The Instrumentation of Space: Time, Cosmos, Politics

One exposes oneself when one makes, one imposes oneself when one unmakes. When one unmakes, one is never wrong, in effect. I know of no better way to always be right.

—Michel Serres,
The Troubadour of Knowledge, 1997

I do think there is meaning in nature and that it is precisely madness not to think so... But we have to rethink what we mean by meaning. If we mean mental content intentionally designed to say something to someone, of course clouds or fire don't communicate. But if we mean repositories of readable data and processes that sustain and enable existence, then of course clouds and fire have meaning.

—John Durham-Peters,
The Marvelous Clouds, Towards a Philosophy of Elemental Media, 2015

Architectonic models presume the loss of images. Images are lost when they become realistic and physically (materially and gravitationally) realizable. Architectonic models take their loss as given and anticipate what this might mean. They draw ideational energy from the emptiness of the image's absence, from the vast importance of what is not there—there, in the unoccupied stead of images. Architectonic models articulate into the void, and as algebra does with its formal treatment of tautology (equations), they bring the nothingness of this void to scales. They articulate this "there;" they make its absence localizable. They make room for it by virtually seizing the "extent" and "content" of such emptiness. These models are architectonic because they are "built." They are not simply "given," but they are also not simply "constructed" either. Hence, architectonic models are "built" daringly with ideation, and they are not "ideal"—there is no "original" that they could mimic more or less well. Or rather, anything at all is of the kind of originality that they "copy." *Copia* comes from the Latin word for "plenty," which means "to transcribe in plenty." For architectonic models, this "plenty" manifests not only as a multitude (many transcrip-

tions, many copies) but also a magnitude (there is a muchness to it, a bigness beyond any as of yet familiar scale; measurement is involved). They do not start with form but with a module. They start with "quantizing" the energy of ideation; that is to say, they articulate order likewise to how our contemporary physics of information (quantum physics) articulates communicational orders proportionate to the physical nature of information in terms of entropy and negentropy. Both articulate orders based on modularizing alloys (forged mixtures, impure "essences") of material quantity and formality. The "stuff" they are built with is stuff that literally "lacks" (in its extent as well as content). The literalness of such "lacking" is of the essence in the quasi-metaphysical sense of primary stuff, substance, or source. Only, this "stuff" is literally "nothing." Architectonic models are not only "lacking" in their place (respective to a preexisting order), but they are actively "lacking," lacking "nothing." Such "lacking" is the activity that makes them what they are. They are built as consolidation, combining into one "body" what is not one, by an inevitably forgetful kind of recollection, a remembering. They are committed to a statuesque point of the episteme, the Greek word for knowledge—they look for a *logos* of such a resting place of "standing upon" and "over-

viewing" (the episteme)—but they don't have one; they don't possess one.[1] Metaphysics has taken birth (natality, nature) for a given and wondered about death; architectonic models presume loss; they acknowledge that there is always death and disintegration accompanying integral orders of whatever kind. Hence, they invert direction and take death for granted. They wonder about birth, nature, and natality. They dare to part ways—even if only speculatively, fancifully—with the epistemological idea that everything happens as though science was resting, standing, or erected on an immutable pedestal. Well-founded. For them, the point of view of the episteme is that of a statue indexing "here lies." Architecture begins with dealings with death, Loos saw this. But what to make of it?

Ordinnateur, in Two Legends

The point I want to develop is that architectonic models ask for computational architecture. But we need to grant that "computation" is much older than we usually think. Computation does not start with calculus in the eighteenth century; it is not specifically related to arithmetics (Leibniz's *Characteristica Universalis*); rather, it is and always has been

1 Episteme's root means something like "to stand on, upon, above" or "nearby."

"mechanical." Newton, who insisted on the tangential method of indexing the infinitesimal (for him: fluctuation), was perhaps more in touch with computation in this larger sense than Leibniz was. The Greek term *mēkhanikos* meant "full of resources, inventive, ingenious," literally "mechanical, pertaining to machines," from *mēkhanē* "device, tool." In Greek, machine was almost synonymous with *mēkhanē*; both went back to the PIE *magh-ana- for "that which enables," from root *magh- "to be able, have power."[2] This etymology nicely captures the proximity between technics and magic—an almost forgotten proximity, whose coming-back we currently witness in the form of distinctly religious overtones to the various ideas of "trans-humanism" and "non-anthropomorphic" truth that are being articulated with the current "computational turn," where the advent of the contemporary "computer age" is often being stigmatized as a singularity, a quasi-messianic "event" that lacks comparison.

Serres, who taught for many years at Stanford University in Silicon Valley, tells the captivating story of how in his home school—one of the last schools in France that did not separate the students

2 Cf. for example, etymonline, and for a detailed discussion Fritz Krafft, "Mechanik. Zur begrifflichen Bestimmung," in *Österreichische Ingenieur- und Architekten-Zeitschrift 135*, No. 10, 1990, pp.470–477.

of the natural sciences from those of the humanist subjects—he overheard a conversation between three teachers. Two of them were talking about how the word "computer" could adequately be rendered in French since the term here was already taken (for a particular device that measures the consumption of water, gas, or electricity).

