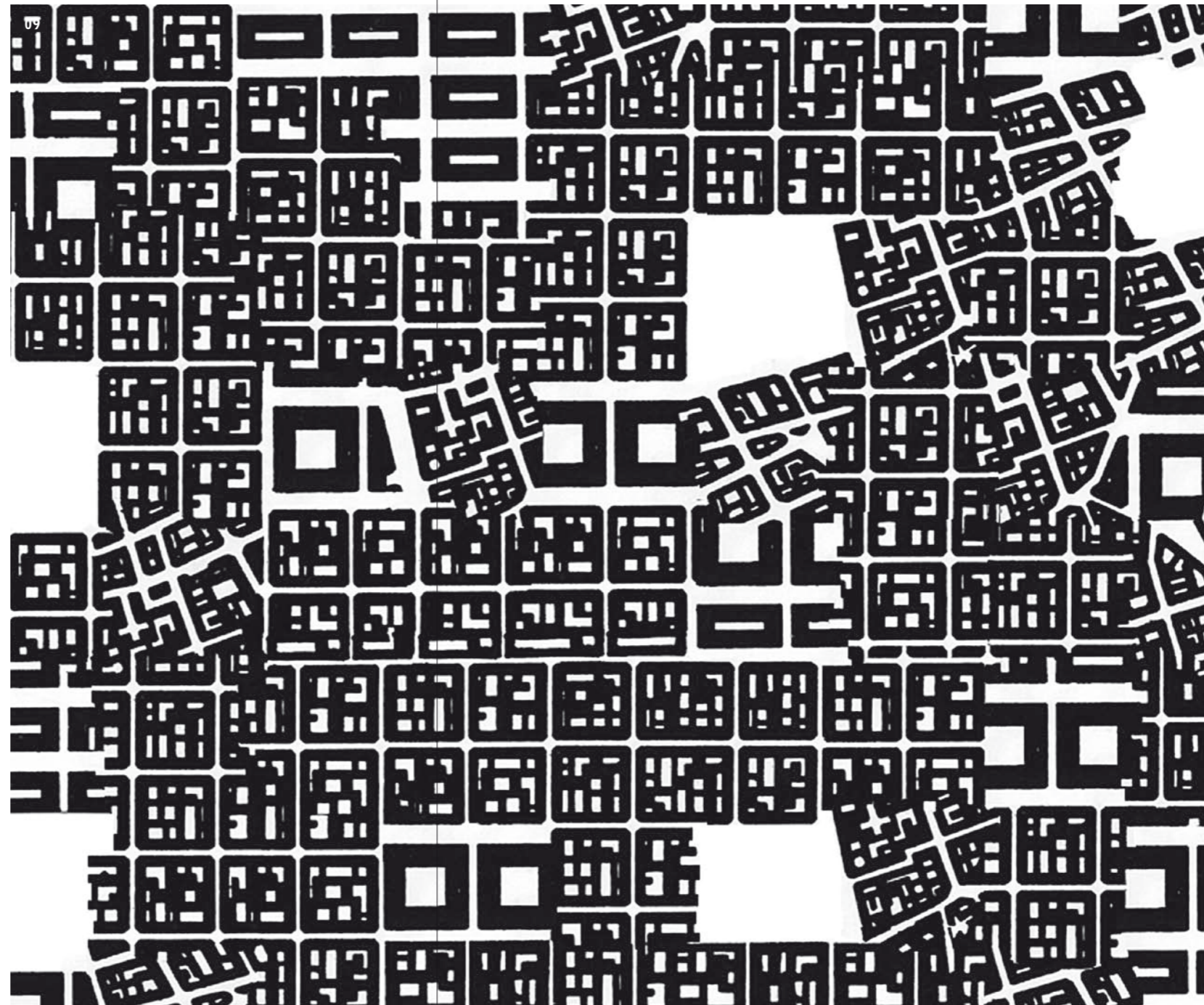
If we imagine the existence of a mega-database, consisting of all the present city typologies, we can try to redraw existing singular cities, for example Venice. It is interesting to see which parts or city elements will be recognized as the authentic, and which ones will be replaced by the analogous. Can the parts that would be up for replacement be read as less significant in terms of a city’s identity? What if the sensitivity for recognizing will be reduced, as the redrawn appearances offered by one such transformation, for example a “Singaporean” transformation of Venice, will increase/intensify how we will see? This very abstract experiment can help to map and visualize, a further development, a process of temporal change, and mark crucial moments of shifting perspective from the age of a city with its strong local identity, toward the potential genericness it hosts, or vice versa: from its genericness to a kind of “super identity,” if such transformations ever were possible.

DIGITAL CITY

With the idea of a digital city, the city metaphor is used to stage an ideal space of knowledge, reason, meant to constitute the technological “location” of an ideal social order, the so-called virtual community. The regimes of classification and categorization, structuring the abstract and infinite data space into visible and sharp units, turn non-territorial data space into highly contested social places, as a kind of territorialization of thought. The implementation of information and communication technology was once (or still is) supposed to revitalize the democratic system. “‘Cyberdemocracy’ or ‘electronic democracy’ are the new tubes which should transform the stale democracy of passive spectators into an active and participatory democracy. At the same time, it creates a global public sphere” (Leggewie 1997). The whole structure must be explicit and transparent in order to be visible for the digitally emancipated “Netizen.” But like a traditional city, the Digital City has a military origin. On one



07 Cities/Paris, New York, Barcelona/Grid: 0.5 irregular/0.5 regular
 08 Cities/Grid: 0.7 irregular/0.3 regular
 09 Cities/Grid: 0.3 irregular/0.7 regular



3 “Would you rather be the mayor of Detroit or Paris?” “Detroit. Detroit. I have zero doubt. Paris is almost perfect—I am joking now. Don’t take it too literally. No, Detroit. You know, we have a sort of one thing, what is happening is, European artists are coming to Detroit, because there is a lot of space. It is a little like East Berlin, you know, after the wall came down, where artists just went and you just squatted in a building. Detroit has enormous potential: urban agriculture of course is a big one for Detroit—I smile, because it was an irony, but it is interesting. So I would rather be the mayor of Detroit.” Lift Conference Marseille, July 6–8, 2011. <http://www.youtube.com/watch?v=Ww4pYjLVlFE> 21:36ff.

being, referring to Ledoux, that *factories* were palaces in their time, and opened up society). All this is incredibly and aggressively ignorant of mastership, and hardly understandable to whomever likes craftsmanship, likes music, likes engineering, likes science, likes thinking. Or take Saskia Sassen who, when recently asked, at a conference in France, whether she would prefer to be the mayor of Paris or rather Detroit, she off-the-cuff answered, with a smile: Detroit, because in Paris everything is perfect, whereas Detroit is where European artists are flocking to, and Urban Farming is a big thing.³

This BoT, this projection of actual logistical phenomena onto proportions, this tying of intuition back to Euclidean geometry, empathy, aesthetics, being friendly, being polite, being correct, optimizing, making no mistake, finds its expression in Koolhaas’s Generic City and is unable to cope with 21st-c. developments. It is not the solution, it is the problem. With what we propose in this text, we do care for the mastership in making croissants, we don’t for the generalization in turning out hotdogs. Only mastership will be capable of coping with the slums of our megacities. What else would? Certainly not generalization, which demands just to be trusted, and left alone about details.

hand, new media technologies have become more accessible and easy to use; on the other hand, access to information that is generated by users is largely controlled by just a few companies/institutions. Could it be possible that the form of a “network society” turns out to host yet another, ever more powerful, society of control? (This paragraph is no literal citation, but it draws a lot from Appich 2008).

JERUSALEM

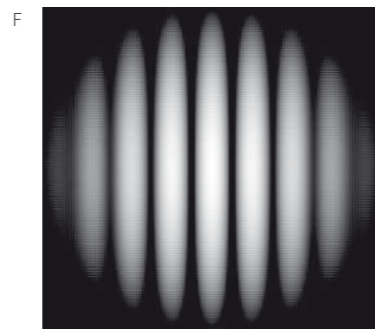
The celestial and profane Jerusalem. Jerusalem is a city of ethnic and religious heterogeneity, and needs to be attributed great cultural significance. The city’s actual spaces bear testimony to its “layered” history, as its plateau in the Judean Mountains, on which it is built, has been carved by conquests, colonizations, and occupations. The layers of history reveal in different parts of the city instances of coexistence and conflict in a fragile, torn, violated, and instrumentalized context in the manner of a collage. The terrain consists almost entirely of borders, and immaterial residuals of invested hope. Otherness, hope, and violence almost fall together in this carved-up and disintegrated, militarized cityscape, especially as the impenetrable cease-fire line runs through the heart of it. Jerusalem, with its temples and walls, has a celestial importance for all Abrahamic religions. For Christianity it manifests the city as a physical reconstruction on divine recreation, as the New Jerusalem. The Earthen Jerusalem juxtaposes in a single real place, as the Holy City, the entire regulation of a totality of “cityness,” aspiring to manifest the opposite of the chaotic disorder of nature. In its legacy, cities hold the promise of salvation. In all this, despite everything, Jerusalem offers, somehow, salvation. Pilgrimage and religious tourism can be seen as a collective, or rather collectively individual, experience of otherness, an event-space of Heterotopias.

QUANTUM, 20TH C.—(N)C

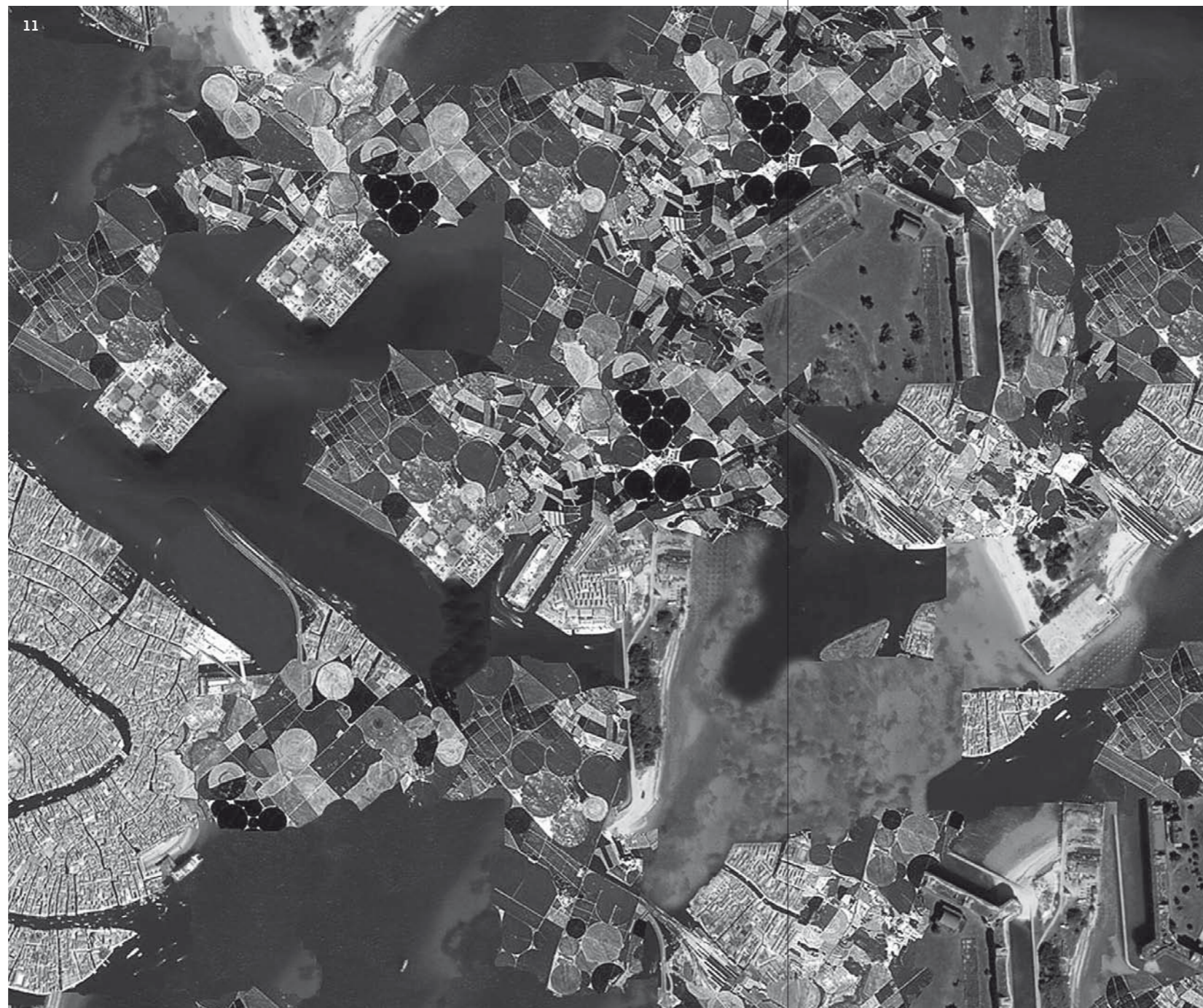
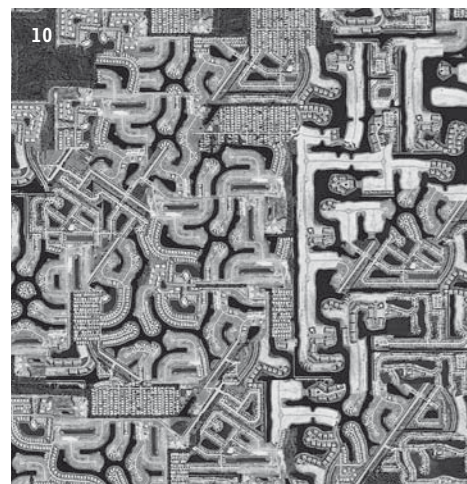
If the reflections presented in this text happen to go against the—to some degree—common-sense concepts of “open society” and “objective knowledge,” why should you then trust our argumentation above others? For it is optimistic, which is not trendy these days. It is challenging, which is offensive today. It is not consensus seeking, which is unusual. Indeed, a lot may be said against it, but surprising as it may seem, it is not new. The BoT which we offer an entry to, is a 150-year-old lady, a lady of elegance, holding artifacts that live on in electricity, information technology, and quantum theory. Let’s pick out quantum theory, which may best help underpin her trustworthiness.

The Double-Slit Experiment and the Dimensionality of Time

[FIGURE F] The famous double-slit experiment, which illustrates impressively the difference between particles and waves, may serve as an introduction to quantum theory. If *particles* are randomly *projected* onto a mask with two slits, a screen behind the mask will show particles in a pattern inverse to the mask. We called this BoT 16th-c. (N)C. If however you inverse the situation on a higher level of abstraction and, instead of projecting



The pattern of interfering waves can be read as reflections of waves, or as probabilistic projections of quanta.



- 10 Artifacts/Generic City/collage: iterative city
- 11 Artifacts/Production of Space/collage: volition space
- 12 » Artifacts/Cyborgian/collage: communication engineering
- 13 » Artifacts/Heterotopia/collage: Heterotopia with Mecca

particles, you reflect *not all the particles* (by opting for the wave instead of the particle perspective, which corresponds to the 18th-c. BoT of (C)N), what is being obtained on the screen behind the mask are patterns of interferences. Thomas Young, e.g., in his famous double-slit experiment (1802), showed up the nature of light as *reflections of waves*. Proceeding now to the next inversion, a 20th-c. (N)C setup, by just projecting *not all the waves*, we find ourselves on the micro-scale of quantum effects, and—a surprising and simple observation—on quantum level, 20th-c. particles, more precisely quanta, are not behaving like 16th-c. particles, they behave like 18th-c. waves. And some further thinking brings about the 18th-c. paradox: how can a single quantum “know” about other quanta yet to come, when they take part in the formation of patterns that are “not there yet”? In other words: how may predictions be made regarding the scales that reveal quantum effects? The answer is simple: by incorporating, in a single point, an overlay of *not all the possible quanta that are not there*. That’s why the setup cannot be measured without affecting it: mensuration changes the possible waves. That’s why the results obtained depend on the questions asked. That’s why the screen is no longer analytically reflecting, but projecting a quantum space. We suggest calling it dimensionality of time.

CITY GRID

The way in which a specific city can be interpreted and distinguished depends upon a city’s “image-ability” and “read-ability.” In the days of Open Source, the interposition of information fluxes that are constitutive for a city becomes the most determining factor. It affects those aspects that had been the decisive ones in the past: the notions of the City Grid, and the City Artifacts. For humans as “users,” one of the ways to perceive information is by attending to it through an internal perspective organized around visual elements: paths, edges, districts, nodes, and landmarks. Those elements *en masse* constitute the city grid, or city pattern. They contain information that contributes decisively to a city grid’s, and the city artifacts’, image-ability and read-ability. The possibility for retrieving information, in order to use it as the means for creation, depends on an individual’s skills and a kind of strictly personal “urban literacy.”

According to the narration of hybridity, three cities were chosen for our narrative that present their city grid (1) as a symbol, or (2) as a congestion, or (3) as a logo.

SYMBOL: THE HETEROTOPIA OF ILLUSION

Hausmann’s renovation/Paris. The world-famous geographical point for romantic trips, the city as a “honeymoon hotel,” the epitome of a contestation between mythical and real space.

CONGESTION: MAN-MADE ARCHIPELAGO OF ARCHITECTURAL ISLANDS

Manhattan Grid/New York. Where commercial interests have enforced to treat each block of the grid as singled-out of the whole, as “one block alone.” This has instigated and fueled a kind of vertical ego that is now proper to each block, and as we can see by now, it has generated a kind of three-dimensional anarchy and an incredible variety of human behavior.

LOGO: OVERSIMPLIFIED IDENTITY

Example/Barcelona. Its old and singular city growth through the process of consolidation due to tourist branding and an overflow of landmark architecture. In consequence, Barcelona no longer “improves” or “develops,” instead it “abounds.”

This chapter results in a set of grids, built from the same simple patterns, but arranged into various configurations. Such adjustments of specified pattern appearances present us alienated visualizations, and through that, different hypothetical “perceptions” of the cities. [FIGURE 07–09]

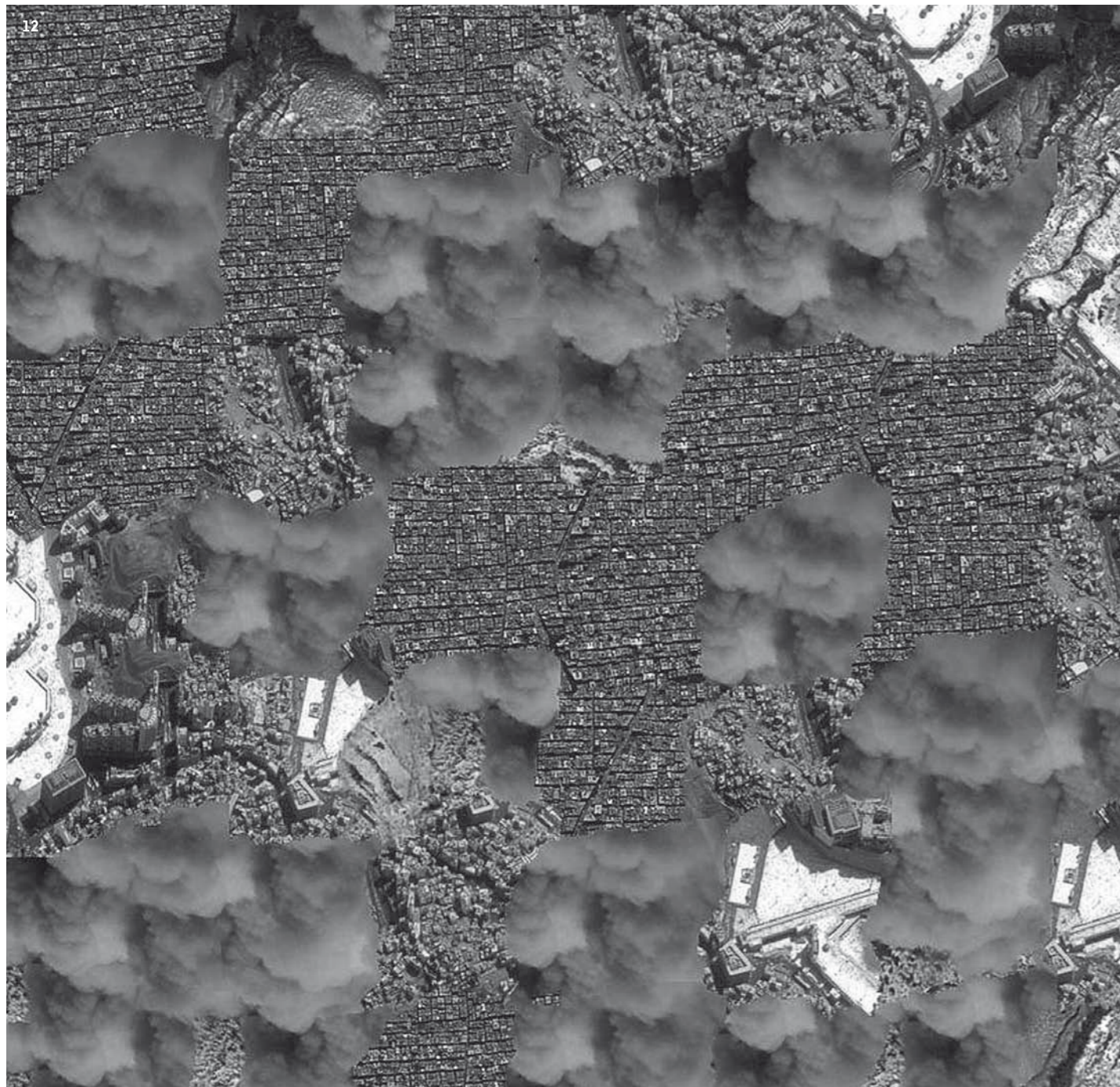
URBAN ARTIFACTS

Utopia as a practice.
(PARAPHRASING FREDRIC JAMESON)

Over three hundred satellite images harvested from the Internet, mostly by Google Earth and the NASA website, constitute the data of a peculiar collection of cities as artifacts. [FIGURE 11] They are images that present urban artifacts as a kind of “evidence” on the surface of the Earth, distributed according to preassigned story lines. They are the product of paradigms taken: city patterns, infrastructure, entities of all sorts, nature urbanized. This chapter arranges their “evidence” into groups, such that they can be re-arranged into meaningful collages. These arrangements of artifacts were done not according to geographical proximities, but according to possible imaginary affinities. This is an attempt in learning to see global phenomena through a practice within the abstract, of patching and overlapping pieces into one image and forming “wholenesses” from parts. The hypertrophy value of iconic artifacts probably can exude an essence of phenomena and new kind of diversity out of the Generic. [FIGURES 10–13]

In classical physics the “state” is complete; it is never complete in quantum physics. In classical physics, object features are *revealed*; they are *produced* in quantum physics. Changes of state are *dealt with deterministically* in classical thinking; they are *dealt with non-deterministically* in quantum thinking: they are at once continuous and discrete; observables do commute and don't; classical physics deals with qualitative features, quantum physics with qualitative values; outcome facts are *potential* in classical thinking, they are *probable* in quantum thinking. All this is exposed in more detail in *QED (Quantum Electrodynamics): The Strange Theory of Light and Matter* (1985) by Richard Feynman; and many of these ideas pop up in Jorge Francisco Isidoro Luis Borges Acevedo's inspiring short stories.

An astonishing view of our urban life may also be obtained from considering cinema, TV, electricity, and computing—all the 20th-c. infrastructures—not as analytical reflections of nature, but as *probabilistic projections* of natures. Which turns the currently so prevalent misanthropic mood inside out! Or from reading Wassili Kandinsky's *Point and Line to Plane* (1926) as a projection of probabilities in non-homogeneous space, or as an *engineering of bodies-in-time*. And there we are, with our view on urban life, at a point we think is corresponding to our time.



INFRASTRUCTURES AND FUNCTIONALISM

After developing the algebraic-geometric setup of the 20th c., and after gaining some experience in describing actual phenomena, let's get back to information technology and architecture, and their present-day tools and artifacts.

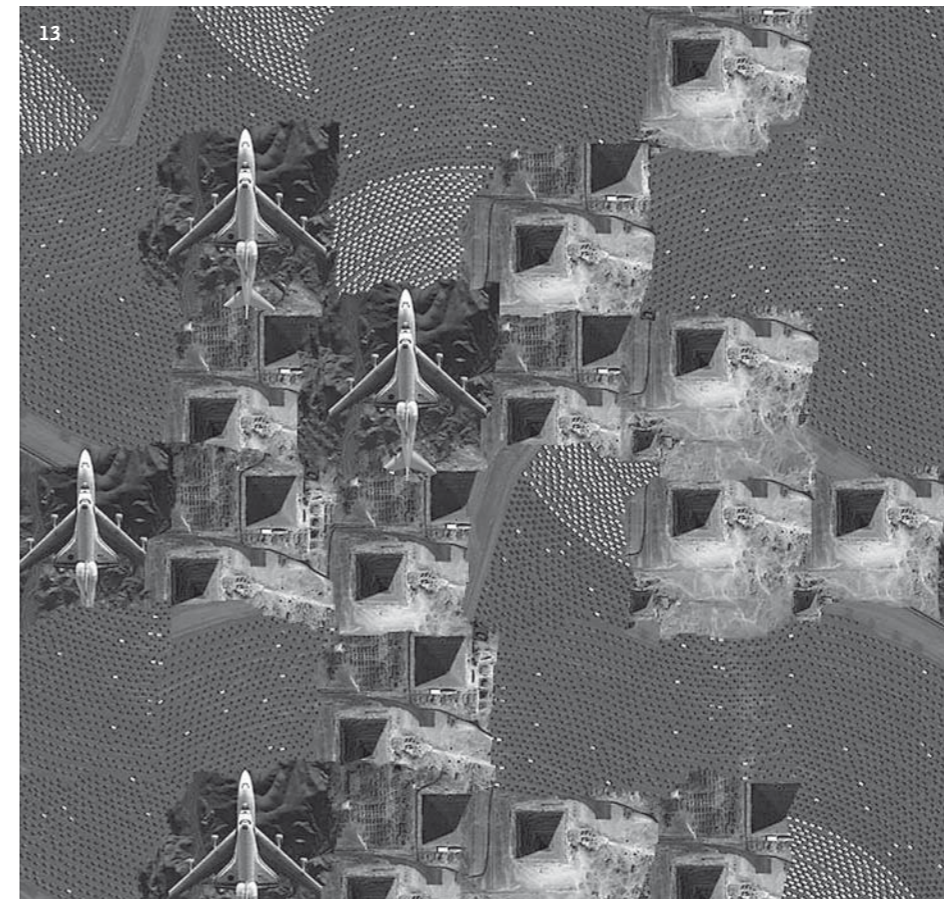
Shape Grammars

A very powerful and widely used tool in architecture and urban design are shape grammars, originated by Stiny and Gips in 1972. By their title and time of origin they directly call up the so-called linguistic turn, Noam Chomsky, and the general linguistics of Ferdinand de Saussure (interestingly not actually his own, but those of a posthumous publication initiated by his students in his name, referring to a linguistic model Saussure himself did not publish, unsatisfied after having worked his whole life on it). Shape grammar is an artifact of the BoT we associate with the second half of the 20th c., calling it post-structuralistic. The interesting phenomenon is that shape grammar is restraining the universal algebra of the 20th-c.-(N)C BoT to patterns belonging to Euclidean geometry, by solely imitating Hilbert's (1891) graphics—without openly refer-

ring to him—and ignoring his algebraic part. This analysis shows up the very scheme we discussed with regard to Popper: dragging 16th-c. (N)N straight into the 20th c., which allows modeling 16th-c. Palladio reduced to (N)N. Since the 16th c. is articulated by Euclidean space, so is its architectonics. Trying its paradigm upon an 18th-c. infrastructure results in deadlock, because elements, instead of being projected into an ordered space, are competing for space. Architectural artifacts may be modeled in Euclidean space, but infrastructure cannot. So shape grammar uses 20th-c. technics for falsely promising 16th-c. (fake) mastership, and fighting 18th-c. dynamism.

Parametrisation

When looking for a setup inverse to shape grammars, parametric modeling is the answer. In a 20th-c.-(N)C landscape, it promises to control complex systems with but a few numbers. But remember what a system is: a fictitious thing of rational talks (18th c.). And mind the makeup of our present BoT, with all the computing around: an evocative talk of *all the fictitious things*. And keep in mind all the inversions, negations, and abstractions. And now consider the undertaking of parametric design, of controlling systems through numbers that represent but a very few parameters. Not only is thereby evocative talk getting reduced to rational talk. Parametric design likewise controls, and reduces to numbers, the infinities and self-reflections of the 18th and 19th c., and thereby their transcendence as well, which we called the natural order. Such a design's formal and logical affinity to nature (we call it “learning from nature”) is an implicit fight against the 19th-c. natural order, played out on a 16th-c. platform of abstraction. Such thinking is



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inadequate to the 21st c. with all its masterpieces and super-powerful artifacts. It resembles toying with a potentially pernicious tool while ignoring where the trigger is. Such convenient 16th-c. rational talk, fine for a small world with about 0.7 billion inhabitants, can be no answer to today's rapidly expanding world of 7 billion.

The Play

So let's see what we got today, and which algorithms may, to today's architects, be found adequate and worth researching. We'll start with the algorithms taught by the 19th c.

SELF-FICTITIOUS THINGS OF RATIONAL TALKS, 19TH C.

PCA, the Eigenvector, or Who Am I?

[FIGURE G] One particular, prototypical algorithm makes self-fictitious things generally applicable: principal component analysis (PCA). Take a cloud of *fictitious points of rational talks*, and try to make sense of them. PCA helps find that cloud's main, secondary, tertiary, etc. axes of balance. What will these axes do for us?

1. They allow us to establish a new coordinate system
2. one providing maximum contrast
3. which is your private reflection of the world
4. based on such reflections, rational talks are rendered to the world
5. thereby you become a fictitious point of rational talks in the cloud, reflecting all the other fictitious points.

What we find here is the (N)C-BoT of the 19th c., and PCA is a generic articulation to the necessity-part N of it. Any apparatus, any system—meant to provide stability to the world—may be seen as a certain dimensionality, a certain fiction, a certain N, each striving to gain contrast, keep rationality in negotiation with all the other apparatuses. This is the contingency-part C of the master argument.

What is most explicitly articulated by PCA is the individual, political person (C) in an economic environment N. PCA helps us to a clear and wide entrance to the BoT of political economy, capitalism, and national state.

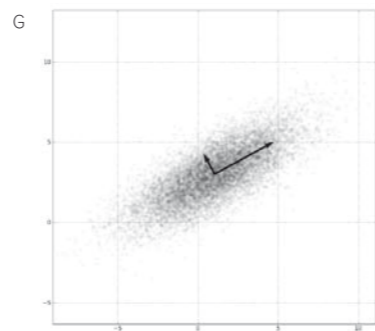
It is important to realize: every machine we design, any system we set up, may be transformed into one single dimensional line. Each component or, rather, each feature of the system is represented by a rational number for its position (magnitude) on this dimensional line (multitude). The interplay of the system's features is orchestrated by arithmetics on these numbers. The 19th-c. setup is that simple and abstract. The PCA is a prototypical mathematical artifact of that thinking. A generic designer of systems. Available on every computer today. Just check how PCA is being used. It is very popular in analytical works in sociology and economy, and the level of facticity or truth associated with these fictitious linear machines is amazing. Whenever we see illustrations of clouds of data points and centered lines, we are right in the middle of this fictitious thinking.

The PCA and the eigenvectors were the topic that most fascinated last year's students. So we named this book, reporting their research, *EigenArchitecture*: thinking of architecture as *self-fictitious things of rational talks*.

Matrix, or How to Talk?

[FIGURE H] Using the formula $ax_0 + bx_1$ to describe the dimensionality of a system, we take two coefficients or names, i.e., a and b, for describing the dimension as a straight line. Therefore we are talking about *analysis and linear systems*, which we introduced as *fictitious things of rational talks*.

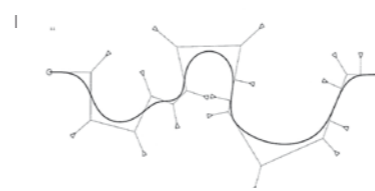
Now, in a further step, toward non-linearity and the 20th-c. BoT, and in accordance with the symmetries we experienced with our BoT, we expect to be leaving the natural order of reflected linear movements. By this symmetry operation we position ourselves in abstraction to Kepler, who quit the cosmic order of reflected stability and projected linear movements, as described above. But what is it that we project in the 20th-c. BoT in abstraction to the linear movements? The term *non-linearity* doesn't cut it, even though much of the looked-for mathematics lives in its neighbourhood. So, sharpening our precision: according to the algebraic skeleton of our BoT, taking the next step requires an inversion and a negation; therefore we are in search of the interplay between *not all the other fictitious things*. By searching for *not all the other fictitious things* we are stepping out of the natural order of moving things. We are definitely out of analytical specificity. And we are putting at least two of these pre-specific natures on stage for a joint interplay. These on-stage entities cannot engage themselves, lest there be movement, which



The eigenvector as the most-balanced dimensionality of a set of data.

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix}$$

A matrix of coefficients ready for an arithmetic on dimensionalities or cardinal numbers.



Animate Form by Greg Lynn, 1999.

would land us in specificity. In a better script, the entities, not engaged and in that sense still "unborn," must self-reflect. But they still maintain relation in the dimensionality of time—a probabilistic relation that comprehends their self-reflection. They meet as mutually outraged—outraged, not engaged: a play of outrage by non-born *pre-specific bodies of any-movements*. Or: an evocative talk of fictitious things. And on the strength of the symmetries experienced in relation to our BoT, we expect a new abstraction of numbers: a rational number', suspecting we may find it in the numerical ideality of algebraic integers introduced by Dedekind in 1872/88. Thus we are exiting the natural order and entering, we'd say, the universal order.

Orchestrating the 20th-c. mathematical masterpieces around our distinction of necessities and contingencies, we would associate logic and geometry with necessity, and algebra and arithmetic with contingency. In Augustus De Morgan we meet an interesting promoter of keeping magnitudes N and multitudes C distinct. We shall keep this distinction even when dealing with ordinals (N) and cardinals (C), remarking in passing that this strongly differs from Cantor's set-theoretical treatment of cardinals as necessities (N), and fictitious things, the dimensions (C), as geometrical lines (N).

So this is our question: how do fictitious things, as arithmetics on a linear axis $a + bx$, talk mathematically on stage? Keeping in mind that that term is not a particular function; in our reading it is an any-function, able to operate as a dimension for the arithmetics of any system, as described with the PCA. The question is: how can a vector of cardinals (a_1, b_1) talk to (a_2, b_2) ? And the answer: by calculating with vectors, as introduced by Grassmann in the 19th c., and popularized in the 20th by Whitehead's *A Treatise of Universal Algebra with Applications* (1910).

Two interesting things in this context: Grassmann is dubbed a linguist in the English Wikipedia, a mathematician in the German. Then, the German term *Vektorrechnung* (calculating with vectors) is commonly translated as "vector analysis," which is the straight opposite: calculation is projection, analysis is reflection. And a look at Grassmann's masterpiece, *Die Lineale Ausdehnungslehre. Ein neuer Zweig der Mathematik* (Theory of Lineal Extension: A New Branch of Mathematics, 1844), shows how the argumentation works: it is about reflective geometry of the exterior as an inversion of the projective Euclidean geometry from the interior. For Grassmann, vectors are fictitious things, and not rational talks as the term "vector analysis" would suggest. If we then talk about "vector analysis" in the 21st c., we find ourselves looking at a masterpiece from a 17th-c. perspective, while trying to overcome 17th-c. geometry. Interesting then that Grassmann was widely unknown in the reflective 19th-c.-(C)N environment, becoming constitutive only in the projective 20th-c. (N)C. Which shows the struggle we are caught up in, adjusting ourselves to the right level of abstraction in the 20th c.

We take Grassmann's vectorial calculation, an arithmetic on cardinals, for letting fictitious things talk on stage: (a_1, b_1) (a_2, b_2) .

As with PCA, we can add more and more dimensions to systems, for rendering them more adaptable to the fictitious points: $(a_1, b_1, c_1 \dots n_1)$. We are still able to put them on stage, and they will have the "Grassmann talk."

Now to the next step: introducing self-reflection to vectors. For specifying a two-dimensional linear system, we need at least two fictitious points $((a_{11}, b_{12}) (a_{21}, b_{22}))$, to be written as

$$\begin{bmatrix} a_{11} & b_{12} \\ a_{21} & b_{22} \end{bmatrix}$$

Such self-reflective vectors are called matrices, and there are arithmetical operators for matrices.

$$((a_{11}, b_{12}) (a_{21}, b_{22})) - ((a_{11}, b_{12}) (a_{21}, b_{22}))$$

For specifying an n-dimensional linear system, we need at least n fictitious points. The arithmetics on these matrices remains unchanged, and we are still in the natural order of linear systems.

In CAD such matrices are constitutive, and used for translation and transformation of the two- or three-dimensional geometry of objects.

[FIGURE I] Greg Lynn's *Spline* (in *Animate Form*, 1999) may be a good illustration of what a high-dimensional, linear natural space is: taking the anchor points of the spline as dimensions of the linear space, and the curve of the spline as a transformation of this

linear system to Cartesian space. But in contrast to what Lynn describes, there is no fundamental difference between the two constructions above. The main one in the center is just a slightly different, more flexible renderer of systematically the same kind of an n-dimensional linear space. A slightly different machine or fiction.

Riemann, or What to Look Like?

In yet another step further: what happens when working with an *infinite-dimensional linear space*? What does the world look like when any point reflects the whole world? Reflects the natural order? What does the world look like if there are no longer points in space, but the world's points themselves are dimensionalities of space? Not projective particles, not reflections of waves, but *projective quanta*? That is what Riemann's geometry (1854) is about, and what improperly is called non-Euclidean geometry. And that's what Richard Dedekind's numerical ideality, i.e., the algebraic-number bodies (*Zahlenkörper* in German, usually translated as "fields") are about.

