# PRIMARY ABUNDANCE, URBAN PHILOSOPHY — INFORMATION AND THE FORM OF ACTUALITY

VERA BÜHLMANN



**VERA BÜHLMANN** has studied English language and literature, philosophy and media studies at the University of Zurich, and holds a PhD in media philosophy from the University of Basel.2003–2007 she held a research position at the Academy of Art and Design in Basel, and since 2008 she has been senior researcher at the Chair for Computer Aided Architectural Design CAAD at the Swiss Federal Institute of Technology (ETH) Zurich, where she has headed the laboratory for applied virtuality since 2010. Her publications include: *inhabiting media. Annäherungen an Herkünfte und Topoi medialer Architektonik*, PhD thesis, University of Basel 2011; *pre-specifics. Some Comparatistic Investigations on Research in Art and Design* (co-editor), jrp Ringier, Zurich 2008; *metaworx*. Approaches to Interactivity (co-editor), Birkhäuser, Basel 2004.



"Either we know what something is, or we do not. If we do, then there is no point in searching for it, if we do not, then we will not know what to search for."1 [↗ P. 120]

"[...] If knowledge is not to be identified with its object, knowledge is a matter of constructing, using and coordinating symbols."2 [↗ P. 120]

This article argues for a radical perspectivity shift in cogitating the urban, which involves an approach to infrastructures not solely in terms of functionality, but predicated on the pre-modern philosophical terms of capacities and capabilities. Characterizing infrastructures as technological means of maintaining a steady supply of existential basics poorly

recognizes the peculiar space of potentiality they maintain and provide along with consolidation of steadiness. The advent of global logistics and media networks not only dramatically enlarged that infrastructurally maintained space of potentiality, but democratized it as well. This space of potentiality is transversal to the nature-culture dichotomy, and can be comprehended as an infrastructural component of urbanity. Thinking in philosophical terms of capacities and capabilities in relation to infrastructures entails the secularization of certain noetic figures related to technics, motion, and power that had a strictly metaphysical connotation while

1 Plato, Meno 80d-2.
2 Ernest Nagel, "Formal Logic and Geometry", in: *Teleology Revisited and Other Essays in the Philosophy and History of Science*. Columbia University Press, New York 1979, p. 255.



they were connected to cosmological or natural frames of reference. This article makes suggestions along the lines of how to conceptualize the triad of information, virtuality, actuality, which today ubiquitously accompanies, and is secularized by, so-called media reality and related technoscience—itself rather urban than natural or cultural—without the triad losing, in the process, the differentiation capacity of its metaphysical past, while being alive to its profanization.

## 1 PRELUDE

"I'm already here," the hedgehogs are calling out to the hare from their distributed places, as he comes tearing down the field like a windstorm. "I'm already here." The hare cannot believe it, 73 times he insists upon making the test, until he falls dead to the ground. This tale of the Brothers Grimm is about a race, provoked by the elegant hare's scornful behaviour towards the hedgehog's clumsiness and his short and crooked legs. As a wager it seems, for one of the parties, to be a foregone conclusion, and nevertheless it cannot play out, because of the other party's cunning contrivance. In calling this wager unfair, one would be jumping hastily to the perspective of moral categories, which to me seems

less promising than sticking for the moment to examining the situation "technically". Let us begin by simply looking over the various capabilities that are pitched against one another in this contest. Thus, I should like just to consider the hedgehogs' mental cunning and the motorial nimbleness of the hare, and thus not to go beyond seeing two principles of capabilities in competition that are apparently neither congruent nor comparable against a common metric. Cunningness as a capability grows out of a discontinuous initial situation and construes purposeful continuity through a smart logistic setup, whereas motorial nimbleness as a capability presupposes natural continuity as a steady background. Their apparent irreconcilability opens up a fault-line, which may be seen as separating, as it were, information technology and its operational paradigm in the symbolic, from that older technology that, on the substratum of the physical, represents, processes and transforms continuous synergies and connections.[3] Through the electronically-digitally conveyed nets, general interconnections between information, circulation and organization came to be established in previously unknown fashion, which form the backdrop to the increasingly overpowering logistics in the electronic infrastructures of our everyday life, which were in turn converted into the basis of our urban life over the past 150 years. We experience our urban basis increasingly as relative and heterogeneous, with a multidimensional, net-like structure that above all ought, among other aspects, to be characterized as "social".

## II ACTUALITY

Here, an old question resurfaces in a new context, the one about formal notions regarding possibility and realization. Electricity and IT give rise to the revival of a difficult language game around the linking of form and materiality, through which, since Aristotle and in multiple manners, the notion of "actuality" has been discussed.[4] Aristotle reaches the notion via the assumption of some principle of abstract activity, which he calls *ἐνέργεια (enérgeia).* It encapsulates the idea of an act that is never-completing and must therefore be thought of as prior to any concreteness in space, time or body. Much of what flows into this figure of thought passes today as metaphysical and unnecessary—even to someone not decidedly thinking of themselves as being positivist. There will be no raising of ghosts here; but we suspect that

3 For a discussion of this fault-line from a historical perspective cf. Bernhart Siegert, *Die Passage des Digitalen. Zeichenpraktiken der neuzeitlichen Wissenschaften 1500–1900*. Brinkmann & Bose, Berlin 2003.

4 The main idea behind any hylomorphism is: "matter provides the potentialities which are actualized by the form", cited in Istvan Bodnar, "Aristotle's Natural Philosophy", in: *The Stanford Encyclopedia of Philosophy* (Spring 2010 Edition), Edward N. Zalta (ed.), http://plato.stanford.edu/archives/spr2010/entries/aristotle-natphil.



it is in this language game, around *enérgeia* and its being-active in an abstract sense, that some index for markings might be found that might allow forward-looking symbolization of the rift that gapes between electronic technics, mechanical technics, and what "technics" itself is taken to mean socially. The central interest of this language game about actuality, from the application-oriented perspective of technics, lies in differentiating between mere ability to do something and being proficient in the ability to do it, in a never-to-be-perfected sense of artifice, which Aristotle, in his natural philosophy, established as a theory of capacities and capabilities.[5] This theory underlies his dynamism of reality, which depends on a relationship between what he called *act* and *potency*, between abstract doing that is never destined for concrete completion, and concrete, corporeal action that accomplishes and completes. In a nutshell, Aristotle cogitated on the character of reality and asked about its beginning, *ἀρχή* (*arché*). In his explanation of how knowledge about a dynamic notion of reality may be gained, he distinguishes, on the part of potency, the connections of concrete motion, which is liable to being analysed, studied and trained. On the other hand, on the part of the act, he postulates the principle of some *primus movens*, of a mover to whose instigation motion can be traced back in order to be analysable, but about whom—at least within Aristotelian philosophy—nothing further can be said. This moment of an abstract act, from which concrete movement is being triggered, underlies the present re-familiarization of the idea of "actuality", related to what has more recently turned into a somewhat diffusely laden buzzword "virtuality". It would seem sensible to assume modi of actualization liable to be differentiated further than those between possibility and reality; this text would even like to consider the question of whether it might make sense not only to speak of modi of actualization, but indeed to achieve altogether a novel way of accounting for the process of relating form and actuality.

The revival of this difficult language game of actuality relating to the interplay of form and materiality is grounded in the problems that originate from the quest for a categorical concept of information. The mathematician, Norbert Wiener, was probably one of the first to have remarked that information is not adequately accommodated by the two traditional scientific categories of mass and energy; it is reducible to neither category, behaving as it does in a fashion transversal to both. The problems thus arising are so disturbingly unsolved to this day, that it seems meanwhile no longer admissible simply to look at

5 Cf. for an introduction to Aristotelian thinking particularly from this perspective: Ludger Jansen, *Tun und Können. Ein systematischer Kommentar zu Aristoteles' Theorie der Vermögen im neunten Buch der "Metaphysik"*. Dr. Hänsel-Hohenhausen, Deutsche Bibliothek der Wissenschaften, Frankfurt a.M. 2002.

information as information, without first specifying whether one's interest be technical, language-philosophical, or indeed one of science history. It is therefore all the more remarkable that just now, in the spring of 2011, a first a-disciplinary and popular-scientific book should show up, under the title *The Information*—note the definite article.[6] The author, James Gleick, said on his blog that when asked by *Wired* magazine for a brief definition of information, he was then short of an answer. On second thought, however, he might submit, "information is how we know".[7]

It is easy to see there a relation, probably more intuitively sensed than dedicatedly stated, between the information question and a philosophy of capacities and capabilities. A relation, however, that appears even clearer in the work of Gregory Bateson who, along with Wiener, is one of the early protagonists to involve themselves in questions about the essence of technically treatable and content-devoid information. He came up with the by now legendary, but also somewhat conjuring, formulation—much more Aristotelian than he might probably have realized himself—that "information is a difference that makes a difference."[8] Thus Bateson quite openly described information as that red-hot iron which nobody would touch directly, since it re-uncovers the very problems one had thought had gone away thanks to the modern matter-as-mass idea. To define information as something being that is, in its being, pure doing, implies—as does the just discussed model underpinning Wiener's noetic figure—a philosophy oriented towards capabilities and capacities from which modern science believed itself long since emancipated.

What this text proposes, then, turns upon the possibility of a philosophy that is on the line not of a capacity / capability-oriented study of nature, but of information. I should like to proffer such a philosophy as a genuinely urban architectonics. It ought to provide orientation for thought enabling it to deal with the polymorphy of urban actuality. Architectonic considerations are inseparable from categorial determinations that organize the structuring and sorting of what happens. If these categorial determinations are to be capable of dealing with the polymorphy of urban actuality, we need to assume an interplay between them, which we shall call motorics of the urban. This does not imply the city as a constructible machine, nor as an organism with natural aptitudes or capacities, as it were. The point is indeed to find a concept capable of abstracting from both of these ideas. Below, some approaches to this end will be presented in concise form.

6 James Gleick, *The Information: A History, a Theory, a Flood*. Pantheon Books, New York 2011.

7 James Gleick's blog, *Bits in the Ether*, http://around.com.

8 Gregory Bateson, *Ökologie des Geistes. Anthropologische, psychologische, biologische und epistemologische Perspektiven*. Suhrkamp, Frankfurt a.M. 1999 / 1981, p. 582.