The word "computer" comes from the Latin *computare*, for counting, calculating; but it is not directive; it relates to a cyclical process where there is transformation but no substantial change. Hence, it was used to describe what astronomists and astrologists were doing when observing and modeling patterns of the sky. Suggestions they were discussing involved "systémateur," "combinateur," "congesteur," "digesteur," "synthétiseur"—but none felt quite right: "Who would like to sit in front of her 'digester' (*digesteur*) in order to work?"[3] A Latin grammarian, passionate for theology, overheard this conversation and told his colleagues that this peculiar machine they were talking about reminded him a lot of the subject he was currently working on, namely the creation of the world according to the doctrine of a *Deus Ordinator*, the doctrine of a

3 Arnaud Schwartz, "Ordinateur, de la théologie à l'informatique," in *La Croix*, https://www.la- croix.com/Ethique/Sciences/Sciences/Ordinateur-de-la-theologie-a-l-informatique-_NG_-2007-08-15- 525218 (accessed February 23, 2022).

God that ordinates ("*un ordonnateur*") and protects humans and all existing creatures. This, legendarily, is how the French word "*ordinateur*" for the English word "computer" was introduced by IBM in April 1955—after consulting his former professor in Paris, the philologist Jacques Perret, François Girard decided to export the word "ordinateur" from its religious usage, and instead reserve it for the novel "machines à telecommunication."[4] Serres is greatly concerned with how such importation and exportation could be thought of rigorously,[5] for it entails the entire problem of how a concept differs from a metaphor. In other words, how can we reconcile thought's rigor with its inventiveness? How can we think about the status of ideation here? The "cutting out" in such export must be a formal gesture if it is to be one legitimated secularly, he maintains. He thought of such cutting as encryption, as coding. There is a way to think of such "cutting" as the building of "bridges," he shows us throughout his oeuvre.[6] To think of communication as a particular kind of economy of

4 Michel Serres, *Éloge de la philosophie en langue française,* Paris, Flammarion, 2014a; also wikipedia.fr: ordinnateur.

5 Michel Serres, "Structure et importation: des mathématiques aux mythes," in *Hermes I, La Communication,* Paris, Les Éditions de Minuit, 1968a, pp.21–35.

6 Vera Bühlmann, *Information and Mathematics in the Philosophy of Michel Serres,* London, Bloomsbury, 2020b.

transfer is constitutive for Serres's understanding of "tele-communication." Communication, in its technical sense, bridges times and spaces; we are meanwhile used to this idea as a fact. But what does it entail philosophically? How can we address the vast (if not indeed ubiquitous, omnipresent) role of communication technology in the infrastructural, technological constitutions of our contemporary living conditions? How, indeed, can we explain that communication is no longer a term reserved for people talking to each other about things; but that rather all processes, in whatever subject of the sciences and technology (whether humanist, social, or natural sciences), are de facto considered as "processes of communication" today. This results not only in a general mobilization and circulation of goods, values, ideas, etc., but it also triggers processes of acceleration, dis-integration, and dissolution across all scales: There is not one field where one would not speak about "noise" that can become "signal" under particular conditions, and "signs" that can lose their significance in "noise." There is a new kind of materialism at play in these technologies, a materialism of quantum physics where light is both particle (massive, material) and wave (extension, immaterial); it is a philosophical materialism that no longer stands for a determinism but

quite the opposite, one that rests on principle and elementary "indeterminateness."[7]

When people in the medieval ages described what they imagined God was doing for the world he had created, and when they considered their god as "*un Ordonnateur*" who is "putting things in order" (French: "*ordonnateur, celui qui met en ordre*"), were they not also talking about a notion imported from elsewhere? Did not, for example, Thomas Aquinas, with his doctrine of the *analogia entis*, propagate a "cutting out" and a kind of "export" from the doctrines of the Universe's univocity? According to its doctrine, God could be thought of as "computing" because he did not exclusively speak to them anymore through the Scriptures that are already written and the language-based hermeneutics of its theology; the computing God spoke to them materially and formally, through what can be found in nature, through abstract but mathematical notions of "numbers" and "forms" that could embrace the novel influence from the Arabic world (revival of Aristotelian metaphysics and natural science, eventually algebra, novel approaches to optics), and that could reconnect in

7 Vera Bühlmann et al., "Introduction to New Materialist Genealogies: New Materialisms, Novel Mentalities, Quantum Literacy," in *The Minnesota Review: a journal of creative and critical writing*, Issue 88, Durham, Duke University Press, 2017a, pp.47–58.

novel ways with the Hebrew legacies as well.[8] Do we not have here a kind of "export" from a particular context and "import" to an emerging other one? Perhaps the "cuts" that separate "secular" usages of concepts and ideas from "religious" ones are not best captured if we think of them in terms of an either-or; in both, for sure, there is a kind of binding together, a contracting is involved (secular, literally "an age or lifespan," pertaining to a generation or age in this world," as opposed to a "religious order" that would transcend this world).

Paul Valéry was very perceptive to the religious implications of any engagement with "ubiquity." In a short article from 1928, entitled "The Conquest of Ubiquity," he addressed these issues: "In all the arts there is a physical component which cannot be considered or treated as it used to be, which cannot remain unaffected by our modern knowledge and power," he wrote.[9] The conquest of ubiquity he was talking about stems from the rationalism at work

8 I am thinking, for example, of Averroes and his "material intellect" in the 11th century, Raymund Lull and Dante Alghieri in the 13th century, the latter with his interest in the vernaculars (especially his text *Convivio*), then the Renaissance masters in the 15th century, later Erasmus (especially his treatise on copiousness, *Copia: Foundations of an Abundant Style*), and Ramus in the 16th century (with his mechanical method of discovery).