Currently we are following the hypothesis that we are able to expand a *finite vector*

$$ax_0 + bx_1 \dots + nx_n$$

where each coefficient a, b ... n needs n values of fictitious points to become a specific fictitious point, to an infinite vector

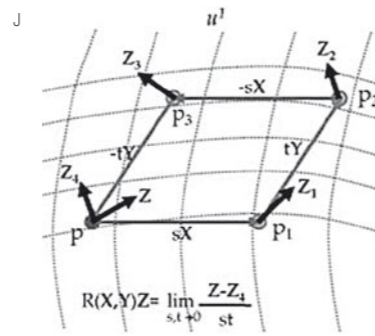
$$ax_0 + bx_1 \dots$$

where each coefficient a, b ... needs an infinite number of fictitious points to become a specific fictitious point.

In a two-dimensional world, looking at two points at least is required that are able to talk (mathematically) to each other—elementary stuff. In an n-dimensional world, looking at a minimum of n points is required, which is advanced stuff. In a real world, the requirement is looking at an infinite number of points that talk to one another, i.e., the whole world. We must balance their talking through algebraic geometry. Master stuff.

This shows that specific talk on principle is impossible when the whole world is on stage. But it is still possible to operate on these algebraic terms in a non-specific way. It is possible to operate with not-any-fictitious-points, represented by so-called polynomials such as $ax_0 + bx_1 + cx_2 + dx_3 \dots$. Affirming the infinity of the polynomials, we need immediately a new understanding of the coefficients (a, b, c ...). They cannot be specific either, whence they cannot be rational numbers. They must be treated in terms of numerical ideality, being, as the polynomials, as yet unspecified. These evocations, polynomials, and ideal numbers, do not have a specific name, as rational projections do have; they have *unspecific names to be negotiated* (by probabilities, we'd say).

[FIGURE J] What is the mien of these evocative talks stripped of specific numbers or specific names? Under the assumption of *continuity* (cf. Dedekind again),



An illustration of Riemann's continuous curves, 1854

BOJANA MISKELJIN

EIGEN-WINDOWS

AS A REFLECTION OF SINGAPOREANS' CULTURAL DIVERSITY

Information is everywhere. Gregory Bateson described information as "a difference which makes a difference" and in reference to that, this thesis is focused on how difference can be articulated in order to engage individuals to appropriate new qualities. The thesis explores how information can be extracted from the shared material world and transferred into a shared immaterial world of bits, and how it can be rendered back in a way such that, when it manifests in the material world again, it may "operate" within an individual's immateriality as a "desiring machine." This project has taken much inspiration from a text by Herzog & de Meuron ("The Virtual House," 1997).

The thesis is interested in learning about where the "cut" (the term "cut" is associated with a procedure from conceptual mathematics known as the "Dedekind cut," which allows for a conception of irrational numbers) operates inside the endless rationality of people's lives, and evokes their irrationality as a second infinity of their existence. It tries to understand where "that turn," from one world to another, takes place: from being "here" to being "there." What is that invisible flow, that sensibility, which Gilles Deleuze named "intensities," and of which he tells us that it keeps worlds together?

The context of the thesis is the cultural diversity among Singapore's inhabitants.

they mutually effect their dimensional spaces. Such is the beauty of Riemann's geometry, opening up the universal order. Thus elegant, and thus abstract.

EVOCATIVE TALK OF FICTITIOUS THINGS, 20TH C. Morphogenesis

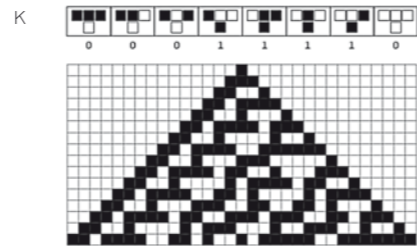
What is a Turing machine? We would say the Turing machine is a polynomial. The infinite stream of this machine is one single infinite polynomial. The whole world in *one* evocative point. There is this one point within a universal nothing. That's frightening. How to get stability? The answer of Turing, Gödel, Russell, et al., is: by logic. They did not trust Boole's or Dedekind's idea that the infinity of polynomials could be stabilized by the infinity of other polynomials. The Turing machine is one polynomial stabilized by logic using rational coefficients. And like Apollo, which took a single picture from outside our world, Gödel and Turing observe from outer space how to live within one polynomial constituted in natural, logical order, using rational numbers. This is what is called calculability. A desperate attempt at specifying the pre-specific, to treat evocation as rationality. Significantly, Gödel starved himself to death, afraid of being poisoned.



Whereas Turing outed himself as a homosexual, was forced to take drugs by court order, and took his own life because he feared the drugs might lose him his intellectuality.

Shortly before his death, Turing accomplished a further major step. As a cryptographer he put several such pre-specific natures on stage for evoking biological phenomena, and started a field of research, called morphogenesis (1952), with vast influence on today's biology.

What is morphogenesis? To determine that, let us first look at what it isn't. There is a little trick for making the abstract Turing machine more intuitively practicable. Instead of taking the machine as an endless one-dimensional sequence, take it as an endless two-dimensional grid. Thereby each element receives not only two but four neighbors, without the principles of the machine being affected. Identical thinking, identical operations. But now we are able to consider this machine a Cartesian map of rational talks reflecting fictitious things (but, however, of course not abstract enough for the 20th c.). Thanks to this natural setup certain events may now be evoked in a familiar Cartesian space, and, following logical principles, they spread out over the map. And results look very natural indeed. Perforce, since it is a tautological setup. A panopticon. We are in

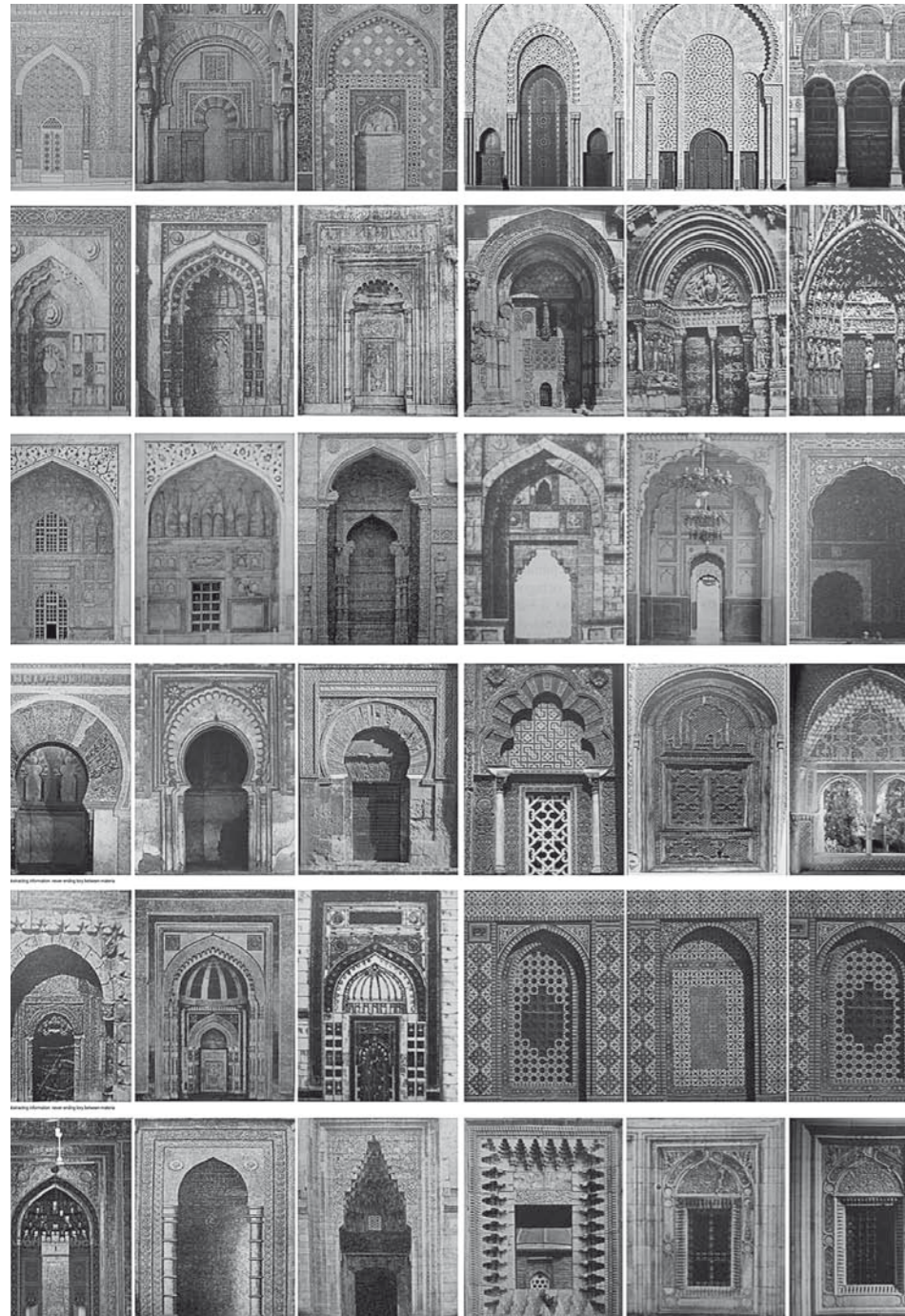


Cellular automata, a spatial grammar by Stephen Wolfram, 1983.

the game of cellular automata, Conway's *Game of Life* (1970), or even *A New Kind of Science* by Stephen Wolfram (2002). [FIGURE K]

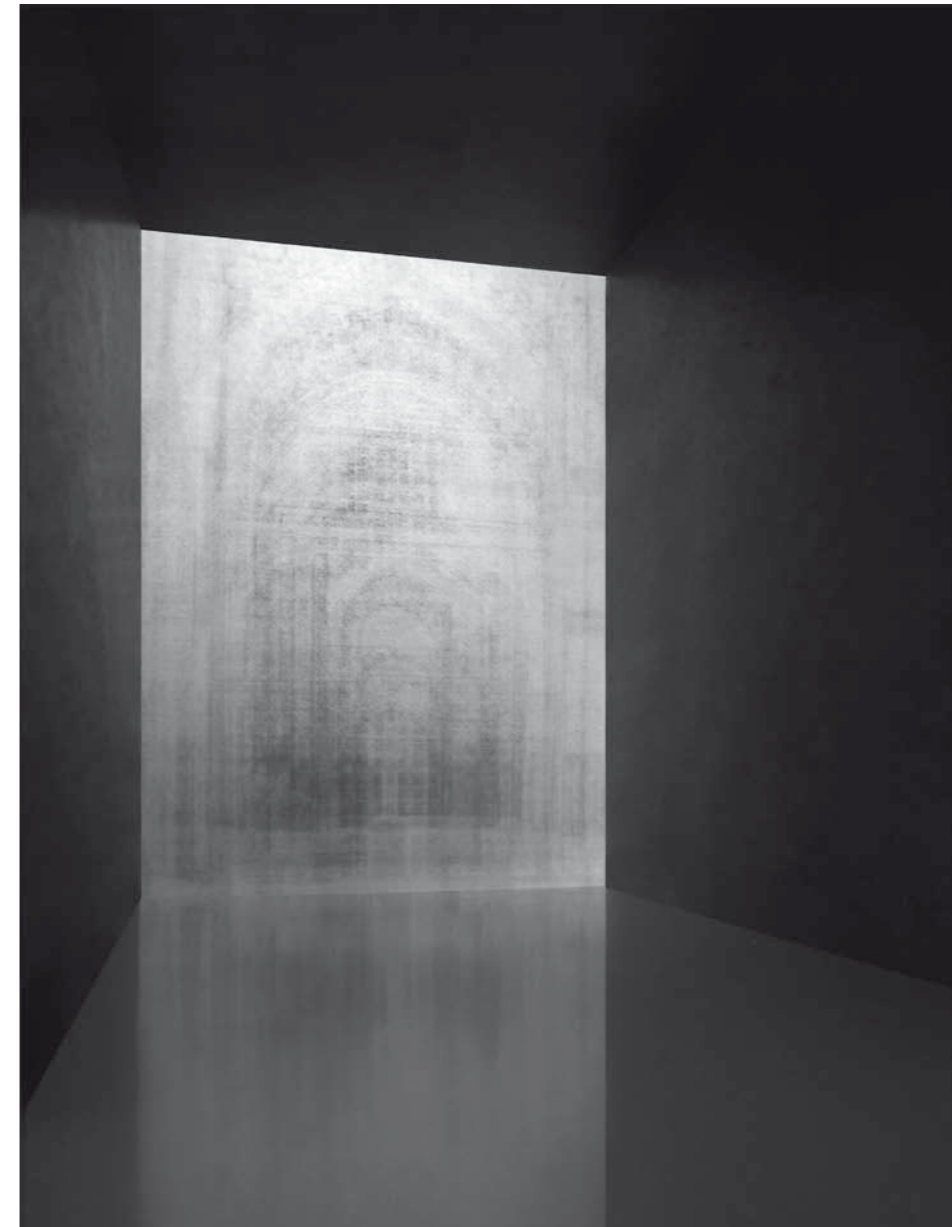
It means thinking in natural order explicated into universal order, so as to be able to look better—rather to reflect better—on phenomena, but still from the perspective of rational talks. (N)C—(N')C—(C)N—(N)C. What is missing, however, is abstraction. Computers (N')C are treated as machines (N)C. Getting faster and faster, and our (C)N reflections more and more detailed. But reflection is no longer one of rational talks, it is a self-reflection of our logical evocations. It is a tautological setup. So we are not looking at details of natural phenomena, but at the increasing speed of logical operations. That's what simulation is about: evocative talks (N')C intuitively (C)N-synchronized with familiar rational-talks-(N)C.

This term (N')C—(C)N—(N)C might be the driving force, the dynamism of the expansive phase of an (N)C setup, which we addressed as (N)CL, and associated with the 3rd c. BCE, the 16th, and, hypothetically, the 20th c., those periods of colonizing new spaces built around numbers, rational numbers, ideal numbers, around syllogistic, logic, logistics, around geometrical analysis, analytical geometry, algebraic analysis. We got



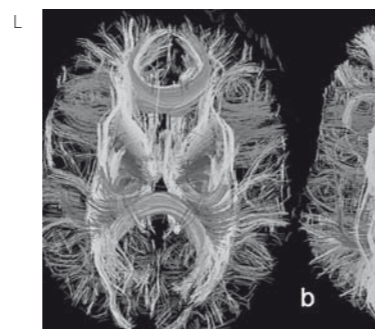
ARTICULATING IDENTITIES: EXTRACT, ABSTRACT, AND MULTIPLY

Singapore has grown into Singapore, throughout the past fifty years, by assembling different cultures such as Chinese, Indian, Islamic, Malay, and European. This thesis is focused on how the rich heritage of these cultures, which dates far back in time, can be cultivated—represented and multiplied with each other—into Singapore's actual and virtual cultural identity. How can we create an abstract space that is capable to actively remember these legacies, which all together make up the particular culture of Singapore? I conceive of such an abstract space as conceptual, and as manifest in the concrete structure of the architectural space as it actually exists. The concepts I work with to explore this abstract space are devised to capture, memorize, and integrate diverse components of Singapore's culturally disparate identity. To this aim, I attempt to translate architectural structures into informational structures, which I can treat by computable concepts. In other words, I attempt to treat the concrete architectural space as abstract. I will create a series of instances capable of expressing such an abstract space. I look at these instances as actualizations of the different gradients of the translated information. By exposing these many instances as apparently the same, I intend to engage anybody (not everybody!) to identify virtually with the same abstract space. Anybody should be able to recognize the culturally specific identities as familiar, even though they are in a new composition. Like this, recognizing something as familiar will inevitably also evoke the recognition of something new at the same time. Furthermore, my thesis experiments with whether

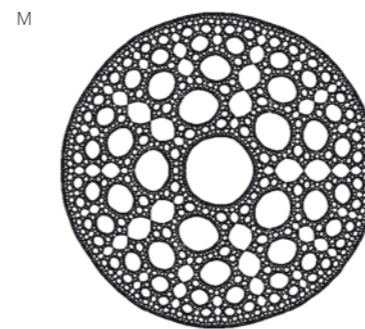


Hellenism, imperialism, and might collocate globalization along this line. All these expansions populate the new, wide plateaus of the new necessities N' by the old contingencies C and the old necessities N, which expire as they butt against the limits of the old thinking, starting to self-reflect it. That's when, on the level of self-reference, logic hands over its primacy in determining contingency to algebra, and we move from (N)CL to (N)CA, from Renaissance to Baroque, e.g.

[FIGURE L] And indeed, adducing today's masterpieces, they explicate the human genome, simulate the climate of our planet, the risks of our societies, the functioning of our brains. And with due respect for all these masterly artifacts, they will end up in the cultural constitution that the late (N)CL setups always end up in: evocative talk is *not 'not all the other rational talks'*. They will collect all the fictitious things around a centered void. We shall find that life is not any of these intuitions, climate is *not any of these intuitions*, thinking is not any of these intuitions. The void is what we called evocative talk. An exact abstraction to the Baroque cultural constitution of people quite as bright as we, who collected all the *animated* things around a centered void, in order to address the questions of *their* time. A void that developed into the rational talk to which we are so used today.



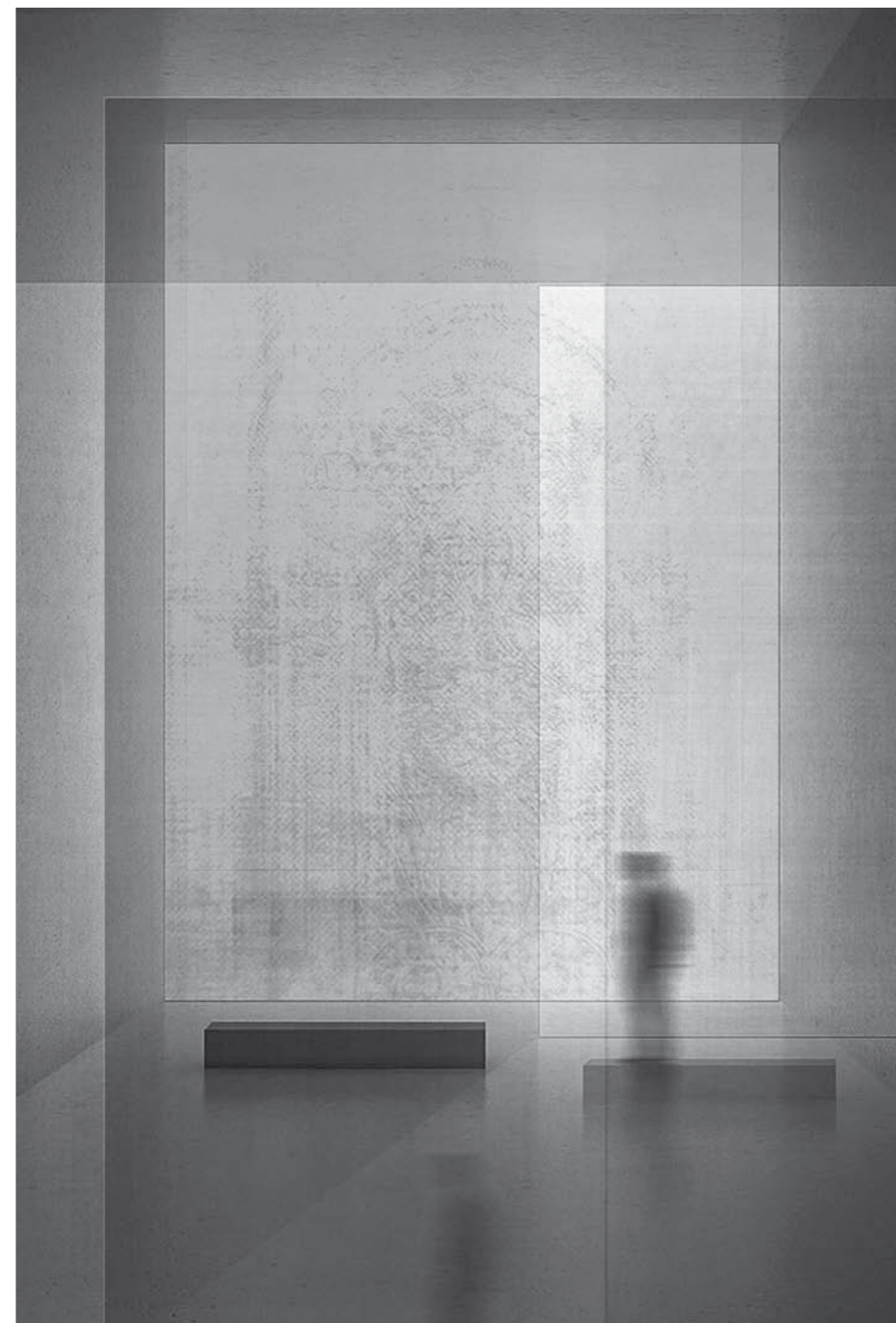
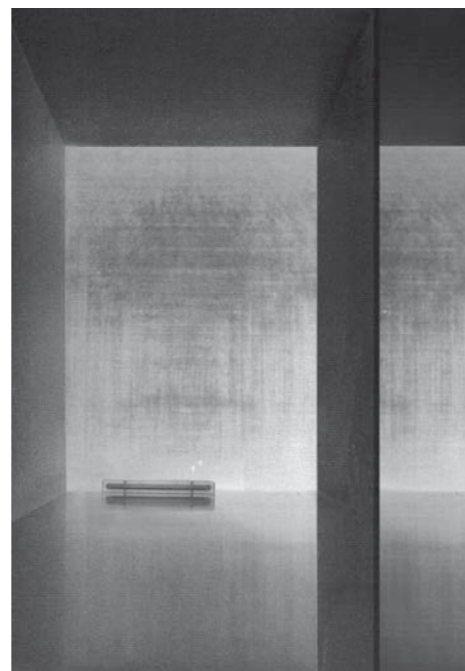
Diffusion-spectrum imaging illustrating the complexity of neural connections in the brain.



A fractal map.

[FIGURE M] Another popular rendering of calculability or the limits of natural order are fractals, as prominently illustrated, e.g., by Mandelbrot (1980). They represent a two-dimensional field of instances of a recursive function which, depending on their position on the map, create series of numbers. The color of a pixel on the map is determined according to the behavior of the number series. If, e.g., their total after ten iterations exceeds a certain value, the pixel is black, otherwise white. That's it, and thence there sprout these amazing naturalistic forms. So fractals are straight rationalizations of the evocations of infinite polygons. One is either inside the natural order (the black pixel—Koolhaas's Generic City), or one is out of it (the white pixel—Koolhaas's Junk Space). Cf. Douglas Hofstadter (1979) for further discussions on calculability.

Yet another prominent source of globalized projections exists. Instead of evocating rational-(N)C-talks, fictitious-(C)N-things are evocated. Which lands us right in the game of grammars, parametrism, genetic algorithms, neural networks, etc. A game not very different from the discussions above, projecting *topographies* into universal space—the focus in this setup is on “projected into universal space.” The term for this mode of expansion and colonialization is (C)N—(N')C—(C)N—(N)C. We'd further say



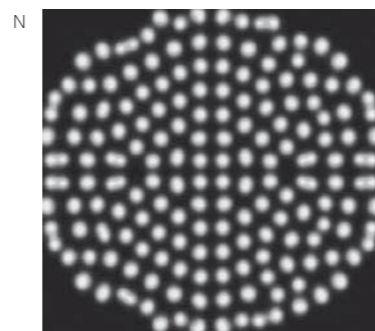
and how identities can be extracted from their natural manifestations—the architectural space, in my case—and raised into a new form of expression; not by making referential relations rooted in a memory one seeks to preserve, but by simply linking it up with whatever inspires one to create a new expression. My guiding questions revolve around, what inspires one to question representation?

THE SPECIFICALLY SINGAPOREAN SKYSCRAPER: A HETEROGENEOUS ARCHITECTURAL CONCEPT

Can we turn the architectural form of “a skyscraper” into an architectural concept of a specifically “Singaporean Skyscraper,” such that it is capable of reflecting Singapore's cultural diversity expressively? This thesis focuses on experimenting with windows as points of intersection, where different cultural identities compose their expressions. So conceived, windows acquire a pre-specificity and stop being merely generic units. Within the corpus of all of Singapore's windows, they acquire a generically specific identity, “a Singaporean window”—at once less schematic, more abstract, and potentially more singular. We can treat “a Singaporean window” as a new architectural unit, and combine its instances into a collective whole as a skyscraper. Of this skyscraper, we can say that it incorporates abstractly, and hence virtually memorizes, all the cultural identities of Singapore that have been translated from architectural structure to an informational structure.

that the (N)C—(N')C—(C)N—(N)C mode dominates the first half of the 20th c., and we would, varying the common acceptance, call that mode *structuralism*, whereas the (C)N—(N')C—(C)N—(N)C mode dominates the second half of the 20th c., and we'd call it *post-structuralism*.

But back to Turing. What did he do so differently from all this, when he introduced morphogenesis in 1952? Why is it new and groundbreaking? He simply layered, in probability space, two of those logical natures—with all the implications discussed above—and merely asked for their difference. His question was not about what each of them was. Therefore his is not a logical talk within a nature, but a talk between different natures. With amazing results: by just contrasting one slowly-and-intensely-evoking nature against another fast-and-smoothly-evoking one (cf. reaction-diffusion diagram), patterns are obtained that are much more adequate to something like, e.g., biological phenomena than anything before. And unlike with fractals, it is *not excluding anything*. With these algorithms—other than with structuralist and post-structuralist simulations—the *fictitious things are not there*. They are treated as “not-being-there,” similar to the things and the lines in prior (C)N setups, as in the Pythagorean-Euclidean and Renaissance BoTs.



Morphogenetic pattern implemented by a reaction-diffusion diagram.

In my final thesis I make use of well-known window designs from some of the diverse cultures that form Singapore's identity (Indian, Chinese, Islamic) and “recycle” them into a new unit that is genuinely abstract—my own articulation of a “Singaporean Window.” Such an abstract unit is capable of instantiating windows made up of the many windows: each of its instances exemplifies its own and singular kind. A “Singaporean Skyscraper” is composed of the abstract unit I call “Singaporean Window,” and articulated as an open vertical pavilion. Like this, a “Singaporean Skyscraper” is specific, yet truly heterogeneous. Like this, I hope, it will be capable of reflecting Singapore's diverse cultures.

The programming tools with which I work are Eigenvectors and PCA (Principal Component Analysis). The input data used are the images of windows, niches, and portals of iconic buildings of Islamic, Indian, and Chinese architecture. They represent the abstract Universes that together make up the “liveworld” of our new one-of-a-kind unit, the “Singaporean EigenWindow.”

IS IT POSSIBLE TO TAKE A PERSONAL POINT OF VIEW WITHIN THE GENERIC?

When abstract one-of-a-kind units are combined, they are capable of producing variants of “wholenesses” within any given reality. Accordingly, the thesis focuses on the question of how one could grasp such “wholeness”—since there can be a whole range of possible ones. Such a notion of wholeness is approached from the point of view of proportions—principles that organize abstract units by rendering them into

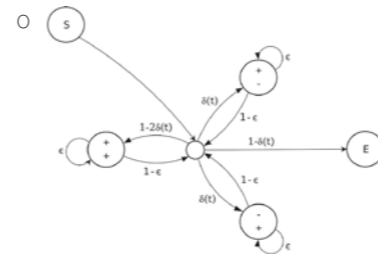


Diagram of a Markov chain of an element of evocation, and the space of probabilities toward its neighbors, 1913.

an open-ended number of articulations of wholeness—such that they can express any (not every!) given reality.

The thesis tries to find ways of how one can dream about abstraction as generating an abundance of opportunities capable of involving as many desires as possible. Moreover, it intends to explore: what are the conditions that make it possible for people to work in such a complex and high resolution setup that extracts and multiplies so many abstract details as potential “cuts” (in between rationality and irrationality); can the “cut” be conceived as a tool for “turning something into another thing”; can we think of the “cut” as an integration of abstract units which evokes a new perception, a new point of view. Consequently, the thesis tries to discover if and how, through a collection of “cuts,” a new meaning can be evoked, in a personalized manner.

To sum up: the thesis investigates how we can incorporate standards in an affirmative way, without subjecting (1) the needs and desires of a singular person to the conformity presumed by standards, and (2) our design to the principles which the standards dictate.

Markov

[FIGURE N] One might object that implementation always happens within Turing-machine logic; that morphogenetic algorithms are still finite algorithms, as are the ones attaching to the fractals. However, there is a crucial point: we establish a new level of abstraction, with new numbers. It must be done with much care and circumspection, not giving in to the facile temptation of unthinkingly explaining new phenomena through old, lower-level-of-abstraction paradigms.

But there is help, from the symmetrical 17th-c. setup and its introduction of the rational number. Remember: rational numbers are *rational talks of animated things*, whereas animated things are made up of *not all the other numbers*. Integrals and differentials are the arithmetic that applies to these rational numbers, a new arithmetic that is symbolizing, and working with *not the infinite series of numbers*. But when rendering results into *numbers as series of things*, after a certain number of iterations, one that will produce the degree of precision wanted, you must say: Enough! Quite as in our school days we were taught how to deal with integrals.

Now, how do we treat infinities? Just operate on the next-higher level of abstraction,

on the negative of infinity. And for bringing everything down again to a lower level of abstraction, just say when it's enough. The advantage of this thinking consists in that, with the help of this abstraction, you may obtain stabilities on the lower level of abstraction—in the case at hand the stability of a series of numbers or things—unobtainable without that abstraction. For people not thinking on the same level of abstraction, such calculations appear as magic indeed.

Thus, in a natural order water can rise through the piping of our infrastructures, in clear contrast to the cosmic order, where the water movement is always downward, and great aqueducts are built for providing cities with water. Hence, in a universal order, a light bulb simply emits light, whereas in a natural order light must be obtained through burning some stuff.

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Websites:
<http://www.flickr.com>
<http://virtualhouse.ch>

[FIGURE O] And now for Google, the social media, and the *non-content indices to the content of the world*. All of them working, symmetrically to the foregoing discussions, only on the level of abstraction on which everything is indexed, and connected with everything else. In the 20th c. we learned how to symbolize, and operate, on the basis of this new infinity. It's called coding. As computer scientists, we would call the lower level of abstraction “rendering level.” Markov in 1913 made a significant contribution toward rendering techniques on this lower level of abstraction, by greatly facilitating, after a few iterations, the saying of “it's enough,” a procedure nowadays adopted into all our renderings, and by Google into its PageRank. Thus we are, actually, in a position to deal with all the explicit content of the world within milliseconds. If one puts up with the

non-reference to content of our indexes, with moving within indexes and thereby exposing asked-for content indirectly and evocatively, and not by representation. We are evocating the appearance of content with every question put to Google or Wikipedia, with every pixel on the computer screen, with every glosseme of this text—to use an important concept of one of the truly algebraic linguists, Louis Hjelmslev, who invented an entire system along such probabilistic terms, which he called “glossematics” (1936).

At that, the problem we are forever grappling with is pitfalls: the conveniently and temptingly mistaking particular results for real, trusting them at face value, taking them as pictures, as signs, as phonemes, as answers. So convenient to ignore their level of abstraction. So easy to forget that they are evocations by mastership, stimuli for further thought.

Self-Organizing Map

[FIGURE P] Now, to wrap it up, a look at the most advanced generic and—according to our current lights—most promising algorithm around evocation: Teuvo Kohonen’s self-organizing maps (SOMs), introduced in 1982. SOMs have become quite relevant; but unfortunately they were received, and are being discussed, as are neural networks, cellular automata, or fractals. Which means their specific potentialities are shrouded by a lack of abstraction. SOMs are not—as they have been made to appear—talks within a nature, but talks between natures.

So let us discuss SOM as a Cartesian map where each pixel represents a vertical Turing machine. The setup used is comparable to that underlying our discussions of morphogenesis and the layering of natures. Our case at hand is marked by a matrix of natures, each of which is indexing all the others. It explicitly represents the basic connectivity of nature, whatever it be. Once again: SOM can do without preordaining any connections of whatever kind, thus differing from the structuralist or post-structuralist approaches typical of neural networks, cellular automata, or fractals. SOMs play with, talk to, or articulate *not all the other connections*, or, one might say, they talk with the pre-specificity of *any connections*.

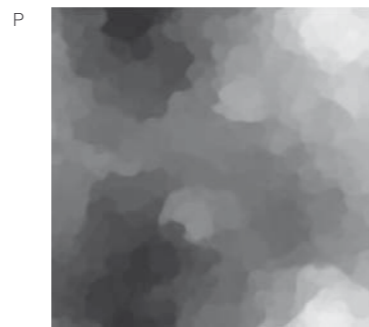
Now, when a SOM is being exposed to a some nature, e.g., to a stream of data from our real nature, its connectivity of natures then adapts to this particular nature, whatever it is, and however it is structured. It may then be said that the SOM exists within its own nature, thus engendering its own kind of ordaining connections. And when asked about its nature, the SOM will answer as precisely as possible, from within its existence inside its nature, as to what—regarding the question—the structure of its nature *is not*. Such infinities ultimately are non-implementable. Give thanks to Markov, and say, at a point you think adequate and that depends upon your mastership: Here’s enough!

Neural networks are logical reflections on natural phenomena. SOM is *not any reflection*. It projects evocations. Put a SOM on a stream of data from our real world, and it will evoke further data. As in questioning Google, no final answer results, but an evocation of a new answer to the world. Our experiences with SOM are amazing:

1. SOM may be fed with any design, engineering, or analytical task
2. SOM produces a most-reasonable next step
3. and with it, one always betters the statistical optimum
4. without knowing why.

That’s the stuff we think our future world and upcoming universal order is going to be about. Not about scarcities, or about just distribution of limited resources. It will be about primary abundance, and about intellectual challenges. About evoking the most promising questions, about cultivating the sediments of masterful articulations, indexed by machines. *Architecture is about evocation of ‘not the other worlds’*. It is about creating identities. The world, in this view, is rich, and not restrictive, either culturally or intellectually. A clear path out of the current, all-pervasive, misanthropic generic setup.

We are not saying grammars, neural networks, genetic algorithms, cellular automata, parameters, etc., are not working. What we are saying, rather, is that they are working too well. Indeed, optimizing our entire world is not a problem. The problem—if this term be used at all any longer—is that the problems are for the computers, and that those are solving them with ever-increasing speed. The problem is that optimizing our world is not a problem. The problem is that the necessity N, which is affine to economy, must be tied to a corresponding C, to contingency, to politics. It falls to us to use all the computing power we’ve got, and to keep asking for next steps within our nature, whatever our nature is. The computed answers, which will appear as necessities N—they



P A self-organizing map, clustering self-reflective vertical Turing machines.

are calculated, after all—will be *what they are not*. We then decide, and reconsider, and play the contingency part C. This is how mastership may be cultivated today.

That was a handful. That’s where we stand. Did it get you interested? Then enjoy the artifacts articulated by our students throughout our past academic year, 2012. More of it will be coming ... Be seeing you ...

Vera Bühlmann

Articulating a thing entirely in its own terms

**Or, what can we
understand
by the notion of
“engendering”?**

071 What or who is the subject of the generic?

071 **Grammatizing symbolic domains**

072 **An abstract object's integrity: Political subjectivization**

082 **Beyond urban comfort, in a state of expulsion**

085 **Generic as an adverb, universality as an oeuvre**

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088 **The man without qualities (Robert Musil)**

088 **The city without identity (Rem Koolhaas)**

090 Falling in love with the in-sinuosity proper to an economy of entropy

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103 **Within the Generic City: Master, yet in "whose" house?**

106 Characterizations of the subject of the master

106 **Attracted by the volatility of a flirtation between the philosophical stances of "critical rationalism" and "speculative realism"**

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118 **Cosmo-politics, or putting to work a symbolist meter**

121 **Cosmo-literacy, or the alphabetization of the nature of numbers**

123 Appropriating a body-to-think-in

124 **The most common representation of the nature of numbers ...**

124 **... and how it got into trouble still not resolved today**

125 **Algebraic operations, or how the nature of numbers can be brought to work**

127 Masterpieces, and why there are so few of them

127 EigenArchitecture

I would like to thank Nathan Brown for his helpful comments on an earlier version of this paper.

1 Here, "tremendous fascination" is deliberately "exported" from religious vocabulary, where *mysterium tremendum et fascinans* is used to attribute holiness to God. It is an ambiguous expression that acknowledges the finitude of man's capacities to understand. It makes reference to something that is fascinating and yet at the same time profoundly unsettling, because it promises a kind of automatic comfort, belonging, and beauty, in which everyone is welcome, while also confronting us with man's helplessness and insignificance in the face of divine inviolability.

2 Louis Althusser may be considered as the most important theoretician here, yet the same symmetrical relation—albeit in significantly diverse manners—is also constitutively present in the work of Jacques Lacan and, arguably, that of Alain Badiou.

3 Especially the diverse attempts of a post-critical return to philosophy as a rational and metaphysical enterprise, which are referred to as marking a "speculative turn" in recent philosophy, associated with philosophers such as Quentin Meillassoux, Ray Brassier, and Graham Harman.

What or who is the subject of the generic?

Most anyone interested in computational design today shares a tremendous fascination with the somewhat dubious notion of "the generic" and its promise of the "one-of-a-kind particularity" of instances that can be computed.¹ Much of the widespread attractiveness of this promise is owed to the idea that such one-of-a-kind particularity be neither *example* nor *prototype*, that its organization be not governed by a logic of rigid classification. Every generic instance counts as "typical" (not needing any surplus qualities to be specified) even though it may well be "singular," the only one of its "kind." In programming, the notion of the generic means to formulate functions that are of highest possible generality such that they apply to no *specific* structures of data, but to (virtually) *any* structure of data. More straightforwardly: in programming, the *notion of a generic* object suggests that its instances are a *this*, without being a *such*. Their one-of-a-kind particularity can only be *indexed*, pointed to; it is a particularity that never manifests as *corresponding* to a certain genus, but only in terms of indefinite *adequation* within a scope of genericness that aspires to be universal (not classificatory), and that is being articulated by each particular manifestation of such an instance. The extraordinary—if not straightforwardly salvational—implication thereby is that with generic objects, *articulation engenders universality*. Generic objects promise, as objects with a nontransparent and apparently singular autonomy, to be shielded off from any attempt at appropriation by individually vested will, desire, interest, or meaning. Instances that are realized from such a generic object appear in a peculiarly innocent sense "genuine."