## III CAPACITY

An urban architectonics presupposes interdependency not only between knowledge and reality, by *τέχνη (techné)* in the sense of artifice, but also between knowledge and technics. Let me begin by taking up a noetic figure of Michel Serres, who sees technics as forever bringing energy stores, and the forces to be culled from them, into constellations. In his *Motors: Preliminary Considerations Regarding a General Theory of Systems,*[9] Serres postulates an indissoluble relation between what people can know at a certain time, and what they are at the same time capable of doing, not only according to an individual's natural capacities but with the population's technical support available at that time. He articulates a generational history of systematic thinking and doing, which he derives from the differing ways in which people have symbolized, at different times, an apparently never entirely positivizable openness of their ability to make the most of their capacities. Serres perceives technics as artifice in the old Aristotelian sense, but also as the realized and concrete architecture of such systemic thinking and doing. Since Lambert and Kant, philosophical architectonics has explicitly denoted the building of systems as an art, within a study of transcendental methods.[10] Demarcated from it, Serres' proposal points in the direction of some meso-architectonics,[11] he proposes including the realized and concrete architecture of systemic thinking and doing into his notion of knowledge, which he understands, with Aristotle, as the characterization of reality. He thereby relates technics directly to something that was divine to Aristotle, and counted as sublime art for Kant: the ability to cogitate systems in general. With this proposal, Serres secularizes that mythical Aristotelian motive of transcendental *enérgeia* to which, in Aristotle, every *δύναμις* (*dýnamis*, potency) must be traced back. Serres will not consider technics independently of where from and how its actuation is thought to be organized. Thus, to Serres, the difference between the wherefrom-driven and how-functioning is sine-qua-nonical

9 Michel Serres, "Motoren. Vorüberlegungen zu einer allgemeinen Theorie der Systeme", in: *Hermes IV. Verteilung*. Merve, Berlin 1992, pp. 43–91.

10 Immanuel Kant, "Die Architektonik der Reinen Vernunft", in: *Werke in zwölf Bänden*, vol. 4, Frankfurt a.M. 1977, pp. 695–709. What is less well-known today is that some years before Kant, Lambert had already published his book on an architectonics of thought. Cf. Johann Heinrich Lambert, *Anlage zur Architektonik oder Theorie des Einfachen und Ersten in der philosophischen und mathematischen Erkenntnis*. 2 vols, 1771.

11 We call it "meso-architectonics" and not "meta-architectonics" because the Lambertian and Kantian notion of architectonics has the transcendental integrated into its methodology. The suggested noetic figure here does not try to further abstract from the assumption of transcendentality, but rather tries to differentiate it. Therefore we call it "meso"—for Greek *μέσος (mésos)*, meaning "middle" or "medial". We cannot elaborate further on this here, but I have developed some approaching thoughts in this direction, in: Vera Bühlmann, *inhabiting media. Annäherungen an Herkünfte und Topoi medialer Architektonik*, 2011, PhD thesis, University of Basel, Faculty of Humanities, available online at: http://edoc.unibas.ch.

to his *Preliminary Considerations*. Therefore, he proposes mutually to interrelate technics and knowledge, without however relating them jointly to a common anchor point, such as nature or culture. I will first follow his proposal of a generational history of systematic thinking and doing, up to a point, so as to carry then the noetic figure somewhat further, in an interpretation of my own.

A first gestalt of such architecture-turned-symbolization of the described difference is found by Serres in the language game of the machine. Machine as a notion harks back to the Greek *makhaná* (means, tool), which in turn traces back to the proto-Indo-European *maghana*, meaning "that which enables". With Serres, we shall associate the machine with technics for which energy stores are latent in nature, e.g. levers, winches, pulleys, mills, turntables. The principle underlying these machines is the linkage of geometrically continuous circular movements, into which ingathered forces are being integrated, and used for driving some further movement. They are all rotative machines. As such they are strictly geometrical, their elements are universal forms, and their enabled motion is mostly used for transport. The technical momentum in these machines is being harnessed through a fixed point, such as the one from which Archimedes famously thought he could move the world. These machines work with motion. In their case, the wherefrom-driven is distributed in natural fashion throughout the world. Machines take energy from nature; they are literally in sync with what happens, to whose "coming-about" they contribute. They convert energy from one form to another, so as to move and transport objects. Michel Serres calls these machines "epistemic machines",[12] because their premise is one point in the without, the standing above happenings, as per the Greek *ἐπί (epí)* for "above, nearby" and *ἵστασθαι (hístasthai)* for "to stand".

A second gestalt of such architecture-turned-symbolization of the difference between a wherefrom-driven and a how-functioning may, with Serres, be identified based upon the treatment of heat. In contrast to machine kinetics, which moves and transports objects, thermodynamics affects matter in its composition. Heat is a uniform principle capable of affecting everything. Heat technology does not transport things, it transforms matter. Following a uniform principle, it effects transformations, it "realizes" states of substances. The epistemic principle of a fixed point in the without dissolves here into an operational difference within the world: heat engines live upon the temperature difference between two sources. Unlike that gestalt of technics that Serres describes as machines, heat technology does not follow any principle of continuous movement deriving from natural distribution, but it does

12 Serres, *Vorüberlegungen*, ibid. p. 50ff.



encapsulate such a distributory principle in construed fashion. Heat technology works with the next derivative of continuous movement, in other words temperature, which forms through differing velocity of molecules. We follow Serres' suggestion in calling this technology "apparatus", from the Latin *apparare* containing *ad* for "towards" and *parare* for "to fit out". Apparatus do not give off energetic power directly from gathered energy, but produce an energetic system that gives off power in a steady flow, and, as drive units, work in the running of machines much more efficiently and controllably. For Michel Serres, this interplay between apparatus and machine represents the general characteristics of a motor. A motor differentiates the continuous motion of machines and thus produces not only output, but output capacity. In apparatus, the fixed point in the without of epistemic machines turns into a motor, and Serres terms the knowledge he associates with it "diasteme",[13] from Greek *διά (diá)* for "through, throughout", related to *δύο (dýo)*, *δίς (dís),* and Latin *duo*, *bis*, with the root denoting "two".

Let us now carry this noetic figure further, in our own interpretation. The capacity of information technology is fully absorbed neither by its machine nor its apparatus quality. The cybernetic and established language game would suggest that it controls the apparatus that power the machines. But that would ignore the difference between the wherefrom-driven and the how-functioning that we find so interesting in Serres' thinking about general systems. Let us first turn to the occurrence and the architecture in which this surmised new gestalt of technics today manifests itself. At first we shall leave aside "the computer" and for a moment consider it as a conceptual hubris having hypostasized into a universal medium. Then we find information technology in the multitudinous applications as electrical devices, and in the thousands of applications that have invaded electronic networks and propose various services. Apple's App Store opened in 2008, with just over 500 downloadable applications. One year later, 65,000 apps were on offer, and by July 2010, more than 250,000 such apps were available in the App Store alone.

Meanwhile, the infrastructures for supplying motive power too have differentiated in two directions: central and heavy mammoth engines or power plants, and comparably filigreed electronic networks in which motive power is, or at least tends to be, ubiquitous and persistently available.

IT-based applications are powered by steadily available electricity. They are no longer translocation-based as were the first-generation machines, nor based upon orchestrating particle velocity, as were the second-generation apparatus. Whereas the first two generations

13 Serres, *Vorüberlegungen*, ibid. p. 50ff.

were both directed at tickling out, in one way or another, the specific capacities and potentials proper to things, it is here much less clear what potentials are to be tickled out, and whether these potentials may be assumed to have pre-existed in latent form previously to being addressed. It feels insufficient for their characterization to say that digital IT apps are powered primarily and directly by available electricity. It might be more accurate to say that they are propelled by the fantasy of their developers, and also that they are aimed at propelling the fantasy of their users. Digital IT apps all offer functionalities whose "purposes" or "usages" are at times apt to hang at stratospheric heights above the manifold facets of our everyday life. The developers of such technology push new modes for everyday dealings and doings, well before any convention for their "assessment" might "situationally" have had a chance to emerge. The driving force behind such apps are developers' phantasmata, who will not and cannot be aware of any actual purpose or usefulness of their brain-children. More specifically, IT developers are not into actualizing things in the sense machine users are, who tickle out the least potency of a thing, nor do they seize upon a thing's natural dispositions for transforming its characteristics, as the apparatus operators do.[14] The IT developers are enablers of genuinely cultural behavioural forms on behalf of urban everyday life, whereby such enabling is inseparable from a process of evaluating the offered apps themselves, an ongoing process all the while that the apps are being accepted, refined, neglected, used, and thus symbolized in their purposefulness. The significance of the things being enabled gets established only through—and dependent upon—the popularity, and actual activity, of using them, and upon the popularity of the modes of applying them.

Against this backdrop, the question about where to look for the specifics of this newer and third gestalt of technics may now be somewhat circumscribed. Serres' noetic figure distinguishes their characteristics according to their wherefrom-driven, or how-functioning. If we are to extend the figure to cover IT as well, account must also be taken of what they are powering. Apparatus in his dramaturgy demarcate themselves from machines by producing not output through

14 Thinking towards "an urbanization of the assumption of transcendentality" that our meso-architectonic theory suggests, relates of course rather closely to many issues debated more recently under the caption of *cognitive capitalism*. My stand here might seem rather uncritical by comparison. Yet the assumption of primary abundance [see pp. 135ff.], and my interest in a philosophy and methodology starting from it, makes the relation to any materialist position complicated and difficult. There cannot be, strictly speaking, something like consumer culture any more—for how can we define waste if resources are not scarce? Instead of elaborating this further here, I would refer to an article the mood of which I share: "Art, Criticism and Laughter: Terry Eagleton on *Æsthetics*", paper delivered at the conference *Æsthetics, Gender, Nation*, organized by the Raymond Williams Trust, Oxford, March 1998, http://www.bbk.ac.uk/english/skc/artlaugh.htm (15 June 2011).



motion directly, but output capacity for motion, through transformation. Let us suggest taking the electric, and digitally contrived, IT applications as drivers for our own phantasmatics, with a view to the development of abilities within apparatus and machine operation. They work in the third derivative, as it were, of motion (of things) and velocity (of molecules). They allow us to put the capacities of a multitude of electrical-device mini-motors into various relations. All of these mini-motors are dissimilarly timed in the heads of the multitudinous urban beings. Putting it a bit differently, they are not facilitating, as the machines are, knowledge in the sense of regular and predictable development along the course of things. Nor do they realize knowledge, as apparatus do, for the optimizing of machine knowledge. IT applications start narrating *with* knowledge, by allowing for constellations of sequences, series, and their integrated embeddings into technically based dispositions, which are therefore in this sense real and not purely fictitious, inasmuch as these narratives are distributed in the populations and infrastructurally supported by electronic applications and devices. IT applications provide integratability of individual phantasmata into socially performed rationality, in the old sense of the Latin word *ratio* for "reckoning assessment", and "establishment of proportionalities".

To address this specific potential, it is not enough to move from the epistemics of machines to the diastemics of apparatus; it takes another step, of cogitating about "knowledge" that were able to meet this new gestalt of technics in IT applications and their electronic devices on an equal footing. Such cogitations about knowledge we will term "choreostemics", from the Greek *choreía* for "dancing, (round) dance", referring to an unfixed point loosely moving within an occurring choreography, but without being orchestrated prior to and independently of such occurrence. The point in the without of first-generation technics was turned into a motor by second-generation technics. This may be associated with the shift from a transcendent notion of knowledge to a transcendental one. Now, we may take this evolution one step further. Along the way, philosophical thought has freed itself from the primary assumption of to-be-referred-to identities, having started to view these identities as differences. Choreostemics lets these differences be treated as operative differentials. It stands for knowledge about the motive dynamics within thinking. Its point is no longer knowledge accumulation or production as is that of diastemics or epistemics. Choreostemics is about training a capability of differentiated behaviour within produced and accumulated knowledge.