9 Paul Valéry, "The Conquest of Ubiquity," in *Aesthetics*, trans. by Ralph Manheim, New York, Pantheon Books, 1964 [1928].

in the empirical sciences. It involves the categorical (the ultimate, the most abstract, the first and last) concepts of metaphysics: "In the last twenty years neither matter nor space nor time has been what it was from time immemorial."[10] For Valéry, aesthetics and the arts had stepped into the placeholder position of former metaphysics, and the question that concerned many in the early twentieth century was the emerging relationship between aesthetics and religion.[11] Henri Bergson, who like Alfred North Whitehead was a philosopher interested in the novel challenges with respect to "quantification," suggested applying the central paradigm of the industrial age, that of the machine, to the universe itself: in *The Two Sources of Morality and of Religion*, from 1932, he begins to articulate the idea of what he calls "an open society." He writes:

> Men do not sufficiently realize that their future is in their own hands. Theirs is the task of determining first of all whether they want to go on living or not. Theirs is the responsibility, then, for deciding if they want merely to live, or intend to make just the extra effort required for fulfilling, even on their refractory planet, the essential func-

10 Ibid., p.225.

11 See, for example, Ernst Cassirer, *Philosophie der symbolischen Formen,* 3 Bde, Darmstadt: Wissenschaftliche Buchgesellschaft, 1964; or Susan K. Langer, *Philosophy in a New Key. A Study in Symbolism of Reason, Rite, Art,* Harvard, Harvard University Press, 1941.

> tion of the universe, which is a machine for the making of gods.[12]

Mankind has to decide whether to "make an effort," this amounts to saying that whether human life will have been meaningful or not (individually as well as collectively) lies in our own hands; for Bergson, this depends on affirming the role that his "model" of the universe foresees for human existence, namely, to operate this machine, such that an "open society" could emerge and prosper. In our contemporary *conditio humana* of the Anthropocene, these questions raised by Bergson some eighty years ago resonate as uncannily prophetic: are we not indeed concerned today with the precarious possibility of there not being a continued human existence on Earth and of being "responsible" for extinctions not only of us, but of entire species, the destruction of living environments by the "using up" of materials and resources, as well as that of cultural diversity in the loss (or sacrifice) of cultural life forms, identities, and so on?

12 Henri Bergson, *The Two Sources Of Morality and Religion,* London, MacMillan & Company, 1935; as Bergson literally puts it: "la fonction essentielle de l'universe, qui est une machine à faire des dieux."

Maintaining a Household and Steering a Ship

How did we get here, and where to go now? These are not only my questions at this point in the text but also the questions at the core of any politics. There is a distinction with regard to leadership between governing and managing (French "*gérer*"), to which Serres points;[13] the latter is an economical term and operates situationally, it is focused on how the integrity of an entity that is firmly planted within largely known and stable conditions can best be preserved, with the aspiration perhaps that local growth or other desirable transformation can be achieved. In distinction, leadership in terms of governing comes from how to steer a ship in the open seas. To lead in the sense of governing, one needs to be able to answer at least four abstract questions: Where are we? Where do we come from? Where do we want to go, and how best to get there? It is this latter form of leadership that we should reserve for politics. It is immediately evident how crucially it depends upon knowledge of history and the capacity to envision—and with this latter aspect (envisioning), it depends also on the apparently never-ending disputes around the core notions in metaphysics (space, time, matter, life).

13 Michel Serres, "Science et Societé," lecture online: https://www.unistra.fr/index.php?id=26376 (accessed August 18, 2019).

With this chronicle—this sectional cut—of where we are today, I want to direct attention to how architecture can be "political." Of course, architecture is also always involved with economy, but it is the political aspect we have largely lost out of sight today. We cannot take this as a fact. Instead, we need to think about why, granted, for some, this might seem all too evident (for example, if somebody maintains "it's capitalism!" or the like), we are being misologists; but by doing so, we presumptively deprive argument and reason of its force. We are not looking from a boat, but from within a particular economical order that we dare not risk. Thus, it seems as if architecture theory "has run out of steam"[14] because we are looking for a place for politics that is continuous with, or even entirely within, the economical paradigm—in so doing, we are frustrated that these places are always already "a made bed," a prepared place (dispositioned, biased) that grants little to no autonomy to what or whomever might "step in" and "hold" the position. I will not join the often-heard complaint that architecture today is largely deprived of its political vivacity—the last paragraph will demon-

14 As Bruno Latour has recently put it, Bruno Latour, "Why Has Critique Run Out of Steam? From Matters of Fact to Matters of Concern," in *Critical Inquiry—Special issue on the Future of Critique,* Vol. 30, No.2, winter 2004, pp.25–248.

strate examples of how and where it can be found, also today. The question I am interested in is how there can be a relation of architecture to politics, and hence necessarily also to history; for, without knowledge of history, the four basic questions cannot be answered—we need to know about past and future to locate a "present." We need to find a novel way of relating to history, other than dialectic materialism as we know it from Hegel, Marx, and Critical Theory. If according to this legacy architecture seeks to be political in a revolutionary sense, the political is explicitly sought from within an order of economy. Maybe the expectation that architecture can or should be "revolutionary" is what has rendered us blind to how and where the political actually manifests. My interest is to foreground how architecture's political strength and liveliness consist of what I will call "scalar inversions" rather than "revolutions." Scalar inversions depend upon architectonic models—models that, to recollect some points from the initial motivic keys, seek to facilitate copies of and make realizable nothing in particular. We can think of architectonic models as manifesting in computational architecture that relates "modeling" with "ideation/imagination" eradicated from any order of pure ideality.