The great fascination for such genuineness today, as I understand it, is driven by a certain subversive pleasure geared against the exhaustive and demanding "political dynamics" of what is often referred to as an *economy of recognition*.² It sets the political confines for most of the twentieth-century structuralist and post-structuralist discourses around a necessity to give difference and self-reference a primacy with regard to identity and representation. In all brevity, central for an economy of recognition is that anything that can participate in and profit from it—anything that can find accommodation within the "modern" *nomos* (political as opposed to cosmological law) of a "modern" *oikos* that is "mastered" collectively (house-as-state)—needs to be mediated through language and concepts.

Such "mediation" involves all the complex cultural issues related to questions such as, what is actually the "object" described by linguistics? Does language, if we could find its pure form, describe natural kinds? Is there a pure form to language at all, or is language in its everyday use a "natural" language—and if yes, are there many natures of language, and what does such an assumption entail? Should we regard language as a system, a structure, or something else? Is it possible at all to generalize from the diversity of languages actually spoken and written, and what does it entail to do so?

To make a long story (very) short, a peculiar inseparability between *interpretation* and *formalization* has haunted notions of theory, objectivity, and subjectivity throughout the twentieth century. The respective discourses have grown quite removed, in all "critical" negotiation, from what is perceived by many as the "real issues at stake" (to improve and optimize global living conditions), and the voices raised are inevitably, it seems, also always acting *tactically*. But most of all, the idea of a position that could clarify permanently the confusions that spring and proliferate from linguistic attempts at clarification, appears to many, meanwhile, as raising the issues in inadequate terms.³ Our relation to language simply remains as intimate as our relation to breathing.

Grammatizing symbolic domains

Now this is exactly what computational linguists like Noam Chomsky began to readily affirm: yes, he holds, language is so intimate to all of us that it makes sense to imagine it as a kind of a cultural "genome" we are born with, just like we are born with a biological genome. Such a radical move, whose affirmation must count as a veritable *philosophical capitulation*, was actually capable of moving beyond the preoccupation of "critical" philosophy with the (politically all but innocent!) *foundational issues* about the nature and role of language for thought, *specifically* (ethnic and racial discrimination), *generally* (socialism), or *individually* (capitalism). Instead, it was capable of *modernizing* the interest in language itself by postulating a categorical break with the mimesis tradition altogether. No longer focusing on mimesis and its questions of interpretation, truth, and the definition of meaning, the interest now shifted to the pragmatism of sheer transformability. The so-called transformational or context-free "grammars"

and “vocabulary” with which programming “languages” work do not even claim to be “natural”; they are, to put it a bit provocatively, *genuinely engendered*.

Let us look briefly at the development of two very strong paradigms in programming throughout the last decades. Early languages such as Fortran, Ada, or C started out with a *procedural paradigm*. The main interest was to make available for easy application, as a kind of toolbox of “instruments” in coded “form,” the precise way of how a certain organizational procedure needs to be set up in order to function well. Every step of decision can thereby be “dispersed” into constitutive procedures, and hence, an infinitesimal limberness can be introduced into organizational forms. The paradigm subsequent to this pursued a much less directly hands-on approach, and instead became more didactical. With languages like smalltalk, Java, and C++, an *object-oriented paradigm* followed the procedural one, and it strictly kept apart the levels of *what* (described by procedures) and *how* (the specification of this *what*). Through this distinction, negotiation began to be supplied by “computational augmentation” about *what is to be reached*, and about how systems can be devised that allow the instantiation of procedures (*whats*) in much wider variations. Object-oriented programming allows devising entire “libraries” of “abstract objects” that depend on no statically specified order or classification system. Yet such abstract objects are not really “objects,” they incorporate entire “objectivities”—they allow for one-of-a-kind particulars to “concretize” singularly, and optimally be fitted according to the requirements of a task.

This is what we are talking about with the generic in computation: the ambition of programmers to develop informational “coatings” as a kind of abstract packaging, as “symbolic cases” that preserve and protect the “abstract object’s integrity.” All the potential functionalities offered by it ought to be provided in a most robust and compact “manner,” and for a largest possible variety of instances. Equipped with the technological power of such “languages,” the subversive pleasure that seems to accompany the wide interest in generic design today lives, on the one hand, from a *radical affirmation* of those liberating and disciplining constraints within an economy of recognition, which dictates that the nature of a thing is to be considered in the (politically sanctioned) terms in which it is actually addressed; yet it also lives from responding to this dictate by what I would call an “expansion in dimensionality” by investing its energies into the “substantiation” of speculative notions of reality: it sets up, by means of such genuinely engendered “languages,” symbolic domains that can accommodate the objects under investigation in the terms sanctioned for describing them, but that open up further possible spaces as well—which are governed “intra-specularly,” within an imaginary locus proper to particular objectivities (or any combination of elements of combined objectivities).

An abstract object’s integrity: Political subjectivization

But what kind of integrity are we talking about here, when referring to an abstract object’s integrity? What kind

**MELINA MEZARI,
STELIOS PSALTIS**

GENERIC VILLA

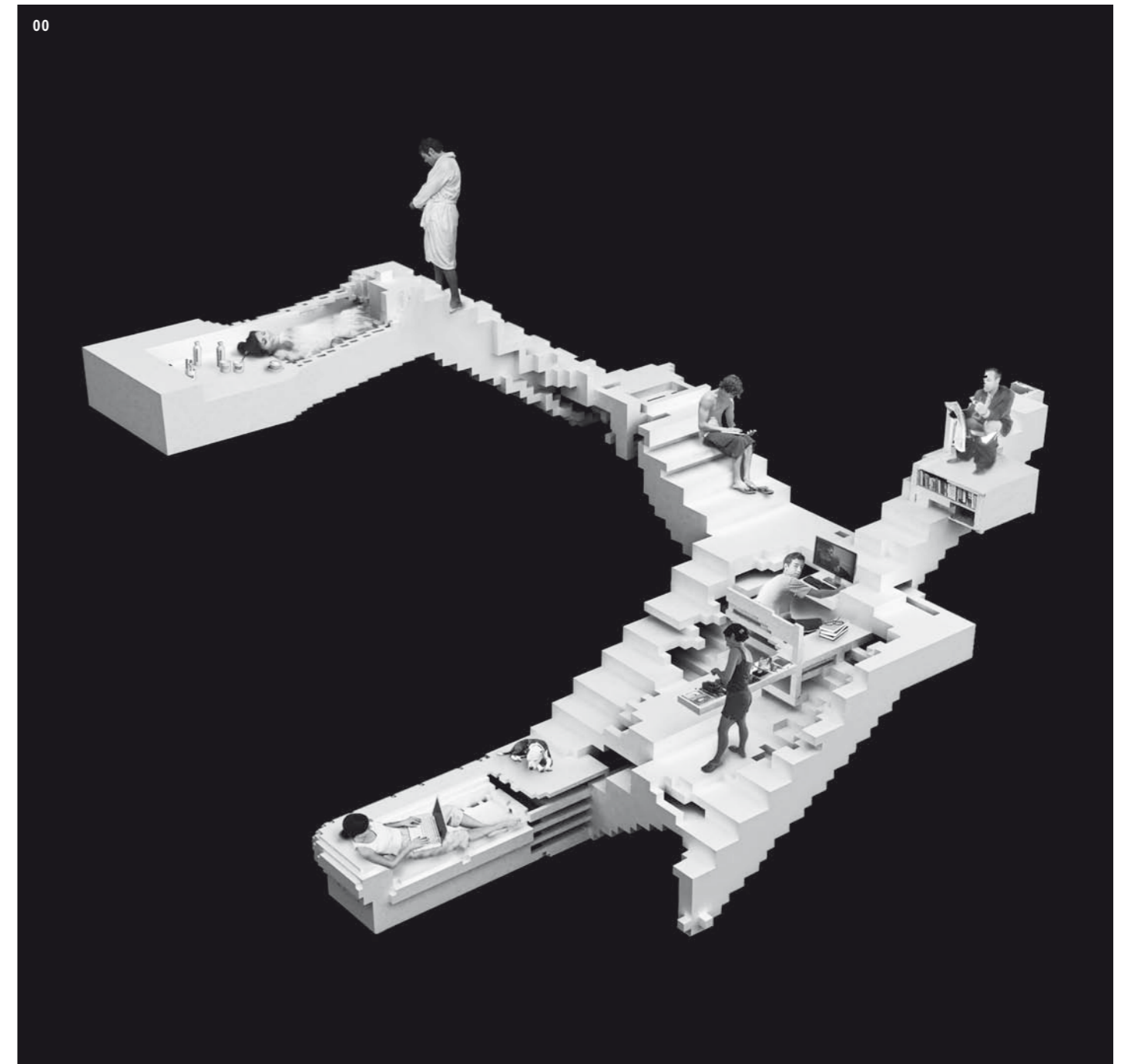
We deal with the notion of the Villa in a way that tries to conceive of a new kind, one that becomes descriptive of the entire group or class of villas, without a brand name, with a generic character. In other words, it is an experiment in universalizing the architectural concept of the villa.

Our project’s focus lies on conceiving the architectural form of the villa as an inhabitable artifact. As such, we imagine that it acquires meaning in an open and indefinite manner, through the articulations of its modularity in all its instances. In our design approach, this modularity is predicated entirely by the activities hosted (actually or virtually) in a villa’s possible compartments. Since these activities are infinite in number and manner, the generic villa can never be exhaustively articulated and actualized. Hence, in our attempt to describe it, we follow what we call “a framework of infinitary inclusion”: we assume that certain configurations of its compartments express the generic yet singular, pre-specific individuality of any one villa in particular.

4 An example of such extensions of numerical corporeality is complex numbers, which are composed by adding the imaginary unit $\sqrt{-1}$ to real numbers.

5 Field theory is more adequately, albeit less often in English, called the theory of numerical *corpus*. This is consistent with the French expression for field, which is *corps*, as well as the German *Körper*.

of integrity is proper to symbolic domains that are governed intra-specularly? Much of what this text will be dealing with concerns this question. Far from desiring to disenchant the fascination that surrounds emerging notions of the generic, this text will suggest *radicalizing* this fascination. Yet to radicalize here, we will see, doesn’t mean to “sharpen,” as if a weapon, or to specifically devise an instrument that could be put to a worthwhile cause. To radicalize a fascination is to radicalize what charms us, the “spells” that take hold of us, and it is meant here as it literally applies to certain ideas about the nature of numbers, which I will come back to later. In essence, it is about mathematical adjunction in field theory, which emerged out of algebraic considerations regarding the solvability of equations. For now we can say that to radicalize the notion of the generic involves affirming the symbolic nature of numbers.⁴ And this entails, literally, regarding numbers in terms of *finite, yet infinitely extendable “corporeality.”*⁵ With the rise of abstract algebra in the nineteenth century, people were also speaking of providing *domains of rationality* for a certain (numerical) solution space (instead of taking *universal conditions of rationality* for granted, as is the habit in a nonsymbolic understanding of numbers).⁶ Put in general terms,



corpus theory is central for establishing domains of unique factorization—that is, numerical domains where the arithmetic operations are well defined *for all elements of a corpus* (i.e. not in general, but specifically). Thereby, arithmetics ceases to be, in a unproblematic manner, universally applicable. We regard this as central to a different paradigm of programming that we would like to help grow stronger—not a *procedural or object-oriented* one, but one we call *pre-specific*.⁷

This has several consequences for how we think about computability. Calculations cannot only be right or wrong, but they can also be set up in an adequate or inadequate manner. The solution spaces that are provided for calculations have different capacities. To put it quite provocatively: computing turns into an art (again), just like mechanics used to be an art (and not a science) before industrialization. Even the expression *to be industrious* once meant to be apt and diligent, in terms of personal qualities one has acquired—very different from the meaning of *industriousness* as an alienating submission to an orchestration that is strictly clocked by a responsibility external to oneself, which has become the predominant understanding today. The entailments for revitalizing this legacy of computing as an art are ambiguous, and they seem twofold: on the

When related to the question of urbanity today, the notion of the villa seems to be of extreme interest once again. Villas were always related to political issues of power, signifying the power relations within certain regions. It is interesting to see that following the iconic examples representing major architectural manifestos throughout history, villas don't seem to narrate a story of progress, of growth and expansion, but rather one which mirrors again and again a time's BoT. There seems to be a certain invariant symmetry constitutive for the development of the architectural concept of villas, between outward-orientation (which we call "expression") and inward-orientation (which we call "impression"). What we find in historical comparison is that this symmetry is repeatedly being inverted in the way and manner in which villas have been designed and built, e.g., from Palladio (expressive) to Semper (impressive), to Le Corbusier (expressive) and Eisenman (impressive). Before the background of this hypothetical setup, our core question is: What is the next villa? [FIGURE 01]

As more and more of the entire planet is being urbanized, and as there is increasingly less distinction between countryside and city, it is our interest to consider the concept of the villa not in terms of a *general class of forms* of how people live in this global urbanity (homes, *Eigenheime*), but as an *abstract modularity* that needs to be articulated—rendered into instances in which it presents itself. Such articulation is achieved through partitioning the compartments that are held to be constitutive for "the villa" as an architectural concept. We regard global urbanity as the *universe* of the villa, where it "lives" as an abstract (not as a generalized) identity. What we mean by this is that instead of departing from standardized units, to which we can apply general principles of composition, we suggest to engage in elementarizing the villa's compartments in any way thinkable. Like this, the villa as an abstract modularity allows for the engendering of the particular compositions in which people live individually, in a one-of-a-kind manner.

Hence, the proposed approach could also be considered as an experiment in universalizing the notion and the principle of "the villa": we propose that to be "villa-ic" must be considered a property of the entirety of all artifacts that exist in the universe of global urbanity. In all radicality, we want to consider "villaic-ness" as a property of *anything at all*. The question then is, in what way can the notion of the villa remain a meaningful notion, if we blow it up beyond all classificatory bounds?

It is not the concrete structure of the automobile engine that is expressed but rather the form, color, shape, the accessories, and the "social standing" of the object. Here we have the tower of Babel: each item speaks its own idiom. The conservative, in choosing and using a car, wishes to convey such ideas as dignity, reserve, maturity, seriousness... Another definite series of automotive personalities is selected by the people wanting to make known their middle-of-the-road moderation, their being fashionable... Further along the range of personalities are the innovators and the ultramodern... No doubt Martineau is right: it is in this way that people define themselves in relation to objects.

JEAN BAUDRILLARD

We suggest partitioning the compartments of the generic villa with reference to the activities that are suggested and supported by domestic objects. We propose to set these activities into the infinitive form (sitting, cooking, chatting, sleeping, dressing, etc.), as abstract acts which can be actualized through individual appropriation of these acts into proper activities, in free combination. Like this, the domestic objects too are infinitized, such that we can consider them beyond the delimitation of the actually objectified functionality which they embody as particular objects. We can begin to qualify the activities in which we appropriate the objects with *surplus aspects* (like pleasing, comforting, challenging, enhancing, grounding, etc.) in any way thinkable. Hence we can look at the functionality that is constitutive for an

⁶ To provide domains of rationality for a certain (numerical) solution space makes sure that the roots of a polynomial with coefficients raised to the *n*th power can be expressed in terms of radicals according to an integral domain governed by the principle of unique factorization. Leopold Kronecker especially preferred to speak of *domains of rationality*, in distinction to the main inventor of corpus theory, Richard Dedekind. Instead of domains of rationality, Dedekind thought about the possibility to extend a numerical corpus in terms of *prime ideals*. The two stances can be seen to represent two epistemological vectors of *induction* (primary in Kronecker's empirically grounded approach), and the strange mixture that Charles Sanders Peirce—another key figure in the rise of universal algebra in the latter half of the nineteenth century—attempted to define as *abduction* that establishes the conditions of *deduction* (Dedekind's approach grounded in abstraction).

⁷ For a discussion of the Dedekind approach to ground corpus theory in acts of abstraction in relation to an understanding of computation and calculability, see Vera Bühlmann, "Continuing the Dedekind Legacy Today, Some



00 « **GENERIC VILLA**/Manufactured objects conspicuously transform into unexpected new forms, making a strong statement about our current cultural condition of abundance. Attention is focused on a reconsideration of the ordinary.
01 Expression—Impression - Expression—Impression

Ideas Toward Architectonic Computability," (lecture, Turing 2012 Conference, Manila, Philippines, March 2012), <http://www.monasandnomos.org/2012/12/05/computing-within-the-open-totality-of-everything-that-can-be-the-object-of-thought-continuing-the-dedekind-legacy/>.

⁸ For those interested in following this line of thought toward a criticality that is local and universal, see the Jules Vuillemin's superb book, *La philosophie de l'algèbre* (Paris: PUF, 1962), especially chap. 4, "La théorie de Galois," 222–300, in relation to adjacency in mathematics, its relation to the notion of groups, and its overall entailments for Kantian and post-Kantian notions of criticality.

one hand its promise is to gain the possibility for a new criticality, yet on the other hand, this new *criticality* is rooted in a kind of *local universality*. When we suggest speaking of an abstract object's integrity, this relates to the particular capacities provided by the solution space that is constituted by such an abstract object.

But let us not discuss this further here in the rather technical terms of mathematics,⁸ and instead refer to the same issue—criticality in relation to a certain *capacity* and *ability* that is involved in partitioning, identifying parts and wholes and their interdependencies—in the context of contemporary political theory. Within the modern *oikos*, sheltered by a modern *nomos* (a political, not anymore divine, *nomos*), each "theme" has to be treated as a "subject" in order to find a platform for public address (newspaper, education, etc.): what once enjoyed generosity in how it was treated (or the silencing violence, or the doctrinary appropriation) attributable to *common places* (a theme as a "topos") now has to be accommodated within an overall organization, and that means its treatment (discourse) has to be surveilled and negotiated. Such a "subject," in a purely passive and nonpolitical way, is an "object" in the sense of the grammatical case of the accusative—the case of that which is "caused," that which is "called to account" and needs to be "accommodated in its proper



object from an inverted perspective—that of its "villa-icness." This inverted perspective allows for specifying their properties purely by indexing: *this, and not the other*. It is no longer necessary to define in positive terms what one is looking for. Instead, if we use activities as our reference level, we can include *infinitely much* into our specification, and we can invert the composition of all these constitutive and surplus aspects of an object in manifold manners. We can design by dramatization and storytelling.

THE VILLA: AN ENCAPSULATED SYMBOLIC NATURE

THE HOUSE AS A FIELD OF OPERATIONS

Within a framework of infinitary inclusion, each domestic object becomes contextualized with potentially all other objects that live in the same universe. On the symbolic level of such universality, different stories take place and become meaningful in different environments and at different locations—for example, in particular villas that one wishes to consider. They too can be regarded as domestic objects like this, as an encapsulation of symbolic stories as the dramatization in various coevolving "acts." Actual villas viewed within such a context express certain generic vectors as their own, independently told stories.

For all their multiplicity, objects are generally isolated as to their function. It is the user who is responsible for their coexistence in a functional context; their coexistence resembles an assortment of partial functions that are often irrelevant or antagonistic to one another.

JEAN BAUDRILLARD

place," i.e. categorized.⁹ A theme as a subject in that sense, as one that is to be *categorized*,¹⁰ is what is put before public assembly, because its predication is yet to be clarified. If we are to consider the integrity of those abstract objects that constitute the solution spaces in generic computations within a scale of adequacy, every commonplace interest (theme) turns into a "subject-with-dispositions-and-capacities." The new criticality at stake, a criticality of finite synthesis, concerns the symbolic constitutions—and through that, the capacities of abstract objects—that are orientating power (public address and its surveillance) in discourse.

This same abstract issue—the partitioning, the identification of parts and wholes and their interdependencies as *problematic*—features centrally, for example, in Jacques Rancière's contributions to contemporary political theory.¹¹ His notion of *political subjectivation*, which he developed in a 2004 essay entitled "Who Is the Subject of the Rights of Man?," is very helpful for developing

9 The accusative is the grammatical case whose primary function is to express destination or goal of motion, from the Latin (*casus*) *accusativus*, "(case) of accusing," from *accusatus*, past participle of *accusare*. The Latin *accusare* means "to call to account," from *ad-*, "against," + *causari*, "give as a cause or motive," from *causa*, "reason." *Online Etymology Dictionary*, s.v. "accusative," http://www.etymonline.com/index.php?term=accusative&allowed_in_frame=0.

10 From the Greek *katēgoria*, "accusation, prediction, category," verbal noun from *katēgorein*, "to speak against; to accuse, assert, predicate." *Online Etymology Dictionary*, s.v. "category," http://www.etymonline.com/index.php?term=category&allowed_in_frame=0.

11 The way Rancière approaches and unfolds his political arguments, which center around a foundation of politics in aesthetic judgments, involves following him on an unusually high and demanding level of abstraction. Indeed, this is often one of the key points for which he is criticized—it raises people's suspicion because it is not easy to follow (in understanding, not in action!). Contrary to this view, his engagement with abstraction is precisely what exposes him within the current landscape of political theory and philosophy—which is to a large amount straightforwardly programmatic, if not outright polemic, by *not* demanding the reader to understand the abstractions at work in it. This is unfortunate because it cannot facilitate a problematic engagement with the proposed arguments, but rather demands devoted followership—the creation of "movements," by being promised (by the *authority of expertise* that is declared too difficult for the common person to understand,

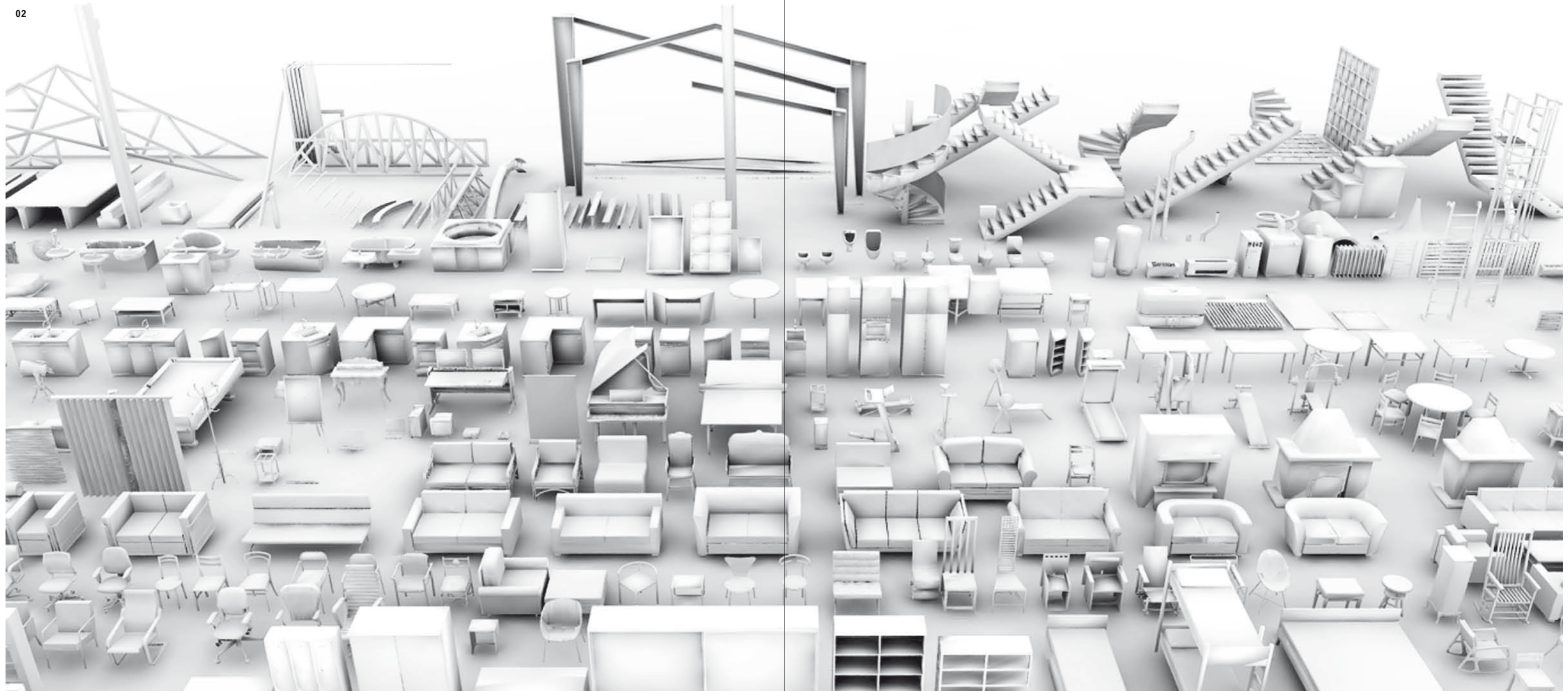
and hence needs to be presented in trivialized and infantilized manners) to "stand on the right side of history." See for example Slavoj Žižek, *Die bösen Geister des himmlischen Bereichs. Der linke Kampf um das 21. Jahrhundert* (Frankfurt am Main: S. Fischer, 2011).

12 Jacques Rancière, "Who Is the Subject of the Rights of Man?," *South Atlantic Quarterly* 103, nos. 2/3 (Spring/Summer 2004): 303.

13 *Ibid.*, 306.

14 Leibniz's dictum was, famously, that *nature makes no jumps*—the assumption of uniform continuity in natural processes has been central for applying the then-new infinitesimal methods in modern science. It is needed to support all epistemological positions that consider themselves analytical-empirical. It seems to us that Rancière is opting for a similar framework as this one between *movement-continuity* (infinitesimal calculus in science) for his context, that of *political-acting-human* (aesthetic judgments in politics).

an idea about what such criticality entails. "Political subjects are surplus names," he holds, "names that set out a question or a dispute (in French, *litige*) about who is included in their count."¹² For Rancière, the name of such a political subject cannot be a *proper name*, nor the name of a general class (a *noun*). It is whatever and however may qualify such a noun: the adjective of the general class of humans. Thus, the name of such political subjects can only be "generic," and as such it is, for him, the name of the *demos*.¹³ Thus he refers to the *demos* in an adjectival sense, from the Latin *adjectivum*, "that which is added to (the noun)." It is in this adjectival sense that political subjects are *surplus subjects* for Rancière, a view that grants that giving a definition of the noun (humanity, in this case) is not necessary—it is barred from articulation and being spelled out and must be taken as a premise and treated approximately, just like the continuities of movements are treated in modern differential calculus.¹⁴ Here is not the place to



discuss Rancière's position in any adequate detail, yet it needs to be pointed out that our own proposition turns away from Rancière's at a certain point. By raising the issue of an *abstract object's integrity*, we propose to treat his notion of political subjects not in classificatory terms altogether, but in categorial terms. This means that we opt to regard political subjects, subjects named generically, as universal and adverbial (not as adjectival). We will come back to what this entails in more detail; for now let me simply point you to Michel Serres, who has most forcefully articulated such a perspective in his 1990 book *The Natural Contract*: "My book argues that this Declaration [the Declaration of the Rights of Man and the Citizen from the French Revolution, and its update by the declaration published by UNESCO after the Second World War] is not yet universal as long as it does not determine that all living beings and all inert objects, in short, all of Nature have in turn become legal subjects."¹⁵

15 Michel Serres, "Revisiting *The Natural Contract*," trans. Anne-Marie Feenberg-Dibon (lecture, Institute of the Humanities, Simon Fraser University, Vancouver, May 4, 2006), <http://www.cttheory.net/articles.aspx?id=515>.

Causal relations enable the functioning of the elements. These relations or recurrent causality between the forms, are constituted by the associated milieu, which mediates the relation between the elements.

GILBERT SIMONDON

Forms exist as separate entities and become active when they organize themselves in relation to the ground—the mental associated milieu, thus actualizing prior virtualities.

GILBERT SIMONDON

A bed is a bed, a chair is a chair, and there is no relationship between them so long as each serves only the function it is supposed to serve. [FIGURE 02]

JEAN BAUDRILLARD

Without such a relationship there can be no space, for space exists only when it is opened up, animated, invested with rhythm and expanded by a correlation between objects and a transcendence of their functions in this new structure. In a way space is the object's true freedom. [FIGURE 03]

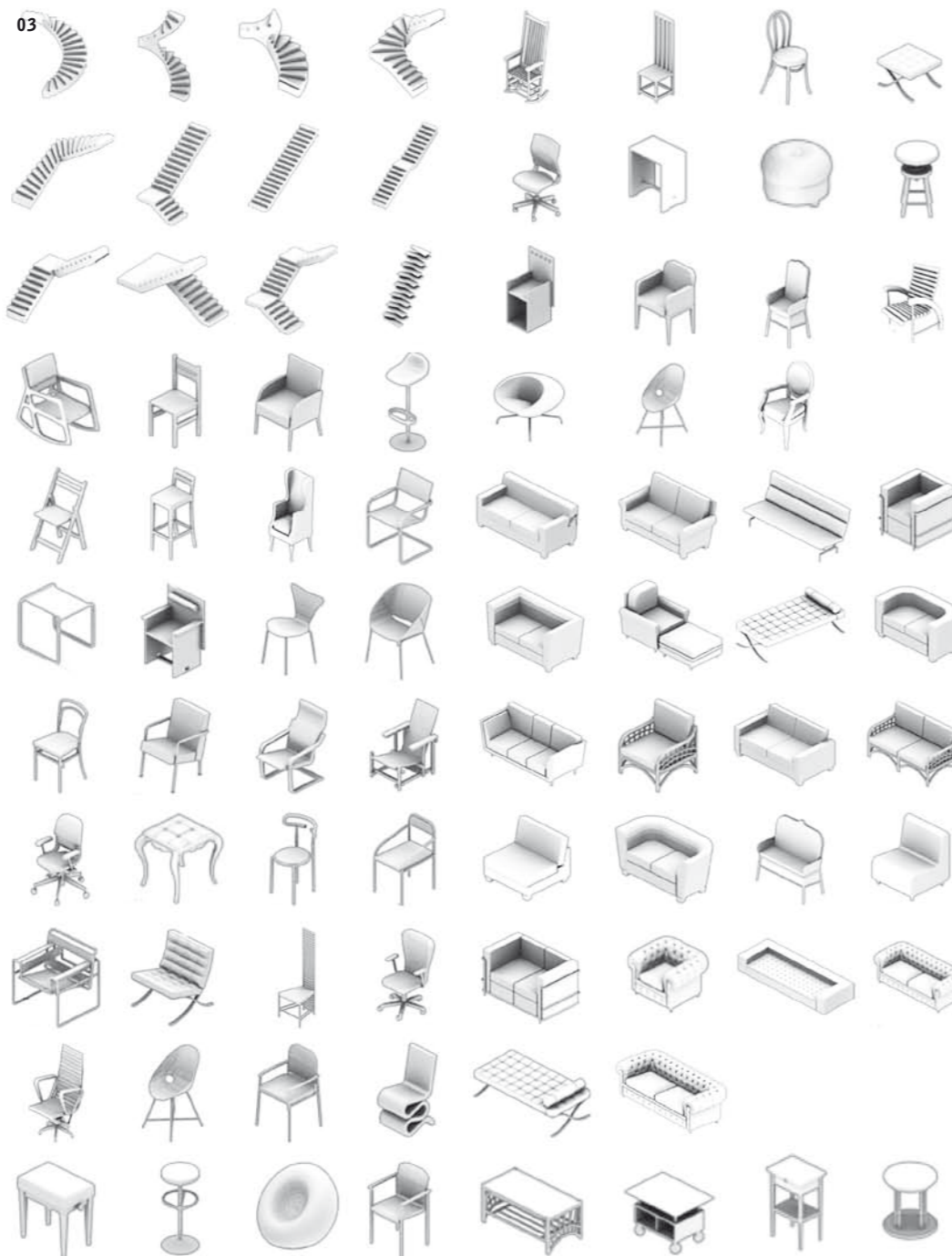
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Space takes the form of relations among sites. Different renderings of geometries, attributes, activities, potentials, blend according to certain vectors. Within the framework of infinitary inclusion, new artifacts can be engendered by 'infusing' indexes into the articulated organization of compartments.

What is the Next Villa?

STORYTELLING BY ARTICULATING AND DRAMATIZING VECTORS

How can the generic villa be engendered specifically and individually by a kind of storytelling that universalizes the architectural concept of the villa into a principle, and global urbanity into an abstract universe? Such storytelling dramatizes everyday stories that are told differently by different houses. We propose that it follows a series of steps, presented here in an "infra-order" from abstraction to actualization:



16 For a contemporary contextualization of this idea see Sjoerd van Tuinen, "Difference and Speculation: Heidegger, Meillassoux and Deleuze on Sufficient Reason," in *Deleuze and Metaphysics*, eds. Alain Beaulieu, Edward Kazarian, and Julia Sushytska (Lanham, MD: Lexington Books, forthcoming).

Let's remember, our interest is in a notion of criticality that need not sacrifice the infinite, into which thought plunges, in order to gain a notion of consistency. This means that we are looking for a notion of criticality that is not grounded in a *general principle of sufficient reason*, but one, we might say, that is *governed* in the way it is foundational for discourse, by a *universal principle*: that of *finite synthesis*.¹⁶ How can we picture such governance? The topicality of a theme that comes to be of general interest cannot be treated as an "objective fact"—precisely because as an "objective fact," it is *called into account*. What I would like to suggest to see in action, in the expansion of the generic whose instances are viewed as pre-specific, is a *universal corpo-reality*, a *corpo-reality of symbolic nature*. Thanks to its symbolic nature, such corporeality is not "the one body of the collective," as the political-state form may be interpreted, and it is not "the one soul of the people," as Rancière's notion of the *demos* seems to maintain. Nevertheless,



1. We assume that every villa can be represented as a constellation of independent compartments, through which it narrates a certain story. Such a story is dramatized individually in the vectors that are actualized by a villa, and in the interplay between those actualized vectors.
2. We start out with identifying the villa's compartments by looking at how domestic objects actually organize the particular house. Like this, we engender the elementarization of the villa into its compartments.
3. We look for stories in the daily used domestic objects. We regard them as pre-functional and begin to overlay and densify these objects in their interplay and meaningful articulations/constellations. We virtually dissolve domestic objects beyond the manifest functionality they embody as objects. The objects turn into platform-like formations carrying certain potential activities.
4. On the dissolved grounds of this activity-based reference plane, species of domestic objects can be designed by including surplus indexes into the reference plane. Such engendered species of domestic objects are of a "villa-ic" nature.
5. The generic villa is engendered specifically and individually, and consists of artifacts that incorporate globally-urban infra-functional structure-abilities. These artifacts spell out singular instances of the generic villa.

02 « We elementarize up to the degree that the object can function as an individual.
03 The object loses its objective functionality and becomes a body of indexes carrying a certain potential activity.

it is political. It binds, as symbolic corporeality, in lofty and contingent manner, what Rancière conceives as *dissensus*: "This is what I call a dissensus: putting two worlds in one and the same world. A political subject, as I understand it, is a capacity for staging such scenes of dissensus."¹⁷ A dissensus for Rancière, as for us, is not a conflict of interests, opinions, or values; it is, as he puts it, "a division put in the 'common sense': a dispute about what is given, about the frame within which we see something as given."¹⁸

What names political subjectivity understood as such must be generic, we can agree with Rancière. But if we understand it as categorial, as an adverb of universality and not as an adjective of a particular natural class, it does not name mankind in terms of *demos*, it names nature itself. The change is profound: both approaches opt for confounding the distinction between politics and nature, but Rancière's classificatory treatment of the generic name places us within a *naturalness of politics*, while the categorial treatment of it confronts us with a *politicality of nature*. Everything among which we live—facts and laws, artifacts and things, elements and climate, codes and rules—appear under their proper natality aspect. Such a politicality of nature puts a *dimensionality* of genuineness in the *place* of points of origin and hereditary lineage. More precisely, it suggests treating

17 Rancière, "Who Is the Subject of the Rights of Man?," 304.

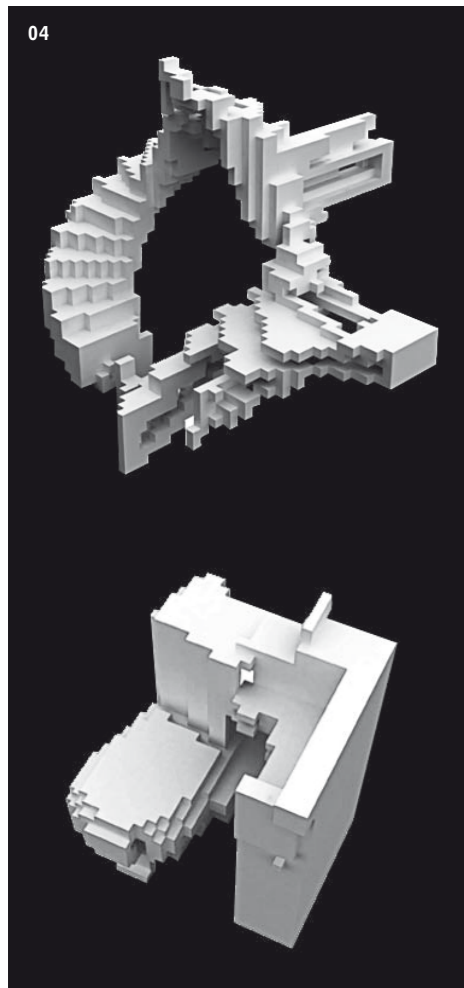
18 Ibid.