To carry Serres' generational model further, the two gestalts of machines and apparatus are to be joined by a third, that of applications. These generate and maintain, on the basis of epistemic knowledge, a diastemic space for dealing with such knowledge. However, they shift

orientation of such dealing with knowledge to the social domain, depriving it of its natural anchor point. Said more graphically, everything we have so far sensibly or non-sensibly stated about, or ascribed to, the world, is apt to be symbolically coded and processed as information. This processing sphere also contains the very properties of the physis that is describable through the scientific categories of mass and energy. These properties may themselves be symbolically coded on an atomic level. Furthermore, on the same level and in the same format as the respective coded knowledge about these properties, the properties themselves may be "talked" about as information. Thus, we may print out, in almost unlimited quantity, instances of a combinatorially arranged physis, and compose and configure their properties; when networked, they may form entire landscapes. These landscapes include public utilities, waste disposal, transit systems, goods logistics, telephony, GPS sets, and social media such as Facebook. They develop from electrically interlinked logistics turned infrastructure, and thus are, in a traditional sense, neither ideal nor concrete, neither neutral nor territorial, neither artificial nor cultural.
We shall call them "culturly" ("kultürlich" in German, a combination of "*kult*urell" and "nat*ürlich*") or "urban". They are landscapes of possibility, attainability, accessibility, applicability, tradability, in short, of actualizability. This third generation of technics evolves from electricity as its substrate. Turning now to this electricity-as-substrate, we propound the distribution of technical-energetic instances being brought into wider relations than just that of the topology of installed power grids. The networked distribution of such technical-energetic instances form out into culturly urban landscapes, charged with potential, and culturly urban loci formed from the manifold ways of how this potential actualizes and even materializes. We are now out to comprehend these strangely distributed loci in their dynamics, which are, for a substantial part, driven by the immanent modes of dealing with them and their accommodative culturly urban landscapes. From these dynamics results the heterogeneous structure of our present, increasingly urban, life.

## IV ELECTRICITY

Under the aspect of their formality, these culturly urban loci may well be perceived as abstract in a sense that is comparable to how electricity, seen under the aspect of its formality, may be perceived as abstract. Any concrete loci may be instantiated from this culturliness, as may any form of energy from electricity. Since the closing years of the 19th century, we have experienced no less than an "information-technical" development, to which there is perhaps only one parallel. While Socrates may be credited with initiating that "speech-technical" development that "brought philosophy from heaven to earth",[15] what we have lived since the end of the 19th century may well some day prove similarly momentous.
In Greek antiquity, the combination of enlightenment and city-state, of free speech and its cultivation through phonetic writing and rhetoric, helped to create the foundations for our ongoing understanding of science and philosophy. As demonstrated by the extraordinary importance taken by earth mensuration as well as the *mos geometricus* within every concept of knowledge—both epistemic and diastemic, in our terminology of generational history of knowledge and technics—territorial ordering and structuring, in terms of quantity, scope, and the systematic proportions between them, are basic to the "earthed" referential relations that spring from them. In the same vein, Plato accepted only those into his Academy that were geometry-literate, and Aristotle oriented his invention of systematic treatment of statements in syllogistics based on the way of treating geometrical elements systematically.[16] IT, on the other hand, accelerates a process today that might, somewhat pictorially, be described as vaporizing our semiotic grounds, and our knowledge derived from them, into some purely formally treatable symbolic.[17] Digital codability causes volatilizing of what had been earthed and solid, into a formal "symbolicness" that is not directly lodged in earth, or things, but primarily in the abstract element of the electrical. This has impacts on how we conceive of the composition of reality. Within the electrical, symbols may be treated purely formally, following concept or experiment, within the already comprehended and without, fantastically, and may be printed out and reproduced into any composition of mass, energy, or signs.
This abstractness of the electrical found early notice in scientific discourse,[18] and somewhat later in more popular culture as well—Dick Raaymakers, e.g. a pioneer of electro-acoustic music, published in 1979 a manifesto under the title *The Art of Reading Machines*,

15 Cicero, *Gespräche in Tusculum*. Translated into German by Ernst A. Kirfel, Reclam Verlag, Ditzingen 1997, 5.4.10.
16 Already in antiquity was there a vast dispute around the relation between geometry and arithmetics, relating to the notion of finitude and delineation. A science of physics needs to defend itself against the assumption of infinity in order to be systematic. In order to get a general idea of how in antiquity, the comprehension of a finite cosmos was sought after, cf. the short text by Archimedes: "Über schwimmende Körper und die Sandzahl", in: *Ostwalds Klassiker der exakten Wissenschaften*, 213, Leipzig 1925.
17 For an overview of the problematics of an algebraic (symbolic) treatment of quantities, cf.: Augustus de Morgan, *The Connexion of Number and Magnitude: An Attempt to Explain the Fifth Book of Euclid*. Kessinger Publishing, Whitefish MT 2009.
18 Especially for the discourse around the theory of relativity in the first half of the 20th century, cf.: Albert Einstein, "On the Electrodynamics of Moving Bodies". In: *Annalen der Physik und Chemie*, 17, 1905, pp. 891–921; Herrmann Minkowski,"Raum und Zeit". *Jahresberichte der Deutschen Mathematiker-Vereinigung*, Leipzig 1909. The postulates of special relativity are undisputed today and have, e.g. via quantum electrodynamics, become the ordinary fundamentals in the design of computer chips.

where he mentions a crucial observation he made during his work for Royal Philips Electronics Ltd: "The electrical device essentially differs from the mechanical in that its components do not move."[19] The power-productive principle of early heat machines, as well as of any mechanical implement in general, lies in the movement of its components. "Movement implies freeing oneself from the ground in some way or other"; in mechanical machines, their functioning can be traced to their positioning and the circumstances resulting from it. The synergy of the positioned components is orchestrated via material contact, or, putting it differently, through transfer of energy. Very differently in electrical machines: "When an electrical device is functioning, its insides are charged." Energy transfer is being replaced by energizing or charging with energy. The electrical implement does not function through some link to the ground, but through being disengaged from it. Unlike mechanical machines—the dynamics of which are also due to being "freed" from embedment in the ground, yet constituted just through this reference to the ground—electrical machines pull back from the ground into a shell, and form their own energetic compartment, as Raaymakers goes on to say: "This means the inside, through its electrical charge, disengages itself from the earth and out of its housing […]."[20] The principle of power production from electricity is still none other than that of moving components—electro-chemically, electrostatically, or electro-dynamically; but the principle of encapsulation with regard to the electro-technical does not follow from this role held by movement in classical mechanics.

Even if nothing moves, the electrical current is still present as a driving potential. It moves at 200,000 km / s through grid topology, feeds by now a worldwide technical population of 500 billion electronic implements, and has no doubt become foundational to 21st-century urbanity.

## V SUN

Yet one may possibly be left, as Raaymakers also was, with some unease about one's own fascination with electricity, in case one perceives it as "material", or as "form" of energy. From such a perspective, he noted, "Electricity is the poorest and most exploited of all matter." There is a concrete reason for our insistence upon divorcing electricity from the perspective of materialistic thinking, and perceiving the potentiality of energy in its abstract formality in it. When pursuing this train of thought—admittedly a complicated one—with a mix of openness, scepticism, and pragmatic expertise similar to Raaymakers' in his manifesto, it will lead us in a twofold way towards a modified relation between symbols and energy, or, more familiarly, between what we commonly distinguish today as the key elements of culture and nature. With respect to this distinction, the sun plays, in ever-changing fashion—but at least since Plato and throughout history—a central role in philosophy. Domestication of electricity, as an abstract, formal "recipient" for various forms of energy, also affects the meaning of the sun for our concepts of nature and culture. This has long since become apparent in our talk about artefacts and a kind of artificiality for which we lack philosophical categories that would let us put them in relation with things natural. Perhaps the most crucial thing about artefacts is that the method by which they are being produced has ceased to be a reference for what they mean to us. This referential relation was still extant and relatively unequivocally constituent for the crafts, and for manufacturing, such as in the way smithcraft clearly calls metal to mind. Whereas this unambiguity has long since been cancelled out by technical production and duplicating processes, such decoupling between product material, structure, and capacity, is being taken a radical step further by the electronic printing methods—in this respect, digital printing processes are just indices pointing to a mere formality manifesting itself in a diversity of materials and structures. The products may thus, on an energetic-atomic level, be equipped with capacities or capabilities that not only do not refer to any specific materiality any more, but that are no longer direct references to any materiality whatsoever. The formality from which printing happens consists of digital code, and must first be evaluated through interpretation and then brought into continuous form.

All this quite touches upon the sun's central meaning for all the language games assuming that in the sun's light and its clarity our concepts of knowledge and insight may be organized. However, there is another—and so far much less pondered—aspect that more importantly wants looking into. For the first time in history, thanks to photovoltaics, we are given the possibility of collecting and storing energy from sunlight directly.[21]

19 Arien Mulder, Joke Brouwer (eds), *Dick Raaymakers, A Monograph*. V2_ Publishing, Rotterdam 2008 p. 10 [134].

20 *Raaymakers*, ibid., p. 10 [134].

21 It has of course been possible to use glass for concentrating the sunlight enough to spark a fire, for example, as Archimedes is famously said to have set Roman ships on fire with the help of parabolic mirrors. But thus only a direct effect may be achieved; storing energy from sunlight became possible only with the latter's direct conversion into electricity. And still today, photovoltaics as energy technology is said to be hampered by the lack of adequate storage devices in the form of batteries; however, such difficulties seem not to be of a principle order, but related to the assumption that we depend upon exploitation of scarce energy resources. That assumption discredits any procedure whose efficiency rate is not on the high side. It has long been known, for example, how gasoline may be produced through artificial photosynthesis, literally from electricity, water and air. Audi, the German carmaker, has recently hit upon this as an opportunity for using excess energy produced by wind power—which troubles electricity grids—for producing $CO_2$-neutral gas fuel: cf. http://www.solar-fuel.net (16 June 2011).

The sun permeates our living environment, which we have come to appreciate as nature. This permeation exceeds, not just metaphorically but quite measurably, the quantity of solar energy that is encapsulated within nature itself, and stored in nature's fossil, biophysical and biochemical compartments. Every day, solar radiation transfers to earth 10,000 times humankind's daily energy consumption. By taming electricity, we are for the first time able technically to harvest energy from solar power directly, and not indirectly by resorting to natural resources. Thus, we become capable of encapsulating energy in a genuinely culturly urban sense, and of integrating it into our environments—quite in addition to the solar energy, as whose storage and transformation system we have through science learned to see nature.

Now, this technology possibility has not been with us since just yesterday, but for about the last hundred years. What changed with the more recent information technology, however, significantly affects the production economics of this kind of technics. Photovoltaics can be produced by printing processes and thus is the sole energy technology whose development follows economically the lines of IT: symbolic imprinting at the atomic level, for producing printable solar foils, is likely to be the only technology that will become not dearer over time, but cheaper. Massively cheaper, such as the computer chips over the past decades. In the photovoltaics area, the products of literally symbolic imprinting at the atomic level suggest the evolvement of a genuinely culturly urban energy household.[22] Thanks to solar foils, energy turns into a consumer product. Not in spite but because of this, photovoltaics today represents a very realistic infrastructural option for energy production,[23] however challenging, in terms of sustainability within an overall energy balance, this may be for materialist ethics, which is predicated upon the distinction of *consumption* from *work*.