Both terms (imagination and model) are highly contested in our contemporary discourses, and much depends upon how we think of them. They are contested because contemporary technology works with them in a manner that is not anchored in an individual's cognitive faculties. A good introduction from a non-specialist point of view to the more recent relevancy of these notions is provided by Paul N. Edwards in his book *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (MIT Press, 2010), but we cannot attend to it here. Rather we will look at Hans Blumenberg, who drew an important distinction between "world pictures" and "world models" in a short text whose title goes by the same notions. From 1961,[15] just before the NGOs and Think Tanks started to focus attention on the planning of demographic developments (the "agencies" at the core of Edward's book), more or less started to gather and organize themselves.[16] The core interest for this distinction (between "world models" and "world pictures") regards the relation between "building" and "education" (in German *Bildung*). As Blumenberg foregrounds, a university is not a conglomerate of disciplines and

15 Hans Blumenberg, "Weltbilder und Weltmodelle" in *Nachrichten der Giessener Hochschulgesellschaft,* Giessen, Universitätsverlag, 1961, pp.67–75.

16 E.g., *The Club of Rome* was founded in 1968, and *Greenpeace* in 1971.

faculties; rather, there is a "vivid economy of specialization and interdependency, of solitude and exchange among its fields and subjects."[17] It is the vivacity of this economy that he is concerned about, and with regard to which he interrogates his own field, that of philosophy. "Philosophy is the dawning human awareness of itself," as he puts it. What he means by this is, so he says, "something very basic. A human being seeks to grasp herself in what moves her in her own life, in what conditions this life of one's own, in the possibilities that present themselves in vivid and powerful manner."[18] Blumenberg is concerned with modern science eradicating philosophy in this very respect. Without being able to discuss his argumentation here, it results in attributing to contemporary philosophy (to the human sciences at large, by implication) a "historicist straight jacket" in the role of attributing to it a warning voice of moral conscience—the individual's "grasping of herself in what moves one's life" is thereby being stripped of its imaginal[19] force. The dualism between natural and human/social sciences is reinforced, together with a strong distinction

17 Blumenberg, 1961, p.67. Here and throughout my own translation.
18 Ibid.
19 Henri Corbin, *Temple and Contemplation,* London, Routledge, 2013; Chiara Bottici, *Imaginal Politics: Images Beyond Imagination and the Imaginary,* New York, Columbia University Press, 2014.

between objectivity and subjectivity, which sits so uncomfortably with the computational turn of our technologies. What about architecture? What about the kind of education needed to communicate, share, and build the knowledge to accompany this political side of architecture that I want to elaborate on, architecture's potential of triggering scalar inversions? I propose to regard architecture analogously to Blumenberg's description of philosophy before its "castration." I want to suggest regarding architecture as manifesting the dawning cultural awareness of a culture as a culture, through seeking to grasp itself in what moves it in its own vivacity, in what conditions its very liveliness in the possibilities that present themselves to it "in a vivid and powerful manner."[20]

Architecture as Civic Anarchism

Blumenberg forgets in two important ways to consider how architecture, and architectonic models, factor in his account of world models and world pictures. One is the transversal domain of consolidation between what we could call "performative" forms of culture and "technically articulate" ones. In other words, he fails to consider the

20 Blumenberg, 1961, p.67.

domain of transition between religious cults and their linguistic articulation and reflection (*Logos*) at work in "world pictures." The other aspect is the domain of transversality between calculation and computation.

This domain confuses any clear distinction between language (alphabets) and mathematics (numbers and forms) that is always already at work in scientific "world models." My suggestion is to think of calculation and computation as "architectonic" in an analog manner as we think of the relation between cult and myth as "philosophical" (through *Logos* as the reasoning means of this relation). Calculation then refers to rules with no reference order external to their own performativity (because it can be equally performative in any order, hence it counts "unquestionably,") while computation, on the other hand, comes to rest on rules "stated," relative to "orders" (computation is algebraic, it mobilizes the terms of equivalences in stated equations and hence is a strange kind of "language" that is neither properly "linguistic" nor "logic" nor "purely mathematical.")[21]

21 Still one of the best texts to learn about this distinction: Alfred North Whitehead, *Treatise on Universal Algebra,* Cambridge, Cambridge University Press, 1910.

If one acknowledges these two domains, one of gradual transition and the other of gradual transversality, as "architectonic" (rather than merely "problematic"), then there is always already a world of noise, a messiness to distinctions like the one propagated by Blumenberg between "world pictures" and "world models"—even before his distinction begins to hold. I want to maintain that architecture is architecture in that it provides world models that live from consolidating precisely this polluted, dirty, impure messiness—about which both philosophy and modern science, with their inclinations towards purification (and hence towards consecration rather than consolidation) are horrified.