19 Ibid., 305.

20 Ibid.

21 See footnote 11. This is what distinguishes Rancière's approach from those that demand followership by *faithful devotion (of the illiterate)* rather than *critical subscription (by the literate)*, with the effect that his arguments hardly lend themselves to creating a movement that will realize a political program.

questions of origin and lineage by recourse to *distributiveness*. Such a dimensionality of distributed politicality adds the modality of probability to those of possibility and necessity, which govern in rationalist philosophy anything that extends in space and in time. Hence the political is not a sphere, both our views agree; rather, it separates, as Rancière puts it, "the whole of the community from itself."¹⁹ The political, for both views, shapes the gap between abstract literalness and the conditionality of possible verification of what is meant by abstract literalness. Such a *politics of difference* is acted out, according to Rancière, by distinguishing two "counts of counting" the community: "You can count the community as the sum of its parts—of its groups and of the qualifications that each of them bears." This way of counting is entirely rule based and uninvolved, and it results in cold observation and surveillance according to a *logics* of classification (Rancière calls it "police"). He puts a second way of counting as follows: "You can count a supplement to the sum, a part of those who have no part, which separates the community from its parts, places, functions, and qualifications."²⁰ To Rancière, only this second "counts of counting" is politics, and such counting is not uninvolved, it is acted out by political subjects, and it does not submit to rules in any mechanical manner.²¹ Its procedures are infinitary,

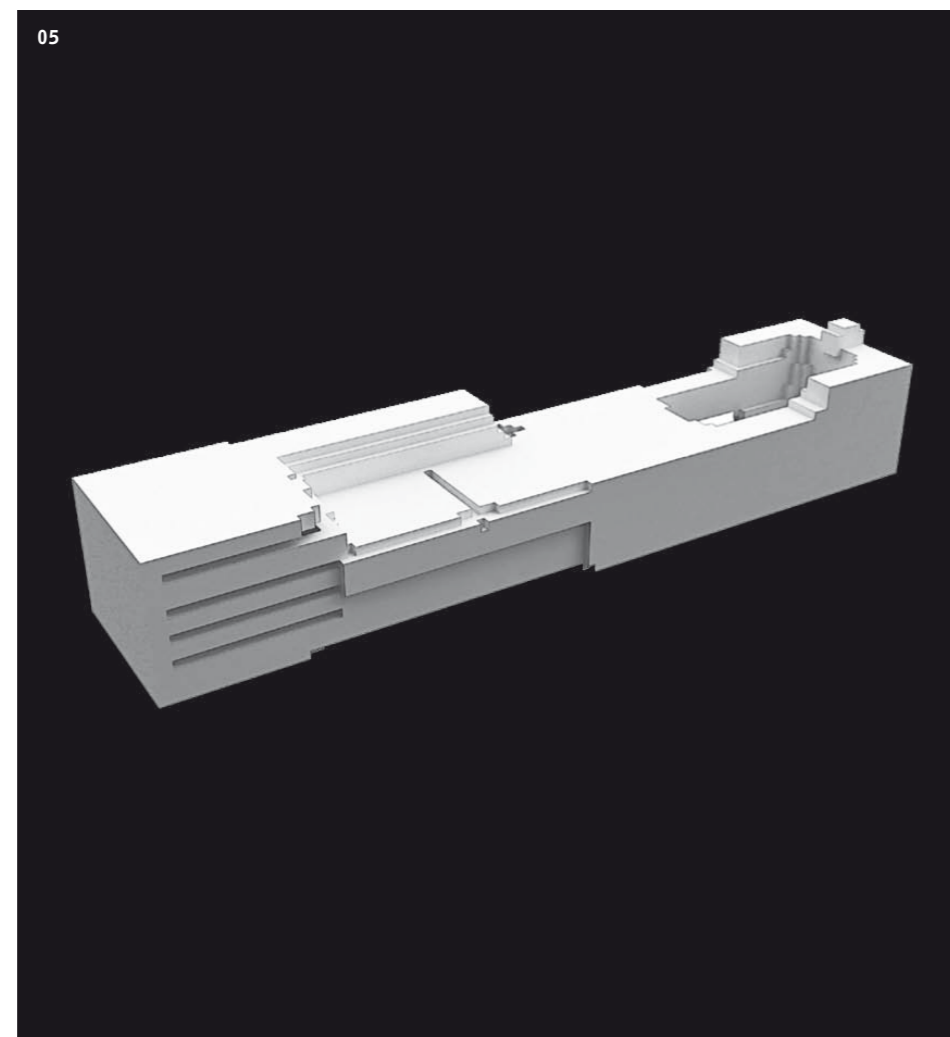


THE NEXT VILLA: AN INHABITABLE ARTIFACT

In this experimental approach of architectural design, the following technical tools are explored and applied:

APPLYING PRINCIPAL COMPONENT ANALYSIS

The codes of Principal Component Analysis (PCA) are used as the main tool. Initially, we select floorplans from twentieth-century villas as input data. The data of these floorplans are related to a domestic object as their common point of reference, and the abstract data space is set up through placing them in relative position to each other. To this setup, we apply PCA. The output achieved is a number of

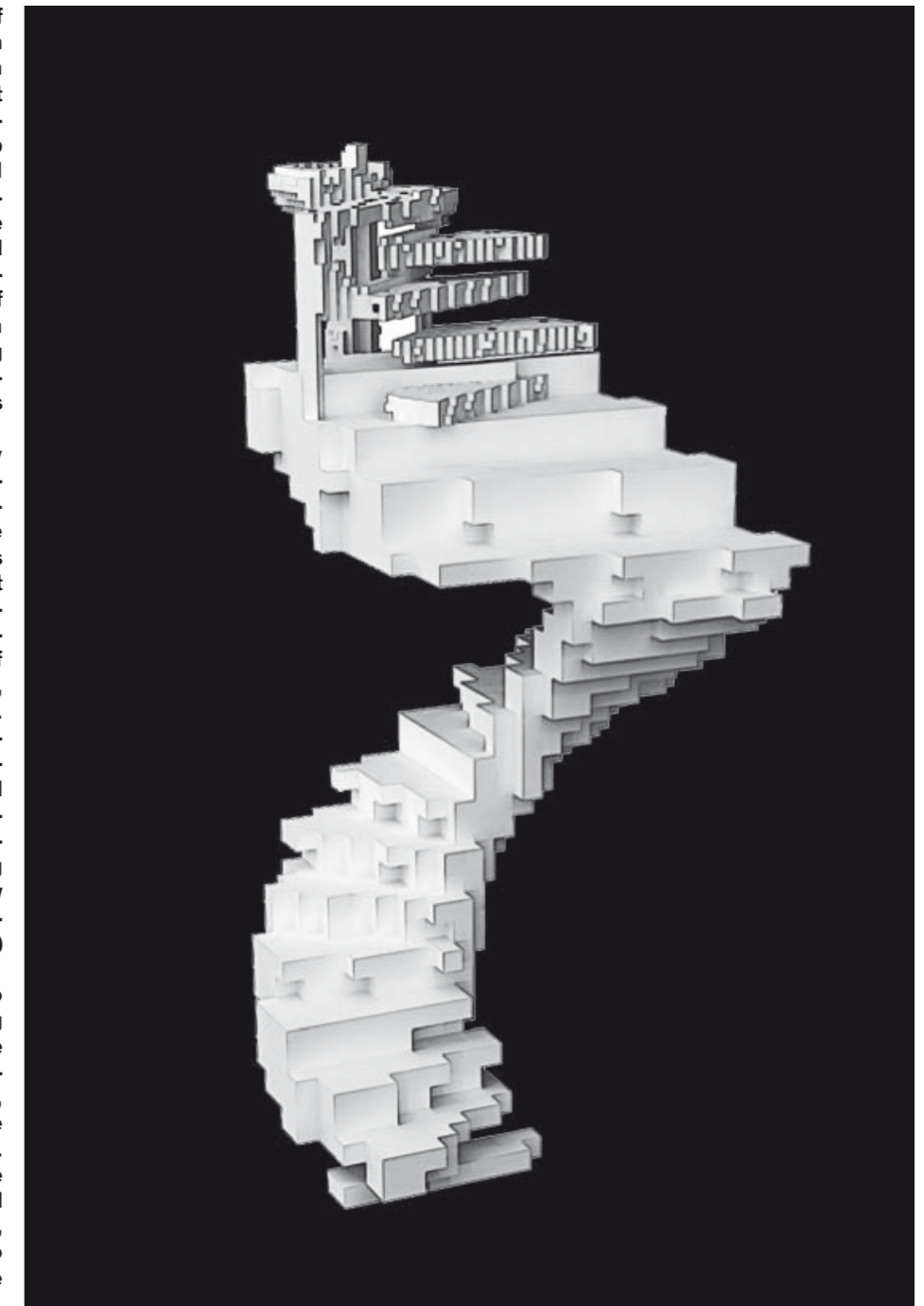


04 First generation
05 Second generation
06 » Third generation

EigenFloorplans, equal to the number of input floorplans. The differences between the EigenFloorplans depend upon which input floorplan is defined as the "first principal component." In that way, different focal points define the overall setup of these arrangements, and rearrange all the included constellations and—consequently—all the stories that can possibly be narrated. Since all floorplans are projected to an abstract and many-dimensional coordinate system that takes the properties of all input floorplans as its coordinates, each one of them potentially gains new meaning and content. At this stage the EigenFloorplans express new constellations of values and unforeseen stories.

In a second step, from a potentially infinite number of EigenFloorplans, certain constellations are selected and rendered in three-dimensional models. The main purpose of this is to create models of real (three-dimensional) hybrids that encapsulate a qualitative variety of different stories. As physical objects, these modeled hybrids extend within the boundaries of three dimensions; but as qualified artifacts, they embody a much higher dimensionality. This high dimensionality is achieved by fusing the input data (the individualized internal compartments, in this case extracted from the floorplans) in a series of generations. Different kinds of qualitative geometries (always within a same 3-D bounding space) merge together and synthesize new articulations, of which each contains a particular distribution of weights (percentages) of the vectors of the input data.

This process could also be referred to as "doping" the original setup after having rendered it generic. We select and exclude indexes from the frame of infinitary inclusion, and through this, new architectural, formal, and functional qualities can be excited from within the original setup. The simple rule we follow: compose all the functional compartments in a manifold way and get their common EigenVector, and this EigenVector once again serves to root—that is, to host virtually—the entire previous stage.



as opposed to the finitary way of counting by summation (that of his notion of “police”). His usage of “counting” consciously evokes that mathematical practice in its irreducibly intertwined double sense of accounting and governing. Such politicized counting, which affirms to count in infinitary values as supplements to each totalizing “sum,” follows in Rancière what might be called a *materialist aesthetics* of classification (not a *formalist logics* of classification). We can see now where the naturalization of politics happens in Rancière’s position: his politics of difference is acted out in a twofold manner, by the police and by political subjects. Thereby, responsibility is delegated to one side only—that of political subjects, while the police is treated almost like we treat the weather: as the quasi-material incarnation of necessities whose constraints are determined on a more abstract level (climate), but that we have to deal with for bringing both rhythm and chaos, fertility and destruction, homogeneous and disrupted growth, prosperity and corruption.

Beyond urban comfort, in a state of expulsion

In order to see more clearly what is at stake with a categorial treatment of what names political subjects, in distinction to a classificatory one, let us briefly consider what seems

TECHNICAL STEPS: THE CODING PROCESS

The overall procedure in which the coding process consists is called an EigenTransformation. We arrange certain setups of a specific constellation and calculate their EigenVectors such that the constellation can be defined as an EigenFloorplan. This is achieved by placing a number of unprocessed input data according to the Eigen-Vector in a single bounding box, by using a 3D modeling software (in this case Rhino).

In technical terms, the whole process follows the steps given in an infra-order (from abstract to actual) below:

1. **Voxelizing.** We convert the input geometries to voxelized geometries, and thereby achieve one-dimensional numerical array lists. This is necessary in order to calculate the EigenVectors of a constellation, as the code procedure requires all the input data in the form of one-dimensional numerical array lists.

code: `_001_VOXELIZING`

2. **Weighting.** We extract the exact values that display the original geometry as a setup for EigenTransformations.

code: `_002_WEIGHTS`

3. **Applying EigenTransformations.** We apply such transformations to the original geometries according to certain controllable attractors: We define areas of 100 percent representation of original geometries, and areas of blending between them. The output geometry is rendered directly as a voxelized one.

code: `_003_EIGEN_TRANSFORMATION_Z`

By looping and repeating these steps, we produce generations of the original geometry, and we can achieve an increase in dimensionality for every new EigenGeometry computed. Each “generational geometry” can be treated with new unprocessed input data, or other already computed EigenGeometries. Following these steps, we can engender an infinite number of generations out of a whole universe of potential

artifacts—resulting in what we might call a combinatorial endlessness of populations of instances. The geometries displayed here are just a small number of the vast amount of examples that could be extracted.

IMPRESSION-IMAGE, TO SYNTHESIZE NEW CONTENT

The artifacts engendered like this incorporate a rich diffusion of function-ability, in a manner that feels like surreal coherence. The objects lose their symbolic naturalness and order, and they achieve a higher degree of abstractness which allows them to experiment with their own functionality.

This experimenting results in the definition of an EigenVector which comprehends all the symbolic activities, and which can be used to articulate an instance of the generic villa to formulate an inhabitable artifact, engendered by doping original geometries. [FIGURES 04–07]

The inhabitable artifact consists in a system of signification, but it lacks an active syntax. It has the simplicity and effectiveness that is proper to code. It formalizes a universal system of statuses. Thus, the inhabitable artifact offers an abundance of electable activities that can be appropriated with its support. Everything is there, but nothing is defined. All we have is suggestive delineations: certain symbols, as parts of the initial inputs, specify possible activities for certain areas.

This experimental approach of architectural design proposes to build on the grounds of activities, as they are commonly and possibly performed in urban spaces. It seeks to translate the increasingly differentiated dimensionality in which we engage in our activities into architectural expressions that allow developing novel ways of dealing and inhabiting the places where we live.

No more beds for lying in, no more chairs for sitting at.

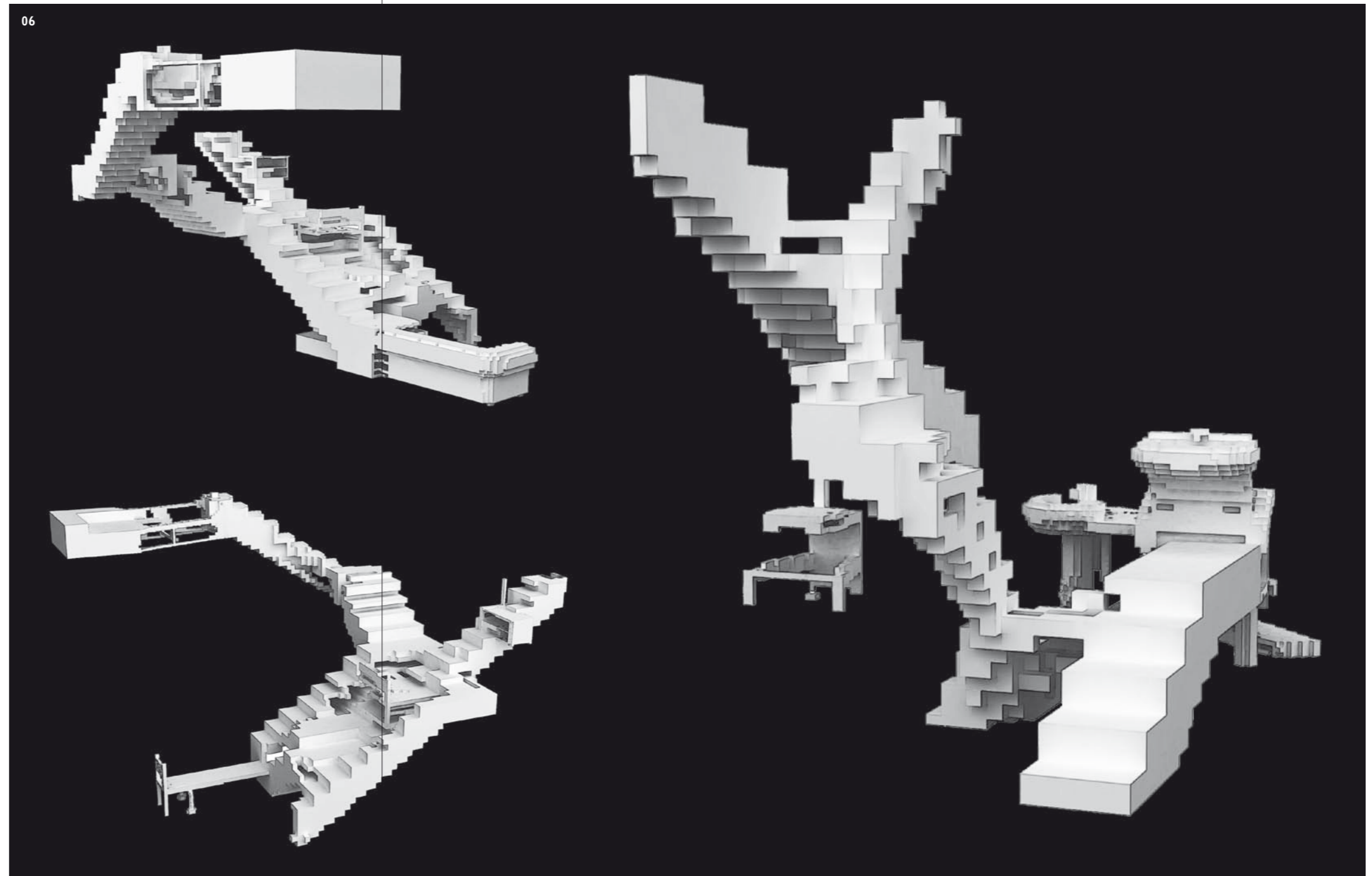
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—instead: artifacts that comprehend any position and hence any human relationship!

22 Ibid., 309.

23 Ibid.

to be an important motive for Rancière and his classificatory treatment. Toward the end of his text he clearly states that he sees a certain contemporary tendency intervening toward the “erasure of the political in the couple of consensual policy and humanitarian police,”²² a tendency he sees threatening to turn what used to be *political activity* into “an anthropological or ontological destiny.”²³ Political correctness, administrated by discourse, perfidiously urges us to be “passive” if we want to be politically “active.” His aesthetics of classification is geared against such false “political correctness,” which in effect hands over the legacy of political thought and action to some larger power that predicates us as Subjects of Rights. This “larger power,” obviously, manifests in the process of progressive rising levels of welfare, which unfolds on a global scale, albeit in unequal manners and paces. Rancière seems to ask, what if we dared to turn our backs to this urbanity that is spreading globally, propelled by its promise of quasi-salvational comforts, and that tends to erase all politics in the manner mentioned? He does not seem to seek to somehow “overturn” the system, nor to fight for more global justice; rather he seems to ask, can there be an exodus, can we not learn to cultivate differently the grounds on which we would happen to find ourselves, if we affirmed to



live in a state of expulsion? Can we not begin to oppose the *auto-logy* of such destiny by producing the means we need, in order to remain active political subjects, through a kind of “farming” that learns to root that for whose growth it cares, in—to use his own formulation of how political subjects “count”—the infinity of a sublime object, the object of aesthetic judgment, which virtually *supplements each sum*?

Rancière suggests a kind of *aesthetic calculus* rather than a logical one. It is aesthetic because its functions map procedures in a twofold manner: by numbers that label the sums of infinite terms, yet these labels are merely indexes, pointers.²⁴ Such an aesthetic calculus is “genetic,” its functions are productive; they do not merely represent a process, they initiate its enactment. Such is the involvement and activity that Rancière holds necessary for *counting as political subjects*. It is not an activity that *fight*s what is counted in a police manner, but one that *has decoupled* from such counting and instead regards it as a quasi-weather, as temporary states that are imposing certain conditions with which we have to deal, if we were to hold that it is not entirely unthinkable *to begin again*: by affirming to live in a state of expulsion from the secular urbanization of modernity, which used to be like a promised land but turned out to sentence its “subjects”

24 It is important to see the difference of an *aesthetic calculus to phenomenology* and *semiology*—both of these attempt to supplement calculus with either a general theory of signs, or with perception. An aesthetic calculus, on the other hand, does not keep a notion of calculus as distinct from one such supposedly more general theory. It stresses that the notion of calculus cannot remain untouched if we want to avoid sacrificing the openness of the infinite. Thus, I describe its labels in the conventions of symbolisms as indexes and pointers (codes), and not as signs, etc.

25 Michel Foucault, “Les hétérotopies,” *Radio France*, December 7, 1966; here cited and translated from Foucault, *Die Heterotopien. Der utopische Körper* (Frankfurt am Main: Suhrkamp, 2013), 39.

26 See Michel Foucault, “Le corps utopique,” *Radio France*, December 21, 1966; here cited and translated from *ibid.*, 55–65.

to the status of “consumers,” allowed to “do politics” in terms of “correctness” that is policed by a kind of counting that builds on a logic of classification that deprives the individual of holding her aesthetic judgments as “naturally legitimate.”

Generic as an adverb, universality as an oeuvre

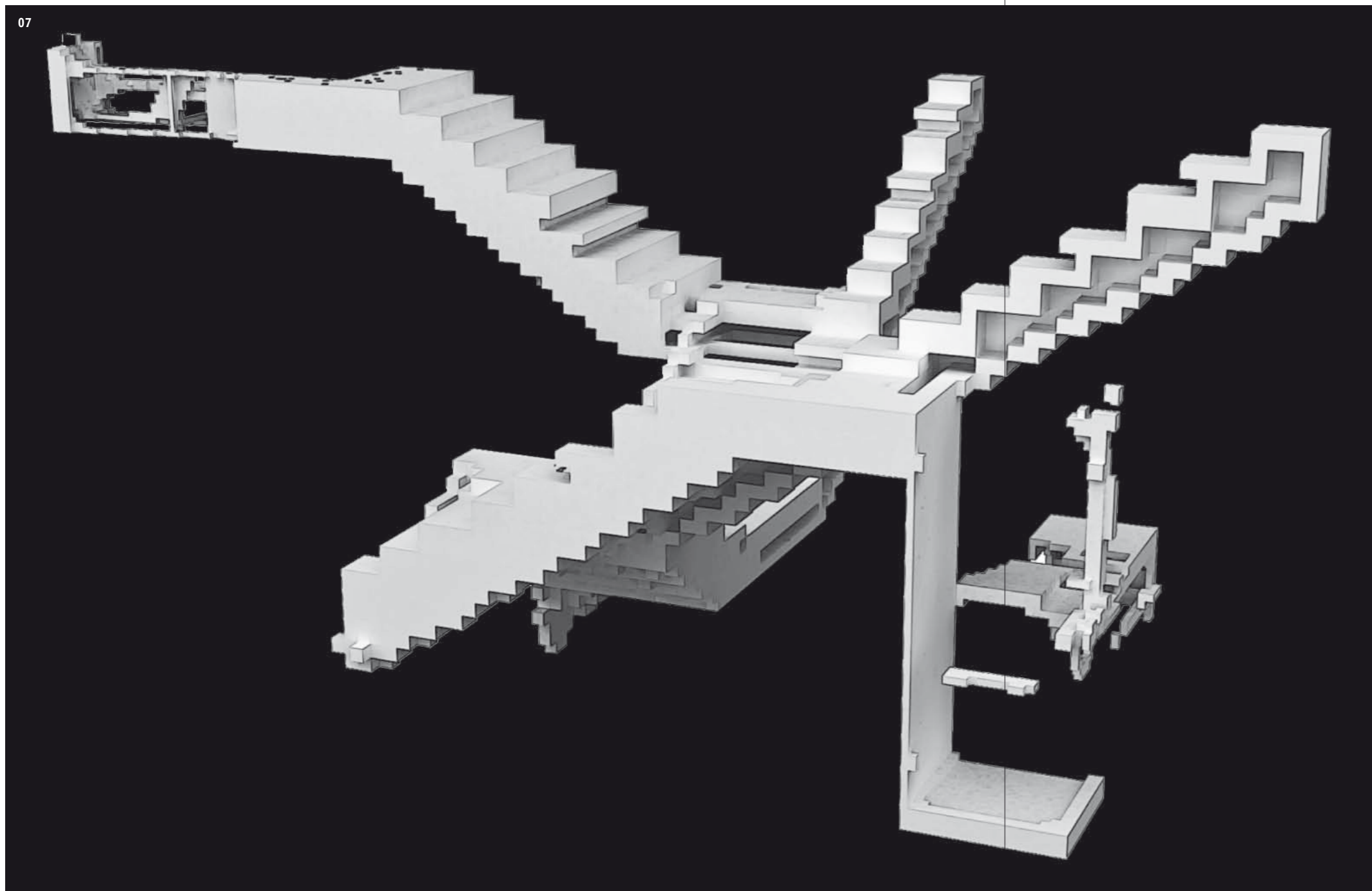
In all of this our own views would agree. But what is entailed now with opting for a *categorial* rather than a *classificatory* approach? How can we picture what a philosophical stance of “critical rationality” would entail, a rationalism that is coupled with a notion of *critique-ability*, a notion of critique in the terms of an ability that revolves around a symbolic understanding of numbers? What would it entail to stick with Rancière’s operative distinction of two “counts of counting,” while transposing them onto a stage set such that the *generic name* acts as a universal name, adverbial not adjectival, a stage on which it articulates and spells out the oeuvre that produces nature? In all figurative brevity, it does not characterize life in such a state of expulsion as the life of farmers, but as that of gardeners. It is not the material grounds of a new existence, generic and singular (politics anchored in aesthetics) instead of comfortable and general (global urbanity), that

needs to be cultivated, but the intellectual grounds of heterotopia, common places (topoi) that are *nowhere there*, but nevertheless real. Heterotopias are the kind of sites that have consistency not *despite* but *because* they are distributed, they are “continents, cities, planets, universes,” as Michel Foucault imagines, that are engendered “in the heads of people from the in-between of their words, from within the deep layers of their stories and also from the place-less site of their dreams, the void in their hearts.”²⁵ If heterotopias are *nowhere there*, which we take from Foucault’s idea, it is because they are always already *here*. As utopian in the literal sense, a place that has no place, heterotopias spring forth from the non-places of the immediacy of a present we live through our bodies.²⁶

Thus we would suggest that the universality named by Rancière’s notion of the political subject, once thinking about its generic name as adverbial rather than adjectival, instantiates as *bodies-to-think-in*. A particular body-to-think-in is one of a kind, and its kind is what I mean with symbolic corporeality. We can look at the universal as an oeuvre, at work in the symbolic contracts that household the energy from which it lives, as nature. Hence it is true that the symbolic is vested toward establishing *consensus*—for Rancière the negative of dissensus, and according to his dialectical thought, the death of politics—but it does this as a means to make room for staging scenes of dissensus. The symbolic is neither political nor doctrinaire, it is *operative*, and only in a derivative sense is it *functional*. It is “at work” indefinitely, never as a process that begins and ends. It creates the capacities proper to generic conditions of transformability, and it insists that these conditions

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07

07 Third generation

be universal while at the same time having actuality only as local instantiations. We can see formulas or equations as the symbolic “form” such *adverbial contracts* take. What I would like to suggest is that they open up and cultivate an interval for the political subjectivization of *any identity*, just as Rancière claims for what-is-being-named-by-the-*demos* (he speaks only of political names and political subjects, not of political identities). Nature’s politicality dimension constitutes, in its principle expropriation of particulars from their individual genuineness (generic means to expropriate all individuality from specificity), the *non-possessable* disposition for staging scenes of dissensus. Things have a genuineness, they have a nature, but it is symbolic and rooted in an elementary distributedness rather than in an individuality.

The unsettling aspect about understanding the symbolic in such terms is, of course, that it may be instrumentalized in both directions—politics and/or doctrine. There can almost be no better characterization than Rancière’s own of what kind of subject is named thereby²⁷—cases whose kinship is unsettled: “Political names are litigious names,” he writes, “names whose extension and comprehension are uncertain and which open for that reason the space of a test or verification.”²⁸ For him, political names name political subjects in such a manner, and this is how they are capable of reorganizing “the frame within which we see something as given.”²⁹

I am aware that suggesting to see identity that can be expressed by a formula or equation in the same terms that Rancière finds for political subjects might strike one as a gross misunderstanding—isn’t the solution space for a symbolic form determined in absolutely *certain* ways, not in *uncertain ways*? On which grounds can we speak of such a politicality that belongs to nature, and of which we claim a universality that allows to characterize the abstract objects of symbolic computation in terms of their particular integrity? I briefly pointed to the importance of how we think about solution spaces when I introduced the notion of adjacency in mathematical corpus theory. Let us see in more detail how this is exactly what was at stake with the emergence of universal algebra throughout the nineteenth century, and how we are confronted today with its entailments.

Bodies of thinking live in algebraic universality

Let us to try to make sense of the sentence—or develop the equation.

Jacques Rancière

Computing with the symbolic means of algebra has added a new dimension to mathematics: the input of certain values in a formula may not only turn out to be unsolvable, it may also yield a solution space that is so vast in options that none of the possible solutions seem more necessary than any other. This was indeed the key critique of George Boole’s *Algebra of Logics*, which is illustratively expressed in an open letter by one of his contemporaries:

The disadvantage of Professor Boole’s method is [...] he takes a general indeterminate problem, applies to it particular assumptions not definitely stated in his book, but which may be shown, as I have done, to be implied in his method, and with these assumptions solves it; that is to say, *he solves a particular determinate case of an indeterminate problem, while his book may mislead the reader by making him suppose that it is the general problem which is being treated of.* The question arises, is the particular case thus solved a peculiarly valuable one, or one more worthy than any other of being solved? It is clearly not an assumption that must in all cases be true; nor is it one which, without knowing the connexion among the simple events, we can suppose more likely than any other to represent that connexion.³⁰

Boole’s methods were not shown to be faulty or inconsistent—the reason why they had been disliked or even spurned by so many was the immense depth of horizon they had opened up. Indeed, Theodore Hailperin has, in a relatively recent paper, explained how Boole’s ideas make sense only if we read them in relation to algebraic concepts like ring, module, and domains, concepts that had, in his time, been far from digested and settled, not even on a methodological level, and certainly not on a philosophical level. I will come back to this in a later part of the paper. These preliminary indications are merely meant to induce some confidence in my postulation of the generic as constituting a kind of *symbolic corporeality* whose singular instances manifest as particular *bodies-to-think-in*, and my speculation about what such a postulate might entail for thinking about computability. The most important aspect is that such bodies-to-think-in are collectively constituted—before they can be acquired individually. Yet this collective

²⁷ Although he would, by what I can understand from his own *programmatically political* commitments—which he keeps respectfully separate from his *philosophically political* commitments, as I have argued before (see footnote 11)—not at all agree with my proposed application of his concept in the context proposed here.

²⁸ Rancière, “Who Is the Subject of the Rights of Man?,” 304.

²⁹ Ibid.

³⁰ Letter by Henry Wilbraham, published in the supplement to *The Philosophical Magazine* 7 (June 1854); emphasis mine. Cited in Rod Grow, “George Boole and the Development of Probability Theory,” <http://mathsci.ucd.ie/~rodgow/boole1.pdf>. See also Theodore Hailperin, “Boolean Algebra Is Not Boole’s Algebra,” *Mathematics Magazine* 54, no. 4 (September 1981): 172–84; Walter Carnielli, “Polynomizing: Logic Inference in Polynomial Format and the Legacy of Boole,” <http://www.cle.unicamp.br/principal/grupogta/Thematic-Consrel-FAPESP/Report-02-2007/C07.pdf>; and Stanley Burris, “The Laws of Boole’s Thought,” <http://www.math.uwaterloo.ca/~snburris/htdocs/MYWORKS/PREPRINTS/aboole.pdf>.

³¹ There is, for example, an extremely interesting history regarding the status of grammatical cases. All throughout the centuries, the disputes of the grammarians centered around how cases can be accounted for: cases express all kinds of relations—there are languages still today that have more than twenty distinct cases that differentiate the most common ones: nominative, dative, genitive, and accusative—and the question of how we can account for them involves assumptions about causality. There are two main positions for which different schools have opted: a *casus* is “what has fallen off” something, literally; that’s how it is caused. The common understanding today seems to hold that the case of the nominative is somehow different from all the other cases, and that the latter are indeed what falls off from the nominative—a view that puts the noun in a grammatically central position. Yet since the earliest grammarians, another view holds that the nominative case is like all the others, and that it marks the imprints of activities that are happening with some degree of regularity—activities that happen in repetitive manners. According to this view, verbs in infinitive form are marked out as central for identifying syntactic units in language, not nouns. It is easily transparent how two views entail profound metaphysical implications. See the classic 1874 book by Heinrich Hübschmann, *Zur Casuslehre*; and Louis Hjelmslev, *La catégorie des cas* (Munich: Wilhelm Fink Verlag, 1972).

³² This is of course not really true; in fact, what characterizes late scholastic philosophy is precisely a forceful dispute around the claim, raised by some scholars, that we ought to assume a reality distinct from that of concrete particular or individual things, and proper purely to the universal. It was called the *problem of universals*, and to liberate thought from the kind of dogmatism that could be attached to such a notion of reality was surely one of the great moving forces behind the break of the Renaissance. Universals constitute every notion of “pure reason”—against which Descartes brought forward a new analytical method linked to an attitude of “fundamental skepticism,” and with which Kant, a bit later on, sought to reconcile a certain legitimacy for speculation with the Cartesian “method of doubt” in his *Critique of Pure Reason* (1781).

constitution is realized only *through* the individual acquisition of the bodies-to-think-in. The agility they are capable of relies upon individuals who learn to inhabit what has been collectively achieved; they turn lonely and clunky otherwise. We can think of such bodies-to-think-in perhaps best as literacies: we can see the *canonical corpus* of authoritative knowledge turning into bodies-to-think-in, animated and vibrantly present in a manifold manner, according to the breadth and articulacy in which these corpora are inhabited. Does such inhabitation not point us toward the possibility of affirming mastery in a different manner than that of domination, dependency, and exploitation? Does it not announce a revival of other aspects proper to mastership, like generosity, care, and commitment? To *inhabit* politically such a canonical corpus requires the act of appropriation as we know it from learning-to-become-literate: not only in the sense of writing and reading *correct* sentences, but finding *apt* forms for one’s words, and *apt* expressions for one’s thoughts.

Let us return from these preliminary remarks, and from viewing computability within the paradigms of programming, back to computational design more strictly. Here we can see in architecture, for example, how the first wave of this fascination with the generic raised an interest in *form finding* as opposed to *giving form*, or *deciding about form*. By now, this first wave has given way to an interest in developing the *parametric conditions* from which such forms can be found. Yet along with this comes a certain complication with regard to seeing in the generic a kind of genuineness that would liberate us from troubles associated with individual authorship and mastership. In the light of parametricism as a new paradigm in computational modeling, it becomes much more transparent that, indeed, the one-of-a-kind particularity attributed to instances of such abstract objects is neither *example* nor *prototype*, but that there is a “suchness” to the “thisness” of their instantiations nevertheless, and that despite the engendering of its hylomorphic identity (its form and content) through mere tentativeness (purely indexical, without a decision of how to interlink the dots into a figure), these instances are *conditioned*. Technically speaking, they are conditioned by a master model whose *instance* they are. Theoretically speaking, the form of organization and government proper to a master model (you can think of the intra-specularly governed domains mentioned earlier in relation to the integrity of abstract objects) may well be *singular*, yet they are *not absolute*—simply for the reason that there is an open range of manners in which each and every one of them could be set up. Or to put it differently: we may well be dealing with absolutes when we deal with such abstract objects, yet they are absolutes whose symbolic nature tells us that there always are alternatives to be considered.

Characterizations of the subject of the generic

Characterization on a grammatical level

Against our suggestion to read the generic in an adverbial sense, the “grammatical common sense” (if indeed there is such a thing) today maintains that the generic be the adjectival form for referring to a genus that can be represented by the formal notion of a class. There are many ways of how this could be explained,³¹ but the most important one seems to involve a strange “metaphysical competitiveness” between the notions of genericness and universality. Traditionally, any one *genus* could never count as universal, because its role is descriptive and representational in relation to concrete things that in reality are always individual, and whose collective nature the genus is to determine. Universality, on the other hand, has traditionally been attributed to *categorial* determination, of which it is clear that it is a genuine abstraction (however we might think about the nature of abstraction). No one would seek a “position in space” or “quality (per se)” as a concrete instance of it existing!³² Categories were held to be universal, and they were what concrete things would instantiate. This is how the universal comprehends, literally, *that which is the property of all things*.

It seems hardly an exaggeration to see in the conflation of this distinction, between classes and categories, the key aspiration for modernist political philosophy. In its striving to rid philosophy and science from metaphysics and theology, it sought to overcome orders of supposedly natural kinds and their rigid class distinctions. The challenge was, and still is today, to find a way of “attaching” the universality proper to categories of abstract criteria to the notion of class that can be formed according to concrete marks of distinction. The quest for a *universal subject*, a *universal object*, or even a notion of *universal reality*, must try—if it wants to be *critical* and not *dogmatic*—to identify a notion of *universal class*. A universal class would be a class that

acts genuinely without self-interest, and *in the interest of all*. Or to put it differently, more adequately but also more difficultly: the universal class would be the class where self-interested action coincides with the needs of humanity as a whole.³³

The man without qualities (Robert Musil)

Robert Musil famously wrote a novel of a man whom he portrayed in the light of such an essential abstinence from desiring individual property, as the man who aspires to be, tautologically, nothing but a man (*Der Mann ohne Eigenschaften*, 1930–32). The novel accounts the struggles its protagonist has to take upon himself: as a character with a life of his own, Ulrich is faced with this task as a sheer impossibility. He tries to find meaning for his life under the condition of resigning from any possibilities offered to him by the particular class to which he happens to belong—in his case as an intellectual, a mathematician by education, that of the bourgeoisie. In vain attempts to reconcile “soul and exactitude,” his vocation and his profession, he searches for a place and role purely within the “universal class of mankind”—that is, by refusing to accept any privileges that might be granted to him on the basis of his particular individuality-within-the-actuality-of-the-social. Musil’s novel is appreciated widely for its capacity to express and thematize in most subtle and differentiated ways a widely shared mood of the zeitgeist of his time, and counts today as one of the most influential books of the twentieth century.