## VI HOUSEHOLDING WITH CULTURE

Photovoltaics is not only a realistic infrastructural option; in its wake new philosophical questions crop up, which revolve around ideas of abundance. Whereas the idea of abundance has never played a notable role in natural philosophies, it has appeared in economic theory at least since Marx. The acceptation of abundance, however, with which we are dealing here, refers to it as something primary, and ought to be distinguished from any notion of affluence, excess or surplus. Unlike these, abundance is not the outgrowth of a temporary feature of some system benefit—which in a finite system must occur at the expense of another sector. The notion of primary abundance, however, considers abundance as fundamentally indefinite.

Primary abundance is indefinite in the sense that it is a potential not yet rated, which is not the same as being without value or worthless. In this, we see the reference plane for a choreostemic adaptation of the philosophical notion of virtuality. Perhaps this indefinite potential may be described as a potential not endowed with one specific form but arising in the appearance of literally any gestalt. In this very quality, in the actualization of the formality in which it will make its appearance, it seems as yet to be unspecific. Physically, electricity itself may be considered as a formal potential that in random forms can become energy, and, via energy, power.[24] Thus, we are beginning to trace the connection between value and form. "Indefinite" literally means without bound, "undelimited". Undelimited means that the potential is not yet to be brought into continuity. Normally, this is just what forms and values do. As intermediary principles, they move formless potentials into continuity; but they do it traditionally in multiple spheres: values are for calculating and householding, with respect to the stock that may, in "earthed" fashion, be demonstrated, described, represented, secured, and therefore also construed by means of the forms. Forms are, already in other sign practices than that of the digital code, symbolically put up, and detached from their territoriality or materiality.[25] Within the digital code and electricity combination, however, they may moreover be

22 Cf. Ludger Hovestadt, Vera Bühlmann, *The Power Path. A radical pathway from energy crisis to energy culture*. Forthcoming 2011/12.

23 "Solar panels are coming down dramatically in cost per watt. And as a result of that, the total amount of solar energy is growing, not linearly, but exponentially. It's doubling every 2 years and has been for 20 years. And again, it's a very smooth curve. There's all these arguments, subsidies and political battles and companies going bankrupt, they're raising billions of dollars, but behind all that chaos is this very smooth progression," says the futurist Ray Kurzweil in a recent interview entitled "Solar will power the world in 16 years". http://bigthink.com/ideas/31635 (16 June 2011).

24 In this context, it is important to define "formal potential" explicitly as it differs from some other concepts that might easily be confused with it. First, we do not mean that which is commonly referred to as "potential energy". In physics, potential energy is a complement to kinetic energy, and in that combination led to the physical measure of *work*, related to the conservation of a momentum or force, which as a measure proved to be much more useful than Leibniz' initial assumption to the same end, that of a *vis viva*. By mentioning here electricity's potential of being converted into any form of energy, we are not calling either for a revival of the concept of *vis viva*, such as Helmholtz was tempted to do when wondering about the electromotive force in the 19th century. Our interest here is not primarily the physical *conservation* of specific potential, but formal *conversion* of the pre-specific potential. The assumption of primary abundance allows us to make this distinction. The indefinite potential we have in mind for electricity, is a purely *formal* potential and not in need of a physical constant behind it; this is also where it differs from Daniel Bernoulli's principle of *Virtual Work* and from the *d'Alembert Principle*, which together form the core of analytical mechanics worked out by Lagrange—to which we will turn in a moment. For a historical overview of the evolution and interconnections of these concepts, cf.: Jennifer Coopersmith, *Energy, the Subtle Concept. The Discovery of Feynman's blocks from Leibniz to Einstein*. Oxford University Press, Oxford 2011, especially the chapter "A Hundred and One Years of Mechanics: Newton to Lagrange", pp. 91–147.

25 We are thinking here of sign practices in general that raise the claim of systematic formal coherence, from a mutually stabilizing interrelation between arithmetic, geometry, and language, as opposed to dealing with signs in terms of open lists, for example, or inconsistent or incompletable tables.

energetically charged and thereby "bodily" articulated, as it were. This takes place without possibility of securing, in unambiguous, i.e. binding fashion, the anchoring of forms in some reality-related physical. The forms with which we computationally operate can therefore no longer be regarded as naturally "motivated" or "conditioned". Consequently, the bodies created from these forms tumble, as it were, out of the orders perceived as being natural. Putting it differently, their state becomes problematic—today we speak of artefacts in this respect.

This arbitrariness regarding motivation and conditionality of forms is a subject that in 20th-century arts has long since begun to be differentiated, in numerous discussions about abstract forms in painting, open forms in music, in cinematic art about Jean-Luc Godard's thinking forms[26] and Peter Greenaway's distributed forms,[27] as well as in the predominant theme of form-finding in architecture, or in design more generally. In computer science, the unconditionality of forms has indeed become quasi-natural, without, however, being adequately comprehended and discussed in the implications that touch upon the comprehensive topos of "calculability". This arbitrary form-related motivation has by now seeped into everyday life as a matter of course. Today, everybody can do many things. And not only that: everybody can move and initiate a lot. Or, with a pinch of drama, it almost appears as if, against the backdrop of these developments, Aristotle's first cause, that "instance" of *enérgeia*, had, through the millennia but since the taming of electricity at tremendous speed, exteriorized into some kind of "instantaneous logistics". At present, everything believed and known tends to be digitally reconditioned and made accessible as information, for general application and playing-out. Given access to such culturly urban infrastructure, anybody, according to circumstances, may be author, mover, initiator, transformer, educator etc. Regarding such applicability itself, it is unproblematic that, in the information format, knowledge (e.g. with regard to nature) can no longer be easily sorted out from the flickering distortions of the unreliable and its fallacious appearances. In the urban household, values and products are being created from either of them. Today, causes themselves, as intermediary "instances" between form and matter, cannot any longer be adequately separated into being either "metaphysical" or "natural". Those two language games clearly seem insufficiently differentiated for addressing the culturly urban consistency of things, whereby culturly urban consistency means "phenomena caused out of this primary abundance of potential that is as yet without concrete form". Such

26 Jean-Luc Godard, *Histoire(s) du Cinema*. 1998.

27 Peter Greenaway, especially: *The Tulse Luper Suitcases*, 2004, consisting of different films, exhibitions, books, websites, among other formats. In this project, Greenaway presents a history of the 20th century as a biography of Uranium, which of course can only appear in a multitude of forms and formats (this, at least, is one of Greenaway's narratives around this project).



phenomena "are" in genuinely pre-specific fashion, pre-specific to mean neither discontinuous nor continuous. Rather, for such culturly urban consistencies formed out of primary abundance, the only characteristic may be seen in the fact that they are prompted and caused from some exuberance; as phenomena they always forerun the process of their becoming assessable and significant, and are in this sense pre-specific. Above, we referred to this formless, not-yet-assessable potential as virtuality. In parallel to this runs what we have described a choreostemic turning-about from technics as a swing from apparatus and their physical motricity towards applications in and from electronic-logistics networks, the "motricity" of which we described as culturly urban.

It is probably part of the timeless invariance of technics, to push human ability to do into some not entirely positivizable openness or artifice. The attempts at a new symbolization of this incompletability are visible throughout the 20th century.[28] In the modern legacy of "earthed" thinking, the distinction between that which was "realistically" conceivable and that which was to be seen as pure fantasizing, was a central concern of symbolizing this incompletability. The orientation of values took place around the topos of feasibility. Today, a new symbolization of incompletability is about to appear of a kind that relates to the conceivable itself, and the limitedness of our cognitive capacities. Of this, 20th-century philosophical milestones are harbingers, such as Husserl's *"Crisis"*, Wittgenstein's *"Tractatus"*, or Gödel's incompleteness theorems, as well as more recent approaches and their techno-scientific paradigms in brain research on the one hand and fundamental physics on the other, with its attempts at "positive" proof of the Grand Unified Theory of Everything. But as this very example nicely demonstrates, even if stabilizing the feasibility topos as an anchor point is at stake, success is not achievable otherwise than by being geared towards the conceivable for orientation.

The real challenge for householding with culturly urban consistencies in an urban philosophy lies in the fact that "budgeting" them "can" no longer originate in circumstances of natural shortage, but "must" be organized from as-yet-unspecific potential-related abundance. For quite some time now, economic and legal developments, such as licensing, franchising, Open Source, or Creative Commons, as well as the technical vocabulary for their organization, have pointed to the inadequacy of our culture-philosophical notions concerning labour, property and wealth. To a large extent, these go on being locked into

28 The turn to such incompletability shows up in Cassirer's *Symbolic Forms* as well as in the turn to phenomenology and existential philosophy since Husserl and Heidegger, and also within analytical philosophy and its search of delineating realms for legitimate statements about the world. As a topos of its own, this incompletability has been popularized by post-structural and post-modern theories, and more specifically in the schools of cybernetic and system theory and its many currents, all inspired by Cantor's noetic figure of ordinal nesting, which organizes cardinal distributions.

traditional differentiation, between authenticity, in the sense of "Eigentlichkeit" as relating to forms deemed naturally motivated, and inauthenticity or "Uneigentlichkeit" as relating to forms deemed unconditional or arbitrary. This is inadequate for representing and reflecting the problems relative to valuation and investment in the context of culturly urban consistencies. The central role of electronic, IT-related infrastructures of the urban leads to the appeal for an urban philosophy that would be called upon to rethink that relation between "eigentlich" and "uneigentlich", oriented towards a pre-specific, or towards a primary abundance of potential that is not yet encapsulated, or integrated into any form.

We suspect the dynamics between actuality, form, expression, and their bodily manifestations to be at the core of such a philosophy. The capacity for a more differentiating view of such dynamics seems to us of central interest for culture-philosophically embedded, but genuinely urban, "householding"; we suspect it to coincide with the above-mentioned paradigm of choreostemics that is being enabled by today's application techniques and in which the fixed anchor point, or, conversely, the point of initial drive, spreads out as "centrality" across the populations. The experience of such distributed centrality is already commonplace nowadays, and is typically called "mediality". We detect, in the medialization of what to Wittgenstein were still Lebensformen—meaning the "patterns or schemata according to which the members of a community live their lives in deed ["in der Tat"], which give them orientation for leading their lives"[29]—a vaporizing of these Lebensformen into a formality of living conditions. In this medialization dynamics, we witness not only the distribution of the schemata of applicatory performance across the population of the communities, but furthermore also a distribution of that fixed drive and anchor point. As a restless "point", as it were, it spreads across the societal communities and perpetrates its moment, from distribution, again and again in different fashion and different places. In these circumstances, it does not seem exaggerated to say that actuality, or what we are used to describe as such, may happen in different forms. Information, particularly as a technically treatable abstract, plays a constitutive role in these dynamics.

