Deleuze-chantier
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DIAGRAMS AS PILOTING DEVICES
IN THE PHILOSOPHY OF GILLES DELEUZE

The tenacity with which Deleuze returns to scenes of meaning that combine language and geometry shows itself in the organic metaphors he uses to plot his conceptual terrain. However, it is above all the diagram that provides the piloting device for his continuous mapping of conceptual topography. If we wish, we may compare the place given to diagram in the graphic laboratory of his writings to Heidegger's work on conceptual topoi. But since the diagram can evade such a hermeneutic strategy, it is better approached in the daily traffic of science and technology where diagrams appear so common that they are rendered invisible. Here, diagram plays a double role by displaying axiomatic rigor at the same time that it works as an agent for reconceptualizing or reconfiguring knowledge. For Deleuze, diagrammatics — perhaps even a diagrammatology, if we think of a project directed toward the ways diagrams function in multiple forms of discourse — emerges from the Montaigne-like setting of his writing that asks how meaning becomes shaped before our eyes. Whether we consider his readings of Kant, Spinoza, Leibniz, Nietzsche, Bergson, Proust or Kafka, we find not simply a revaluation of the history of thought but a comparative discourse that challenges readers to trace the shifts, jumps, and slips encountered as one moves from one symbolic form to another. Rather than conceptual trajectories of individual biographies, Deleuze's readings track a surveillance of the cross-mappings that enable his own work within the traffic of concepts.
The ways in which diagrams work to convey meaning are in ample evidence in the daily practice of mathematics even though the graphic operations through which mathematics is taught and thought are often pushed to the margins of the history of the discipline. Diagrams hardly stand as isolated figures but are placed within a narrative setting. They become — or are intended to become — part of a structured argument. We may think of mathematics as a process of building logical modalities that entail the representation of diagrammatic space. It is quite true that our scientific conception of space is thoroughly mediated by diagrams. Just as we can define a taxonomic structure for the genre of story problems, we can identify categories for diagrams. A broad distinction can be made between ephemeral and professional applications. Doodling on a napkin, or the ideosyncretic systems of a Feynman are in a category separate from the diagrams of textbook traditions. Even here, however, it is not possible to make a rigorous distinction. And indeed it would appear that rigorous distinctions will become increasingly difficult as we follow diagrams into the experimental space of the monitor. Whether one looks at Tartaglia, Galileo, Newton, or Leibniz, ephemeral manuscript diagrams — napkin doodling — are placed in the realm of biography rather than that of mathematics. This is a mistake because it removes the site of invention from mathematical discourse. Not surprisingly, the success that mathematics has had in pushing away its narrative and graphic material has contributed to its mystification. By mapping the ways meaning emerges from our diagrammatic shaping of conceptual space, Deluze not only suggests strategies for demystifying mathematics but provides examples for a cognitive discourse that traverses multiple disciplines.

After looking at several settings that are necessary for an inquiry about Deluze and diagram, I turn my attention to Deluze's archeology of Baroque diagrammatics. My comments conclude with several observations on the ways in which the concatenation of diagram within architecture provides means for approaching a discourse on technology.

I. A Setting for Diagram

The first extensive reference to diagrams occurs in A Thousand Plateaus (1980) where it appears in an inventory of semiotic tools useful in a project of intellectual cartography. Diagrams are simple drawings or figures that we think of or think with. The idea of thinking through a diagram is crucial not only because a diagram provides order and stability but because it is a vehicle for destabilization and discovery. Just as a rich terrain is negotiated between the different meanings of the word plot in English, multiple valences surround the word diagram or diagramma (διάγραμμα) in Greek. The root verb of diagrammat (διάγραμμα) does not simply mean something which is marked out by lines, a figure, form, or plan, but also carries a secondary connotation of marking or crossing out. Such a meaning is inherent in the word διάγραμμα (in contemporary Greek the verb διάγραμμα means to write someone off). The connection between marking figures and making them disappear is more than a phiological curiosity because it suggests writing on a wax tablet where writing with a stylus would involve crossing over the marks that had been drawn previously. In this sense, diagramma embodies a practice of figuring, defiguring, refiguring, and prefiguring. What is interesting is that diagram participates in a genealogy of figures that moves from the wax tablet to the computer screen. From a phenomenological vantage point, the Greek setting of diagram suggests that any figure that is drawn is accompanied by an expediency that it will be redrawn. Within such a dynamic framework, such expectancy must also be accompanied by an understanding of the ways in which diagram can shift in status. Here diagram may be thought of as a relay. While a diagram may have been used visually to reinforce an idea one moment, the next it may provide a means of seeing something never seen before. Because diagrams mark a gesture or momentum toward definition, they function as vehicles that enable and invite elaboration through narrative. It is also quite appropriate to think that diagrams provide vehicle for seeing how visual discourse is actually comprised of a genealogy of figures that trace the generation of meaning. For example, a map might be thought of as a diagram that has forgotten it is doing work. We may even extend this idea to artifacts that become used as examples. An example might be approached as a diagram that has been discarded after it has been «thought through». There are important implications here because the agents thought of within the setting of distributed cognition may have very different valences depending on who is using them.