The city without identity (Rem Koolhaas)

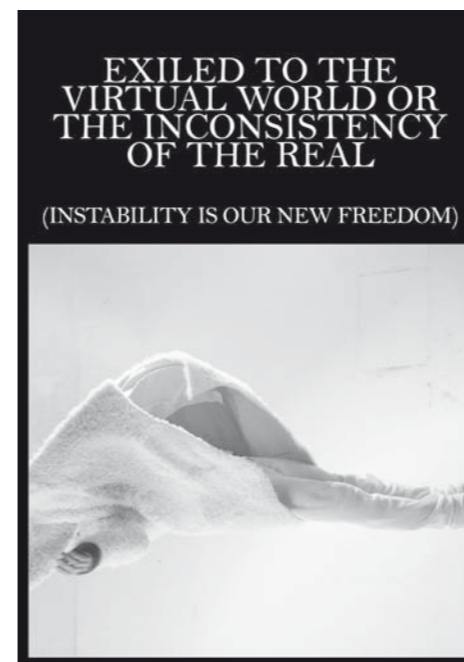
More recently, the architect Rem Koolhaas has taken up this Musilian theme, yet now in relation to cities instead of an individual person. The *Generic City* gives the portrait of a city in the light of *having done away* with all that Musil’s protagonist still tried, in vain, to reconcile for himself—in short, identity, property, history, the entire inheritance from a premodern era with which an individual has been equipped “to-begin-and-continue-with-itself”; in short, to lead a proper life, a life of one’s own (to pick up a wording coined by Virginia Woolf in her seminal 1924 essay “A Room of One’s Own”). The Generic City confronts us with an account of the peculiar realism of the generic; there is neither identity nor history nor property in the Generic City. Consequentially, the Generic City establishes its order in purely infrastructural, systematic, and continuous terms. There is singularity in the Generic City as he portrays it, yet it is a singularity that is liberated from the standardized. Rather than incorporating a cosmic, cosmological, or otherwise transcendent order, the Generic City provides settlement within what Koolhaas in all consequentiality calls *Junkspace*: preempted from ever manifesting something of substance—something that would have to be conceived of in how it maintains its own finite continuation—such space is only there to ultimately be disposed of. All reason for categorization is annihilated in it. In *Junkspace*, order must not be wrested from chaos. Instead, one-of-a-kind particularity (which he calls “the picturesque”) is wrested from the homogenized.

³³ What haunts modernity, and thereby hinders it to continue with itself on its own terms, is the idea of a natural reality, one capable of hosting a notion of universal commonality. Still today we can read much of contemporary political philosophy through the lens of how a universal subjectivity might be conceived—from this point of view, even very contemporary contributions to political discourse root back rather directly to Hegel’s suggestion of understanding *bureaucracy* as such a universal class that serves all, without self-interest, and to the Marxian totalization of this idea by seeing in the universal class the *proletariat*: from Laclau and Mouffe’s dialectical affirmation of the political as a condition of *competing hegemony* to Hardt and Negri’s *Multitude* as the political subject of the New World Order they postulate, Badiou’s and Žižek’s ideas about how to conceive, in secular terms, of an abstract persona *whose voice is to matter most* (Žižek’s Lacanian-Hegelian *master discourse*, and in the case of Badiou, his *set-theoretically constituted mathematical ontology*) to Agamben and Virno’s interest in personifying abstractly the (Marxian) concept of a *general intellect*.

DIANA ALVAREZ

EXILED TO THE VIRTUAL WORLD OR THE INCONSISTENCY OF THE REAL

(INSTABILITY IS OUR NEW FREEDOM)



Unsurprisingly, the reception of Koolhaas’s portrait of the Generic City is quite different from that of Musil’s theme-opening novel. Bluntly speaking, it tends to be perceived as a bothering impertinence. Its clinical viewpoint and the somewhat drastic (and also, arguably, resigned and sarcastic) tonality is often taken for the cynicism of a global architect who portrays, with a certain braveness, it must be admitted, a threatening development that he contributes to and lives from: the drastic homogenization of our living environments. For many people it seems clear that the homogenization he portrays is an effect of the global expansion of capitalist economy and a respectively Darwinian survival-of-the-fittest dynamics that goes along with such expansion. To this understanding, Koolhaas’s suggestion of relating these effects of homogeneity to the strengthening expansion of the generic must appear monstrous. Large portions of the aggression Koolhaas attracts is surely because he seems to ridicule hopes that feed from the belief that there must be a way to purify the generic from the exploitative dynamics of capitalism, and to find in it, finally, a long-sought means to realize the core values of socialist and modern politics. But where am I speaking from, when daring to refer so distantly and seemingly uninvolved to this thematic locus of vibrant emotion

Perhaps this story will be almost out of date by the time you’ve read it. The twentieth century gave way to the Taylorization of the city and by the same tokens to a massive production¹ of generic² space, as the imprint of industrial age and globalization. However, the emergence of networked communication technologies has extended our interaction with the city toward an invisible and complex network of relations and data. For the first time in history, we are not only aware of such a degree of complexity surrounding us on an ordinary basis, but also likely to grasp it through a real-time flow of data. Hence, we are no longer constrained to see the city as a limited set of logical assumptions on reality, but as a data platform apt to preserve any potential relations. The Pre-specific City is the upgraded generic space.

The Pre-specific City is not exactly definable in geometric terms. In order to locate it, one must consider *n* dimensions, out of which none is correct or false. In fact, all of them coexist simultaneously, engendering one and only space-time. Therefore, the Pre-specific City is not a point in space, but rather a point and all its possible trajectories. This non-Euclidian condition induced in some of its inhabitants some kind of painful sensation, like the one that persists in an amputated phantom limb. Seemingly, the definition of the city has been stretched toward inconceivable limits, in a desperate try to fit to it what has become the contemporary urban condition. But why does detachment seem always so painful, when change is the only certainty there is?

“Exiled to the Virtual World or the Inconsistency of the Real” is an initiatory journey through the Pre-specific

City. After a violent flow of information, ceaseless political fluctuations, and the marks of globalization, the stability and longevity of contemporary life have been dismantled. One funeral after another, the deaths of the main stands of modernity and its immanent rational principles have been declared: control, order, identity, beauty, the city ... At the rate at which population growth increased and at which the speed of changes accelerated, there were too many disappearances and not enough room for all the dead bodies. The bodies were then buried in a reversed skyscraper, hundreds of stories deep, below the buildings. Coupled with an elevator, an undefined number of Typical Plans³ will turn into a freak show, a surrealistic machine enabled to fabricate some unexpected encounters.

Could architecture’s focus on order, crystallization, and longevity become its own damnation? How can architecture cope with the speed of changes? Wandering through the reversed skyscraper, Rem Koolhaas performs, like a contemporary Dante, an allegoric travel in search of project strategies likely to deal with this radical shift, through misappropriations, overlaps, and hybridizations. His stroll through the Pre-specific City is like a shopping afternoon in a mall of predicates. If by chance you manage to wander inside the reversed skyscraper, you will find everything described here, but also its perfect opposite, the only sure thing is that there is no sure thing. And one cannot even guarantee this ...

¹ Lefebvre, Henri (1974).
² Koolhaas, Rem (1995).
³ Koolhaas, Rem (1995).

(and activism)? Before turning to my staging of that conceptual persona that, as I would like to convince you, ought to complement that of the *generic*, namely the concept of the *master*, it seems adequate to make a few short statements about this.

Falling in love with the in-sinuuousness proper to an economy of entropy

Primary abundance

I am speaking from a point of view that credits a development with principle importance in a manner not usually shared today, even though as a phenomenon, it is almost permanently in the media—yet as an observation only, without instigating the least dissensus so far. The phenomenon I mean is this: our planet is literally bathing in the solar stream, with ten thousand times as much energy to be potentially harvested from its light particles

as all of humanity is currently using worldwide, each day, streaming by continuously. For the first time ever, we can encapsulate and integrate, within the planet's ecosphere, energy that is *additional* to that which is already stored in its manifest *natural body*—the weather, plants and animals, stone and earth. It may sound strange and somewhat amazing to view photovoltaics like this, but as a phenomenon it doesn't seem to be disputable. Yet weighing this phenomenon as being of principle importance for how we think about our habitat and anything that derives from such thinking—economy, politics, how we make sense of what we experience and engage in—this is much more critical. Because it means to attempt *generalizations* that were based on what this phenomenon *implies*.

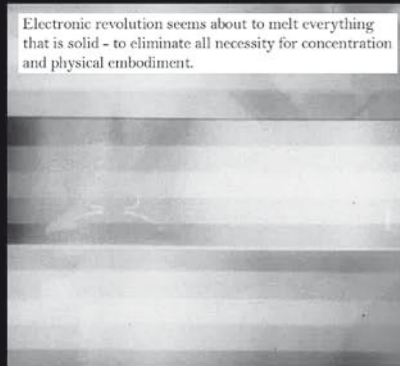
What would that mean in the first place, attempting to generalize on the grounds of regarding the planet's location in the universe not in terms of its *position* within the interplay of cosmic forces, as in astronomy and geometry, but in terms of the planet's *active energetization*? I put "generalize" and "phenomenon" in quotation marks. Why? Because this "fact" is an "artifact." It didn't come about (in a naive sense) naturally, it became a fact only on the decisive grounds of human intellectuality. Photovoltaics is technics at its most sophisticated level (yet). And to generalize usually means to



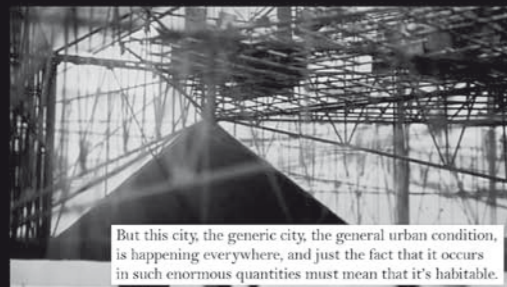
The city no longer exists as we knew it...



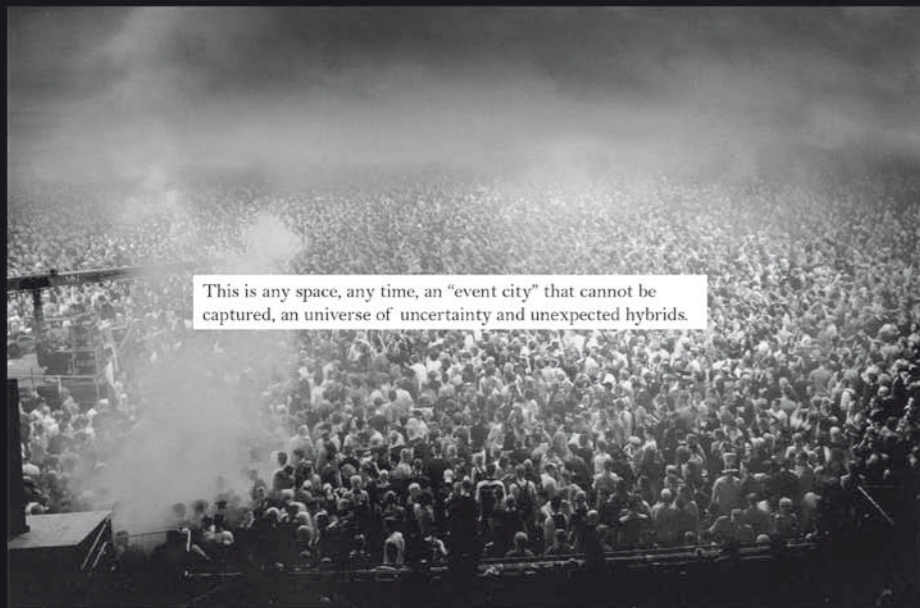
Each insistence on its primary condition irrevocably leads via nostalgia to irrelevance, like a phantom pain about an amputated limb.



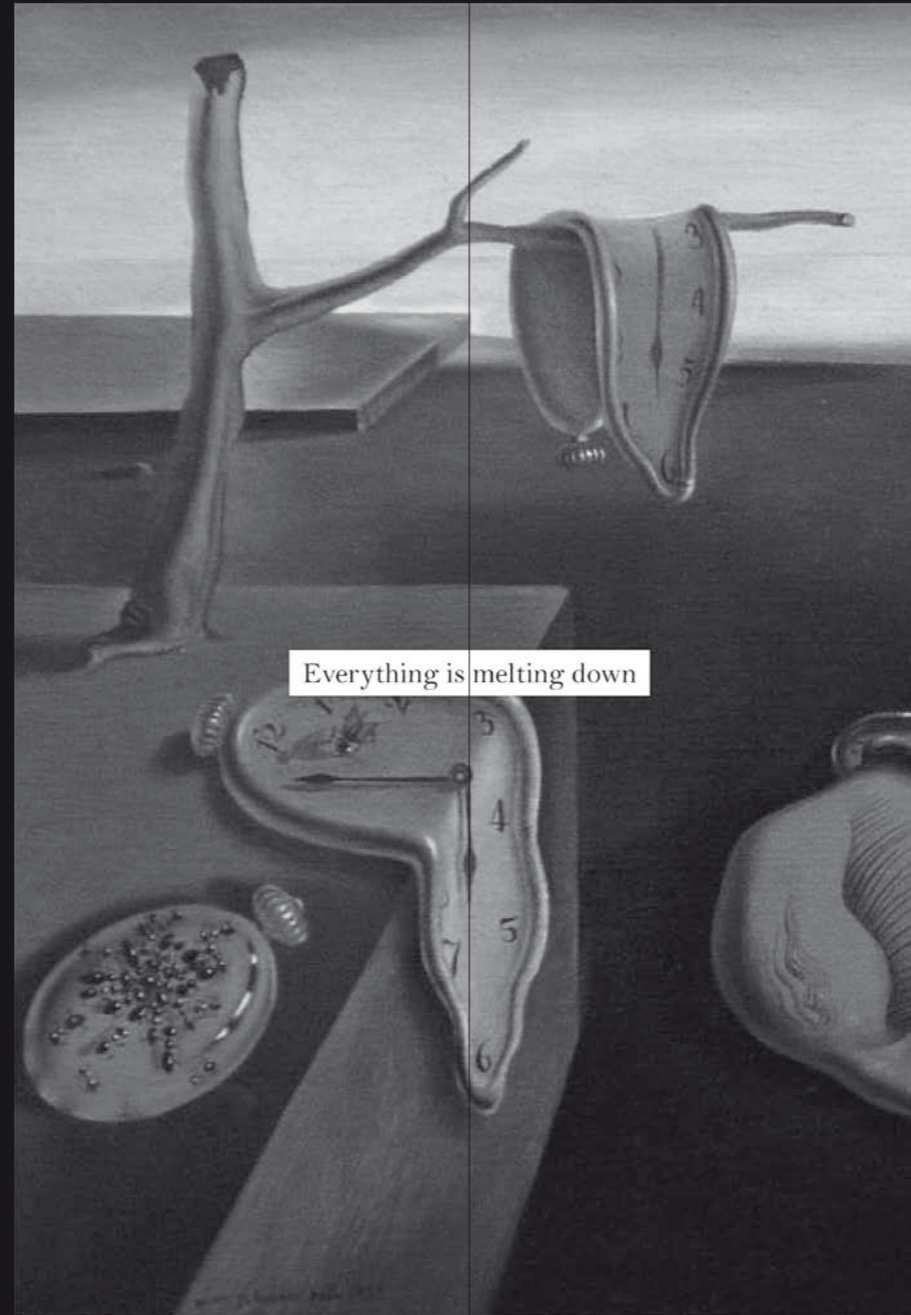
Electronic revolution seems about to melt everything that is solid - to eliminate all necessity for concentration and physical embodiment.



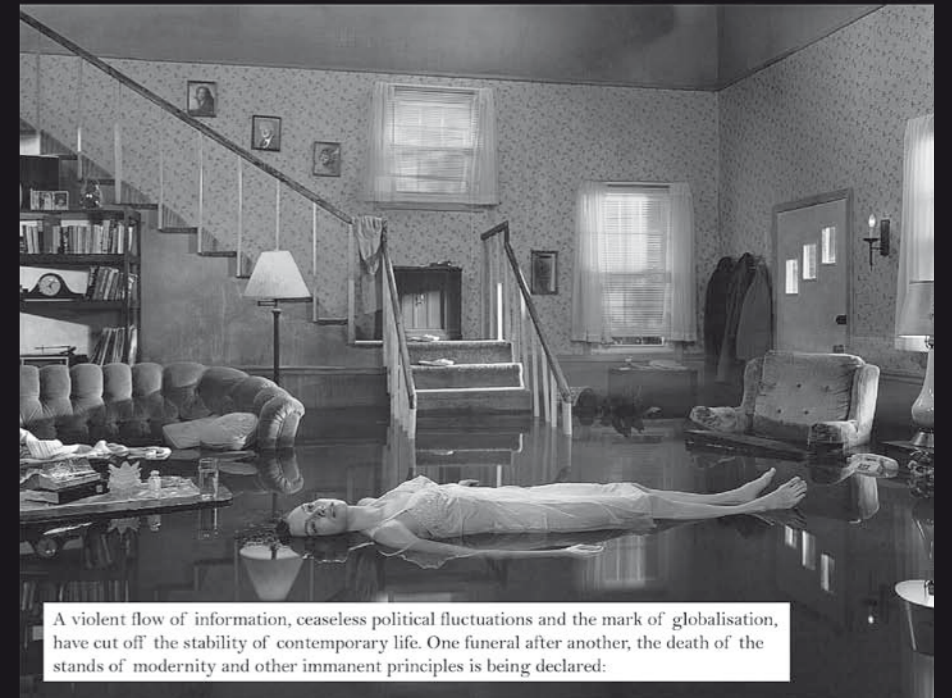
But this city, the generic city, the general urban condition, is happening everywhere, and just the fact that it occurs in such enormous quantities must mean that it's habitable.



This is any space, any time, an "event city" that cannot be captured, an universe of uncertainty and unexpected hybrids.



Everything is melting down



A violent flow of information, ceaseless political fluctuations and the mark of globalisation, have cut off the stability of contemporary life. One funeral after another, the death of the stands of modernity and other immanent principles is being declared:

delineate classes such that they are capable of representing as adequately as possible, in mimetic terms, a certain *common nature* among different things as *they are given*. Yet in the case of the Earth, viewed in such terms, we have a singular situation. Attending to how we might “address” the planet’s situation in the universe in terms of its energetization inverts our well-tested and refined language games around *localizability*. The *principle of locality* in time and space—the principle that each thing has its place—needs to be replaced with a *principle of circumlocution*. The point is that which is *being given*, not that from which we can deduce given in an immediate sense. It is not enough to consider *circumstances* as characterizing location; more radically: we owe our *location* to the *circum-giving* (*das Umgeben*, in German) of rambling tails (the wave ranges of cosmic streams). Under such conditions—let us call them adverbial—*quantization* precedes *localization*, just like the case in quantum electrodynamics, which also views light as particles.³⁴ In all consequence, attempting to generalize from the implications of photovoltaics irrevocably urges us to distinguish between “generalization” and “abstraction” much more strictly. The implications of such generalization are *abstract* at first, they affect our notions of universality, but

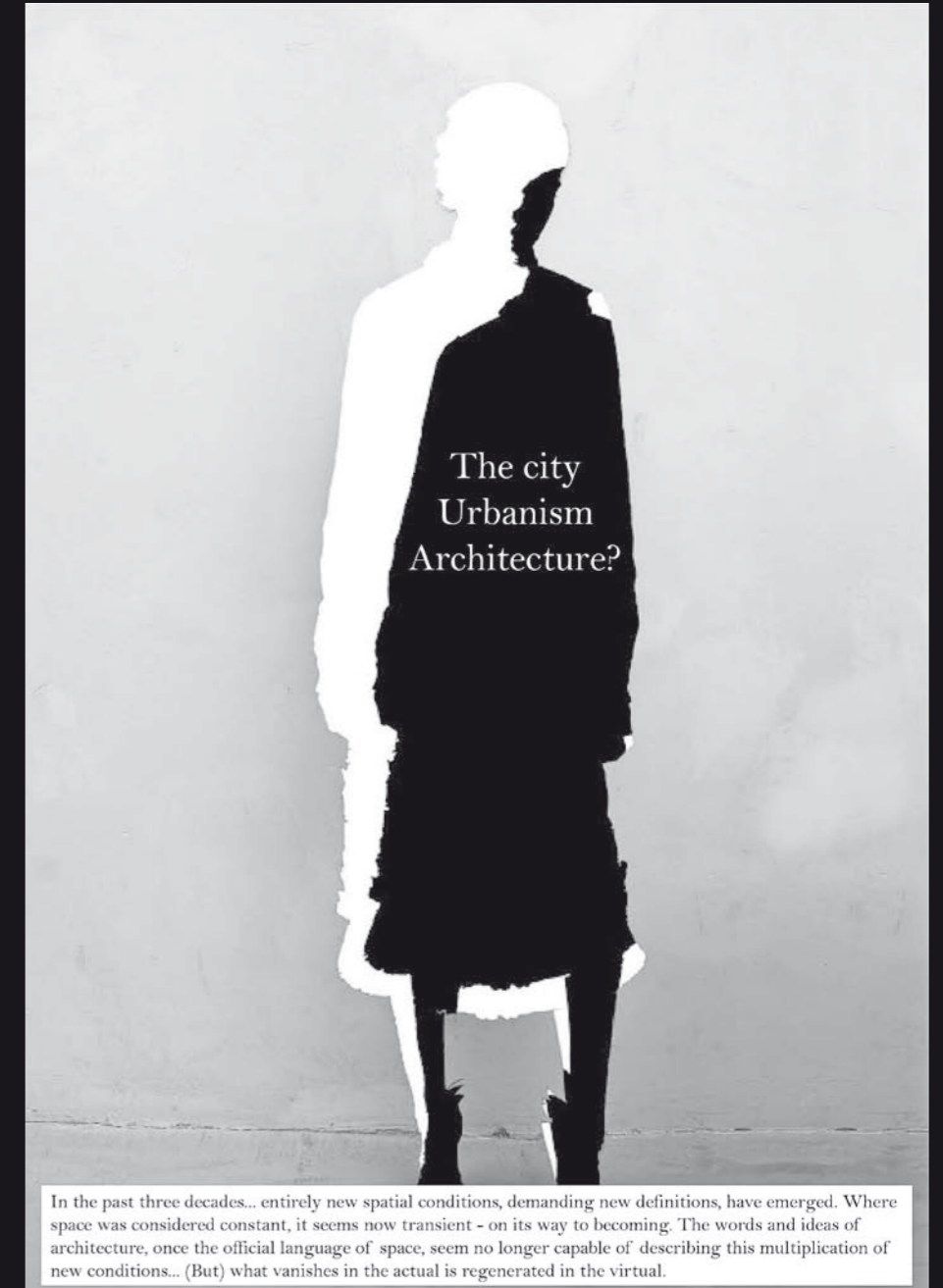
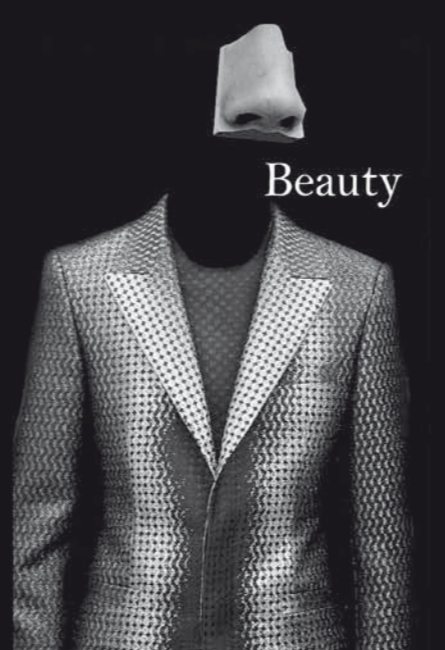
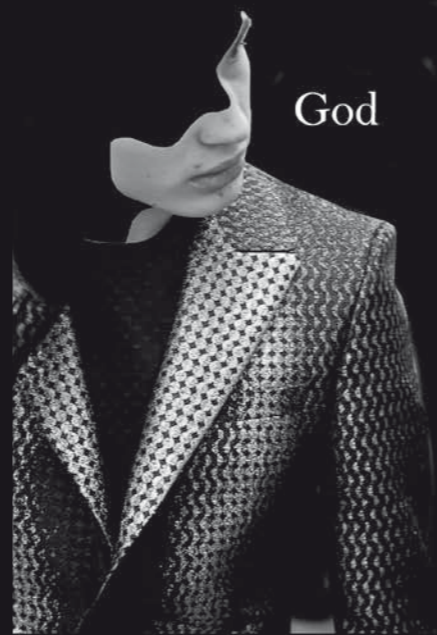
³⁴ See Richard Feynman, *QED: The Strange Theory of Light and Matter* (Princeton, NJ: Princeton University Press, 1985).

³⁵ Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley, Mark Seem, and Helen R. Lane (London: Continuum, 2003), 112.

they also reach back to what we hold as general, the empirically based and classified descriptions of things. Attempting to generalize from the planet’s situation within the solar stream comes close to a *modulation* of cosmologic stability. To put it as pragmatically as possible: it suggests that we should count on a primary abundance of (clean) energy, and with that, an abundance of water and food; furthermore, bringing all materials that are rare and scarce into a regenerative cycle was not a paramount problem anymore, because the main obstacle to recycling is energy-budget calculations, which depend upon the principle scarcity of resources. In less pragmatic and more theoretical terms: such an inversion turns the Earth not only into an object, but also into a subject. This falling together inevitably collapses the critical distance that is so necessary for thinking *considerately*—which literally means through *observing the stars*, from *com-* (with) + *sidus* (genitive sideris, constellation)—and not *furiously and impetuously*. This was the key motive for Gilles Deleuze, with his difficult attempt at inverting, philosophically, the entire legacy of Platonism, which he stated in strikingly clear terms: “It is not the slumber of reason that engenders monsters, but vigilant and insomniac rationality.”³⁵ If it wouldn’t sound so dramatic, it would seem adequate

Weight
Integrity
Composition
Proportion
Detail

But also...



In the past three decades... entirely new spatial conditions, demanding new definitions, have emerged. Where space was considered constant, it seems now transient - on its way to becoming. The words and ideas of architecture, once the official language of space, seem no longer capable of describing this multiplication of new conditions... (But) what vanishes in the actual is regenerated in the virtual.

to say, instead of speaking about the possibility to “generalize” from this “phenomenon,” that to assume the very possibility to do so entails assuming the possibility of *engendering the Earth in its kind*.

This is a hyperbolic way to put it, and I am aware of its polemical nature. To contextualize this, I would like to come back now to what the perspective of universalizing the Subjects of Human Rights entails in more detail. Let’s attend more closely to the position of Michel Serres already mentioned earlier. To illustrate more concretely what motivates such overstatement—that we are engendering the Earth in its kind—we can take up helpful terms he has coined. He names “collectivity” as the new object-subject distribution, and places in its range of responsibility what he calls *world-objects*: “By world-objects I mean tools with a dimension that is commensurable with one of the dimensions of the world. A satellite for speed, an atomic bomb for energy, the Internet for space, and nuclear waste for time [...] these are four examples of world-objects.” The turn in the language game of localizability for him means that “we become the victims of our victories, the passivity of our activities. The global object becomes subject because it reacts to our actions like a partner.”³⁶

36 Serres, “Revisiting *The Natural Contract*.” See also Michel Serres, *Le contrat naturel* (Paris: Bourin, 1990).

Hence, attempting to generalize from the planet’s situation within the solar stream in terms of its *energetization* and *circumgivenness* (instead of position and locality) comes close to a *modulation* of cosmologic stability, and this, perhaps, with a momentum no less severe than that of the *secularization* of cosmology that accompanied modernity. There is little reason to doubt that we can continue to count on what we believe to “know”—all the technical and scientific artifacts certainly bear witness to that—yet we might have to reconsider how we can *account* for the stability that is captured in what counts as knowledge. If our thinking about the Earth means to engender it in its kind, the Earth—of which we are, intimately, a constitutive part—is the “whole” that comprehends *all that can be articulated, and all that can be substantiated in formally corporeal terms* (symbolic artifacts) *as well as in materially corporeal terms* (manifest artifacts). Taking the implications of mastering photovoltaics seriously means to articulate the “identity” of the Earth not in its *general* or *correct* terms, but *in any terms that can be substantiated*. And it also means that all the terms that can be substantiated are terms that properly characterize its kind.



Modern science has assumed a natural homogeneity as characterizing all things natural, in terms of which it attempted to classify scientifically all things on an equal basis, dynamic yet universally coordinated, within dimensions whose interplay applies uniformly and globally. Serres has named them as the “dimensions of the world”—speed, energy, space, time. The principle that modernity found for identifying the individuality of all things in this manner, as constituted not by natural kinds but by a universal nature, was “work”: transforming energy from one form into another. The architectonics of such systematicity rests on the assumption that the total amount of energy within the cosmos is finite. Only on the basis of this assumption can we learn to understand forms of individual becoming purely on the basis of what a thing is doing, literally, through understanding the transformations of energy and matter. What we see questioned with the principle of primary abundance is not this axiom, but the adequacy of the modern (thermodynamic) stance to treat world and universe alike. There seems to be no reason to reconsider that the total amount of energy within the universe be stable, and that energy is what can neither be produced nor decay. It is the equivalence between cosmos and universe that appears as inadequate from the energy perspective of primary

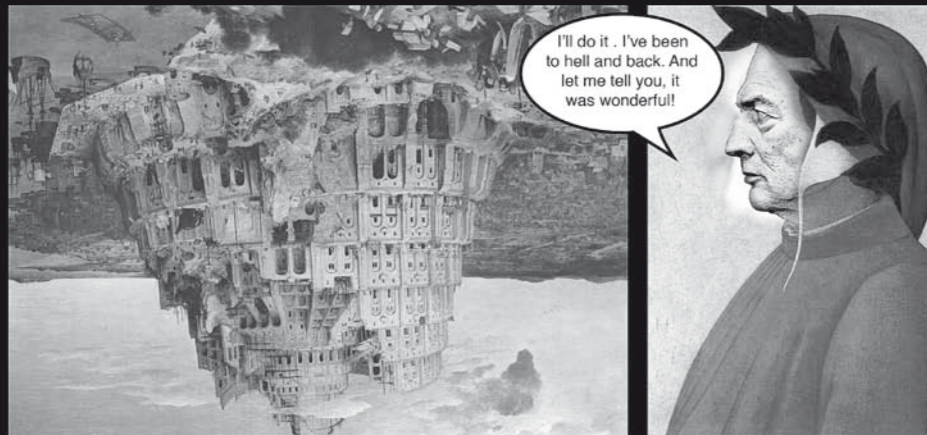
37 The aspect that there is a third component is a key motive of cybernetics, and has perhaps most prominently been articulated by Norbert Wiener—“Information is not energy or matter”—without being able to suggest a different architectonics that could accommodate all three of them. Serres’s approach here is the first that aspires to do so.

38 Michel Serres, “Les nouvelles technologies: Révolution culturelle et cognitive,” lecture held on the occasion of the 40th anniversary of INRIA, a public institution for research devoted to the sciences of computation (*les sciences du numérique*) in France, December 11, 2007; https://interstices.info/jcms/c_33030/les-nouvelles-technologies-revolution-culturelle-et-cognitive?hlText=michel+serres. Thanks to Diana Alvarez-Marín for translating from the original French.

abundance. In concrete terms: the total amount may well be finite and stable within the universe, yet that which is integrated and encapsulated within the ecosphere of the planet Earth is not. The criticality we are looking for, one not based on a principle of sufficient reason but on one of finite synthesis, needs to live up this change in perspective.

Toward an information-based architectonics

Michel Serres has recently suggested not only that but also how the two physical categories of mass and energy—those that are derived from the principle of work—could be complemented with a third component that is orthogonal to the latter two: information.³⁷ “I do not know any living being, cell, tissue, organ, individual, or perhaps even species, of which we cannot say that they store information, that they treat (or process) information, that they emit it and they receive information. [...] I know of no object in the world, atom, crystal, mountain, planet, star, galaxy, of which one could not say again that it stores information, it treats (or processes) information, it emits and it receives information. So there’s this quadruple characteristic in common between all the objects of the world, living or inert.”³⁸ Between all things in the world, he suggests, what is common



I'll do it. I've been to hell and back. And let me tell you, it was wonderful!

At the rate at which population size has increased and at which the speed of changes has accelerated, there were too many deaths/disappearances/dismantlements and not enough room for the bodies. The dead were then buried in a reversed-skyscraper, hundreds of stories deep, below the buildings. Coupled with an elevator, an undefined number n of Typical Plans will turn into a freak show, a surrealistic machine abilitated to fabricate some unexpected encounters.

The Typical Plan is “the plan without qualities”. Its only function is to let its occupants exist. Create new territories for the smooth unfolding of new processes. At the same time, the reversed-Babel was transformed by its own Bigness, it was no longer a building but a city in itself. It could compete with “the city”.



LEVEL -1

I arrived in a panoptic room where moderns still tried to cope with instability...eternally

I still don't get it...



Allez, once more!

CHECK MATE!

At one of the desks, Le Corbusier desperately multiplied his attempts to win a chess game against a computer.

Hi. I'm the receptionist. If you are here to visit the chambers, please take the lift and go all the way straight down. The number of floors is undefined, only direction is unvariable.



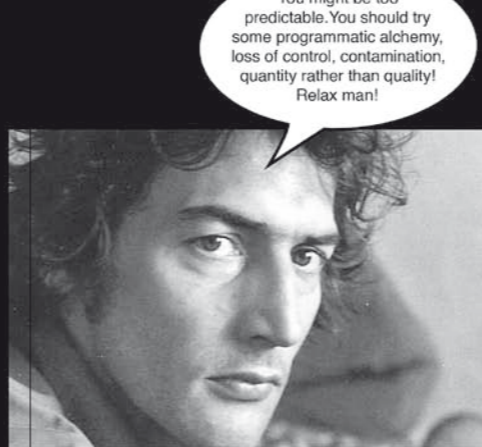
Look, Michael Jackson!!

I wonder on which floor in this building we can find its architect

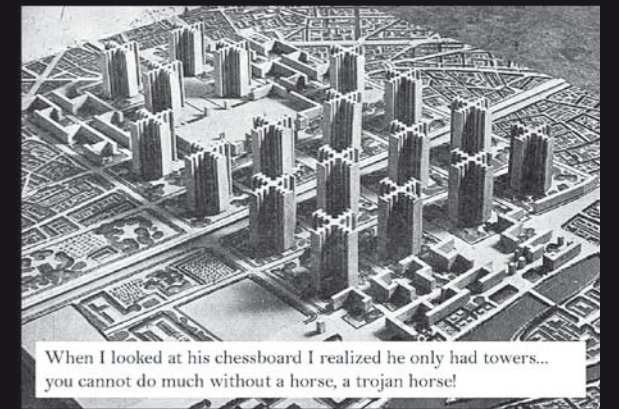
Wow, there's a whole floor dedicated to Post-Moderns, amazing!



I have 5 strategies to win this game, this is irrefutable:
1. Pilotis
2. Terrace roof
3. Free plan
4. Band window
5. Free facade



You might be too predictable. You should try some programmatic alchemy, loss of control, contamination, quantity rather than quality! Relax man!



When I looked at his chessboard I realized he only had towers... you cannot do much without a horse, a trojan horse!

Bigness has the potential to reconstruct the whole, resurrect the real, reinvent the collective. A dissociation tool from exhausted movements of modernism and formalism... a new economy where no longer “all is architecture”.



CHECK MATE!

is a fourfold *activity*—to store, to treat, to emit, and to receive information. While work, the transformations between energy and matter, was the emancipatory principle that allowed the overcoming of premodern doctrines of natural order by demarcating a strict separation between culture and nature, mind and matter, and spirituality and reason, the introduction of information severely complicates things. While work as a category operates on the level of representing a generality (the class of all things insofar as they are *natural*—or *technical*, in the sense of *scientifically natural*, as they do work), the fourfold activities operate on the level of actualizing abstractions. The cosmos (world, manifestations of things) does not *represent* a universal order (forms, templates, types, etc.). In fact, the universal cannot be represented because it is pure and infinite activity: storing, treating, emitting, receiving. The so-induced notion of universality cannot be represented by concepts; it acts. Within the quantum clouds of probability distributions it *keeps predicating potentially*, and can only be actualized when articulated (factorized and complemented with coefficients) within a formula, and expressed as a case of the symbolically established solution space. Information (what is distributed and integrated in this acting) is like the photons from the solar stream: *an elementarity abounding and*

discrete packages of powerful indefiniteness. Articulating it, in the metaphorical terms of how an alphabet articulates the stream of breath, excites its indefiniteness to take on the characteristics of what we might call an *imaginary magnitude*, corresponding to how the number that counts (and through that, governs and accounts) the possibility space is *indexed*, and *indexically labeled*. Such indexing raises the indefiniteness of information into lofty probability distributions of *local density (amplitudes)* and *local plenty (probability amplitudes)*. As long as information is not thus excited and raised, it is indefinite just like the photons of solar radiation are indefinite as long as they don't incite, through interaction, state changes within the relative stability of chemical bonds.

In all consequence, the relation that can be maintained to the universal, so conceived, varies locally and depends upon the capacities and abilities that can be mobilized for articulating the terms of a formula that render solvable functional mappings. As long as the virtuality of the universal is not actualized, it remains pure indefinite elementarity, an elementarity we could call ideal because it is of no substance. Such virtuality of the universal is a kind of ideal that *belongs* to all things. In order to turn substantial, it depends upon being actualized, and such actualization, I would suggest,

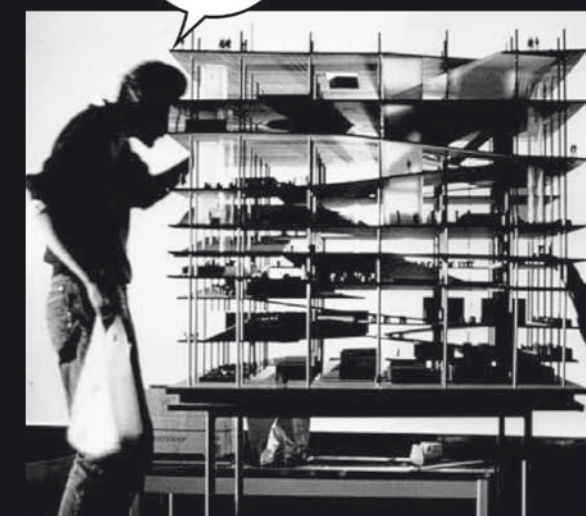
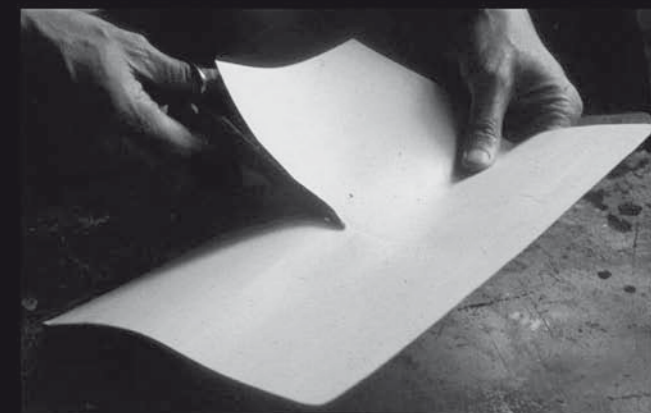
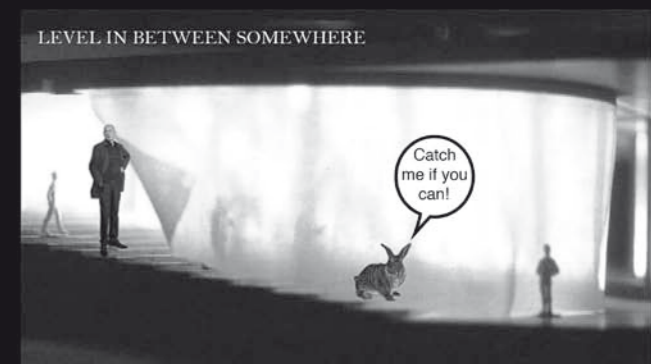


The new definition would be " Beautiful as the unexpected encounter of a sewing machine, an umbrella and Dali, fabricating hybrids, on a dissection table"



I just followed the hare as fast as I could. All of a sudden the floor started folding down, and I had the feeling someone was playing with us, someone playing to be an architect...