Why architecture? Perhaps the attribution I want to make is not exclusive, but I tend to think it is. Because no other form of the "fine arts" or the "applied arts" is so constitutively entangled like architecture is with all of the institutions of secular power at once: with politics, economy, religion, culture, technology, science—and this in time scales that not only overarch human life cycles in both directions (towards the pole of "smallness" in building materials to that of "largeness" in a building's monumentality) and in a way that lacks comparison to any other field, and that furthermore equips ar-

chitecture with a strange sense of self-confidence about being "masters," oddly so in *rendering service* to those very institutions rather than aspiring or claiming to "direct" them. How can there not be an outright contradiction in saying that architecture *masters* through *serving?* That its pride is to be of service while at the same time proudly carrying the notion of a "first" and a "beginning" in its name (Greek *arkhein,* "be the first," thence "to begin, begin from or with, make preparation for;" also "to rule, lead the way, govern, rule over, be leader of?") How can serving and directing not be contradictory to each other? This is what the notion of scalar inversions (rather than revolutions) regarding the relation between architecture, history, and politics is all about. My point is that in architecture as a term, as a name, perhaps, to be the first, to rule or direct, is a *political role* coupled with a *technical* spirit (Greek *tekton,* from PIE **tecs*, to weave, to fabricate) that does not shy away from a "numerical" kind of imagination. What I find interesting to think about is whether or how it is precisely in architecture that we can find an understanding of technics and its role concerning *episteme*, to knowledge, and hence to secular forms of "culture" (cultural techniques) that bypasses the dualist and progressivist

distinctions such as civility vs barbarity, or modern vs premodern.

Every globe has a north and a south pole. What I want to suggest is that we can think like architecture as one of two poles, the other being metaphysics. I suggest regarding them on equal par because both want to confine an infinite domain of "ubiquity" within rational bounds, with an "ultimacy." Metaphysics (with its doctrines) is concerned with anticipating consequences that derive from an ultimate, a first, a principle, beyond which it *declares* thought could not make any reasonable sense. Architecture too, is interested in anticipation and the drawing of consequences with respect to such ultimacy, but different than metaphysics, it does not produce *doctrines* (that articulate how we can capture the world in pictures); rather, it *makes room* within the noise produced by the plurality of doctrines. So considered, it is clear why architecture strives especially in times of social transition of the greatest order, and perhaps only then. Perhaps when an order focuses on differentiating itself inwardly, in times of *instituting* an order (not merely consolidating the grounds for such novel institutionalization), architecture is subsumed within either science or art (or in the disputes that lay claim to it from either side).

According to this view, architecture does not represent world pictures or realize world models. It articulates "miniatures," reduced images, literally "images greatly reduced in scale"[22]—but it is crucial how we think of such "scaling" and "reduction." An image that helps here is how we use "reduction" in cooking or in perfume (when reducing ingredients into a concentrate of aroma). The definition of a miniature as being greatly reduced in scale should read accordingly slightly different: a miniature then is an image whose Greatness is being modelled as Bigness. Its reduction is not one *in* scale (where scale would be pre-existing) but *into* scales (that are to be appropriate for just that particularly reduced image," the architectural miniature). As such, architecture indeed engenders "models," for which it articulates their buildings as miniatures through a process of *reducing* them to their "proper" scales. And these models are "structural," but they are not "frameworks" like the "world models" secular science wants to produce are. These models are auxiliary structures, meant to be done away with (decoupled, deconstructed) once a building stands (and manifests the crystallization of a model in

22 Cf. for the etymology of the word "miniature," for example: https://www.etymonline.com/word/miniature (accessed October 24, 2023).

a miniature)—not because they can claim to be "natural" but because they have done their situational service. They are not structural in the sense of a skeleton or core, but in the sense of a facilitating, real, but ideational "adjunction." Architectonic world models thought of like this are at one and the same time much more ambitious and much more modest than scientific models: through their alliance with metaphysics, they are models that seek to realize something "universal" (not something "worldly"); in this, they are more ambitious. But they know that no empirical data can legitimize (found) their models exhaustively; in this they are much more modest. It is why architecture can be considered the polar complement to metaphysics. It is one of two poles of the abstract and yet the real, an entirely fancied (invented and imagined) and yet buildable "globe/sphere." Both metaphysics and architecture need to "inflate" what can be imagined beyond all (as of yet) reasonable bounds, hence their interest in mathematics and its precise and rigorous (finitary) dealings with the infinite. They inflate their imaginations and take them for real, not because they want to "transcend" *this* world once and for all, but because they want to be in touch (*con-tingent* to) with an outside to man-

made institutions.[23] They want to *project* themselves beyond the horizon instituted by the established social and civic orders—to bring back fresh views, ideas, and literal *projects*.[24] They build speculative models of the universe in order to stay human, to divert institutional power such as to prevent the sphere of their fragile and balanceable *concert-ation* of ideational power from rigidifying and becoming an unbalanced *con-centration.*

The constitutive element for architecture—if it manifests world pictures reduced to scales, miniatures of world models—is the module. The module facilitates the reduction to scales which is at stake between the "architectonic model" and the "miniature of a world picture" to be built. "Module" literally means an "allotted measure," from Latin modulus "small measure," diminutive of modus "measure, manner" (from PIE root *med-, "take appropriate measures.") Mathematicians think of it as a name for a relation of one-over-many, because it is an algebraic term and became important after the introduction of the group concept by Evariste Galois and Hendrik Abel. We can best think of it as a