## VII WITHIN THE URBAN

Phenomena presenting this status of "Uneigentlichkeit" were of course always part of the supportive structures of common social life. But with electricity and information technology gaining in importance in our everyday life, these phenomena are taking a supportive part on an infrastructural level too. Since the domestication of electricity, technology has been losing its stabilizing self-evidence of functioning-thus-and-not-otherwise, and becomes variably composable out of mediality. This mediality unfolds within scientific, social, political, economic—or initially "simply" within "logistic"—networks.

In urban research, this tendency has long since been recognized and studied. In his *Theory of Good City Form*, for example, Kevin Lynch introduced a differentiated terminology for analysing, describing and modelling urban dynamics across varying scales.[30]

Working with such a terminology however must needs be guided by an idea of "city" and thereby falls—or rather remains—dependent on philosophy. Today's urbanism distinguishes widely between three big normative city models: the city of faith, city as a machine, and the ecological city,[31] in which varying paradigms may easily be recognized that all refer to relations between nature and rationality, or between philosophy and technology, and the resulting different conceptions of science. Regarding their—perhaps factual rather than explicitly claimed—normativity, these city models follow the notion of a determinant, final or initial, state, whether it be the idea of a holy city, a functioning machine, or ecological equilibrium. Short of achieving its own comparatistics regarding these paradigms, urbanism remains, even while including geographic, economic, political and social characterizations, tributary to some unconsidered "Weltanschauungness"—which explicitly shows in the term "urbanism" and its -ism suffix.

Approaches to an urban theory that are less directly application-aimed than urbanism or urban development, but take social sciences as their starting point, often refer to Henri Lefebvre. His assumption of an urban revolution tries indeed,[32] by way of the noetic figure of urban totalization and particularly with his idea of producibility of space, to break free of the idea of an anticipatable final or initial state.[33] But he merely shifts the problem away from model-relatedness into an historical process; his urbanization process develops along a time-line, from agrarian society towards city, via the Greek *polis*, the Roman *urbs*, the mediæval town, to 20th-century total urbanization. Yet, what makes his approach

29 Michael Kober, "Die Funktion des Begriffs der Lebensform bei Wittgenstein", lecture held at the DFG-Rundgespräch "Lebenswelt in Wissenschaft, Ethik und Politik", organized by Felix Mühlhölzer and Julian Nida-Rümelin 11–13 October 2006 at the Carl Friedrich von Siemens Foundation in Munich. The manuscript is available online at: http://www.nida-ruemelin.de/docs/vortr_kober.pdf (16 June 2011).

30 Among his concepts for speaking about these topics, one finds for example notions like "galaxies", "polycentric nets", "lacework nets", "alternating nets". Cf. Kevin Lynch, *[A Theory of] Good City Form*. MIT Press, Cambridge, Massachusetts 1981.

31 David Graham Shane, *Recombinant Urbanism. Conceptual Modeling in Architecture, Urbanism and City Theory*. Wiley, Chichester, West Sussex 2007, p. 7.

32 Henri Lefebvre, *La révolution urbaine*. Gallimard, Paris 1970.

33 Henri Lefebvre, *La production de l'espace*. 4th edition. Anthropos, Paris 2000. For an interesting discussion of his theory of the production of space cf. Fernand Matthias Guelf, *"La révolution urbaine", Henri Lefebvres Philosophie der globalen Verstädterung*. PHD thesis, Berlin University of Technology 2010, available online: http://opus.kobv.de/tuberlin/volltexte/2010/2537/ (16 June 2011).

interesting is without doubt his assumption of some spontaneity inherent in the arts, a creative act that is part of what he treats under the term of urban poiesis. Thereby, Lefebvre opens the way for an æsthetic-political practice of action, with Aristotelian poiesis still passing in his theory as appropriation of nature *(physis)*. Nature however—according to his strong thesis of urban totalization—to him is not in the first place related to a natural outside, but to the interior nature of the senses, sensibility, sensuality, needs and wishes. Hence, in his meta-philosophy of the urban,[34] to him all poiesis is creation. He assumes a practically unlimited creative capacity that, in his meta-philosophy, turns into the motor of societal development. His thinking thus develops along the lines of reformulating the Aristotelian relation between act *(enérgeia)* and potency *(dýnamis)*. But he pulls it back into the language game of revolutionary development, and his theory therefore fails to integrate productively the challenges of primary abundance; the motorics of the revolutionary is perforce committed to a logic of scarcity and re-evaluations of shortages. The idea of primary abundance, however, as considered here, pre-exists any "valuableness" and is impervious to re-evaluation processes.
Nevertheless, we are going to take up Lefebvre's move towards cogitating the urban, and its enquiring about a dynamic genetic principle of urbanity. But we will not do this within a model of politico-revolutionary thinking, but by looking more fundamentally into the essence of the relationship between philosophy and city. Our proposition is directed at a philosophical architectonics that eschews attempts at defining *arché* as an historical or quantitative pinpoint, but as a mobile point instead, at once moving and being moved as it were, within architectural motorics. Such motorics will then be the point of reference for the choreostemics that, as we suggested, was to accompany the capacities and the potential of today's electronic application technology. We shall submit a concept that might open a way towards acquiring a differentiating manner of dealing with the situation of primary symbolic-energetic abundance. To that end, our architectonic motorics would have to facilitate a comparatistics of Weltanschauungen that would be of great importance for culturly, urban economy-related assessment processes.

## VIII MOTORICS OF SYMBOLS AND ENERGY

Ever since Aristotle, it has been philosophical architectonics' job to assist in the sorting of ideas, with a view to facilitating reliably conceptions of support, stability and order. Herein lies also the fundamental meaning of geometry and its reliability in applicative constructive

34 Henri Lefebvre, *Métaphilosophie*. Editions de Minuit, Paris 1965, here cited from the German translation: *Metaphilosophie*. Suhrkamp, Frankfurt a.M. 1975, p. 43 [orig. p. 50].



thinking. Regarding urban philosophy, it cannot suffice any more to rely upon constructive thinking; indeed, it ought to aim (again) for a more comprehensive concept of cultivation *("Bildung")*. Such philosophy cannot any longer be about house-building, complex-building, or system-building; central place must indeed be taken by ways of structuring and organizing that may be regarded disconnectedly from what is concretely being structured and organized. Figuratively speaking, in an urban environment today it seems somewhat inadequate to say one inhabits a house that may be owned, in the full sense of ownership. Instead, it would be more appropriate to say that, while inhabiting "one's own house", one lives *into* something happening, which was there before one's arrival, and is going to remain after one moves. In this happening of urbanity, philosophy must facilitate notional coordination, and help with learning to differentiate urbanity as such. Its architectonic needs to be able to provide integrity while inhabiting the culturly occurrent.
Agreeing with Lefebvre, we also believe urban thinking must be unshackled from the traditional town / country dichotomy, in which the city had the role of centre of power, order, and society. Architectonic motorics of the urban that, as architectonics, does not aim for construction but more comprehensively at cultivation *("Bildung")*, must cultivate the subtle difference between centralization and mediation, in the sense of tending. Staying for another moment with this technical language game of motorics, let us examine the relationship between a wherefrom-driven and a how-functioning, which had already guided our earlier discourse about technics and knowledge. With urban motorics, this relationship complicates one step further, because now the question about the where is added. A technical engine, we might say colloquially, lives in the world; Lefebvre's revolutionary motorics lives in history; but where are urban motorics to live, such as we attempt cogitating them here?
For our proposition, we shall differentiate the language game of localizability. We phrase the question about the *where*, in accordance with thinking in capacities and capabilities, as a question about the *where-on* and *where-in*. Our proposition of an architectonic motorics of the urban comprehends the electrical as the urban's substrate. Aristotle differentiates his notion of substrate, through a combination of forms, and their dynamics of a fourfold causal theory,[35] into ontologically structurable substances. We would now be foreshortening the issue, were we simply to substitute the notion of information in place of the Aristotelian

35 Aristotle, in the second book, third chapter of his *Physics*, distinguishes four causes for a causality theory (material, efficient, formal, and final). These four causes are not to be taken dissociatedly, they "effect together", inseparably. For an introductory overview, cf. the article in the Standford Encyclopedia of Philosophy: Andrea Falcon, "Aristotle on Causality", in: *The Stanford Encyclopedia of Philosophy (Spring 2011 Edition)*, Edward N. Zalta (ed.), http://plato.stanford.edu/archives/spr2011/entries/aristotle-causality/ (16 June 2011).

forms, and a modern notion of causality in place of his causal theory. This is the very nub around which all problems of a scientific-categorical definition of information turn in circles. Information clashes with both the assumption of universal forms and that of uniform materiality as implied by a modern notion of causality. Let us therefore try to reflect more abstractly about a notional combination that might differentiate the electrical as substrate of an architectonic motorics.

Two main players present themselves for notional-motoric teamwork: symbols and energy. These two pass in different ways—but always in interplay—as being constitutive for the language game about the electrical, as well as those about substrate, and also those about the urban. Let us first look out for similarities. Seen from sufficient distance, both language games, that of symbols and that of energy, seem to be about explicating the possibility of "liability" in dealing with "effectiveness", and admit a shared reference to it. Both deal with apprehending effectiveness, without however sharing similar conditions. In the one case, the liability explicated via the symbol notion is geared around the gravitational centres of "meaning" and "sense", in the energy case around "power" and "drive". The notion of energy traces back to the Aristotelian neologism of *enérgeia*, without however entirely coinciding with it. Aristotle probably derived his notion of *enérgeia* from the Greek *ἄγειν (ágein)*, for "to guide, to lead, to command, to carry, to bring". The Scottish physician, William Rankine, who in the 19th century played an important role in the reintroduction of the energy notion into physics, derives the term from the Greek *ἐν* (*en*) for "in, inside, within" and *ἔργον* (*érgon*) for "work, act, action". The introduction of the notion of energy aims, both in Aristotle and in more recent times, at the opening-up of transformative activity, or of the changeability of the transient world, in a systematic-organizing manner. For all the shifts that intervened between that early metaphysical acceptance of the term and, for example, its more recent, thermodynamic one, energy for us today is still a principle of continuity that must underlie the externality of objective things—energy is neither expendable nor producible, and for this reason its notion allows of physically describing, and empirically testing, change.[36]

Relating to our outlook upon architectonic urban motorics, we shall now look for a similar setup with respect to the symbol notion. Here again, our first question is about the purpose of the notion, and not about a specific meaning. Hence, we turn to a pragmatic variant of dealing with symbols. *Symbola* used to be small clay tablets, or wooden sticks that were broken into pieces for evidencing a legitimate claim for fulfilment of a contract or promise. The term traces back to the Greek *σύμβολον* (*sýmbolon*), a nominalized neuter of *σύμβολος* (*sýmbolos*) for "coincident, something that meets", related to *συμβάλλειν* (*symbállein*) for "to put together, to compare". Putting it abstractly, such *symbola* managed the distribution of effectualities in the social sphere. Over time, there resulted a rich language game in which the current meanings of "sign", "mark", "proof", "contract", "passport", "password" and "code" also play a part. The controllable formal fit among the elements of any symbolics seems to be an invariant of the symbolics notion across time. Individual symbols, by themselves, mean nothing to us—or may, on the other hand, mean quite anything, as any conspiracy plot will illustrate.[37] Symbols must stand in relation to a referential framework, because they gain their significance from a context that must be assumed in order to ascertain the way of dealing with them, of how to "apply" them, as it were. Symbols represent bindingness, needed for orienting the expectation of future developments and for having reasons for counting on anticipating them. Yet, they are not doing this through forms directly; they are achieving a formality by rendering values, formally packaged and "encased", procedural through organizing their formal fit on an arbitrary yet formally coherent basis. Through a distribution principle, they establish a fabric of differential bindingness supported not by firm grounds but by distribution. Within such fabric, proceduralness may emancipate from time-spatial actuality, and be symbolically encapsulated. Of course, this relationship between *symbola* and their referential frameworks has been subject to varied and highly intricate shifts and changes. But even today symbols are being called in—e.g. in mathematical equations—to legitimize or discredit expectations of future developments.