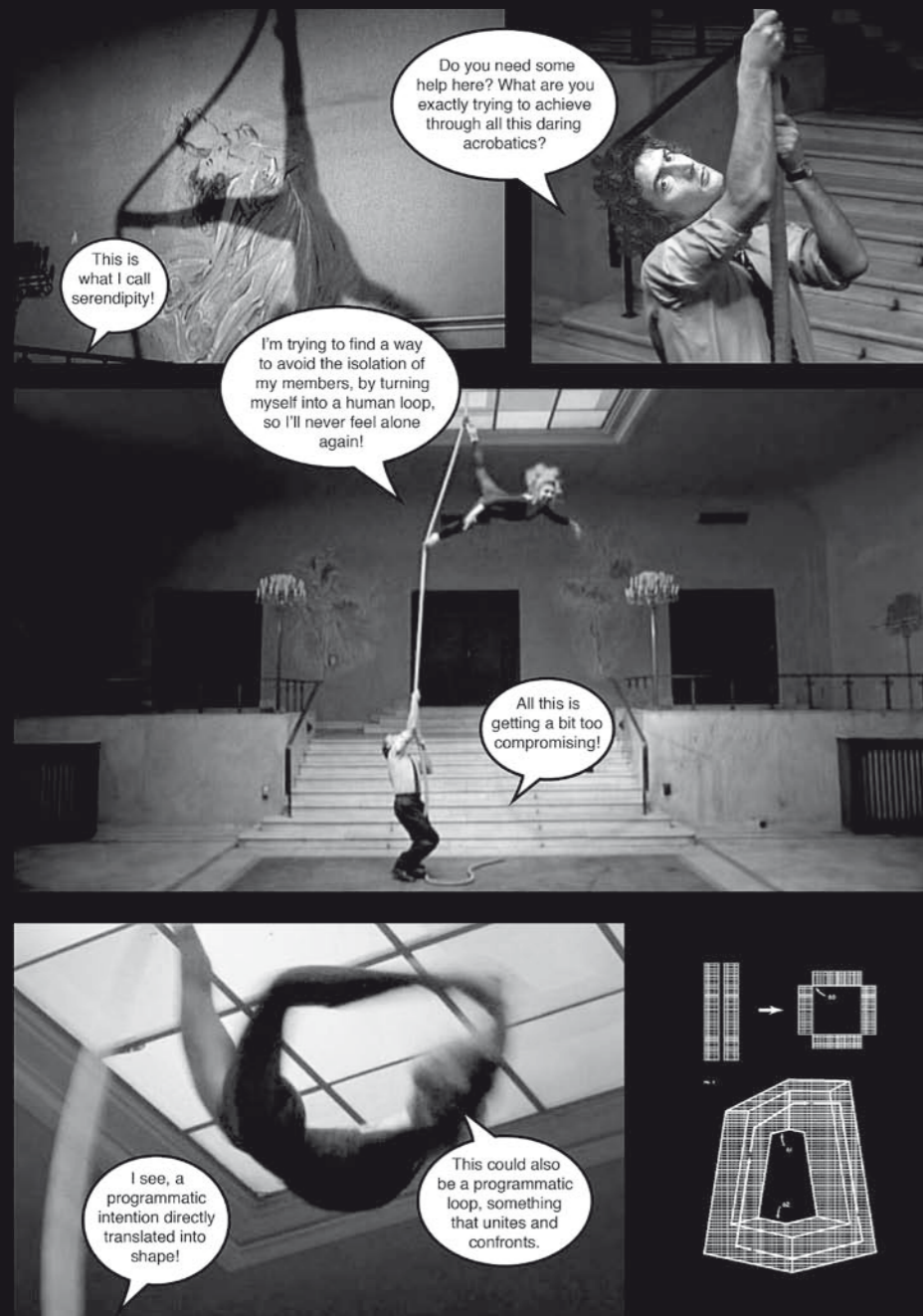
A system of folding plans was about to destroy the status of the individual floor. I lost the notions of above and below, while having the sensation that the regime of orthogonality that had dominated architecture was close to an end. Combined to a grid and stacked this new architecture could be defined as new inside-out city. The hare disappeared...



is achievable in acts of learning. Learning, literally, is an act of appropriation: it means mastering a subject matter, and it is through such mastering that the virtual can be actualized and rendered manifest. It is not the formulas that incorporate the universal in any *schematic* sense; the formulas, in their apparent schematism, depend upon animation through the learnedness according to which the partitioning differentiation of the activity a formula *constitutes*, as a *matheme*, is modulated. To conceive of formulas as *mathemes* from the Greek *mathema*, for “that which is learned,” has been the custom for many philosophers throughout antiquity to the Enlightenment, and has been revived very prominently in the twentieth century by Martin Heidegger in *Die Frage nach dem Ding* (1950), and also by Jacques Lacan or Gilles Deleuze, among others. From our point of view with regard to primary abundance, what all of them are concerned with (in very different ways!) is that the universal—if it is *in act* (ontologies of the event)—is literally *entropic*, from the Greek term *entropia*, *en* for “in” and *trope* for “a turning, a figure of speech.” The universal is that which keeps turning within figures of speech.

With this, we can now summarize our proposition of an entropic economy: It is not *against* entropy but *thanks to it* that we can maintain a locally variable relation to the

universal, and *substantiate* figures of speech by treating them as *abstractions*, not as *generalizations*, and by striving to formalize them into the constitution of a possible *matheme*. From the point of view of *mathemes*, the relation we can maintain to the universal is locally variable, and it is subject to an “economy” that is both collectively and individually based, and whose “stocks” are those accumulated through learning, and whose exchanges are rated by the appreciation of mastership. In all dramatic exaggeration: surplus names can be rated in terms of any scale, from completely worthless to sublime dearthness. The subjects that are mastered, by learning, are completely subjects in Rancière’s sense, which I introduced earlier. They are subjects whose names do not represent definite collectivities. It is in this sense that their names are *abstract*, not *general*. They are “surplus names, names that set out a question or a dispute about what is included in their count.” The predicates whose activity is being governed by such counting are, due to the virtuality of their universality, *open* predicates: they do reign by (arithmetic) means of summation, division, etc., yet what they sum up is symbolically constituted, and because of that, can never be exhaustively totalized as a finite sum. They are predicates that *open up a dispute* about what they exactly entail and whom they concern in which cases. They are capable



of introducing an interval that makes possible political subjectivization into any status quo. Let's remember: "Political names are litigious names," Rancière points out, "names whose extension and comprehension are uncertain and which open for that reason the space of a test or verification. Political subjects build such cases of verification. They put to test the power of political names, their extension and comprehension."³⁹ It is such a putting to the test that formulas, conceived as *mathemes* that are allowed to *calculate with what has been learned*, are engaged in. What has been *learned* can also be *taught*. If we cease to *represent* the universal, and instead relate to it by means of actualization, what opens up is the perspective of an economy in which all acts of appropriation are *contributing to*—not depriving—the prosperity of the universal. What comes within reach to be thought is an economy where privation increases the wealth of that which belongs to all. If an individual learns to know, through acquiring mastership, developing it as a proper ability and demonstrating that and how it can virtually be learned by anyone, it *differentiates and proliferates* the richness of the universal.

From the adverbial and categorial point of view to universality, the commonness of the common nature of things is the result of *inception*, rather than the result of

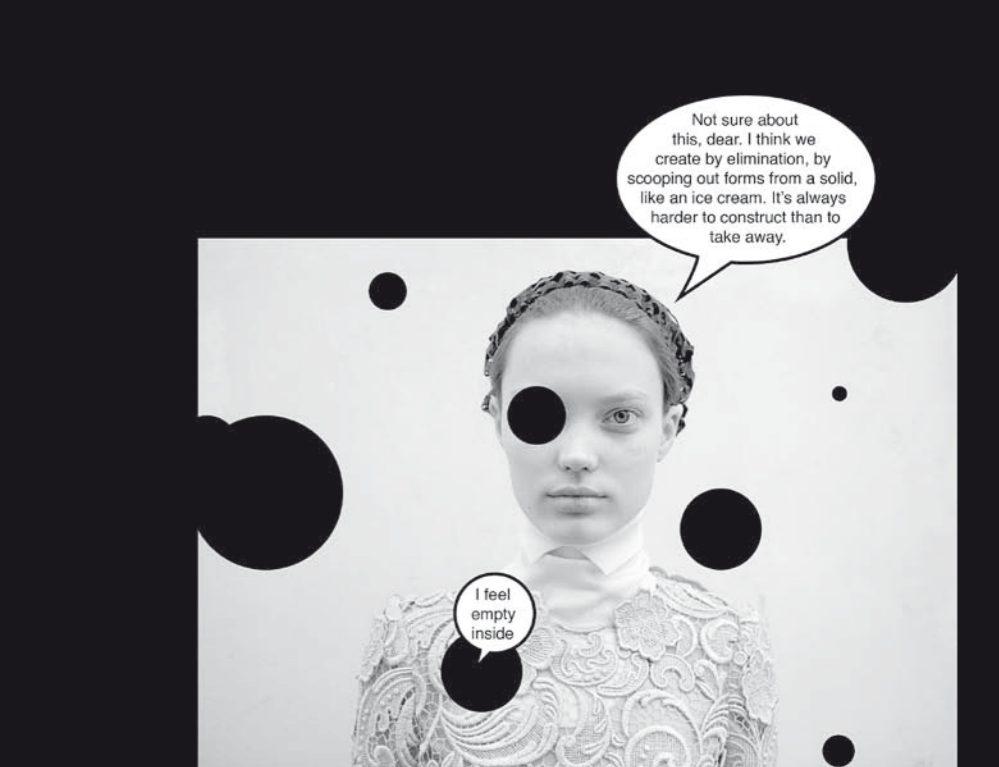
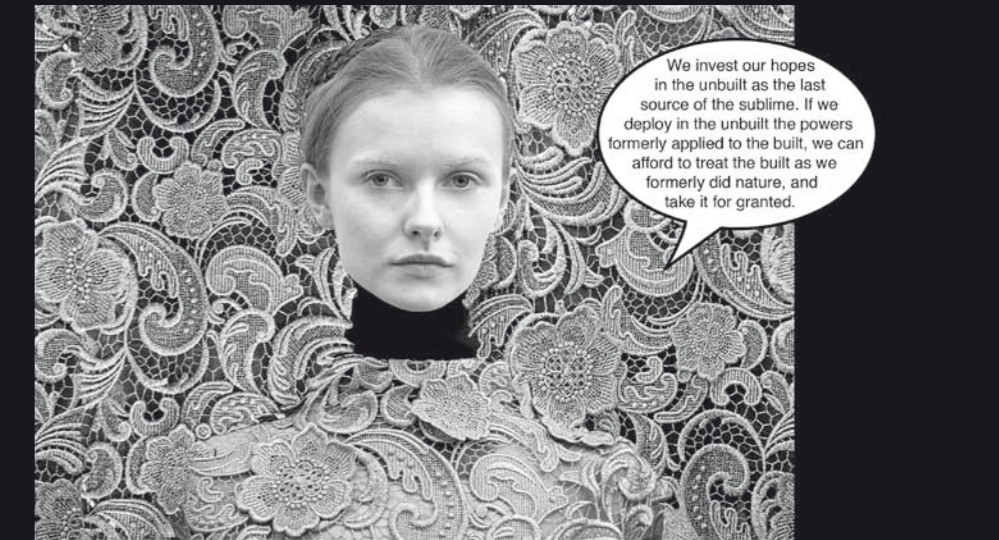
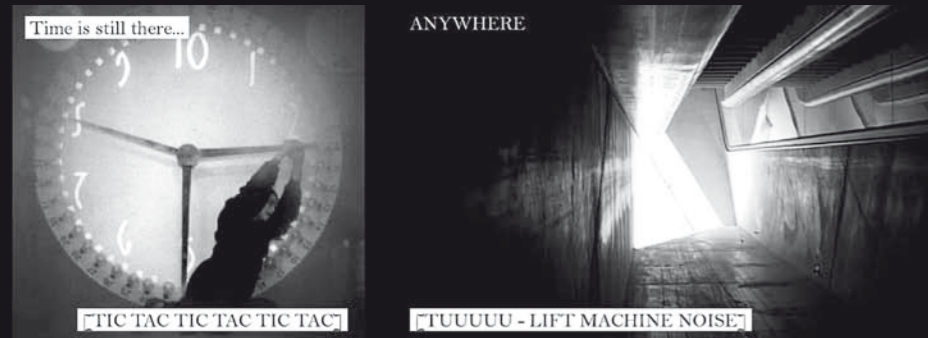
³⁹ Rancière, "Who Is the Subject of the Rights of Man?," 304.

conception. With regard to political subjects (in the extended sense proposed in this text, not in Rancière's original sense), abstraction precedes the concrete existence of that which presents itself to us in regularities. That which appears recurrently as cases follows a categorial order before it can be tested inductively, empirically. Abstractions are for learning, generalizations are for testing and settling the learned such that it can be treated as a case, as a "such" and not only as a "this."

Contrary to pursuing a prosaic disenchantment of the fascination with the generic, I hope to have been able to express why I think it only now begins to get truly interesting: the generic introduces a possible understanding of mastership that, seemingly paradoxically, builds on the premise of *expropriation*. It introduces an understanding of mastership where the *-ship*, the affix demarcating a "state, condition of being," is primary to the individuality that actualizes and acquires this state—the masters.

Within the Generic City: Master, yet in "whose" house?

By coining the striking word of mankind as having to come to terms with "not being the master in his own house," psychoanalysis has suggested that we ought to understand



ourselves through roots within the *unconscious* as a peculiarly *expropriated groundedness of what can be understood and known*. Psychoanalysis has rendered explicit a veritable *negative form of architectonic thought* that operates by working through an element of collectivity that remains unavailable for all attempts at taking control. Jean-François Lyotard has modulated this language game by making the point that notions of humanity need to be rooted in an element of what he calls “the inhuman,” a constitutive part of us that we do not control—which may be birth, infancy, the law, God, or the unconscious. Rancière has taken up this consideration in his reflections about who is the subject of the rights of man, to which I have made reference several times: “Absolute evil begins with the attempt to tame the Untamable, to deny the situation of the hostage, to dismiss our dependency on the power of the Inhuman, in order to build a world that we could master entirely,” he writes, and continues: “Such a dream of absolute freedom would have been the dream of the Enlightenment and of Revolutionary emancipation. It would still be at work in contemporary dreams of perfect communication and transparency.”⁴⁰ Important is that such inhumanity is the irreducible otherness, the part of the untamable of which human being is both host

40 Ibid., 307.

41 Hans-Dieter Bahr has developed this theme toward a veritable reconception of philosophy, which he calls *Xenosophie*. See Hans-Dieter Bahr, *Die Anwesenheit des Gastes: Entwurf einer Xenosophie* (Nordhausen: Bautz Verlag, 2012).

and hostage, *Gastgeber* and *Gast*, as a relation we might perhaps call “coexistence” or “genuine mutuality.”⁴¹ Along the lines introduced in this text, I would say it is the infinite surplus that needs to be taken into account wherever we are working with summations, checks, and balances.

The grand project of an architectonics of reason, whether in positive or in negative terms, even if it were to inverse the problematics of mastership into non-mastership—purely into activity that doesn’t require mastership at all, but that unfolds auto-logically and automatically—meets its limits and turns stale and oppressive in the reduction of its own categories to representable schematisms. A schematism cannot engage critically with its own constitution intra-specularly. Our interest in a next paradigm for programming languages, a *pre-specific* one after the *procedural* and the *object-oriented* ones, derives from the unease in observing that these limits are indeed being met today.

Programming languages, as I have argued earlier on, have entirely broken with the mimetic paradigm of language (at least in the representational understanding of this paradigm)—their grammars are engendered, their structures are governed self-reliantly, symbolically, within the confines of certain arbitrarily set determinations of usefulness. Without an understanding of mastership, all engagement with intra-specularity would mean to subject one’s own critical engagement to the governance of these arbitrary determinations. In other words, if the generic makes a worthwhile point in suggesting to trust in a “groundedness” of knowledge that roots within an elementarity of distributedness, where all particular instances are expropriated from their individual specificity, such trust would mean—in programming more generally—to subject readily to the abstractly synthesized and arbitrary *master language*, or to *master models* in object-oriented computing more specifically. The problem thereby is not that these synthesized *masters* are synthesized; and neither that their “nature” is induced according to the orientation of a certain ambition. The problem is that the synthesized masters tend to appear as quasi-naturalized, while in fact they are synthesized by acts of learning and on the basis of acquired mastership. The problem, hence, is that they ought to be esteemed and treated accordingly—that is, the categories with which they operate ought to be understood as characterizing “political subjects,” not the subjects of “natural kinds.” The criticality with which they need to be met is not one principled by criteria indicating when reason is sufficient, but by criteria that index the capacities that constitute acts of finite synthesis.

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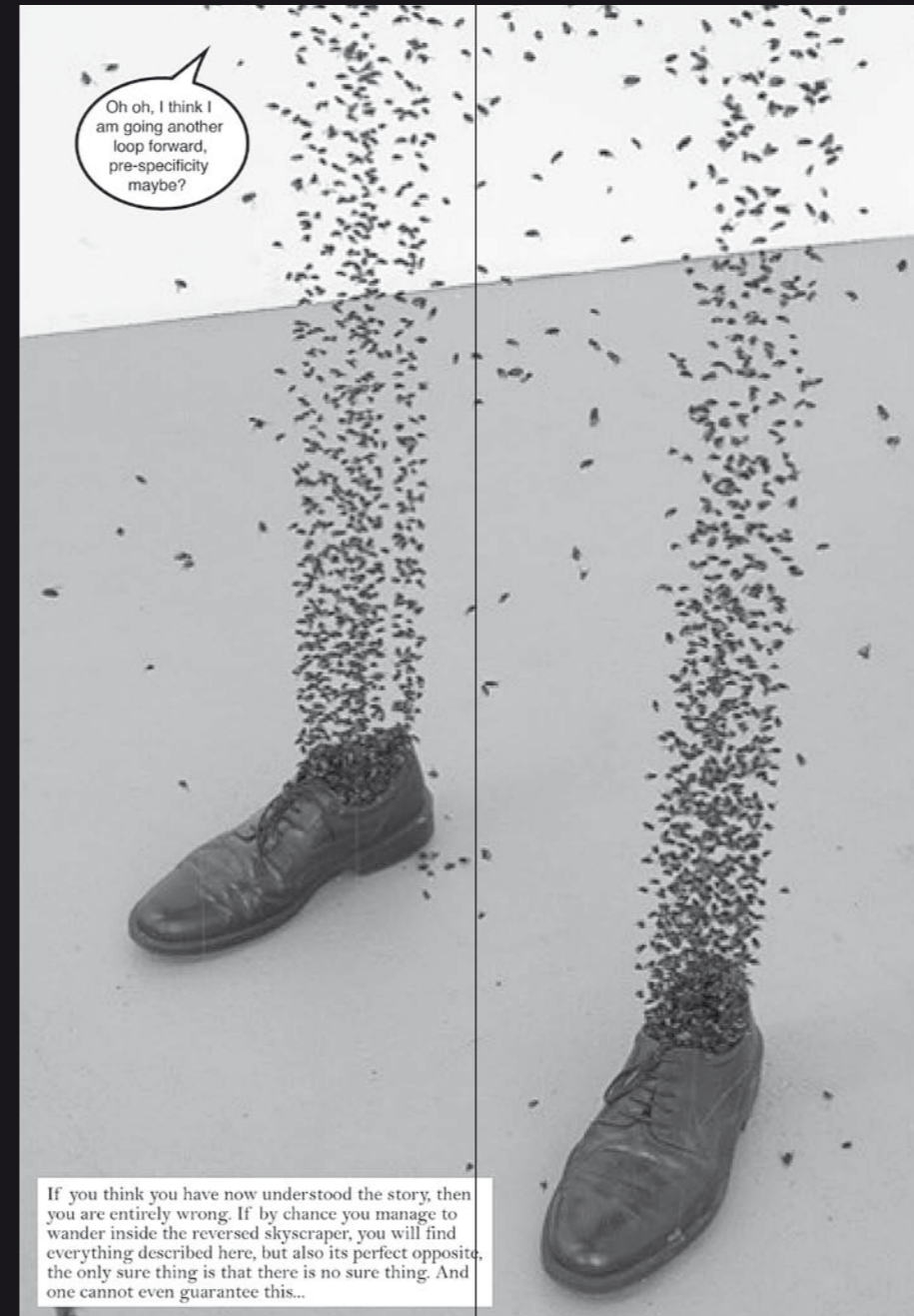
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Thus, instead of referring to this dimension of expropriation as an expansion of the Unconscious, the Law, Provenance, or Divine Chance into and within the scope of what can be computed, I prefer to call *literacy* this abstract “where,” where “what can be engendered through learning” is rooted



and grounded. We need not make any appropriative claims about the untamable nature and insistence that animates literacy, if we relate to it as a kind of *body-to-think-in* that indeed is generic, and hosts us *before* it can be inhabited individually, while its existence depends, at the same time, on actually being acquired and inhabited by individuals. We can now see, in literacies, that which incorporates “loftily” what I have earlier suggested to understand as the politicality aspect of nature. I have characterized it as a dimensionality constituted purely by distributiveness, and as complementing the modalities of the necessary and the possible with a further aspect, that of the probable. Expropriation and mastership maintain a kinship relation that might appear surprising.⁴² Yet at the same time we all well know how, in order to communicate—whether in spoken words (speech), written phrases (discourse), or symbolic terms (algebraic code in IT and IT-based CT)—we depend on means and constraints *from which* we may well choose, but *to which* we *first* have to submit, in order to be able to choose. As long as we don’t master articulation and expression, argumentation and composition, signal interpretation and interface decodings, the less schematic and more interesting ones of them appear to us not as wrong, but as empty, superfluous, often confusing, insufficient, not entirely adequate, etc. It sounds quite paradoxical, but we feel comfortable, individually, within this generic dimensionality (our literacies) proportional to *how well we are able to “master,” individually, these collectively constituted and governed capacities.*⁴³

Characterizations of the subject of the master

Attracted by the volatility of a flirtation between the philosophical stances of “critical rationalism” and “speculative realism”

So let us get back then to characterizations of the second conceptual persona that features centrally in this text, next to that of the generic: the master. While many contemporary intellectuals seem prepared to submit, with all due acrimoniousness, the rich legacy in *architectonic inception* to forms of often all too unimaginative and uninspired *scientism*,⁴⁴ a young French philosopher is currently raising hopes for the possibility of philosophy to actually *continue* its legacy of architectonic inception. Quentin Meillassoux is central to an emerging school called “speculative realism,” or sometimes “speculative materialism,” a vibrant field of intellectual thought and debate characterized through its reactivation of metaphysical and ontological themes, while at the same time being very active in strictly programmatic and political terms as well. Furthermore, the people associated with this community are closely watching recent technological changes, and they often take certain aspects of what they observe as their starting point. All of this is interesting enough for our context of computability, information, and architecture. Yet what I would like to focus on here, in order to bring out as clearly as I can the distinction between what I suggest to call “critical rationalism” and “speculative realism,” is not this larger context around Meillassoux in general, but a particular book he recently wrote on Stéphane Mallarmé’s poem “Un coup de dés jamais n’abolira le hazard” (“The Throw of the Dice,” 1897). This 2011 book, entitled *Le nombre et la sirène*, is equally brilliant as it is unsettling with regard to our interest in computability. The main protagonist in the poem is the *Master*, in the double sense of a particular authority and yet also (as is the case with most fictional characters) in a generic sense. We encounter the Master on a boat in the midst of a stormy and wild sea, holding dice in his fist and pointing his hand into the air. The poem never resolves what the Master actually does or intends to do with the dice, whether he wants to throw them in order to learn about his near destiny, whether he believes that he can intervene in the “fulfillment” of what appears to be his “predicament.” Are the dice a sign of the Master’s despondence, his impotence to continue being what he is, a master, vis-à-vis the powers of cosmic chance that science has just began to affirm in the stochastic methods introduced by Laplace and others? Does the calculation with probability mark the ultimate end to any form of mastership, and instead enforce a more humble stance for man in a cosmos whose nature is determined indirectly, on the level of a second derivative, as a paradoxical determination of being undetermined?

Most of the interpretations somehow unfold along these lines.⁴⁵ The brilliance of Meillassoux’s reading lies in opening up, quite inversely to these readings, a novel possibility of how the poem can be interpreted as *presenting an instance of actual, successful mastership*. Meillassoux presents nothing less than an understanding of the Master in an entirely original way, which relies neither on annihilating chance nor on desiring to control it, and the calculations that are possible with it, objectively. We could easily call what Meillassoux reveals in Mallarmé’s poem a symbolist way of engaging with the

⁴² A recent discourse where thought is devoted to this kinship between expropriation and mastership, via the question of whether and how sexuality can be understood as the being of symbolic relations—i.e. the being of relation-in-general—was published in two booklets, one by Jean-Luc Nancy, *L’œil y a» du rapport sexuel* (Paris: Éditions Galilée, 2001), and one by Alain Badiou and Barbara Cassin, *Il n’y a pas de rapport sexuel: Deux leçons sur “L’Étourdit” de Lacan* (Paris: Fayard, 2010).

⁴³ Judith Butler makes a similar argument about language as the dimension in which we are all equally dispossessed, in her essay “Giving an Account of Oneself,” *Diacritics* 31, no. 4 (Winter 2001): 22–40. Her argument, I would suggest, can be expanded and generalized along the lines I propose here.

⁴⁴ For any esteem of intellectuality as something that has been *achieved* by civilization, it is, for example, a sheer disaster that so much of research all across the social-science and engineering disciplines today is evaluated, funded, and discussed along the simple and reductive line of carbon dioxide reduction.

⁴⁵ The “death of the author,” which was proclaimed by Roland Barthes, Maurice Blanchot, and Jacques Derrida, among others, was decidedly rooted in particular readings of Mallarmé’s great character of our poem, the Master.

⁴⁶ See Vuillemin, *La philosophie de l’algèbre*, especially the concluding chapter, “La mathématique universelle,” 465–518.

⁴⁷ In his earlier book *After Finitude: An Essay on the Necessity of Contingency* (London: Continuum, 2008; published in French as *Après la finitude* in 2006), Meillassoux reflected on what such an “encapsulating move” entails in relation to the philosophical tradition, and introduced the notion of “correlationalism” for referring to all stances that embrace a transcendental position. He suggested calling “realism” any stance that negates correlationalism. With due distance to the euphoric reception of this proposal (but also with some sympathy) Alberto Toscano has discussed the (also politically) problematic aspects about such an ambiguously “generous” generalization in his essay “Gegen Spekulation oder eine Kritik der Kritik der Kritik,” in *Realismus Jetzt*, ed. Armen Avanesian (Berlin: Merve, 2013), 57–75.

⁴⁸ “We have abstractly developed the hypothesis, which seemed to us to correspond in ‘The Throw of the Dice’ to Mallarmé’s draft since 1895—the one of a diffusion, rather than a representation, of the divine within the Oeuvre.” Thanks to Diana Alvarez-Marin for translating this and the subsequent quotes from the original French: “Nous avons développé abstraitement l’hypothèse qui nous a paru correspondre, dans le ‘Coup de dés,’ au projet de Mallarmé depuis 1895—celui d’une diffusion, plutôt que d’une représentation, du divin par l’Oeuvre.” Quentin Meillassoux, *Le nombre et la sirène: Un déchiffrement du “Coup de dés” de Mallarmé* (Paris: Fayard, 2011), 89.

theme of mastership—yet this, at first sight at least, comes close to saying nothing very surprising. And yet, the theme of symbolism as Mallarmé renders it present in the poem, and that is worked out by Meillassoux, not only affects severely what is more commonly associated with symbolism in art, it also affects the notion of symbolisms in mathematics—the entire legacy of developing, trusting, and departing from what can be learned through working out resolutions to formulas. The clue in Meillassoux’s reading—as I would put it—is to have Mallarmé engender a one-of-a-kind corpus of numbers whose “nature” is universal, while at the same time being singular. Meillassoux speaks differently about this; he does not mention the context of corpus theory in mathematics at all, for him it is all about the unique event of depositing *the number that can be no other* (on the side of Mallarmé) and someone (him, Quentin Meillassoux) finding it. Already before Meillassoux, many interpreters have sought to find a *clue*, and to be able to prove the hermetic nature of the poem as a treasure that was capable of conserving something inarticulate yet essential, by seeking to demonstrate how their clue fits the structure of the poem like a key fits the keyhole. What distinguishes Meillassoux’s reading from any such attempt is that he finds the clue he needs not in something exterior to the poem, but only because he engenders it himself, immanently, by working through and appropriating the materiality of the text, intimately and from within the poem, literally by not much else than counting, speculating reasoning, and by providing the grounds for his reasoning in clear and distinct form. And yet it would be mistaken to assume that at stake in Meillassoux’s reading is a notion of mastership that relates to a Cartesian subject, that knows how to master an object in all critical distance and pious devotion (after all, for Descartes it is God gifting us individually with ideas).⁴⁶ Rather, at stake in Meillassoux’s reading is a notion of mastership based on what I would call *insistentially shared intellectual intimacy*. The mastership that Meillassoux portrays in Mallarmé’s poem, I would like to suggest, is mastership in succeeding to invoke acts of learning against the sheer improbability that characterizes learning. In such a situation, all clearly set identity distinctions between author, reader, and the protagonist are *raised into a lofty cloud* where the outcome, after settling back to “commonness” again (which we could call *existential extimacy*) after such exposure into the *insistential intimacy* of such learning, is profoundly uncertain. This is ever more remarkable, I think, if we consider that our present, in the beginning of the twenty-first century, marks a moment when all hopes that count as reasonable with regard to the relation between chance and calculation go toward controlling chance through calculus, under the positivist restraint that such calculation needs to be combined with the provisional empirical precision and explication that characterizes *the least degree of speculation*. Against this critical divide between induction (empirical) and legitimate generalization (formal and deductive), Meillassoux affirms the move to symbolically encapsulate both, and work empirically within the abstract “indexicality” of the poem’s “material.”⁴⁷ I call it indexicality and materiality of the text because the stance of such “encapsulation” means to depart not from clearly bound dimensions, but from a state of mixture involving the semantics, the harmonic and graphical meter, the broader historical-political-cultural context as well as the history of the legacy he continues (poetry), and all hermeneutic aspects one can think of; having all the distinctions that grow out of these classical dimensions, he takes the liberty of putting them into a cloud of probabilistic relationality from which he then sets out to extract his own reading, where all classical stances that could be taken as a “ground” end up being slightly shifted, revolved, and rearranged in a manner that is consistent within itself, yet that lacks objective necessity in the consistency it arranges. Indeed the main hypothesis he puts forward is that Mallarmé’s project was not to represent the divine, but to dissolve it through his own poetic oeuvre.⁴⁸ It is this contingent character of his reading, coupled with fine exactness and formal rigor, that sets up what I would call “the improbability of learning” that I see staged in Meillassoux’s reading. Every act of learning, I would like to argue, confronts us with just such a “confused” and “oversaturated” situation. To deal with such confusion through trust, until one has developed a “stable ground” or “consistency” that one can master in a relaxed (not in any particular and strict way dependent) manner, is the “spiritual” character of learning—in all the ambiguity this entails.

I must say that this emphasis on seeing a notion of mastership introduced through Meillassoux’s reading of Mallarmé’s poem, which sets upon the fundamental improbability of learning, is not (not directly, at least) the way Meillassoux himself wants to guide the outlook that stems from his reading. For him, this point of view would be much too prosaic. In his eyes, the genius of Mallarmé (and that of himself) is—explicitly and literally so—*programmatically* spiritual in nature, not *technically* spiritual as I would prefer to have it with my emphasis on learning and literacy. The great passion that I wish to point to as being involved in any act of teaching/learning plays a crucial role

for Meillassoux as well—he is very attentive to it—yet to him it does not characterize learning in general; he sees in it a singular moment that grows so powerful in this focalization as a singular moment that he recognizes in it an act of divine nature. I will not attend much here to the aspects of Meillassoux's book where he draws quite daring consequences from this, suggesting to see in the poem a veritable *liturgy* that is capable of hosting and bringing comfort and orientation to a community-to-come, open to anyone who is willing to participate in performing the sacred rituals of what he calls "Mallarmé's secular religion."⁴⁹

Cosmic untendedness, prosaicness in verse

But let me sketch a bit the larger context within which Meillassoux is inspired to such ideas. For it is a context that bears close familiarity to the contemporary situation in architecture, vis-à-vis the power of computing. So what was at stake more generally with the question of meter in poetry, and the rise of free verse?

Since antiquity, poetry was always credited a certain dignity, as rightfully deserving a peculiar kind of spiritual trust. Different from other manners of expression through language, a poet did not lecture a doctrine, and did not speak in the name of an authority. And yet, there was a peculiar necessity attached to poetry, because any appreciation of excellence, as a poet, was tied to the poet's strict subjection to a metrical law that was larger and more binding than his will: a poet strictly had to subject his verses to the conservative constraints of poetic meter.⁵⁰ If a poet could lend his voice to evoke a thing with elegance, and without doing it violence—that is, through masterfully playing *within* these constraints—there could be attached, to that which is voiced poetically, a certain divine autonomy or gift. Like this, whatever was articulated poetically could be articulated only *indirectly*, and thus remain divine in nature. The oeuvre of a poet was to express this divine insight. As such, it is not appropriated by the verse that composes it, and what is more, the meter that renders the verse enunciable allows the listeners/readers to participate in the appreciation of such divine nature. There was in this sense, of a peculiarly poetic and strangely singular kind, a necessity involved in the creative vocations of addressing that which cannot be voiced directly. Due to this necessity, poets were held to deserve a particular kind of spiritual trust. Before the background of this legacy, the rise of so-called free verse in nineteenth-century poetry mirrored a profound crisis of cosmic untendedness that has its roots in a larger context, and that resulted from the strict separation of science from religion during the Enlightenment.⁵¹ For poetry, the indirect manners of linking the sounds not only in a grammatically

49 "Modernity had therefore triumphed, and we did not know. The passion put, throughout the nineteenth century, to snatch the messianism of his Christian condition, to reinvent a civic religion freed from dogma, an emancipative politics exterior to the former Salvation. [...] Mallarmé would have taught us that modernity had in fact produced a prophet, but erased; a messiah, but by hypothesis; a Christ, but constellatory. He would have architected a fabulous crystal of inconsistency containing in its heart, visible by transparency, the mermaid gesture, impossible and vivid, which had engendered it, and still engenders it. And the poet would have thereby broadcast the 'sacred' of his own Fiction with each reader accepting to nourish herself on the mental wafer of its fragmented Pages. The whole in accordance with an accurate atheism, to which the divine is nothing beyond the Self articulating itself to the very Chance." (From the original French: "La modernité avait donc triomphé, et nous ne le savions pas. La passion mise, tout au long du XIXème siècle, à arracher le messianisme de sa condition chrétienne, à réinventer une religion civique délivrée du dogme, une politique émancipatrice extérieure à l'ancien Salut. [...] Mallarmé nous aurait appris que la modernité avait en effet produit un prophète, mais effacé; un messie, mais par hypothèse; un Christ, mais constellatoire. Il aurait architecturé un fabuleux cristal d'inconsistance contenant en son cœur, visible par transparence, le geste de sirène, impossible et vif, qui l'avait engendré, et l'engendre toujours. Et le poète aurait ainsi diffusé le «sacre» de sa propre Fiction auprès de chaque lecteur acceptant de se nourrir de l'hostie mentale de ses Pages fragmentées. Le tout selon un athéisme exact, pour lequel le divin n'est rien au-delà du Soi s'articulant au Hasard même.") Ibid., 128; see also *ibid.*, 78ff.