23 Elizabeth Grosz, *Architecture from the Outside,* Cambridge, MIT Press, 2001.

24 Massimo Cacciari, "Project" in *The Unpolitical: On the Radical Critique of Political Reason,* New York, Fordham University Press, 2009, pp.122–145.

diachronic tripod providing a plateau (the plane on top of the pedestal of the episteme's point of view?) If viewed in time as a magnitude (diachronic) rather than in space, a tripod is precariously balanced by its three legs—namely geometrical proportion, arithmetical proportionality, and harmonic proportion—since any of these means establish proportion differently.[25] Here is not the place to elaborate on this, let me say for now that the module can count as the magnitude (how much) as well as the multitude (how many). Respective to its units, a reference order can be appropriate (pro-portionate). As *magnitude*, it is the condensate of a world model, the seed for a realized, built copy of it (a miniature, an image of the model reduced into scales); as *multitude*, it renders the magnitude countable and thus facilitates its condensation into a model that can be realized. The peculiarity of architecture is that it has a notion of the module that is all at once mathematical, metaphysical, scientific, and technical, but also "cosmical" (in the sense of both myth and beauty, and their inspiration for decoration, decorum, cults and customs, and arts).[26]

25 P.H. Scholfield, *The Theory of Proportion in Architecture,* Cambridge, Cambridge University Press, 1958.

26 Cf. Robert Hahn, *Anaximander and the Architects,* New York, State University of New York Press, 2001.

In architecture, the "module" refers to the foot of a column, often its diameter (geometric proportion). But the significance of a column in architecture is cosmic: it is the cosmos's axis, it symbolically separates, joins, or interpenetrates the cosmos. It is the scope that spans around the radial line which contracts the Zenith (the summit point on a spherical surface that is higher in elevation than all points immediately adjacent to it) and the Nadir (the base point on a spherical surface, opposite to the summit point). This is why the architectonic column is an allegory for what carries the world's weight in the universe. Architecture considered through the symbolism of the column can never perfectly integrate the three ways of rationalizing the balance (the stasis, the status, and the statement) of its buildings into one whole "body": the harmonic proportion (status), the arithmetic proportionality (stasis) and the geometric proportion (statement). The three kinds of being-in-proportion cut through one another, they intersect each other in angles (inclinations and declinations). They cannot be reduced to one another (now specifically in the arithmetical sense of a mean magnitude, a common denominator). But from transcribing their respective scales (from having a model of how they cut through one another), architecture produces "re-

duced" miniatures (with respect to world pictures, they are "improperly" articulated models, they are rhetorically reduced, fashioned (coded) for a particular site and situation, rather than claiming general validity) of the world modelled architectonically. "Reduction" here produces the "essence," it is hence a reduction to scales (not a reduction in scale).

I proposed such a notion of architectonic models as computational models at the beginning of this text. They are computational because they articulate balances in the "place-holding void" constituted by the absence of images. It is this absence that they fill, ideationally, with numerical imagination. Where the place of world images is unoccupied (or highly contested, and therefore subject to great tumult and disorientation), architectonic models contract (mechanically, inventively) metaphysics with geometry. They follow metaphysics without obeying its doctrines.

This is why I suggest speaking of architecture's political role as that of an anarchic civility: civil with respect to a self-understanding as civil servants but anarchic with respect to any one world picture or world model (ideology) in particular. Computation is the postponing of decisions (one can indefinitely further proceduralize a process). Still, it actualizes through an axial kind of deci-

sion—a scission, rather than simply a decision—like the cut of the umbilical cord every infant is subjected to; the word "tekton" indeed shares the root with "tikto," for "give birth, engender."[27] Architectonic models are computational models, but unlike computational models considered as "calculative" only, architectonic models place the infant, so to speak, in the position of a discrete beginning that is always also a continuation. Architecture claims a protective and leading role for such beginnings (*arkhon*), but it understands this role as one that seeks to step back and share its rules as soon as possible, that is, as soon as the weaving of threads (lines of continuity) through the noise, through which it cuts (scission), grows sound, solid and stable enough for maintaining its own integrity other, perhaps self-directed.[28] In this sense, education plays in the interplay between the initial consolidation and the subsequent institutionalization of an order that truly deserves to be called classical, because it never possesses (but therefore also never loses) its own originality and "moderni-

27 Cf. Alberto Pérez-Gómez, Stephen Parcell, *Chora 3: Intervals in the Philosophy of Architecture,* Montreal, McGill Queens University Press, 1999, p.120.