While symbols and energy were facing the separate spheres of nature and culture without being motorically related to each other, they could be treated without their respective symbol-ness and energy-ness ever being thematized. This being so, discontinuities were strictly a matter for one's own brains; in nature, all processes are unquestionably regarded as continuous. If we now try to disengage the thinking about city from the traditional urban-rural dichotomy, it becomes clear that in the urban we are not just dealing with symbols within natural energy-ness, but with symbols within a sphere where symbol-ness and energy-ness intermingle, which we are calling the *symbolic*. Such symbolic, however, cannot be taken as a kind of "nature of the urban", unless remaining entangled in ideological premises. The language games around the notion of nature imply continuity of processes that would be incompatible with the urban values of diversity, freedom of expression, negotiability etc.

36 For an elaborate overview of the reintroduction of the energy notion in modern science, cf.—although no reference is made to the Aristotelian legacy of the concept—Cooper-smith, *Energy*, ibid., especially also chapter 14 entitled "The Mechanical Equivalent of Heat", pp. 246–263.

37 A further aspect related to meanings of symbols becomes apparent here, that of "creed", but without direct relevance here for our subject, as we are interested in the formal aspects.

Let us therefore assume electricity to be a substrate of the urban, and see how far that can get us. To us, however, electricity is not, to be as we have already explained, a form of energy, but a potentiality of energy in its abstract "formalness", which makes electricity into something like an abstract container for *any* possible forms of energy that can be actualized from it.

So let us sum up, and revert to our triple question called upon to give orientation to an architectonic motorics of the urban: what in, whence driven, and how does differentiation of its materialization work? We stick to Serres' idea of relating what can be known at a certain time to what can be done at a certain time, with technics support intrinsic to such doing. Thus, the architectonic motorics does, as we assume, work within and upon the substrate of the electric. So, from where is it being driven? Electronic devices and the applications in which today's information technology finds its gestalt, no longer provide realization in the old sense any more—or so goes our argument—nor do they produce any centrally manageable power capacity as do the engines of thermodynamic apparatus. Rather, electronic application technology channels such power capacity into practical applicability by the many, with many different purposes, interests, intentions. We are therefore not seeing primary physical-energetic motricity in this motricity; rather, we should consider it to be primarily symbolic-energetic motricity. Electronic application technology finds its differentiating driving force in the interest of people who use it to organize their daily chores. Architectonic motorics of the urban folds the fixed point, indispensable for any mechanics, either as an Archimedean point in the without or as a thermodynamic motor, from an earthed and territorially localizable position into the distributed domain of symbolic values. Symbols organize their own effectiveness through distribution, not through reference to some assumed firm ground that was not itself symbolizable in variable ways. Therefore, architectonic motorics of the urban—which as architectonics is chiefly interested in the conditions in which ideas of hold, stability, and order may appear—is not primarily aimed at some construction of "residues" or "stocks" of knowledge, or of the established. Characterized as urban motorics, our architectonics acquires its stability through differentiating these stocks, and in this sense is focused upon a more comprehensive notion of cultivation *(Bildung)*. The more differentiatedly we are able to convert our actions within the urban into sophisticated capabilities to act, the more stable the architectonic motorics.

## IX VALUES

What remains now is the question of the how-functioning of this motorics of the urban. Functioning is always consequential upon the purpose at which it is directed, a fact that poses problems when related to a pre-specific, non-assessed potentiality with which we have characterized our notion of the urban. The prime motive informing the present text lies in the quest for a philosophic attitude towards primary abundance. While such abundance—according to photovoltaics, and electronic energy logistics, in which it is grounded—is a civilization-historical product, to us it is an abundance principle that as such cannot be apperceived following traditional modes of observation. We perceive this abundance principle as pervading our global living conditions with formless potential. Were the phantasma of the perpetual-motion machine not tantamount to asserting independence of the machinal from an external source of energy, one might indeed recognize, in this abundance principle, the principle of perpetual motion. But it sets free a form of potentiality that precedes any valuation and any form, and thereby escapes calculability precisely in the way calculability is being proffered by perpetual-motion machines. The kind of potentiality to be released from primary abundance must be seen as being unconditioned, or in that sense absolute, since being genuinely formless. On behalf of this kind of potentiality, we suggest the language game of virtuality, as will be explained below.

The challenge for philosophic thought of the urban lies perhaps precisely in finding a way out of the perpetual-motion phantasma. Even Lefebvre's ideas of total urbanization remain prisoners of it. He can conceive of his impulse-setting activism in terms of revolutionary dynamics only because his idea of totalization of the urban unhooks the latter from whatever dependency on anything extraneous.[38] In our mind, however, the urban remains kept in constitutive dependency, cultivating culturly urban values as a breeding ground, in the manner of urban agriculture. Design and planning can no longer mutually orient themselves in accordance with some territorial ordering and structuring, as to quantity, scope, and proportion. The usual procedure, of methodically searching for the shortest way as the way of best promise of stability, there loses its immediate bindingness in favour of proceduralizing what passes for valuable. The richness of that which passes for valuable, in this conception lies less in a capacity to conserve the energy-ness of natural-material resources than in conservation of the symbol-ness encapsulated within the cultural-historically grown referential conditions. What passes as valuable for an urban architectonics derives its value from the richness and fertility of the historically cultivated grounds of knowledge and signification, which in their scientific, cultural, artistic, and economical mappings, are prepared within the urban for acquisitive realization by

38 The abundance principle, or so it seems, cannot be comprehended within any thinking of totality, nor within thinking of the absolute, precisely because this unconditionedness remains intrinsic to the constitutive dependency on its own cultivation.

individuals. Thereby, we relate Aristotelian poiesis not to nature, but to the culturly urban richness of the thinkable. We did not describe the urban as a machine for transformation and production of power and power capacity, but as symbolic-energetic motorics cultivating a pervasive flow of virtual and pre-specific potential. The architectonic motorics of such urban aims to expand the scope between the two poles, of stabilizing social community, and of differentiating such stabilities.

Such reflecting about the urban, however, would not be motorics worthy of the name, were it not to be supported by a technological basis. That which is apt to sustain such architectonics must not be dependent upon the moral integrity of individual persons, but must be transferred to some extraneity. Let us remember that information-technological appliances today allow technically supported dispositions to be configured on the basis of information, aptly conceived by James Gleick as *how we can know*. We are tempted to call these ways of giving an account "infra-stories", in reference to the etymology of the Greek word ἱστορία (*historía*) for giving an account of things intuited according to one's own perspectival observation and valuation, which in the late-Latin word *storia* turned into a summary term for "knowledge, history, account, tale, story". In the urbanity conceived here, the technically supported dispositions distribute the infra-stories that they incorporate and as which they are constituted, in sequences, series, and as a fabric of integrations, into the populations. Their sustainability needs to be maintained equally in terms of their architecture-turned-symbolic, or short: technical infrastructure, and their narrativity. The established technics today, operating within the substrate of the electrical, supports the integratability of the individually phantasmal into socially lived-out rationality, in the ancient sense of the Latin word *ratio*, for "calculating estimation, establishment of proportionalities". In this sense, infrastructures in the urban are not just constructive girders to narrations, but are in a constituting manner themselves narrative. In the electrical, inasmuch as an abstract element and nutritious substrate of the urban, large stocks of the historically cultivated grounds for knowledge and signification have already vaporized into purely formally treatable symbolicity. Symbols catalyse values into procedurality by distributing them, formally packaged and encapsulated, into a fabric of differential bindingness. Such bindingnesses today exteriorize themselves in the medial networks which are not only electric, but in their narrativity also medial, and issuing from which the information-technological applications are coming up with technically based narrations for organizing our everyday life. They convey to us modes of conduct of a kind unlike any by which preceding generations of technics, in the form of apparatus or machines, convey modes of conduct to us. In order to allow us, nevertheless, to speak of motorics, we argue that this language game be in orthogonal relation to the described and varying generations of technics. This assumption of motoric orthogonality cannot be entirely detached from the assumption of a language game of continuity, because in whatever way, every intermediation, if to be deemed motoric, demands continuity of that which is to be coherent as motorics.

Are we to stick to our motorics language game then, the challenge consists in comprehending this continuity neither as naturalness nor as any other objective reference, but in its mediality. In contrast to geometric-proportional or thermodynamic-transformative mechanics, which presupposes continuity either as nature or as reference, we cannot presume, on behalf of our motorics, that medial continuity might "earth", in a "containing" sense, the constructs it helps to realize. Much rather, a notion of intermediation must belong to such language game of urban architectonic motorics for which the continuity itself that flows from the intermediation's taking place, is an integral part of the motoric activity it describes. Such an idea of intermediation seems only imaginable within an element of abstract "formalness"; it does not take place through value transfer, as in machine power, nor through value transformation, as in the generation of apparatus capacity. Rather, this intermediation happens through proceduralizing values formally and through proffering the formal procedures obtained thus. In this text, we have set out to comprehend the electrical as such an element of abstract "formalness".

## X INVARIANCES

It is not easy to imagine how one might reflect about change and development setting out from the abstract formality as we have sketched it here for electricity without "earthing" or "territorializing" it from the outset. In that abstract space, starting points, planes of reference, and coordinates for orientation are set with no more legitimacy than that of an experiment. If we do not want to "earth" or "territorialize" that space unreflectedly, we are in a space of general modelling without anchor point. As difficult to imagine as this may be, we are familiar with a quite comparable situation in cultural history. Metallurgists managed to distil substances from rock and prove to themselves—and everybody else—that a certain something that was present in the rock could be extracted from it, and brought into any form whatsoever. Furthermore, this shaping, performed upon metals, i.e. upon the "abstract", is reversible. At that time, people began exploring the phenomenon that things, such as may be found and known by them, and for which they have developed an intuitive feeling from daily interaction with them, may be brought into different consistencies, different-looking surfaces, and different shapes. In so

doing, metallurgists acted in keeping with a notion of invariances.[39] Via this assumption, we may at least distinguish today's materials sciences from earlier metallurgy. For unlike the idea of homogeneous uniformity of matter, the idea of invariances suggests that materials are never, to our understanding, accessible disconnectedly from the variations in which they materialize. We are of course far from advocating, on behalf of architectonic motorics of the urban, resuscitation of metallurgy and the attending alchemy, scientifically speaking.