MAURICIO RODRIGUEZ

HOUSE OF THINGS

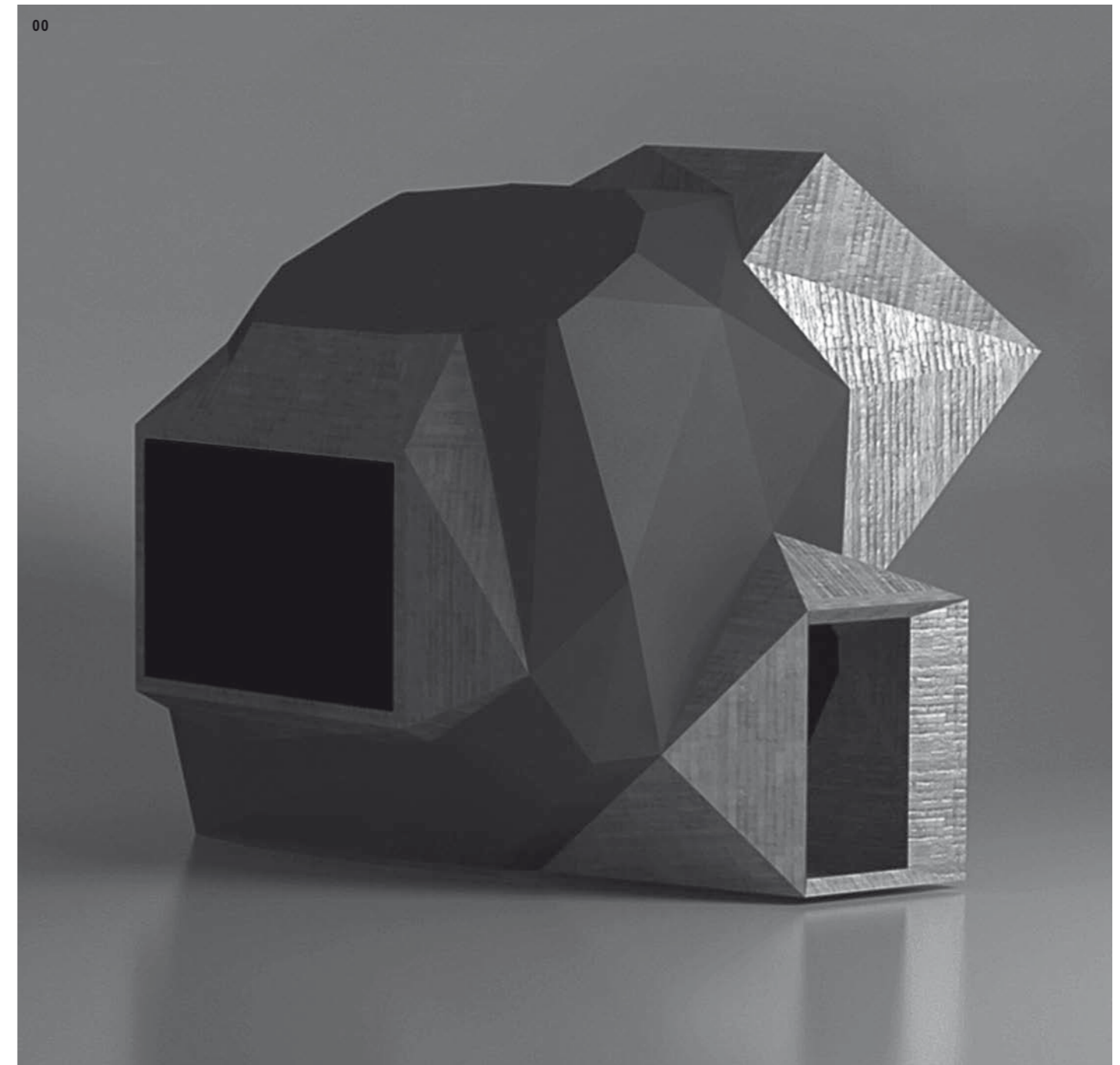
Once architecture is open to embracing key paradigms of Information Architecture (IA), architects can think about a "digital" order in a more instinctive manner, foreshadowing an imminent future in which "we're all becoming librarians" (MORVILLE 1998). In essence, the nature of "architecting" is purely organizational; only now, it also operates over an informational, no longer exclusively manifest material ground. A central concern of IA and architecture alike, is to provide the structure of a corpus to an unstructured field of givens. A series of such parallelisms has been set to project new opportunities for architectural design by means of symmetry. The goal of this project is to illustrate how abstract relations are capable of reconstructing spatial configurations in a manner that originates from synthetic grammars engendered by following a desired narrative, and specifically designed to tell stories about people, about events, or about things. Considering artifacts as components endowed with potentiality and capable of altering architectural experiences, the notion of a house is to be reevaluated—this project considers dwelling in terms of an informational model of human activities that can be described, organized, measured, and classified in an open variety of ways as a household of familiar objects: a "House of Things."

50 The role of meter in poetry can be paralleled with the role of modularity in the architectural order of columns.

51 This same crisis famously provoked Kant to face the problem of philosophy being left with grounding reason within the sole alternative of either skepticism or dogmatism, an alternative that he sought to overcome with his notion of critique as a means to dethrone the centrality of whatever notion of "pure reason." For a broader discussion see again Vuillemin, *La philosophie de l'algèbre*.

52 In the same manner, it is this cosmic untendedness that liberated architecture to concentrate on the vectors of how to build institutions as a form of political "tendedness" on the one hand, and on that of radically subjecting the building practices to procedures of technological industrialization—a vector that itself found an institutional form in the polytechnical universities that were founded in the late eighteenth century and all throughout the nineteenth century. The secularization movement in post-revolutionary Europe was carried by this momentum of modernization, and it affected also the fine arts. The mechanists were considered artists before this, as the French expression of industry as *arts et métiers* still illustrates.

correct way, but also figuratively coherent through rhythm, rhyme, alliteration patterns, and the like on a structural level, began to turn prosaic as the custom of fixed meter became secularized. Allegorically speaking, within the Cartesian coordinated space of representation, connecting points to the continuity of a line can count as no more but a *simulated continuity*. It is in a similar sense that also the poetic line (verse) literally began to turn *prosaic*.⁵² It is difficult to thematize this today, but the secularization that took possession of the ancient legacy of creative speech was of such awkwardness! Its old and trusted sense of necessity was threatened, naturally, from the arbitrary decisions that ordered the lines of free verse. At the time when Mallarmé was writing, that very spirit of modern prosaicness had set out to modernize even poetry, while nevertheless remaining keen in attempting to maintain a distinction between poetry and prose. Like the other symbolist poets, Mallarmé was outraged by the entailments



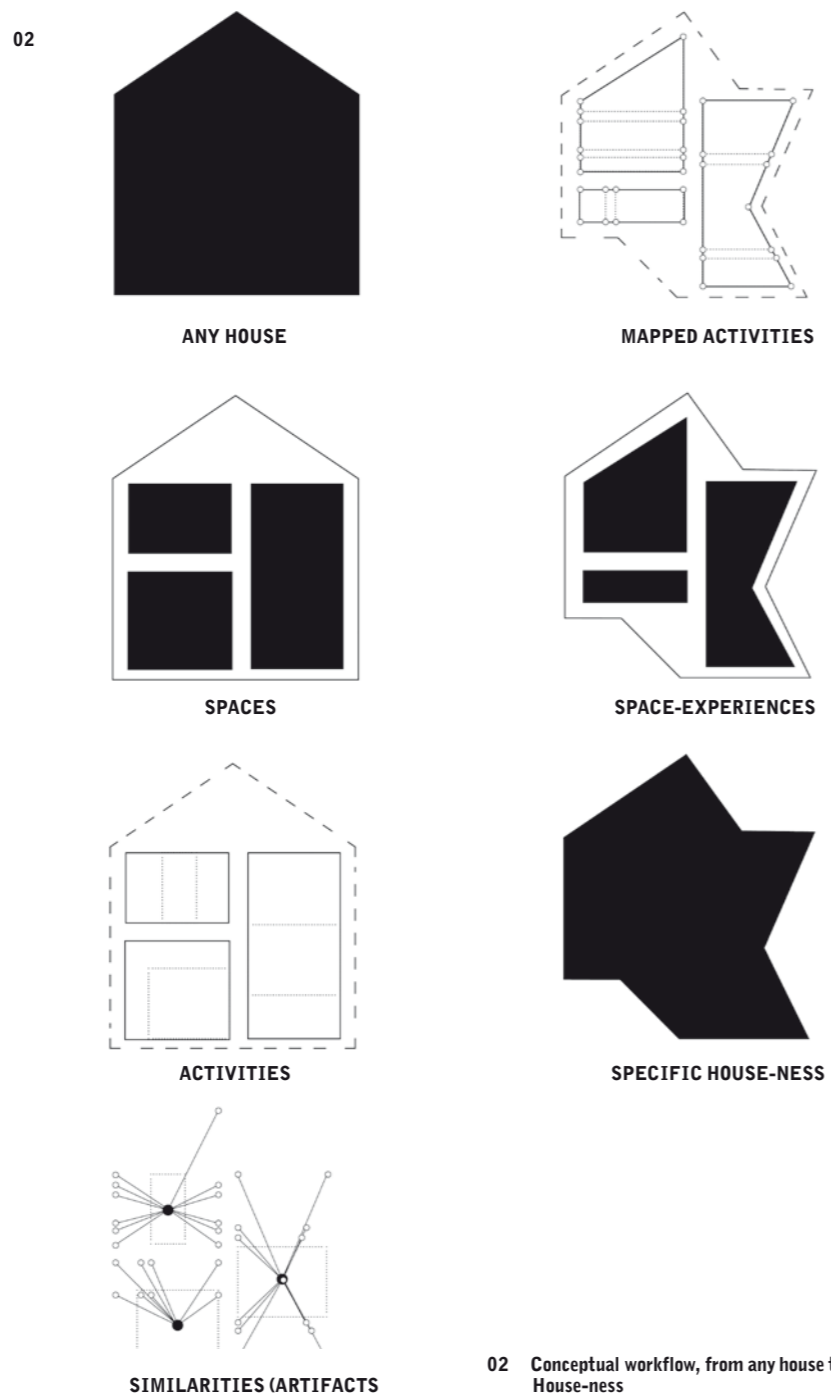
also embodies as a certain transpersonal, not strictly willfully postulated, necessity. For Meillassoux, it is the *being of chance*. So let's see how the meter that Meillassoux extracts from the sum of the poem's words is not simply a *representation* of the meter Mallarmé has worked in, but truly an *extraction*; that is, the result of an algebraic-symbolic procedure. And let us see what is meant by this "numerical corpus."

Because his procedure is itself masterfully artistic, and it would be silly to summarize it here, it must be sufficient to indicate in inverse terms how Meillassoux proceeds: he looks for the summation of the numbers cast by the dice throw, based on Mallarmé's line that says "Toute Pensée émet un Coup de Dés" (Every Thought engenders a Dice Throw). If the clue to the poem lies in identifying the *number that could not be any other*, so Meillassoux, then its "meaning" must be to achieve the inevitable engendering of this number (in German I would say, *ins Werk setzen*, tentatively translated as "to put into place and action") a thought of such nature, and this in a manner such that it unfolds by necessity when being read within the oeuvre. Hence, the identity of this number that Meillassoux is looking for cannot be given as a representation, it must be "placed" operatively. As he puts it:

architecture. The reaching out toward abstraction should not be understood as an attempt to suggest impossible spaces, unbuildable structures, or to drive architecture away from its traditional core of real buildings, and into cyberspace and game spaces of illusion. Rather, as we understand it here, abstraction is about finding commonality, about finding resilient and insisting invariances within levels of conceptual depth.

Throughout this text, abstraction specifically refers to that which gives rational means that are developed and applied in mathematics, logics, and computer programming. Abstraction is what is capable of dealing with any meta-activity (TURNER & EDEN 2013). Pursuing abstraction within the computational design process permits to include anything that can be indexed, measured, or counted as a potentially relevant factor. Like this, computational design opens up the traditional material palette with which architects are used to working. Architectural design can now also involve language, associative semantics, and emotional response. By indexing its patterns as computable data, such immaterial aspects can be translated into architectural substance.

The concrete interest of this project is to illustrate how abstract relations can construct spatial configurations whose form comes not from predefined geometries or references, but from synthetic grammars that follow a desired narrative. This narrative can tell any story, about people, about events, or about things. Architecture has paid a great deal of attention to matters of scale and proportion, mainly based upon the human body and its relation to space. However, architecture is not made up solely of bodies in spaces that can be composed in their interplay, but of experiences. Understanding architecture as a collection of experiences entails an understanding of space as a condition. Within the domestic, experiences are composed of architectural objects (affect spaces) and their relationships. These objects are increasingly being modified and affected



02 Conceptual workflow, from any house to a particular House-ness

57 "Il y a une façon triviale, mais par là même précise, de comprendre cette phrase. Au lieu de dire qu'il s'agit dans cet énoncé d'affirmer, de façon assez vague et plutôt banale, que toute pensée est un pari, nous pouvons l'interpréter ainsi: toute pensée, dans la mesure où elle est formulée dans un langage, produit une série de nombres aléatoires liés aux composantes de langage nécessaires pour la formuler. Notre phrase conclusive contient en effet, comme toute phrase, un certain nombre de lettres, de syllabes, de mots, de substantifs, etc. Ces nombres sont «engendrés» par la pensée qui s'y trouve formulée, mais ils n'ont par eux-mêmes aucun sens—et en particulier aucun sens lié à la pensée enjeu." Meillassoux, *Le nombre et la sirène*, 32.

There is a trivial way, but by the same token accurate, of understanding this sentence. Instead of saying that this statement is about affirming, in a quite vague and rather mundane way, that every thought is a gamble, we can interpret it this way: every thought, insofar as it is formulated in a language, produces a series of random numbers related to language components necessary to formulate it. Our concluding sentence contains in fact, as any sentence, a certain number of letters, syllables, words, nouns, etc. These numbers are "engendered" by the thought that finds itself formulated in it, but they do not have in themselves any meaning—and particularly no meaning related to the thought at stake.⁵⁷

In short, Meillassoux substantiates his hypothesis such that the final code consists of the ciphers 7 - 0 - 7, and he legitimates the entire argumentative path that leads him to this number by showing that—if written as 707—it is indeed the number that counts all the words in the poem.

So if we explicate this procedure inversely, it strikingly resembles what any statistician does on an ordinary basis: he determines the "indexical magnitude" (often called *random*

by technology. It indeed requires some effort to ignore the pervasiveness of artifacts and their enhancing contribution to complement our quotidian activities. Interconnecting a network of everyday objects to track and compare data which they gather about how much, when, and in which ways we use them, might reveal a different set of notions of density, frequency, rhythm, intervals, resonance, and other landmark descriptions of spatial grammars throughout architectural history (ASHTON 2009). Considering artifacts as operators for experiences, a new kind of tectonics can be conceived, one that uses ensembles of ordinary domestic objects, of our things and our stories they are invested with, as units to articulate spatial design.

The final interest of this project is to reevaluate the notion of a house by considering dwelling as an informational model of human activities as they are described, organized, measured, and classified in terms of artifacts: a "House of Things."

HOUSE-NESS & DOMESTIC ARTIFACTS

Striving to shift from traditional dependency on geometrical elements to a dependency on a symbolic system of relationships that can encode magnitudes, quantities, and qualities according to our (various) abilities in dealing with them, implies fundamental revisions of current design methodologies. This perspective has two major entailments: (1) a critical examination of how the individual's scope of training and developing abilities in computational architectural design is unnecessarily restrained by the predefined settings of template procedures in software, and (2) a critical examination of how, and if at all, there can be room once again for an architect's intentionality and authority in

the predominantly pragmatic and largely opportunistic-seeming praxis of contemporary and future architecture. This new role of intentionality and authority might concern the articulation and organization of a higher-level abstract "materiality" rather than the implementation of particular planning processes and designs. Architecture might perhaps regain a position of integrity if it finds ways of instrumenting the purely pragmatic, short-term projects as exemplary cases in which long-term interests can be pursued.

The issues addressed by this text so far, especially those regarding the relationship of architecture and technology, refer implicitly to a discussion about space at large, or more precisely about the process of how space is conceived. This can be regarded as the common denominator between Information Architecture and Architecture. For architecture, material and spatial order is traditionally organized according to a metrics derived from other material and spatial things. That is, architecture has been organizing concrete matter departing from concrete matter. Architecting, as the integration of the "informational rationale" into architecture, is capable of acting upon a much greater variety of "substances" other than extensive matter. Just like mathematics and information technology are operating on a symbolic level of substances that can be encoded in different manners, so architecture can also operate on a symbolic level.

If we think about it, the idea that architecture is made up of much more than "just" materials is not hard to acknowledge. After all, the dependency of space with its users is what ultimately defines, animates, and activates architecture. Without the experience, there is no architecture. This dependency directs architecture away from a mere validation by presence or absence of certain aspects, and closer to seeing in it a not fully reducible assemblage of engagements or emotional relations. Engagements happen between users and particular experiences. With

the inclusion of the emotional, the idea of architectural experience becomes much harder to pin down. At the same time it becomes a much more general concept that can be tailored to specific scenarios or narratives. In this project, we seek a way of creating particular units of experience that remain valid to work with in a tectonic and natural architectural approach.

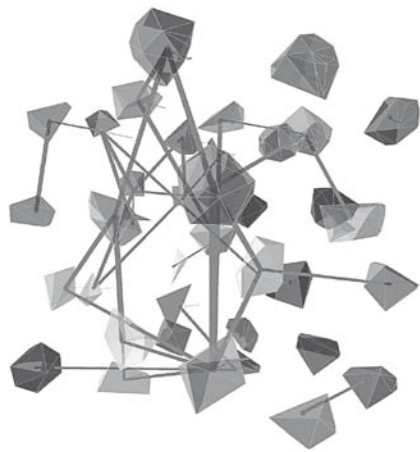
The approach to define the "units of experience," as it is pursued in this project, analyzes and classifies architecture into collections of spaces that are composed in a purely relational manner, around a collection of activities. Thinking in terms of "activities" decouples "functions" from representational notions that assume an elemental or archetypal spatial order. It separates programmatic design from strictly deterministic definitions, and hence creates a concept of "what can be done," as a space of potentials. In such a verbal mode of program, architecting allows to design with spaces-to-be, enabling a projected space that is flexible and adaptable, and which can eventually be materialized in a variety of ways.

But how to obtain, out of such abstractly projected experiences, a system of measurable and countable units, elements, and proportions, as architecture needs it in order to compose real spaces? To determine a spatial grammar and a set of objects to be assembled into design, we can call on technology's aid. The "Internet of things" foresees a network of appliances and applications that share and exchange data. Open-Source Hardware is making this a reality, easily endowing any artifact with an immense variety of "capabilities." Even though domestic artifacts are usually perceived as somewhat disconnected from, or foreign to, architecture, our approach is that they can be referred to for producing an accurate and rich description of our engagement with spaces, people, and the environment; domestic artifacts are seamlessly embedded in our daily routines; and because of that, they can be helpful for creating maps of experiences.

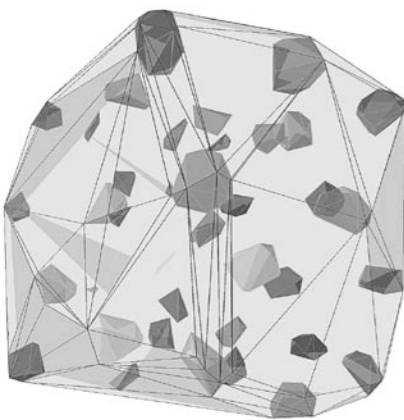
or *chance variable*) of which the possibility space “consists.” All he needs for that is a code—e.g., the alphabetical code, or the Morse code, or any physically metrical measure expressed in digital code.⁵⁸ The creativity of Meillassoux lies, among many other aspects, in looking out for what might count as such a code for “probabilizing” Mallarmé’s poem. More concretely, Meillassoux experiments with adjoining (metaphorical, nonmathematical) “domains of rationality” as such a code—for example, the musical scale of C major in order to determine which number is labeled by the expression *car si* (which returns in certain patterns throughout the poem). Such labeling numbers again indicates particular constellations that ask for further codes to decipher labels as pointers to the next steps in substantiating his hypothesis.⁵⁹ For example, he ascribes a specific importance to the numbers 5 and 7, links those to the stellar constellation of which Mallarmé says, in one line, that the final sum of the number-that-cannot-be-another is expressed in. An excerpt of how he renders this plausible:

Yet we know [...] the author of “The Throw of the Dice” held the stars in their pure dissemination like a celestial symbol of Chance. To cut by the gaze a

03



04



The technical approach of the intended project stems from computational strategies known as Machine Learning, which allow computers to learn from experiences by evaluating performance on tasks (MITCHELL 1997), as opposed to being explicitly programmed to perform in a pre-set way (SAMUEL 1959). This project embraces the power of these programs to provide opportunities for engaging architectural discourse and thought with contemporary technology. It sees in machine learning technologies a fundamentally different and creative collection of methodologies, which are capable of reframing the current stance of computational design toward a more “human” approach. The interest in these methods for architectural practice relies on their capacity to organize complexity into design, in a way that does not reduce, but learns to cope with, the imprecision and uncertainty involved whenever we deal with the veritable medley of people’s emotions, material, and environmental behaviors. This novel understanding implies giving way for margins of error, and accepting speculatively general or loose (JONES 2006) concepts, categories, and assemblies of potential architectural elements that are not predefined but pre-specific (BÜHLMANN 2008). Architectural objects could engage with everyday things, embedding potential capabilities that are specific only in a to-be-realized sense (BÜHLMANN 2010).

DEFINING HOUSE-NESS, DESCRIBING ARCHITECTURE

A house is described in terms of the spaces it contains. Spaces are then described in terms of the activities that are related to them. These can be obtained from existing plans, that is, by example or by any kind

58 Those interested in the background of communicational coding theory, and the role of entropy measure and chance variables therein, are recommended to look at the classic paper for communication theory by Claude E. Shannon, “The Mathematical Theory of Communication” (1948), where he describes the two modes of coding that are still central today, in the distinction they have introduced, so-called *channel coding* and *source coding*.

59 See Meillassoux, *Le nombre et la sirène*, 54–59.

of relation (e.g., etymological, narrative, or statistical). A description of these activities can then be obtained by their relationship to artifacts. Assuming such artifacts are capable of gathering almost any type, size, or preciseness of data concerning the activities, content is generated through use. This “flattening” of a complex description into a homogeneous set of artifacts makes it possible to compare activities by merging notions of quality and quantity. New versions of the activities can be mapped to reflect a particular stance or feature. Finally new spaces can be composed of the modified activities, and a specific House-ness is created from them. [FIGURE 01]

Traditionally, the approach toward the understanding of space in design involves projecting the metrics of objects and bodies onto a spatial plane where they are to be arranged. In the proposed method, a distinct metrics of relations is put forth, describing a core relationship between household artifacts and activities. This complex relationship is projected onto an abstract map (SOM) and spaces can emerge by grouping potentially equivalent spaces. In principle, the relationship between artifacts and activities could be as rich as the amount of data that can be processed and collected. There is no real limit to the complexity of this description.

Enter lists. Architecture is complex. Attempting to model this complexity represents an enormous challenge. However, it is within reach to obtain seemingly endless arrays of information that can be arranged to produce meaningful combinations. We say seemingly, but it comes within reach also practically, since data can be collected at a constant rate. The challenge is not really a technical one, but a conceptual one. The principal strategy proposed consists in taking traditional spaces that make up a particular architecture, and describe them in terms of what happens in or around or because of them. [FIGURE 02] Such a description can never be exhaustive or definite; it cannot crystallize beyond its indexicality. The link to artifacts is a “degree of membership” or

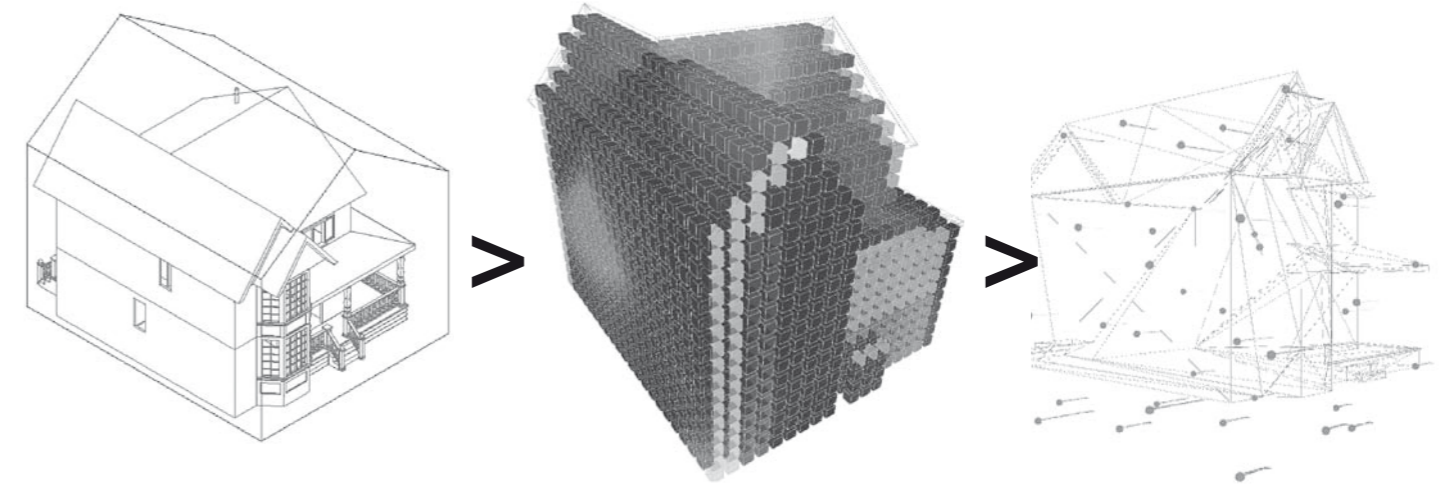
60 “Or nous savons [...] que l’auteur du «Coup de dés» tenait les étoiles en leur dissémination pure comme un symbole céleste du Hasard. Découper par le regard une constellation dans cette splendeur dépourvue de sens, c’est accomplir un acte tout à fait analogue à l’acte poétique selon Mallarmé. Car ce poète s’attache à faire scintiller les mots, forgés et disséminés par le hasard de la langue, par l’usage d’une syntaxe déroutante en laquelle chaque vocable semble isolé par une «lacune» de tous les autres, comme décontextualisé: ce qui lui permet de rayonner d’une lumière qu’on ne lui avait jamais connue.” Ibid., 30.

61 In the second part of the book, entitled “Fixer l’infini,” 61ff.

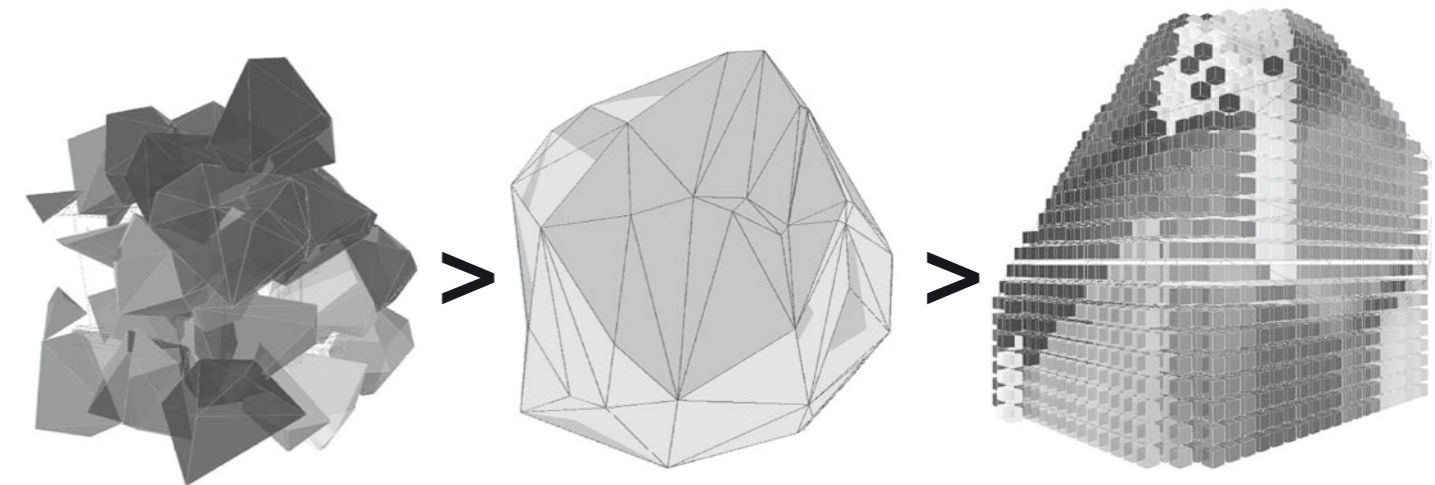
constellation in this meaningless splendor is to perform a totally analogous act to the poetic act according to Mallarmé. For this poet is committed to make the words sparkle, forged and disseminated by the randomness of language, by the use of a confusing syntax in which each term appears isolated by a “gap” from all the others, as though decontextualized: allowing it to shine a light we had never known it capable of.⁶⁰

Although he does not mention it, Meillassoux is pondering one of the favorite themes in thinking about proportionality—the golden ratio. Two quantities are in the golden ratio if their ratio is the same as the ratio of their sum to their maximum—this is exactly what Meillassoux’s reading will postulate (without stating it explicitly).⁶¹ The golden ratio has inspired people throughout many centuries precisely because it provides maximum stability for maximally different “components” within a strictly proportional framework. This is why Le Corbusier famously integrated the golden ratio into his architectural measuring system that he called “The Modulor,” and that he “rooted” in a certain partitioning scheme of the human body. But different than Le Corbusier, Meillassoux suggests rooting his “poetic

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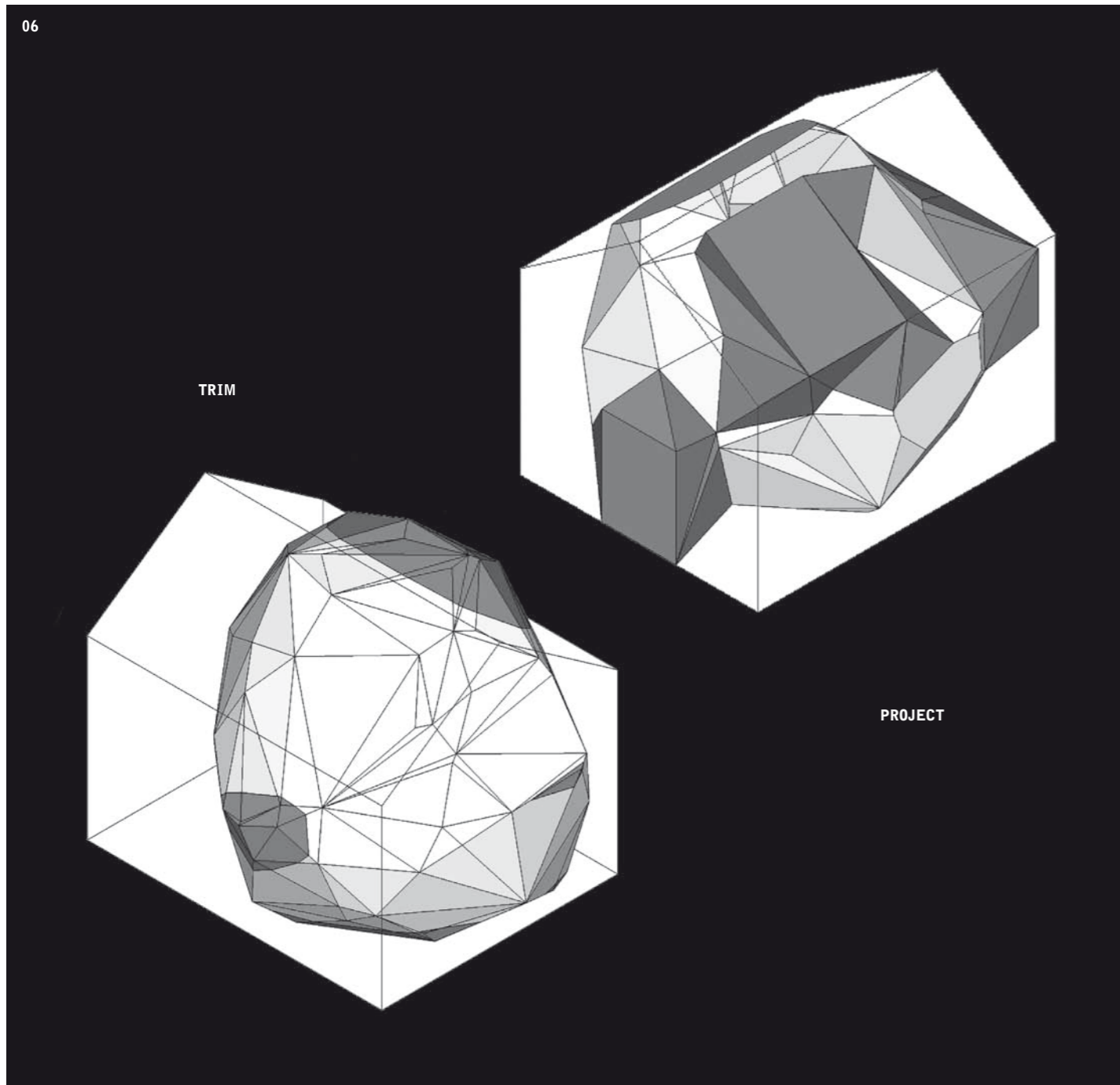


ANY HOUSE
[VICTORIAN HOUSE]



- 03 Activity proto-spaces with similarity links
- 04 Activities and containing mesh
- 05 Training procedure for a House of Things

modular” not in the profane human body but in the numerical corpus of divine chance. As such, Meillassoux takes the noninitiate reader through a fabulous and awe-inspiring journey to how he ends up with the number 707, which—in the finale of this speculative trip through possible codes—turns out to be, and I am sorry for the prosaicness in putting it this way, the chance variable we know from ordinary statistics, the sum of all the counted words. The number-that-cannot-be-another facilitates to carry out probabilistic analysis on Mallarmé’s text. Even in statistics, a random variable is not a variable strictly speaking, for it has no fixed value. In other words, it is not a magnitude of which we could ask metrical questions like *how much?* What it does is *label a number that counts a magnitude* that is unknown. As such, a chance number (I would prefer to call it an “indexical magnitude”) can incorporate a possibility space, and allow to experiment with it in probabilistic terms, by partitioning it into a set of events that can be combined in their interplay. Thus we can see how Meillassoux experiments with adjoining (metaphorical, nonmathematical) “domains of rationality” for his hypotheses. From the hypothetically postulated distributions, patterns, and regularities he seeks to extract a certain meter—and this means, in his case, nothing less than a proportionality of numerical infinity.



a labeling number that describes a potential or actual connection between activity and objects.

The basic relationship between the chosen activities responds to the following question: What artifacts are normally used, or lend themselves potentially to being used, while performing an activity? The program outputs a proximity map that backs up the supposed similarities between activities. However, the clustering, distinguished through color tones as a code, yields unforeseen groupings that could hint at new spatial configurations. Given the potential for discovering new relations, this map was translated into three dimensions, converting an abstract linkage into a scale-less spatial distribution. A cube is the starting point of the space bounded by the map. The program starts with a now three-dimensional random layout of the weight values for each node (they are called “neurons” in the machine learning jargon) and iteratively tries to represent the data. A simple interface allows to display progress, and adds basic control functions for viewing and saving different information.

A connectivity map [FIGURE 03] determines the possible clusterings that result from comparing activities. The emerging configuration of connected activities is logical and yet uncommon. The creation of new space “types” out of combined activities yields a significantly different programmatic scheme than can be achieved by traditional methods. The degrees of closeness or strength of the connections can be visualized in the thickness of the links.

It is also possible to reconstruct a geometry that gives a “face” to the activities; we suggest calling this a proto-space. These activity meshes [FIGURE 04] are created by selecting the highest value features (artifacts) from the original dataset, as the most influential ones or as the best descriptors of each activity. A point is then created for each high-rated artifact, forming a mesh that varies in shape, number of vertices, and color. Out of this proto-geometry, a different space can be

created. An envelope wrapping the activities describes the volume that is necessary for the map to operate. This opens up other possibilities to explore the SOM’s behavior on various topologies, site constraints, configurations, and settings. Volume can be understood as a map, creating both a space and a representation of spatial information: an inhabitable map.

Any particular geometry is therefore a suitable candidate space for mapping. For the scope of this project, only relatively simple geometries are used. However, looking at existing designs as envelopes for mapping could produce interesting results, reflecting the examples’ aesthetic notions of proportion, or more functional ones like the maximum building volume for a specific location, et cetera [FIGURE 05]. This research project focuses on making use of abstract and potentially more comprehensive relations for architectural design. Therefore, a basic model of any particular house (in our case an arbitrarily chosen Victorian house) is chosen to reflect a spatial idea of house-ness as a starting point. Further iterations derive from the dataset that describes the program of the chosen house. An apparently analytical process is driven toward synthesis by reconstructing the composing elements and creating fundamentally different arrangements. [FIGURE 06]

The final mapping produces a flexible definition of spaces, or more accurately, of boundaries between spaces. The actual constraint of spaces is left open for further decisions related to traditional top-down design strategies. The volumes that these boundaries occupy (they are seldom linear) could probably be utilized to contain spaces for all the technical fixtures or infrastructural utilities. This strategy of deriving contrast-driven boundaries is not far from an architect’s attempts to separate spaces, classifying them into distinct areas by traditional means. There is a distance, however, that puts apart the two methods: the former method clearly profits from computational integration and manages to embody both analytical and synthetic procedures simultaneously.

FINAL REMARKS & IMPLICATIONS

A translation of the tectonic logic from a material to an informational model (assembling an architecture from data), and back to reality, might set the basis for the development of a new kind of architectural grammar. This sets forth an interesting scenario where constraints of the real world, together with possibilities of computation, strive for balance and confront the exactness of computers to the richness, ambiguity, heterogeneity, and dynamism of human interactions with themselves and their environments. This project intends to reflect upon plausible disturbances and complements to “traditional” design processes, regardless of the availability of robots, software, pencils, or paper. It intends to integrate a different set of architectural contents or “substances,” extending the scope of operation for architecture. [FIGURE 07]

Considering data handling and analysis as an active part of architectural design could produce new visions of what “performance” means, or different definitions of “smartness” in buildings. The idea behind seeking to integrate within architecture the tools and the learning paradigms pursued in information architecture is to develop future designs and improvements to existing ones. If we want to liberate architecture from the doctrines of typologies, a necessarily different approach must be taken. In order to work with unclassified populations of houses, we can learn from those paradigms how relinquishing control enables developing a methodology of discovery, in which neither collection nor element provides the final authority of a “foundation”; rather, from their interplay we can “architect” a methodology based on the engendering of a synthesis. [FIGURE 08]

This could certainly be interpreted as an inroad from architecture to computer science. However, because of its broad scope, it seems only traditional of architecture to allow, or even to seek, the exchange of

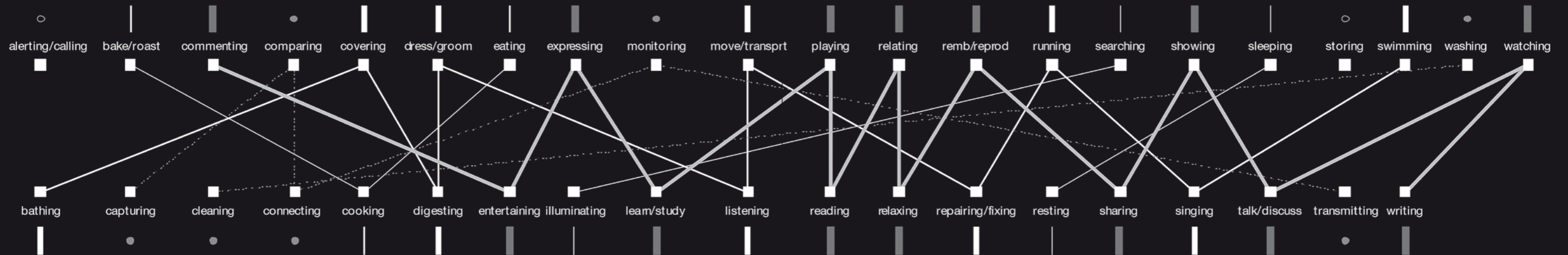
variable on the basis of which one could carry out numerical analysis, and that would very likely be capable of “substantiating” very different overall readings. This does not weaken the brilliance of Meillassoux’s own reading, in my opinion. But it does introduce complications for the performative-liturgical role he attaches to his reading. While I obviously do not share this programmatic stance, I very much share the interest in seeing a novel understanding of mastership, rooted in *symbolization within probability space*.