28 Indra Kagis McEwen, "The 'Architectonic Book,'" in *Vitruvivianism: Origins and Transformations,* ed. by Paolo Sanvito, Berlin, De Gruyter, 2015, pp.101–112.

ty." Interestingly, Vitruvius thought of architecture as an *enkyklios disciplinae*, an imaginal and circular public domain that accommodates all knowledge available at a time.[29]

Scalar Inversions: Nine Vignettes

Let us summarize: I would like to propose thinking of architecture as the *instrumentation of space,* in its full scope of epistemic and aesthetic richness (*Raumerfahrung*). This implies to think in architecture not only in terms of lengths in a given, coordinated space, but to think of the axes that give us dimensions in terms of rotations, i.e., as temporal. The coding of the rotational axis gives us scales, and together in combination with lengths they allow for interiorizing temporalities within dimensional architectonic volumes, elements, and concepts. To give an idea of what this would entail: Architecture is then an instrumentation of space that articulates temporalities like a musical instrument articulates sounds (its extension, its body) in time. These articulations are then articulations of the world as a miniature that brings the world to scales in each particular articulation. Such articulations are guided by holistic ideas of the cosmos and their conju-

29 See Indra Kagis McEwen, *Vitruvius: Writing the Body of Architecture,* Cambridge, MIT Press, 2003.

gation by what we could call *metaphysical gestures*. Through such a notion of instrumentation (not instrument*ali*zation, which would mean to turn an object into a tool for achieving a particular goal), these miniatures are not meant to *represent* a world picture, and neither are they *realizations* of a world model. Rather, they can be thought of as crystallizations that modulate *alloys* (forged mixtures, impure "essences") of material quantity and formality according to architectonic models—models that relate "modeling" computationally with "ideation/imagination" eradicated from any particular order of pure ideality. This eradication is what is meant by the loss of images. Its acceptance amounts to architecture affirming finitude and death in relation to its core concept, that of form. Hence what I propose is a materialist understanding of architecture. With this, architecture can continue the humanist legacy foregrounded by Blumenberg, namely that there is a particular relation between "building" and "education" (in German *Bildung*) that manifests in the university's "vivid economy of specialization and interdependency, of solitude and exchange among its fields and subjects."[30] Architecture could then play a similar role at the social scale to the one whose loss Blumenberg was mourning for philoso-

30 Blumenberg, 1961, p.67.

phy on the scale of the individual, namely to grasp the possibilities that present themselves for living in a vivid and powerful manner. The philosophical "dawning human awareness of itself" would then not relate to the individual, but to cultures at large. Architecture education would be distinctive in how it bridges technics with arts, by drawing an ideational energy from the unoccupied stead of images: With numerical imagination, architectonic models bring the nothingness of this void to scales; this is what is meant with the term "scalar inversions.[31]"Architects, then, act politically as civic servants whose work is nevertheless that of a kind of mastership, because they remain "anarchic" with respect to any one particular world picture or world model.

What follows are nine indexical *vignettes* to illustrate such architectonic-political gestures (here without unfolding any entailments they contain with respect to world pictures). The selection is not meant in a canonical sense if canon means a list of best-of examples. But it is meant in a canonical sense if canon is taken in its old sense from sculp-

31 The term of the "vignette," as well as that of "scalar inversions" and their roots in "numerical imagination" is inspired by John Durham Peters, "33 + 1 Vignettes on the History of Scalar Inversion," in ELH, Vol. 86, No. 2, New York, Johns Hopkins University Press, 2019, pp.305–331.

ture and architecture, where it provides an abstract rational framework that keeps proportion, analogy, and symmetry as separate dimensions that can be related together in various manners.[32] The examples are called vignettes to foreground the materialist understanding of time, which treats time not in terms of progressively-linear historical periodization; vignettes come from vineyard, a name that beautifully bridges how the fertility of a ground and its particularly local character and temper, together with the technical/metrical cultivation of it (yard) affect the produce (wine). Each of the vignettes brings temporalities to scales in space and exposes scalar inversions on diverse levels of abstraction—each demonstrating an instrumentation of space in the sense elaborated above.

LEON BATTISTA ALBERTI (1404–72)

Alberti thinks of architecture as ordinated volumes made of pictures that represent nothing;[33] he transcribed his experience with dioptric instruments to cryptography, and invented new principles of

32 I have elaborated on this in "Once Upon the Autonomy of Words," in *Architecture and Naturing Affairs,* ed. by Mihye An and Ludger Hovestadt, Basel, Birkhäuser, 2020.

33 Leon Battista Alberti, *Das Standbild—Die Malkunst. Grundlagen der Malerei /De Statua—De Pictura—Elementa Picturae,* Berlin, wissenschaftliche Buchgesellschaft, 2011; the first treatise on painting decoupled from its mimetical function.

encryption with his so-called Alberti Cipher;[34] he applied such encryption to develop grammatizations of vernaculars;[35] he bridged philosophy and economy by asking: can I be friend (in the philosophical sense of soulmate) with the prince whom I depend upon? Can there be friendship in marriage? Is the home the proper place for education?[36]

CLAUDE PERRAULT (1613–88)

Perrault made a strong intervention in the so-called "Quarrel between the Ancients and the Moderns"[37] in the seventeenth century, by proposing to mechanize the Classical Canon of orders and styles: his columns for the Louvre are columns liberated from carrying any weight, they are bound to carry the passing of time alone.

GOTTFRIED SEMPER (1803–1879)

In tune with the analytical paradigm of thermodynamics and the theory of evolution, Semper insisted on continuity between nature and tech-

34 Alberti's *Ludi Mathematici*, cf. K. Williams et al. (eds.), *The Mathematical Works of Leon Battista Alberti,* Basel, Springer, 2010.