For Deluze, the diagram drawn or printed on a page remains a relay or transitory vehicle to other structures within the cognitive process. Although the meaning of a diagram can be framed by its setting, its meaning enforced by the narrative in which it is placed, it may also serve as an agent for conceptual mapping. As a consequence of the linkages it creates, Deluze and Guattari call the diagram an abstract machine:

Defined diagrammatically in this way, an abstract machine is neither an infrastructure that is determinative in the last instance nor a transcendental idea that is determining in the supreme instance. Rather it plays a piloting role. The diagrammatic or abstract machine does not function to represent, even something real, but rather constructs a real that is yet to come, a new type of reality. Thus when it
constitutes points of creation or potentiality it does not stand outside history but is instead always « prior to » history. (Deleuze and Guattari, 1980, p. 142, my emphasis)

Contrary to any preconception that would limit diagram to pedagogy as a form that might be used to graphically encase an argument in geometry, Deleuze stresses the way that diagram functions as a vehicle that engenders pronouns or that sees into the future by intimating a horizon of thought. Rather than sequestering or polluting the diagram in an axiomatic grid, Deleuze repeatedly emphasizes the ways diagrams work to generate a kind of cognitive sweep that extends the possibilities of thought. Yet it is the axiomatic control of diagrams within mathematics that both situates and controls whatever presuppositions we may bring to them.

Mathematical writing systems were axiomatized, in other words, restatified, semiotized, and material flows were rephysicized. It is as much a political as a scientific affair: science must not go crazy. Hilbert and de Broglie were as much politicians as scientists. They reestablished order. An axiomatization, a semiotization, a physicalization, is not a diagram but in fact the opposite of a diagram. (p. 143, my emphasis)

Diagram's potential « to drive science crazy » sharpens its importance. From a Latourian vantage point, the diagram may be defined as either a stabilizing agent within ready-made science or as an agent that combines both rhetorical and instrumental functions within a domain of science in the making. Deleuze would focus even more on the schizophrenic identity of diagram and see it as an agent that could carry both identities at the same time. The double role that diagrams embrace as piloting devices should be related to the earlier discussion of signifying chains in Anti-Oedipus (1972). Recognizing Lacan's own interest in mathematics and with topology in particular, Deleuze and Guattari stress the ways that non-Euclidean geometries offer a revelatory vehicle within the psychoanalytic process. 

It is an entire system of shuntings along certain tracks, and of selections by lot, that brings about partially dependent aleatory phenomena tending close resemblance to a Markov chain. The recordings and transmissions that have come from the internal codes, from the outside world, from one region to another of the organism, all interweave, following the endlessly ramified paths of the great disjunctive synthesis. If this constitutes a system of writing, it is a writing inscribed on the very surface of the Real: a strangely polyvalent kind of writing, never a discursive one; a writing that constitutes the entire domain of the « real inorganicism » of the passive syntheses, where we would search in vain for something that might be labeled the Signifier — writing that ceaselessly composes and decomposes the chains into signs that have nothing that impels them to become

The reference to Markov chains resonates with subsequent references to « schizophrenic mathematics, uncontrollable and mad desiring-machines » (p. 371-372) and Cantor's struggle with insanity: « every child is a little scientist, a little Cantor » (p. 100). Here Deleuze and Guattari remind us of the ways the study of mathematical pedagogy complements developmental psychosynthesis. Although the point had been clinically established by Piaget and others, Lacan refocused attention on mathematics, and particularly non-Euclidean geometry, as another point of access for psychoanalytic discourse. Attention was focused as well on the tension between mathematical play and the axiomatic control required by a rigorous, professional mathematics. As Foucault was showing at the same time, the history of discourse is replete with the legislation of what are deemed acceptable forms of human expression. An example of tension between practice experienced as liberating and shameful appears in the random movement of images recorded by Montage, for they could appear as a symptom of instability or as an insight into the mental process. In a similar way, the generation of diagrams can hover schizophrenic-like between mathematical discourse and something emerging that remains to be defined. As vehicles that both carry phenomenological momentum and trigger mechanisms that strive to control or direct their application, diagrams mark important sites for the intersection of invention and control. As such, the diagram may be compared to linguistic forms such as metaphor. One practical consequence of such inquiry is the development of projects that open mathematics to developmental psychology and phenomenological analysis, in the recent work of George Lakoff (cf. Lakoff and Nunez, 2000). Finally, diagrammatism does not pertain only to the use of drawings in scientific or technical discourse but identifies a cognitive inquiry into the use of graphic figures in the mediation of meaning. From such a vantage point, figures are not neutral but reveal matrices through which meaning is negotiated on an individual and social level. Because they identify the cognitive space in which meaning is generated, they can both personalize and socialize meaning. What the Renaissance regarded as thinking in pictures is not simply allegorical but an indication of pattern recognition and pattern manipulation in the cognitive field. Although diagram may be used in private ways, it is also frequently a component in distributed cognition (cf. Hutchins, 1995).