Cosmo-politics, or putting to work a symbolist meter

This novel understanding of mastership is rooted in a slight shift in perspective, which allows Meillassoux to look at Mallarmé’s poem in this way: he does not read the poem in terms of how it articulates the nature of chance directly, but in terms of how it articulates the nature of chance through articulating the nature of numbers. Rhetorically, this is how he can begin his book with a powerful statement like “Let’s get to the point directly” (page 9). The point he wants to get at directly is the nature of numbers. Yet, we must remember, according to Meillassoux this nature is engendered in the poem. So there can be no mentioning of “directness” in any strict sense. Directness—this is what we can pursue if

we *presume* a nature of numbers, not if we attempt to evoke such nature in a poetically particular manner. The power of the opening of Meillassoux’s book is a rhetorical trick that envelops in a veiling manner all implications that point in this direction. For him, as he makes clear later on, Mallarmé’s act of articulating poetically the nature of numbers is *an absolute and singular act*—this is what moves him to see in the poet-author a figure no less eminent than that of Jesus Christ. The way he sees it, Mallarmé literally incorporates, in his oeuvre, the possibility of a *new poetic meter to come*. According to Meillassoux, Mallarmé is a figure as eminent as Christ because as the latter sacrifices his body, Mallarmé sacrifices the Corpus of his Oeuvre—the living “substance” of what makes him a master, by giving over the reception of it to *the unlikeliness that is proper to anything that is governed by chance*. This is how Meillassoux wants to read this engagement with the “indexical magnitude” of a “chance variable” within the Christian theme of transubstantiation. Within this Eucharist tradition, the sacrifice of Jesus Christ’s body was “necessary” to evoke the unity of a community to come—anyone who believes in the actuality and truth of this happening was welcome within the community, whose unity is grounded on no other inclusion/exclusion criteria but the appreciation of this “act” and its particular

Activity relations and resulting spaces from sequences



KEY» [|] Seq. 1: 14 Activities
(creative)

[|] Seq. 2: 10 Activities
(functional/recreational)

[|] Seq. 3: 3 Activities
(functional)

[|] Seq. 4&5: 2 Activities
(passive)

[•] various Act.
(service/routine)

[◦] isolated Act.
(generic)

theological interpretation. Reenacting it brought absolution and purification of the members from their sins, and from their distinctions among each other, and constitutes the “force” capable of strengthening the Holy Communion. Meillassoux reads Mallarmé’s *act* (of sacrificing *the corpus of his oeuvre* to the unlikely reception in the unlikely event that someone actually bears witness to his act, and proclaims its significance widely) in strict parallel to this tradition. He imagines also a people to come, to be united through reenacting the liturgy of Mallarmé’s poetic oeuvre as a means to strengthen such a coming sense of community. Such union Meillassoux imagines as a truly postmodern communion; that is, a people who complement a *secularized politics* with a *poetic religion*. The daring cultural-historical symmetry evoked thereby is that of modernity in the position of the Old Testament, and the problem of how to continue modernity (which is our problem today) in the position of the New Testament. In his poetically grounded cosmo-politics, Mallarmé is stigmatized by Meillassoux as the only one and true master who has managed to gain victory over chance (which reigns within science and thereby unsettles the very values that are foundational of modernity; e.g., individual identity, self-governing subjects, scientific progress through steady refinements in approaching

the realization of an ideal and universal [all-inclusive] order, etc.). Meillassoux, in his reading, reveals his own communal identity as that of those who know how to bear testimony to Mallarmé’s symbolist and graceful gift to humanity—the act of his sacrifice.

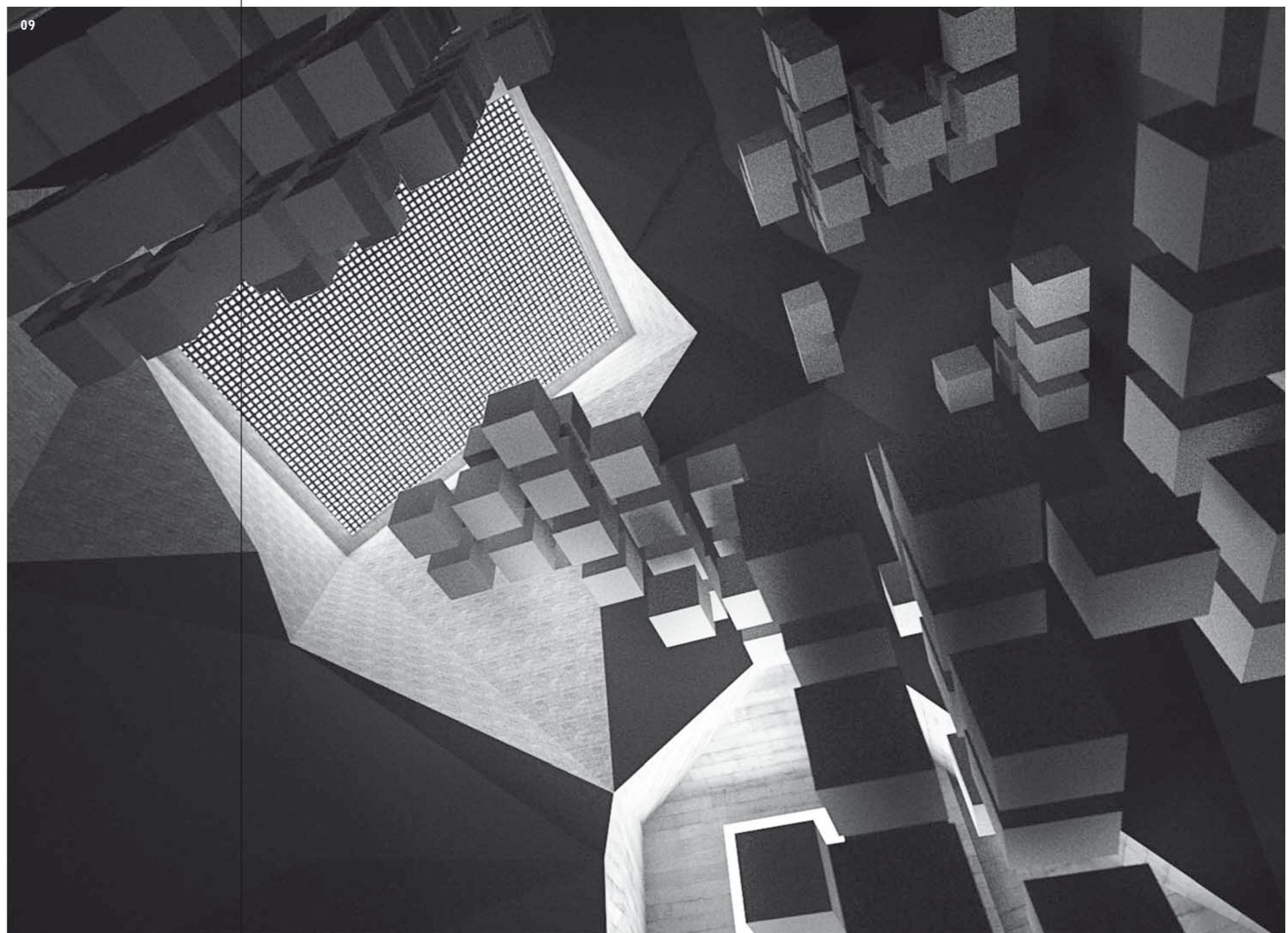
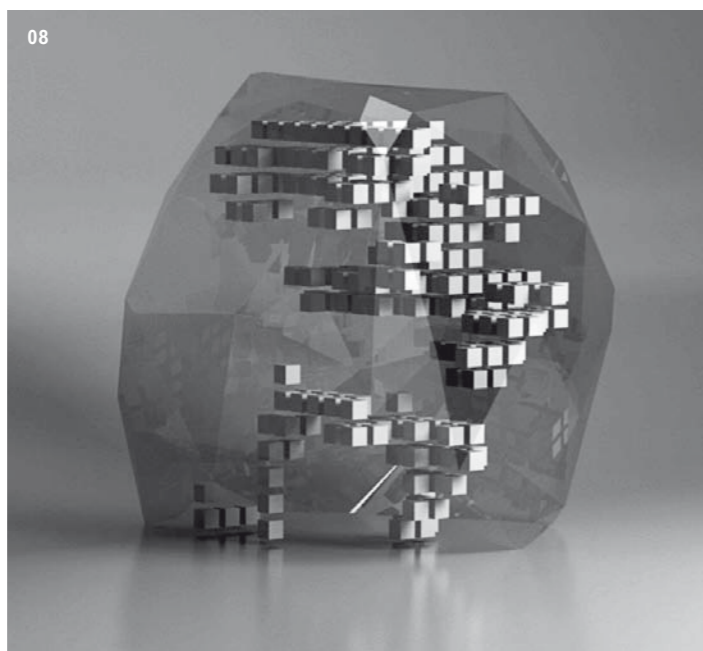
Cosmo-literacy, or the alphabetization of the nature of numbers

If we relate this interpretation to its recent reception, it may on the one hand strike one as unbearably uncomfortable, to the degree that one feels tempted to call it silly. Yet on the other hand, one cannot help but admire the conclusiveness in actually working with the text material as it is there, in the verses of the poem and the reality of the contextual questions raised, and this makes it equally an irresistible attraction. Indeed, it has been a while since a voice in philosophy has dared articulate such claims on such speculative yet precise grounds! But then again, such intimacy of philosophical thought with what we might call religious energies is straightforwardly *inevitable* if one seeks to resist the submission of philosophy under the ultimate governance of scientifically declared legitimation—that is, to free it from all forms of inspiration and spirituality. What Meillassoux does, and what can be decoupled from his *mission*, I think, is to expose a notion of

concepts across disciplines. In fact, integration or mediation could be regarded as the constitutive “Other” to those functions of architecting, which happen to be considered “essential.” Although this project provides only a glimpse and an example of what can be done with these technologies, it is meant to provide an idea toward articulating how architecture could be affected by the “materiality” of information.

The notion of highly specified and determined spaces or capsules and their loosely defined relations has the intention of permitting to compose and recompose their configuration, affecting the overall structure but leaving its order untouched (JONES 2006). This could be interpreted as a kind of programmatic modularity (JONES 2006), producing adaptable or resilient assemblages and allowing to understand space no longer in terms of static places but as a complex condition. [FIGURE 09]

Function in architecture can no longer be thought of in the same way as it used to be before the informational turn (BÜHLMANN 2010). Issues of mobility, generality, and materiality are being vigorously modified by technology toward lighter, faster, and programmable embodiments of functions. A tendency can be afforded to divert from the full-sized appliances with enormous spatial extension, to the imperceptible, ubiquitous applications embedded and distributed in tiny chips. Perhaps the scaled “components” in these novel capsules of programmable function or contained specificities can endure as “building blocks” for thinking order in architecture. This project explores the possibility to address technology in its own “language,” assuming that it might become once as familiar to us as understanding the spatial implications of drawing a line or sketching a box is today. [FIGURE 10]



- 06 « Basic geometrical operations (architectural intentions)
- 07 « Activity relations and resulting spaces from sequences
- 08 Final envelope
- 09 Scenario for internal view
- 10 » Scenario for urban location

method that proceeds by scientific standards, yet hands it over to the field of aesthetics and art. From this perspective, and in order to appreciate the originality of Meillassoux's reading, one does not have to follow him in the mission he attaches to it. Mallarmé's poetic articulation of the nature of number, if we read it not as a poetic dedication in the form of a song of praise or an ode to this nature, but along with Meillassoux in a *quantitatively symbolist manner*, points the way of how we might consider *symbolization* as a means for learning *how to articulate numbers and develop mastery in dealing with the indexically and symbolically given "magnitudes."* Such mastery is grounded in learning how chance variables can be counted, literally in the sense of *ordered enumeration* (discretizing and grammatizing) but also more comprehensively in the sense of *governing*. If we affirm that modernity has disentrained us from all hopes in Aristotelian-minded symbolization, as the articulation of the *voice of being*,⁶² we might also affirm in Mallarmé's poetic *articulation of the nature of numbers* a continuation in the spirit of Aristotle. Since Pythagoras, and especially since Plato's *Timeaus*, the widespread idea about the nature of numbers is that the very "framework" of a cosmos that we can hope to understand by reason, consists in numbers. The numbers are the soul of the cosmos, which

62 Univocity is the crucial assumption in Aristotelian metaphysics. It demarcates where Aristotle departs from his teacher Plato, for whom the cosmic assumption (especially in the *Timeaus*) is a principle of analogy and proportionality. The book that Alain Badiou (whose faithful disciple Meillassoux identifies himself) wrote on Gilles Deleuze, entitled *The Clamour of Being*, clearly itemizes these sentiments in a straightforward polemic (Minneapolis: University of Minnesota Press, 1999; originally in French in 1996).

the Platonic Demiurge has mingled and mixed, cut into two to connect end to end, such that an inner circle comprehends all material becoming, while an outer circle comprehends all ideal being. Numbers make up the *auxiliary structure* for a *cosmo-logy*, they are the necessary *coefficients* in any formal term. Numbers are what is capable of *holding, literally*, a logical cosmos in order—we come back to this in more detail in the following paragraphs. Suffice it to say that from such a perspective, Meillassoux's reading of Mallarmé's poem would suggest nothing less than that the nature of numbers at stake is one that can now be *alphabetized*. If the natural numbers are what is capable of *holding, literally*, a logical cosmos in a universal order, by deriving criteria for consistency from the assumption of primary "fullness" or "perfection," the symbolic nature(s) of numbers need to find criteria for consistency by dealing with "primary abundance." Dealing with primary abundance would mean that no order of consistency (logical order), no such and such "fullness," can ever comprehend *all that might, virtually, be possible*.

Is not this a reading whose relations to poetry feel almost banal? While ancient meter was capable of liberating logics from directly stating truth and thus made room for poetic articulation, which may count as divine because it is neither comprehensively necessary

nor arbitrarily contingent, the meter engendered by Mallarmé (and any meter that can be engendered in the same manner) makes room for *cosmo-literal articulations* of ideas that might characterize a *world to come*. But, we might ask, does the assumption of such a quantitatively symbolist manner of poetic articulation not indeed confront us, as Meillassoux seems to hold, with a sheer *impassability* (in German, *Ungangbarkeit*)? To count as *poetic* (and not political) articulation it would be essential for such a symbolist manner *not to treat this nature that it articulates (that of number) in a violent manner*. It must affirm this nature's dignity—i.e. as inexhaustible by the reasoning of finite synthesis or speculation—while nevertheless setting out to articulate it as a means to communicate that which *does not avail to appropriation by reason*. In short, it must respect its "integrity" and "identity" neither on the transcendent grounds of *sufficient reason*, nor on the symbolist grounds of *infinite speculation* (as Meillassoux proposes), but on symbolic grounds of *finite synthesis*. Such respect would be the core aspect of a truth notion that is worthy to be called that of a critical rationalism.

Appropriating a body-to-think-in

One of the arguably most influential documents of the history of Western Culture—Plato's dialogue *Timeaus*—tells, in the form of a myth, the coming into being of the cosmos *such* that we can conceive of it logically. The cosmos turns into *the subject of knowledge* in Timeaus's account, and

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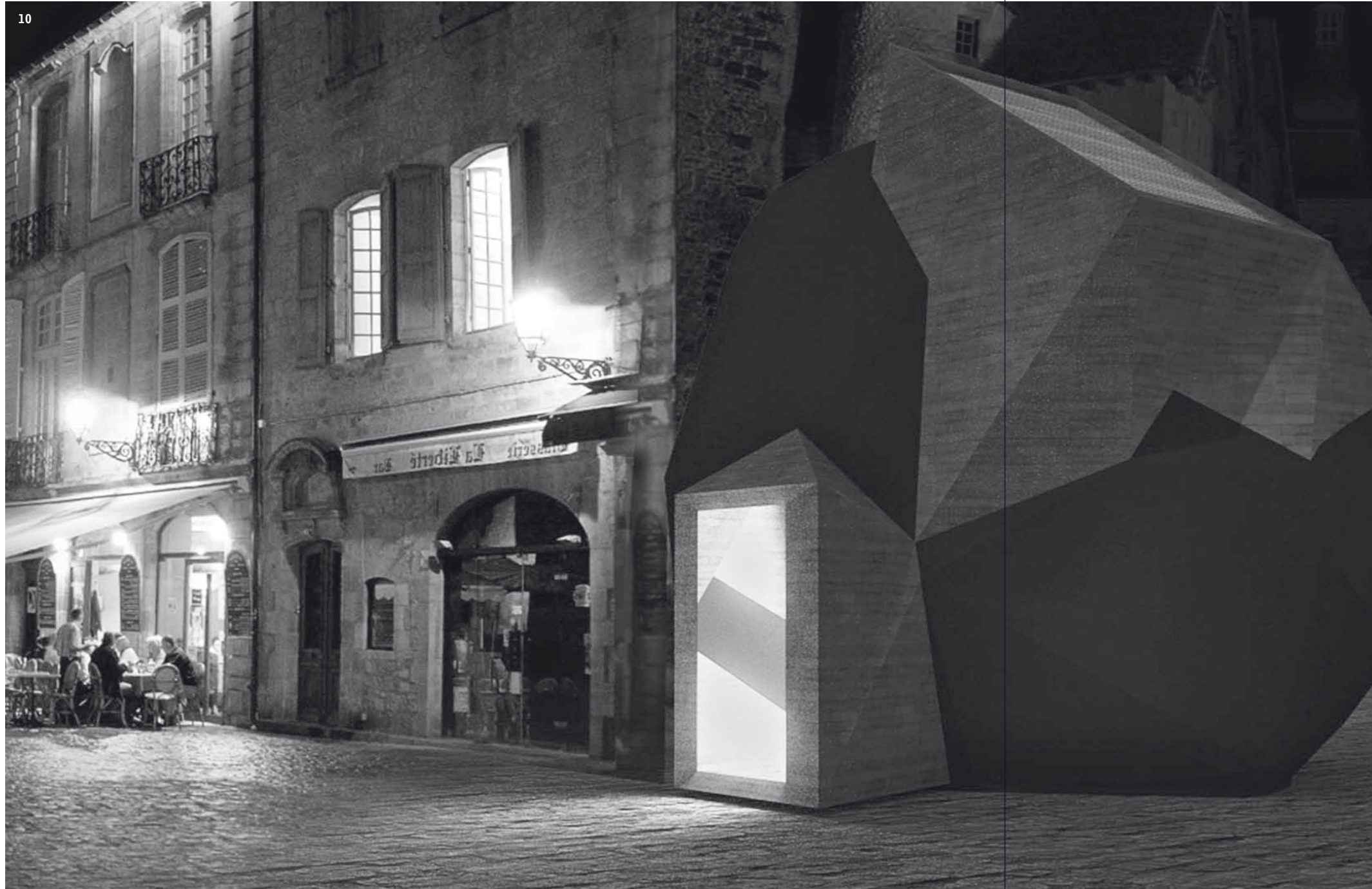
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he conceives of it as a *symbolic body*—the cosmic animal—whose corporeality he conceived, somewhat surprisingly perhaps, already 2,500 years ago as being constituted by *numbers*. In Plato’s cosmic animal, there is but *one* nature of numbers. Today, with universal algebra, we have as *many* natures of numbers as we can symbolize consistently into structures. We call them by the names of rings, fields (*Zahlenkörper*), modules, and the like. They work with matrices and “animate” relations—animate because vectors are lines that embody direction, they have a “motive force” or “cause” *immanently* to the relation they incorporate. We call algebraic structures universals, in the plural, and each of them has “one-of-a-kind” scopes of how their organization may be articulated. Much of our technics today is ordinarily dealing with such abstract structures. At the same time, philosophers and mathematicians are initiating veritable battles around how these structures are to be rooted and identified (the so-called Foundational Crisis, and more recently, the struggle between set theory and category theory for primacy in settling, as in the former, or overcoming, for the latter, the issue of foundations).

Let me perhaps indicate initially where I intend to lead this line of thought. What I would like to consider is viewing what we readily call “a symbolic corpus” outside the confines of *representational* speculation, reflection, and mimesis, and instead in terms of *indexical* speculation, reflection, and mimesis. Such an *indexical* turn would entail relating to the symbolical corpora of mathematics not as we relate to a constellational order of the heavens, but as *we relate to our bodies*. Our bodies too do not fully avail to reason, and they constrain our sensual and motor capacities. Might not the notion of “a body” be a better word than the notion of “a house” for picturing what the philosophical tradition has strived to conceive as *the architectonics of reason*? A body-to-think-in, with proper constraints of *intellectually sensual* (intuitive) and *intellectually motor* (literate) capacities? Is it possible that we are so much accustomed to an understanding of numbers as giving us the one and only framework within which things can be rationalized and appear consistent, that the assumption of treating them as bodies-to-think-in sounds too frighteningly strange? Even if one might feel spontaneously compelled to agree, the question that motivates such a daring shift in perspective has been up and on the table for more than a century: *How might we come to terms with universal algebra, its symbolic corporeality by probabilistic methods, and the generic instances that are articulated out of it?*

The most common representation of the nature of numbers ...

To put it in words we all remember from our school days: we take the positive integers as the proper class of natural numbers;⁶³ we know we can symmetrically mirror them to negativity—for the sake of *speculative* analysis; and we remember that the boundedness among the integers can be “spelled out” into ratios (the rational numbers)—if only we put the integers into mutual relations. Of course we also don’t forget the irrationals, those numbers that yield an *indefinite* value when they are put into a “ratio.” Despite their name, they are not too troubling anymore. There are sophisticated limiting and bounding processes with logarithms and series such that the *counting in* of irrationality seems like a reasonable and respectful tribute to be paid to the vastness of real numerical nature. An illustrative picture for this concatenated and comprehensive nature of numbers is the continuous number line. With its totality, including rationals and irrationals alike, we associate today the domain of real numbers. To put it straightforwardly: the *real* numbers contain *all that can possibly be marked out by reason, as rational or irrational, and hence understood about numbers’ nature*.

... and how it got into trouble still not resolved today

This was still the firm belief of one of the founding fathers of a logical calculus, Gottlob Frege (1848–1925) when he assumed—not unlike a *prosaic* double of Plato—the existence of a transcendent realm where the class of natural numbers rests as “objects,” eternally and ideally, and given directly to human reason without requiring mediation through the senses.⁶⁴ With his text *The Foundations of Arithmetics: A Logico-Mathematical Enquiry Into the Concept of Number* (1884) we have another strong story about the nature of numbers by one of Mallarmé’s (1842–98) own contemporaries. While Mallarmé (according to our discussion above) has taken the Platonic *numerical* ideality and turned it into a *probabilistic* one, Frege took it and turned into a *logical* one. Only three years after Frege, Edmund Husserl also wrote a treaty entitled *The Concept of Number* (1887). He published his own book entitled *Philosophy of Arithmetics* (1891) only four years later. While Frege meant to engage strictly logical issues in such elementary consideration with the intent to purify reasoning, at least ideally, Husserl instead meant to complement logical issues with psychological issues—which he hoped to be capable of treating

63 Starting from two. Even within a nature of numbers so conceived, the integration of the zero for nothing and the one for entity remains a crucial obstacle for any exhaustively explanatory consensus.

64 For him, the explanation why humans have been capable of “inventing” mathematics as the core power of reason, is that these idealized natural numbers are “reason’s nearest kin.” “Frege’s central claim in the *Grundlagen* was that in arithmetics we are not concerned with objects which we come to know as something alien from without through the medium of the senses,” writes Michael D. Potter, “but with objects given directly to our reason and, as its nearest kin, utterly transparent to it.” *Reason’s Nearest Kin: Philosophies of Arithmetics from Kant to Carnap* (Oxford: Oxford University Press, 1996), 79.

65 See page 86.

66 Rancière, “Who Is the Subject of the Rights of Man?,” 304.

67 Israel Kleiner, *A History of Abstract Algebra* (Basel: Birkhäuser, 2007), 8.

with equal rigor as is possible for logical issues. We cannot go into this theme in much breadth here, but let me briefly recapitulate the larger context and how it relates to our two conceptual persona, the generic and the master, and the possibility to see, in what they open up in their interplay, the birth of bodies-to-think-in that are *collective before they can be appropriated individually*, and whose nature is engendered together with the symbolic corpus of numbers according to which they are organized.

First, let us take this background as an indication that indeed something larger than a poet’s personal resignation vis-à-vis the rise of free verse must have been at stake in the nineteenth century. This seems all the more justified if we remember that the mathematician George Boole (1815–64), whom I have already mentioned earlier for having been accused of proceeding in a strikingly similar manner as Meillassoux does in his reading of Mallarmé—namely of “bringing forward definite solutions from treating indefinite problems symbolically”⁶⁵—preceded all of these investigations on the nature of numbers by a few decades. His main work was entitled in all due provocation, *An Investigation of the Laws of Thought on Which Are Founded the Mathematical Theories of Logic and Probabilities* (1854). To view Mallarmé in this context adds a lot of plausibility to Meillassoux’s shift in perspective, namely that the poem is not directly about the nature of chance, but about that of numbers. But not only this. It also tells us something important about our context and interest in computability, design, and the generic today—it allows us to see the force of what Rancière calls dissensus at work *in all that can be computed*. Let’s recapitulate again: dissensus is “not a conflict of interests, opinions, or values” but “a division put in the ‘common sense’: a dispute about what is given, about the frame within which we see something as given.” While on the level of generic instances, those one-of-a-kind particulars that can be instantiated and modulated within the framework of a master model, we might only negotiate “conflicts of interests, opinions, or values”; what is at stake with a criticality on the level of the master models is indeed dissensus as “a division put in the ‘common sense’: a dispute about what is given, about the frame within which we see something as given.”⁶⁶ This is why we ought to treat the *instances* of generic computing as *pre-specific* rather than as *typical* (which would be to view them as generic in an adjectival, not in an adverbial, sense), and the respective master models as what they are: models that owe everything to mastership, and not to some *generic “nature.”* But let’s look more closely at how this background in number theory relates to computation.

Algebraic operations, or how the nature of numbers can be brought to work

As sketched above, the understanding of the nature of numbers has indeed been bracketed and marked as “something to be put in question” throughout the nineteenth century. Yet this was not, however, a result of pure intellectual curiosity and ideological speculation, but of the facticity of technical eminence: The taming of electricity equally rests upon calculating with a domain of numbers that does not fit within the continuity (represented as the real number line) within which *all that can be called natural about numbers* ought to be accommodated. Calculations that regarded waves and currents had to be rooted in a numerical domain that is organized by a peculiar unit, of which it is *indeterminate what magnitude* (which physical quantity) *it allows to measure*. Descartes had suggested calling this unit “imaginary,” only to discard it as irrelevant and purely speculative—the imaginary unit is that of the square root of minus one. The “impossibility” it manifests is obvious: surely everyone remembers from somewhere that arithmetically, the multiplication of a negative number with itself must yield a positive result. Hence, it ought to be categorically impossible, or at least sophistically meaningless—i.e. without any real consequences—to extract a root from a negative quantity. And yet, it does yield consequences, and not only that, it yields consequences in reliable and modular manner: as Israel Kleiner accounts, in his book *A History of Abstract Algebra*, mathematicians have “given meaning to the ‘meaningless’ by thinking the ‘unthinkable,’ namely that square roots of negative numbers could be manipulated in a meaningful way to yield significant results.”⁶⁷

All of electronic technics, including information technology and quantum mechanics, rests on the application of this particular numerical domain—whose magnitudinal referent is symbolically determinable, while remaining physically (and philosophically) “unthinkable,” “meaningless.” To put it more simply, it remains unclear of what such a “how much” can be determined. The imaginary unit allows measuring whatever is indexed within the systematicity of a symbolism, and this makes it so peculiarly “unnatural.” Unnatural, that is, unless one were to assume a *nature of such a symbolism whose magnitude is only indexically given*. And this is exactly what was at stake throughout the

nineteenth century as the development of abstract algebra prospered more and more. The disputes indeed centered around whether we ought to assume different natures of numbers—a variety of different numerical genera—and if yes, how many.

The *nature of number* might not be *one*: Alfred North Whitehead attempted to gather all these developments in a first systematic study under the troubling caption of *Universal Algebra* in 1899. It was a work that cleared the view on these developments and stated as straightforwardly as it was groundbreaking:⁶⁸ the problem at stake is the relation between mathematics and logics. To be clear on what we are talking about—why was this groundbreaking? While logics promises to give *adequate* classification of the nature of things (or in the modern paradigm: the determination of objectivity), such *adequacy* has rested for Plato (as well as again later, for the moderns) on the assumption of *finitude* on the empirical side of science. If we start out from things as they are manifest corporeally, in terms of *magnitudes* that can be *measured*, we can depart from very basic (and through that very secure) assumptions, and reach gradually more and more abstract heights through speculative generalizations. Such is the trust in scientific method by the moderns in a kind of science that lets itself be guided by the logics of finitude, as opposed to spiritual doctrines that all involve infinity. It rests on the assumption that the nature of number is one and that number is universal. From this nature, hence, it ought to be possible that one can extract universal principles that are capable of treating all things equally, and therefore justly. Such universality was seen by Frege and Husserl, and many others at the time (and still today), in arithmetics. The suggestion of Boole, on the other hand, was to ascribe the status of universality to algebra instead of arithmetics. This opens up the notion of the universal to *infinitary determination*. Algebra has been understood, always, as the art of determining unknown quantities through procedures of articulating the proportionate terms that in their interplay make up a formula; with the elevation of its status beyond its merely *representational* character (what Meillassoux calls “the correlational”⁶⁹), the meaning of “unknown” opens up the modern tradition of keeping the scientific and the artistic, in its entanglement with some sort of spirituality, strictly apart. It releases instead a nature of the technical—the means for artifice—in an unbounded condition between mastership and schematic repetition, in which all questions of legitimacy are once again unsettled.

The consequences of affirming the infinitary methods are such that we can no longer maintain in an unproblematic manner that the universal—that *which is to be regarded as the property of all things*—accommodates *naturally* the categories we apply, even in the natural sciences, as they too, meanwhile, fall within the domain of technology. Affirming to work with infinitary methods entails dealing with an inverse situation: the categories we apply, in science as elsewhere, determine what can be treated as universal. In all radicality, this amounts to saying that *universality* appears as a kind of *wealth*, it means that the universal can *prosper* or *decay*. It means that there is an economical dynamics constitutive for what counts as universal; it means that *that which can be the property of all things* can be more or less prosperous and that this prosperity depends upon the capacities of intellectuality.

This might seem a little like sophistry, admittedly so. And indeed, this criticism has accompanied the disputes around the nature of numbers from early on. Rafael Bombelli, who contributed much to the development of a calculus of this peculiarly imaginary numerical domain (constituted by the *imaginary unit*), wrote already in the sixteenth century that the development of such a calculus “was a wild thought in the judgment of many; and I too was for a long time of the same opinion. The whole matter seemed to rest on sophistry rather than on truth. Yet I sought so long until I actually proved this to be the case.”⁷⁰ The calculus he developed worked with articulated formulations of the One according to rules such as $(+\sqrt{-1})(+\sqrt{-1}) = -1$ and $(+\sqrt{-1})(-\sqrt{-1}) = 1$. These rules allow to define, mathematically, addition and multiplication; yet these definitions do not apply to all numbers *in general*, but only to numbers that are members of numerical domains that form corpora, and which are specified according to their immanent partitionability and organization.

This is the level of abstraction proper to algebraic number theory and all mathematics and logics that work algebraically; today this entails nearly all of applied mathematics. The philosophical problems entailed thereby had been systematically put into its proper relations by Alfred North Whitehead in the abovementioned book *Universal Algebra*.⁷¹ Let me add, perhaps, that the relevance for keeping track of developments on such an abstract level, which urges us to assume a symbolically (not naturally) determinate “nature” of numbers, is crucial for developing an understanding of what we are actually *doing* when we work with *universal code* in computation. Anything that we regard on the level of its electric materiality must count as a manifestation of such

⁶⁸ It is clear that Frege’s suggestion regarding the transcendent *one nature of numbers*, as well as that of Husserl regarding a *psychologically differentiated* one nature of numbers, both aspire to ward off what Whitehead faced boldly—the universality of algebra (not of arithmetics), and with that, the nature of numbers as subject to categorial determinability.

⁶⁹ See Meillassoux, *After Finitude*.

⁷⁰ Quoted in Kleiner, *A History of Abstract Algebra*, 8.

⁷¹ A book that he wrote before he set out, together with Bertrand Russell, to once and for all clarify the troubles in their seminal work *Principia Mathematica* (1910–13). Whitehead’s subsequent turn away, after the acknowledged failure of the approach proposed in *Principia*, from analytical philosophy and toward a new kind of metaphysics in *Process and Reality* (1929), must surely be understood in terms of his awareness of the profundity of the problems involved.

⁷² I think it is hardly an exaggeration to say that this lies at the heart of the new attention philosophy started to attribute to a primacy of *difference* beneath all possible notions of *identity*, from Kirkegaard and Hegel via Nietzsche to Heidegger, Derrida, Deleuze, and Lacan.

⁷³ Serres, “Revisiting *The Natural Contract*.”

⁷⁴ Gertrude Stein, “What Are Masterpieces and Why Are There So Few of Them?” (Los Angeles: Conference Press, 1940), <http://gaslight.mtroyal.ca/masterpieces.htm>.

symbolically engendered nature.⁷² Its nature can be determined based on probabilistic measurements—measurements that we carry out today, usually without much consideration, in terms of *information*. It is before this background that Michel Serres urged intellectuals across all disciplines, in his lecture from 2007, to engage with the fact that the storage, treating (processing), emission, and reception of information is the “quadruple characteristic in common between all the objects of the world, living or inert.”⁷³

Masterpieces, and why there are so few of them

So we can see how much this peculiar procedure that Meillassoux “detected” in Mallarmé’s poem is indeed a procedure that is affine to what preoccupied anyone who followed the development and the rise of *universal* algebra. Mallarmé, with his desire to link abstraction directly to poetic texture, and his poetic interest in *evoking through* words rather than *describing with words* (which became famous as *the mark of symbolism in art*) certainly was following all of this. It seems more than likely that with his fascination for “absolute truth” he attempted to draw the consequences from what he saw happening to the idea of the universal. He hoped to be able to continue the cultural legacy he was ambitious to contribute to, poetic verse and the dignity it had always been attributed, by reconsidering, poetically, all these issues around the *nature(s) of numbers*, the *nature(s) of counting*, and *the modalities of mastership* in relation to both.

Meillassoux’s reading is original in the way he found to *quantitatively* engage with the symbolist tradition in poetry. It stresses the interest in attending to the powers of symbolization in terms that are not strictly “linguistic,” thereby reducing reality to language and relations of reference and interpretation. Instead, he draws our attention to terms in algebra that are best called “formulaic.” What it stresses is not only the “nature of numbers” as problematic, as something that needs reconception, but also the “nature of formulas.” It is in this vein that another document from the early twentieth century is important to consider: Gertrude Stein’s 1936 lecture, “What Are Masterpieces and Why Are There So Few of Them.” In an inverse manner to what we have discussed so far, she does not so much attend to clarifying the “belonging” or “authorization” of the voice with which the figure of the master articulates his evocations. Instead she draws attention to the articulated evocations themselves. Stein insists on the *reality* of masterpieces, in all their problematics. For her, a masterpiece bears testimony *to the fact* of acts of engendering. She sees them motivated out of a principle unsettledness of any identity issue, the identity of the master as well as the identity of the subject matter a master masters. “It is not extremely difficult not to have identity,” she says, “but it is extremely difficult the knowing not having identity. One might say it is impossible but that it is not impossible is proved by the existence of masterpieces which are just that. They are knowing that there is no identity and producing while identity is not. That is what a masterpiece is.”⁷⁴

EigenArchitecture

Like Stein, we want to hold onto the idea that *articulations of things entirely in their own terms* is not an absolute impossibility, although it certainly seems a paradoxically tautological idea. Yet this is one of the core interests behind what we wish to thematize in this book as *EigenArchitecture*. We are interested in a literacy that arises out of such an algebraic, formulaic, and apparently tautological notion of identity, a literacy that cultivates the infinitary articulate-ability of the One (identity). If we affirm infinitary methods in computation, the terms that express an identity are not *nominal* terms, but *polynomialal* terms. And polynomial terms, unlike nominal terms, are capable of settling their clauses in amphibolic multiplicitous structures. Every polynomial term involves variable values and constant values, of which the latter can be “spelled” by attaching them to constellations of coefficients that can be designated and balanced. In other words, they *participate* in a quantity that is yet to be determined. Polynomials name terms whose literalness needs to be characterized. They are quantitative, yet the quantity they comprehend is not a fixed value, but a genuinely relational value. They comprehend *ever so much* as the term is rendered capable of bounding within the constellation of amphibolic multiplicities that makes up the system of formulas in which polynomial terms feature. Properly speaking, the determinability of this *ever so much* is *adjoined* to the terms. It is in this manner that we can speak of *articulating a thing entirely in its own terms*. In qualitative terms, however, such articulation of course depends upon how developed and differentiated the literacy and mastership is of the person who articulates.

Eigen Architektur

Computability as Literacy

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