35 Alberti wrote the first syntax of the Tuscan vernacular language.

36 Leon Battista Alberti, *Dinner Pieces*, trans. by David Marsh, Michigan, Medieval & Renaissance Texts & Studies in conjunction with the Renaissance Society of America, 1987; Leon Battista Alberti, *I Libri Della Famiglia*, ed. by Ruggiero Romano, Alberto Tenenti and Francesco Furlan, Turin, Einaudi, 1994.

37 https://de.wikipedia.org/wiki/Querelle_des_Anciens_et_des_Modernes (accessed February 23, 2022).

nics; he subjected architecture to a materialist turn, and regarded it as a fabric, an industrious function of nature; he was looking for an architectural science of style.[38]

ADOLF LOOS (1870–1933)

Loos proposed to arrange rooms not according to planes (planar geometry), but within a given volume: he partitioned volumes into scales cutting through and freely arrangeable within it (*Raumplan*). To distinguish (or extend? refine?) this approach, he came up with what he called the principle of cladding, by which he meant an imagination that does not form spaces, but masses.

LE CORBUSIER (1887–1965)

Le Corbusier developed a calculus of how to render the analytical partitioning of volumes into scales that were once again continuous, as liberated ratios of logic orders. His reference hence was neither space nor mass but economical order, according to particular "rationalities" (*plan libre*). An instrumentation that "modulates" the volumes of massive spaces, or spatial masses.

FRITZ HALLER (1924–2012)

Haller was not afraid to think the absolute of change: "*Totale Stadt* is here called the structure

38 Gottfried Semper, *Style in the Technical and Tectonic Arts, Or, Practical Aesthetics,* Los Angeles, Getty Publications, 2004.

[*Gebilde*] that allows for this network [*Geflecht*] of different living spaces in one total living space. *Totale Stadt* is a system of resting and moving objects and energies covering the entire world," and "the sections 'general model,' 'specific model,' and 'concrete construction' plan of this study do not represent a well-ordered, complete whole. They can rather be compared to a loosely arranged puzzle from which pieces are still missing or have not been put in their proper position."[39]

ALDO ROSSI (1931–1997)

Rossi writes a scientific autobiography, inspired by the principle of the conservation of energy and its relation to a material kind of memory, as he illustrates it with the schoolmaster Muller's story, where a mason who is struck by the idea that the energy expended from heaving a rock to a rooftop does not get lost, but remains latent in the stone and might, if the stone fell down one day, even be the same energy that kills a passerby: "The principle of the conservation of energy is mingled in every artist or technician with the search for happiness and death," a death that "in some sense is a continuation of energy."[40]

39 Fritz Haller, *Totale Stadt: ein Modell. 2, Ein globales Modell,* Olten, Walter, 1975.

40 Aldo Rossi, *Scientific Autobiography,* Cambridge, MIT Press, 1982.

PETER EISENMAN (BORN 1932)

Eisenman is the thinker of the ultimate diagram in architecture, for him, the diagrammatic is *totalized*: "With the end of the end, what was formerly the process of composition or transformation ceases to be a causal strategy, a process of addition or subtraction from an origin. Instead, the process becomes one of *modification*—the invention of a non-dialectical, non-directional, non-goal-oriented process."[41]

REM KOOLHAAS (BORN 1944)

For Koolhaas, the force of manifestos acts upon the past, it dopes logistic grid-structures through ciphering them: "Manhattan is the 20th century Rosetta Stone."[42] He depicts architecture as ultimate, against urbanism, by attributing it an ultimate magnitude called 'Bigness': "Beyond a certain scale, architecture acquires the properties of bigness";[43] the rationality of its massivity refers self-referentially to a voided and ciphered principle of causality: "the best reason to broach Bigness is ...because it is there."

41 Peter Eisenman, "The End of the Classical: The End of the Beginning, the End of the End," in *Perspecta* Vol. 21, Cambridge, MIT Press, 1984, pp.154–173.

42 Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan,* New York, Monacelli Press, 1997.

43 Rem Koolhaas, "Bigness and the Problem of Large," in Rem Koolhaas and Bruce Mau, *S, M, L, XL,* New York, Monacelli Press, 1995, pp.494–516.

PETER ZUMTHOR (BORN 1943)

Zumthor turns to atmosphere as a word for architectonic quality: "I enter a building, see a space, and get its atmosphere, and within fractions of a second I have a sense of it as it is [*für das, was ist*]."[44] An architect "rationalizes" this viscerally experienceable quality—holistically, mythically, technically, psychologically, materially.

JUNYA ISHIGAMI (BORN 1974)

Ishigami articulates constitutions of time dissolved. He follows rituals of a massive kind of transcendence. He builds a box of aluminum the size of a four-story house and weighing a ton, which he fills with helium so that it floats and can be moved at the touch of a finger, and designs columns about as thick as raindrops: "I want to make a new scale of architecture, a natural scale, an elemental scale" for an architecture as based on any sizes found in nature: "in nature structure and space are not divided. Air is space but it also has a structure. But architecture divides these things."[45]

44 Peter Zumthor, *Atmosphären: Architektonische Umgebungen. Die Dinge um mich herum,* Basel, Birkhäuser, 2006.

45 Junya Ishigami, "Architecture of Air; Serpentine Gallery Pavilion 2011– review," online: https://www.theguardian.com/artanddesign/2011/jul/03/junya-ishigami-serpentine-pavilion-zumthor (accessed February 23, 2022).