Nevertheless, we would propose taking that tradition of considering invariances up again, so as to facilitate proceduralized dealings with the values that are being processed and differentiated within our model of an urban motorics. A formal-analytical toolbox for such metallurgy of urban consistencies may be made out, at least embryonically, already in Lagrange's analytical mechanics. Joseph-Louis Lagrange succeeded Leonhard Euler at the Prussian Academy of Sciences in Berlin, and very likely was impressed with Euler's equations with imaginary numbers, and the concomitant abstraction from an intuitive, figurative view.[40] The core idea of his analytical mechanics of 1788 consisted in the breaking down of all constants of system equations into ever-finer procedures. Lagrange has introduced nothing less than a method for generalizing coordinates. On the strength of it, the assumed constants may, in increasing differentiation, be made treatable on behalf of a multitude of variously differential purposes.[41] The difficulty, in philosophically cogitating the city or the urban, lies, as we have seen before, with

39 Gilles Deleuze, Félix Guattari, "Treatise on Nomadology—the War Machine", in: *A Thousand Plateaus. Capitalism and Schizophrenia II*. Trans. Brian Massumi. Minnesota University Press, Minneapolis 1988, pp. 351–423, especially p. 412ff.

40 For a historical account of Leonhard Euler's symbolical strategies for coming to terms with an "algebra of seeing", cf. Wladimir Velminski, *Form, Zahl, Symbol—Leonhard Eulers Strategien der Anschaulichkeit*. Akademie Verlag, Berlin 2009. Velminski sums up what is at issue in Euler's algebra of seeing: "Die Gestalt des Auges wird zum variablen Verfahren, um durch symbolische Operationen experimentelle Praktiken—eine Algebra des Sehens—zu erfinden. Und da Algebra die Kunst ist, aus unbeständigen Gleichungen, Ungleichungen und Identitäten Schlüsse zu ziehen, setzt Euler für Variable Zahlen ein, mit denen er den Vorgang des Sehens fokussiert", p. 229. For a mathematical history of imaginary numbers and their applications, cf. Paul J. Nahin, *An Imaginary Tale: The Story of i [the square root of minus one]*. Princeton University Press, Princeton 2007.

41 Coopersmith elaborates: "Although he doesn't elaborate, this [the "generalized coordinates" VB] is where all the hard physical thinking comes into each new, mechanical problem. One must examine the scenario carefully (whether it be a compound pendulum, a rotating solid body, in fact, any combination of pulleys, levers, inclined planes, and so on) and then use past experience and general physical nous to determine what are the relevant degrees of freedom of the problem. The degrees of freedom are those features that determine and describe all the possible motions of the mechanical system. The generalized coordinates then map out these degrees of freedom. They should form a complete set (not leave any feature undescribed), but they don't have to be the minimum set possible (some amount of over-determination is allowed)." *Energy, the Subtle Concept*, ibid., pp. 136–137. The latter statement regarding relief from granting the minimal set possible is important for our translation into urban motorics, as here one of the troubling questions is how to behave methodically, without relying on the assumption that the "shortest way possible" were the most reliable way, in terms of which method to follow.



the capacity of dealing in an open and open-ended, yet systematic manner with the determinability of initial and final states. It is precisely the determination of such "initial" and "final" states that needs to be proceduralized. And that's what in Lagrange's analytical mechanics is productive for our architectonic motorics. As algebraic mechanics, it neither starts from a known initial or a final state, nor does it treat forces as merely reactive forces but brings them into experimental constellations through the principle of Virtual Work,[42] and is then not compelled to standardize quantitative differences of its measurements in a stochastic-global manner. Lagrange's *Mécanique analytique* deserves great credit for leading mechanics over into the realm of mathematical analysis, and thus for the advent of thermodynamic apparatus. Typically, he writes in his preface: "One will not find figures in this work. The methods that I expound require neither constructions, nor geometrical or mechanical arguments, but only algebraic operations, subject to a regular and uniform course."[43] Had Lagrange, in his reflection about mechanics, not referred to a premise of uniformity, one might indeed say that his principle of algebraic mechanics prepared, in the thinking about technics, a constitutive role for Nietzsche's later notion of *the eternal recurrence*.[44]

In algebraic mechanics, the assumption of invariances constitutes the necessary condition for bringing them, upon the impermanent gestalts of their embodiments, into modelling-induced continuity. Next to Lagrange, it was Leonhard Euler who contributed prominently to the development of the required variational calculus. The reliability of such modelling grows in proportion to the degree of differentiation of the models obtained. The measure of their differentiatedness lies in how many of the variable impermanent gestalts of such invariances may be brought within the model, under one integration, and in stable fashion, into relationships to one another, without the need to reduce

42 The principle of Virtual Work goes back to Johann Bernoulli, and is summarized by Coopersmith as follows: "It applies to systems in equilibrium—in other words, where there is no movement between the parts. There has always been a problem with analysing such systems—it is the fact that there is no movement, an indication that there are no forces present, or are all the forces exactly balanced out?" The principle of Virtual Work allows us to remain undecided with regard to this assumption, and in fact provides a frameset for finding out by testing through symbolic operations: "To a system of variously directed forces in equilibrium, an overall virtual displacement is applied. This results in a set of local virtual displacements at the point of application of each internal force. Each force therefore carries out virtual work that is neither positive [...] nor negative [...]." *Energy, the Subtle Concept*, ibid., p. 128 / 9.

43 cited in: Leo Corry, "The Development of the Idea of Proof up to 1900", in: Tim Gowers (ed.), *The Princeton Companion to Mathematics*. Princeton University Press, Princeton, NJ 2008, pp. 129–142.

44 Nietzsche defined his notion of "Will to Power" as that element from which simultaneously emerge the quantity differences between related forces, and the quality that applies to each of the forces respectively, as long as they are within the established relation. Cf. Gilles Deleuze, *Nietzsche und die Philosophie*. EVA, Munich 1976 [orig. 1962], p. 56ff.

their variability. In today's sciences, these mathematics are importantly used in the research of minimal surfaces, e.g. of soap bubbles. We suspect that in analytics related to our architectonic motorics of the urban, it might play an important role. Because variational-calculus modelling, as starting from the assumption of invariances analysable only by means of surface measurements and their behaviour to one another, works comparatistically within the framework of its models and can be evaluated—at least if it were to be portable from scientific mechanics to general motorics of the urban—literally according to the degree of differentiation to which such modelling manages to integrate the fantastic into the rationalized.

## XI MEDIALITY

Design and planning based, as their dynamic "foundation", on such architectonic motorics, are consequently unable to obtain mutual orientation from some earthed and territorial, quantity, scope and proportion-related ordering and structuring. The idea of identity had been central to such territorial, geometric ordering. By putting the idea of invariances into the philosophically systematic place of identity, we obtain a new referential frame for orienting design and planning: the criterion of fitness of forms is superseded by cross-compatibility of the values behind the formal gestalts of their appearance. We assume in our motorics such compatibility of values to be, via the mechanics of proceduralizing, accessible to variational-calculatory analysing, comparing and construing. Thus, the gestalts of values assumed as invariances may comparatistically be tested for compatibility. The conspicuous advantage of the swap of roles between identity and invariance, as submitted here, lies in the fact that the number and quantity of such values assumable as invariances are not in any principle limited. On the contrary, such role exchange lets us, in open-ended fashion, differentiate and refine values, and develop products from them. In our view, this is a referential framework for householding with culture; from it we shall see emerging, on behalf of choreostemics, the anchor point apt to give direction to that third gestalt of the technical that we postulated for electronic appliances.
Of course, off-hand it might seem obvious to associate the unfamiliar notion of invariance with technical schemata, types, templates, print forms and the like. But that would mean foreshortening the issue and regressing to identity-logical ways of thinking, because the characteristic of these concepts is precisely to make identical things technically reproducible; in this way they are indeed prevented from proceduralizing their cultural value—they particularize it.
As we know from Lagrange, the notion of invariance is borrowed from formal-scientific discourses. There, however, it is *not* representative of reproducible shapes, but is used for treating quantities that are not conceptually treatable as numeric values—e.g. the numeric values set in applying Lagrange's generalized coordinates are set out of purely symbolical considerations.[45] Their invariability is being assumed so as to enable systematic treatment of measurable gestalts as variations of such modelled invariance—hence also the descriptive term for such processes as "virtual work".
The proposed role swap moves, via the notional couple of identity and invariance, the notions of individual and quantity into interesting proximity. The two notions, that of individuality and that of quantities, share the primary fact that they are referring to some not entirely positivizable "consistency". They thereby postulate a consistency that might neither be taken purely quantitatively, as generalness, nor purely qualitatively, as special expression.
From the relation between individual and quantity, new roles may be foreseen for the mediating language games of values and shapes, by which we shall now be in a position more accurately to describe our motorics. Traditionally, forms are considered to be means of bringing measured values into proportional continuity. From this capacity of the forms, geometric mechanics are evolving. So, what is the appearance of such mediation when seen in the light of algebraic mechanics? It seems to be crucial to extricate ourselves from the language game of mediation-as-"imprinting", or "transmission", and to encourage a language game of mediation as "proceduralization", with some analytical mechanics as starting point. So we shall assume, on behalf of such mediation language game, invariances that we take to be embodiments of consistencies that are never positively, but only differentially determinable. This is not an unusual assumption, and different ideas of approximation logics are normally applied to such analysis. But we are looking for another way, since the idea of approximation remains bound to identity thinking. Thus, let us assume that these "bodies" of invariances as such are not positivizable, they just appear, in the gestalts in which we perceive them, supported by our encoding and decoding habits and expertise. The gestalts of these embodiments become apprehensible only through interpretation, by being brought into continuity with what we know, and what we are thus able to see in them.
Without doubt Henri Lefebvre's thoughts, with the notion of the producibleness of space as a situation generated through creative action, followed the same direction in his theory of total urbanization. But short of carrying formality algebraically-symbolically further and thereby stabilizing structures intended for symbolic encapsulation and integration of released impulses, such dynamics cannot but end in explosive incandescence.

45 Re problems surrounding number and quantity, and the intermediary role of measuring the in-between, cf. Augustus de Morgan, *The Connexion of Number and Magnitude: An Attempt to Explain the Fifth Book of Euclid*. Kessinger Publishing, Whitefish MT 2009.