The question of how we navigate in our cognitive experience of the texts we read becomes reworked in What is Philosophy? Here concepts work as extensions of diagrams and begin to work within imagined mental landscapes. As
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envisioned by Deleuze, the planes along which our thought occurs are constructed through our experience of reading and thinking and are often inhabited by mental figures that participate in our own logodramas. My own cognitive constructions of Montaigne or Deleuze would be examples. According to Deleuze and Guattari, «[e]nceptual personae are thinkers, solely thinkers, and their personalized features are closely linked to the diagrammatic features of thought and the intensive features of concepts» (Deleuze and Guattari, 1991, p. 69). The personified figures animating philosophical discourse from the Roman de la Rose to the dialogues of Leibniz remind us that what Deleuze has in mind is not unusual. His emphasis shows that such personifications are omnipresent in our mental worlds and that their presence marks nodes that we connect through the agency of diagram. Philosophy itself depends on the continuous diagrammatic plotting of concepts:

Philosophy presents three elements, each of which fits with the other two but must be considered for itself: the prephilosophical plane it must lay out (immanence), the person or personae it must invent and bring to life (insistence), and the philosophical concepts it must create (consistency). Laying out, invention, and creating constitute the philosophical trinity — diagrammatic, personificative, and intensive features. (p. 76-77)

Since the practice of philosophy assumes a continuous interaction between writing and thinking, philosophy appears not unlike the writing of a novel or drama, where the development of thought also takes place in stages. What is striking is that diagram has a function analogous to constructing a plot for a narrative argument. Once diagram has completed its prephilosophical task of mapping a conceptual space, the diagrammatic nodes must be animated with figures who speak in coherent and consistent dialogue.

Although Deleuze refers frequently to mathematics, it is especially his colleague Gilles Châtelet who bring meticulous attention to the diagram in the archaeology of geometry in his book Les Enjeux du mobile (1993). Châtelet's book is remarkable exactly for the ways it would have readers recognize the contortions embodied in a history of mathematics written from the vantage-point of theorems rather than from a combination of theory, practice, and application. In effect, for Châtelet, our relationship to mathematics has been explained only halfway. To activate our understanding of intuition, invention, and discovery in mathematics we need to relearn that the space of mathematics has been mediated not through theorems but through diagrams. By arguing that mathematics embodies a rich display of cognitive patterns, Châtelet creates an archaeology of geometric diagrams that resonates with generations of work. Certainly, one ground is provided by neo-Kantian epistemology (Cassiret), another by the efforts of phenomenology to describe mathematical operations (Husserl, Merleau-Ponty, Bachelard, Heidegger, Derrida), and another by the pragmatic semantics of Pierce. Michel Serres (1974) and more recently Brian Rotman (1993, 2000) also mediate these questions. A further setting for the work is provided by visualization within our evolving electronic environments. Although it may initially appear a misstep to compare Châtelet with Derrida, I think the comparison not only appropriate but instructive. A major feature of Derrida's work is his ongoing conversation with mathematics, represented in his commentary on Husserl's Origins of Geometry. But while Derrida's project has involved language and the multiple strategies that have been used to encompass language, Châtelet's project involves the ways entailment has worked in the description of geometric space. Both are drawn to moments in which the use of language or mathematics becomes self-referential. Both are interested in graphology or the technologies we create not just to remember but through which we think. For Châtelet, in particular, diagrams work as prosthetic devices that become vehicles of intuition and thought.