## XII DOUBLE ARTICULATION

If algebraic-symbolic cogitation on formality is to be carried another step further, then it is neither in its symbolically expressed form nor its approximatable-scopeness or, as it is often termed in analytical logic, as an extension. An approach that is pointing to a further degree in abstraction may be found in Louis Hjelmslev's algebraic semiotics. His noetic figure of "double articulation" sought to set the notions of content and expression into mutually constitutive relation.[46] Gilles Deleuze and Félix Guattari then imported Hjelmslev's concept from linguistics and developed, in their text called "Géologie de la morale" (geology of morals),[47] a philosophic language game about formality within the framework of analytic invariance-thinking about values.[48] They generalize, for use in philosophy, Hjelmslev's differential relation of linguistic content and expression, into a relation between "form" and "substance". This justifies my reading here, in which I link their notion of "double articulation" with their remarks about metallurgy,[49] and the

46 Louis Hjelmslev, *Prolegomena to a Theory of Language*. Trans. Francis J. Whitfield. University of Wisconsin Press, Madison 1961. Cf. the adaptation of this noetic figure by Deleuze and Guattari: "The first articulation concerns content, the second expression. The distinction between the two articulations is not between forms and substances but between content and expression, expression having just as much substance as content and content just as much form as expression. [...] There is never correspondence or conformity between content and expression, only isomorphism with reciprocal pre-supposition. The distinction between content and expression is always real, in various ways, but it cannot be said that the terms pre-exist their double articulation. It is the double articulation that distributes them according to the line it draws in each stratum; it is what constitutes their real distinction. (On the other hand, there is no real distinction between form and substance, only a mental or modal distinction: since substances are nothing other than formed matters, formless substances are inconceivable, although it is possible in certain instances to conceive of substanceless forms.)" Gilles Deleuze, Félix Guattari, "The Geology of Morals", in: *A Thousand Plateaus. Capitalism and Schizophrenia II*. Trans. Brian Massumi. Minnesota University Press, Minneapolis 1988, pp. 39–74, here p. 44.

47 *The Geology of Morals*, ibid.

48 They do not themselves call it this, but refer to the aspect of relative invariances within what they call "a function of stratification". Their interest is to think about variance and variability in a way that does not rely on any identity notion. Cf. for example: "Even though it is capable of invariance, expression is just as much a variable as content. Content and expression are two variables of a function of stratification. They not only vary from one stratum to another, but intermingle, and within the same stratum multiply and divide *ad infinitum*. Since every articulation is double, there is not an articulation of content and an articulation of expression—the articulation of content is double in its own right, and constitutes a relative expression within content; the articulation of expression is also double and constitutes a relative content within expression. For this reason, there exist intermediate states between content and expression, expression and content: the levels, equilibriums, and exchanges through which a stratified system passes." *The Geology of Morals*, ibid., p. 44; or more straightforwardly: "A stratum always has a dimension of the expressible or of expression serving as the basis for a relative invariance", *The Geology of Morals*, ibid., p. 43.

49 Which they develop in another chapter of the same volume: Gilles Deleuze, Félix Guattari, "Treatise on Nomadology–the War Machine", in: *A Thousand Plateaus. Capitalism and Schizophrenia II*. Trans. Brian Massumi. Minnesota University Press, Minneapolis 1988, pp. 351–423.



notions of "singularity" and "*haecceitas*" which they use in that context. Broadly speaking, each of these notions belongs to a different line of philosophic discourse. "Singularity", in more formal and measuring theory discourses, means one singled-out relation, one that is applicable to just one field, and not liable to generalizing exportation. "*Hæcceitas*" on the other hand, was introduced, among others, by Duns Scotus for emphasizing the individual features of an object as opposed to its general properties as an element of a class. Singularity, for example, means for Deleuze and Guattari a physical-nomological index, such as the melting point of some specific material, whereas "*hæcceitas*" means instances that are generated through dealing with such indices. In consistency-metallurgy, which they are thus heralding, each technical poiesis always plays in several such varietal lines at the same time.

Thereby, the narrowing that traditionally attends the notions singly can be avoided. On the one hand, individuality can be released from marginalization, seen, under formal aspects, as a shortcoming inflicted upon individuality because there is no scientific discussion of singles. On the other hand, the idea is to pry individuality loose from being mystically-praisefully exalted to perfection, meant to be exclusively experienceable, and in no way expressible.

This, then, is the way of dealing double-articulatingly with the formality issue of culturly urban consistencies. Such consistencies as are being mined, by the Deleuzean-Guattarian noetic figure of the geologist of morals, from culturly urban sediments, and reprocessed for ulterior use, are then, after the erstwhile metallurgists' fashion, pre-specific in a radical sense. This pre-specificity constitutes their virtual status, as a potential value that is only consecutively and procedurally determinable in the course of acting according to that value in the way being determined *in actu*. This sounds rather abstract. But by recalling today's gestalt of the technical as electronic appliances, we find many examples of pre-specific value and their virtual meaningfulness. The architectonic motorics that is at the centre of our investigation here is being driven by way of applying what we may learn to know, surmise, and esteem.

## XIII CODA

The real question now, as posed for a philosophy of the urban as architectonic motorics, is how this energetic flow of undifferentiated potentiality might be encoded and symbolically integrated, so as to allow differentiable capacity to be gained from it that is apt to be developed into ability, proficiency and artifice.

Our initial question was how hedgehog cunning and hare performance might be put in reference to each other without giving precedence to either. The gist of the tale was the competitive situation between

the capacities-related principles of distribution, symbols and discontinuity on the one hand, and that of mobility, energy, and continuity on the other. The reconciliatory question, of how to deal with both of them, may now be rephrased to how to virtualize values we consider as actual and binding—a potentially life-saving point to the hare, or at least dignity-saving. For it would have let him forget his physical superiority, and perhaps see through the hedgehog's ruse. On the other hand, and complementarily, there is another question coming up: of how to gain something potentially actual from something virtual. After all, it is neither easy nor evident, sign-technically speaking, to deal with an unfair-contest situation by displaying one's self as specific "information", and thus to turn the fairness issue upside down and regain the upper hand in an uncomfortable situation.

### INDEXICAL MARKINGS OF THE TOPICS DISCUSSED

These summary discussion threads relate to the lecture "On the Question of Constructing within the Symbolic", which was presented by Vera Bühlmann at the first Metalithicum Conference, and which forms the basis of this text.

A first discussion thread developed around the topos of networks and their topologies. It was considered to what degree each instance of speaking of networks must always already include a specific dynamic as a constitutive dimension. The discussion went that if such a dynamic were excluded from considering networks, it is possible to speak seemingly much more clearly, in the familiar language of games of structure, frameworks or the like, about the idea of networks, which is still very vague today. These familiar language games were identified as being part of the direct tradition of geometric mappings, however, which form the basis of a classical-mechanical understanding of dynamics, and which therefore are conceived on the premise of initially static conditions. Several views focused on the degree to which descriptions of static conditions can at all be assumed as adequate when dealing with networks; respectively, how to deal with the fact that such static conditions, when considering networks as networks, in their dynamics, can only be attributed to them—but can never be "observed" objectively, in an uninvolved manner. The situation is similar to that which had led to Lagrange's algebraization of Newtonian mechanics—namely the question of how the stability of dynamic systems at rest can be tested, without knowing in advance whether the apparent resting state can be understood as static or instead, whether a subtle temporary balance of the system's constitutive forces is responsible at that moment. As was discussed, there is a dependency on dynamic systems between the ascribed state descriptions, the interests that prompt an investigation, and the observer's patterns of expectation. If with all due caution, prematurely dismissing the language game of the networks altogether were to be avoided, some interesting questions arise that apply specifically to the established noetic schemes regarding causation, causality, determination, tendency, intentionality or the like.

An additional discussion thread developed around the topos of a genealogy of mediality. As was discussed, mediality has been closely linked with the inquiries into the capacities of objects, animals and people since ancient Greece. Even if the current format of the medium now has very little to do with earlier occult formats—from visions and revelations, inspiration, the muse's kiss, to the obsession with and the idea of the romantic cult of genius in terms of an artist's ingenious, therefore incomparable singularity of thought—mediality and media's influence on an individual's thinking is nevertheless still a topic today, for example in the areas of education and information. It was discussed if, and in what sense, the idea that it might not only be possible to train one's

cognitive abilities within a naturally given disposition of capacities, but that it might also be possible to learn how to expand, compose, refine these dispositions themselves, poses a challenge to the values of enlightenment, for example in societal institutions of education in their established forms. In sometimes very heated discussions, differing language games were considered for this re-emerging philosophical dimension of capacities and capabilities, and especially also the role of technology therein; it was suggested for example to consider an "unsettled capacity for thought", or an "intervention of novel disponibilities of cognitive capacities".

A third discussion thread developed around the topos of a concept of continuity. In particular, the discussion centred on how to find a way out of the discursive calcifications that arise from schemas of linearity, circularity or an absolute break within historical thought. At stake are two incompatible postulates: on the one hand the assumption that the past and future can be seamlessly reconstructed, and on the other, the assumption of a possible innovation, caesura, a starting era, or the assumption of modernity. The discussion as to whether and to what degree the concept of the symbol can be rendered productive in order to emerge from a dialectic view of continuity and discreetness was relatively controversial. Regarded from an application oriented or operational perspective, the concept of symbol has always been involved, as Bühlmann argued, allowing the conditions of continuity to be created. *Symbolon* (symbol) generally means "that which is thrown together". According to this view of the conceptual history of the symbol, this concept has always referred to a situation that is constituted by an initially unsettled and dynamic event. A *symbolon*—in the Greek sense of a guest label, or carrier of another contractual agreement, only functions by investing a tear or a discontinuity with meaning and by indexing it for verifiable agreement. In this ancient concept of symbol, the discontinuity itself can neither be reduced to a break (which it is) or as a merging (which it is as well), but instead, it allows a handling method, an operability that simultaneously produces that which it wishes to secure—without its being assumed to exist independently of the implementation of this handling method. The discussions focused in particular on how these specific operational capabilities of symbols could methodologically be integrated into a broader values debate. Opinions were especially divided on these points. In summary, it can be argued that if a sign-interpretive rather than an operational perspective is selected, the genealogy of the concept of symbol is cast in a light that appears to threaten hermeneutic-contemplative semiotic-theoretical thinking at its core: if the symbolized relations of reference are granted a positivity, as a universal value for example, as an archetype, a thought-form (and not a figure of thought) or the like, they indeed arrest the process by which the meaning of signs emerges as open, yet analytically accessible, semiosis. A consideration of the operability of symbols, however, as Bühlmann counters, is like a semiological perspective as well, directed against the assumption of a positivity of referential relations. Yet the application-oriented, operational view of symbols attempts to align itself with the "effects" which, as a result of an interpretive signs practice, inevitably keep arising, appearing, and challenging.

A fourth discussion thread developed around the topos of "projective construction", or "acting by designing". The dynamics, to which the *symbolon* ("that

which is thrown together") refers, is one of throwing. From an etymological perspective, the Latin term "to throw", *jacere*, constitutes the central word stem for the concept of "object", of "subject" and of "project". In this sense, for every composition or design, a projective or an investing, credit-giving plan would have to be considered constituent. The concept of symbol in Bühlmann's presentation suggests dealing with this by way of an active indexing or placement of markings. Certainly the liability of this kind of concept of symbol can only result through the ceasing or missing acceptance of what was meant. Projective design is formative, in this case, because it must involve the acceptance conditions in its design. These discussions are also controversial. In particular, a more administrative perspective following Heidegger's postulate of an "axiomatization of composition / design" was cited against the operational concept of the symbol, and its pointing in the direction of design thinking conceived as a way of economic cultivation.