In his preface to the first edition of the Principia (1687), Newton writes that geometry is «founded in mechanical practice» (Newton, p. 10). Even though he literally means that geometry relies on the manual arts, Newton's discussion shows that he believes that such mechanical ability ultimately depends on one's capacity to comprehend natural law. In other words, one's mechanical ability to draw is shaped by one's capacity to translate God's graphic presence in nature. The Newtonian mechanic takes inspired dictation. Newton's argument is all the more remarkable given the extraordinary degree to which he is obsessed by the graphic representation of his own thought. The almost continuous celebration of Newton's axiomatic accomplishment and its separation from his own obsession with the mediating presence of writing technologies is symptomatic of the histories Deleuze and Châtelet would reopen. For from being a simple register of a mechanical process, diagrams work as a means for mathematical discovery. What Newton ascribes to metaphysics — and what has become a factor in the mystification of mathematics — is rather a manifestation of his interaction with the shapes, marks, scribblings, sketches on the paper now before us. What often is taken for granted — what was regarded as «scratch paper» — becomes a significant means for mathematical exploration. It is revealing that, at the same time that Newton assumes a transcendent authority and even authorization for his work, his own manuscript work is filled with masses of scratch paper. Indeed, from the vantage point of seventeenth-century mathematics, Leibniz's own fully conscious and active
interest in the importance of the graphic media used in thinking marks an important difference between his work and Newton's.

Work with diagrams hardly occurs in isolation but is a practice that involves a complex interaction of patterns. The complex field in which such modeling occurs may be compared to reading that cannot be reduced to grammar but must include the ways we process the metaphor clusters through which we move (cf. Knoespel, 1999b). Metaphor is not a figure as much as a vector or plot line which takes in an amount of space. In the layering of concepts explored by Deleuze, diagrams function as vectoring tools that probe meaning by testing or suggesting connections. With this topographical survey of Deleuze's mapping undertaking in mind, I will turn my attention to a particular study that takes us further into diagrammatic fieldwork.

II. Diagrams and The Fold

Through its very title, The Fold (1988) acknowledges a metaphor long used within Western hermeneutics. The multiple variations on the word « fold », as either an infinitive or a noun, refer to the allegorical practice used to formulate levels of understanding that could be manipulated by sharing with a select group the particular code that would permit a figure or entire narrative to reveal special meanings. As explored by Deleuze, the practice of folding extends well beyond its defining use within classical rhetoric, to function as not so much an interpretive method as an active formulation that includes multiple levels of discourse. The Fold shows Deleuze engaged in a practice of slicing through the Baroque archive in ways that embody the very practice for which he had celebrated Foucault (cf. Deleuze, 1986). Again and again, Deleuze asks his reader to connect matter from multiple landscapes. The book is not, however, a heterogeneous collection of images but is remarkably ordered. Its order comes in part from an accumulation of references to the Baroque that work as vehicles of familiarization, in part from the developed allegory of a Baroque building. Above all, order comes from its strategy of shaping a multitude of diagrams that form a progression of piloting devices which seem to fill the air almost as vapor trails that suggest a movement in the sky.

Deleuze maps the Baroque through his reference to aesthetics and a history of styles. A partial list of references includes: Tintoretto (p. 30, 75), El Greco (p. 30, 34, 122), Caravaggio (p. 31, 115), Wölfleln (p. 32, 123), chiaroscuro (p. 32), Uccello (p. 34), Manerism (p. 36, 53, 56, 67), the Baroque concetto (p. 42), Lanfranc (p. 121, 124), Il Rosso Fiorentino (p. 121), Zurbarán (p. 121), Bernini (p. 121), Joseph Christian (p. 122), Jean Goujon (p. 122), Spinazzi (p. 122), Corradini (p. 122), the Baroque as « the unity of the arts » (p. 123), Tasso or's La Lucte d'Artiste (1655 [p. 126]), « concertant » style in music (p. 132), Kameau (p. 135). What is striking is the standard nature of the discussion. One quotation will suffice:

[If we want to test the definition of the Baroque — the fold to infinity — we cannot be limited to masterpieces alone; we must dig into the everyday recipes of modes of fashion that change a genre. For example, the object of still life is the study of folds. The usual formula of the Baroque still life is: embroidery producing folds of air or heavy clouds: a tablecloth, with marthames or fluvial folds; jewelry that burns with folds of fire; vegetables, mushrooms, or sugared fruits caught in their earthy folds. (p. 123)]

The seventeenth-century references deployed throughout the book resonate almost like honing devices to a host of more recent and contemporary ones: Pierre Boulez (p. 33, 82, 163-64), William Burroughs (p. 164n), John Cage (p. 136), Christo (p. 161n), Jean Cocteau (p. 155n), Debussy (p. 136), Walter Gropius (p. 35), Henry James (p. 20, 22), William James (p. 20, 100), Joyce (p. 81), Kandinsky (p. 14), Klee (p. 14, 15, 35), Le Corbusier (p. 28), Alfred Loos (p. 35), Jackson Pollock (p. 27), Proust (p. 139), Thomas de Quincey (p. 94), Robert Rauschenberg (p. 97), Stockhausen (p. 136, 137), Richard Wagner (p. 136). The linkages between the seventeenth century and the last two centuries function both as historical plottings and diagrammatic piloting devices. These scatterings invite us to imagine linkages between the Baroque and the modern (between Leibniz and Deleuze) and to create synchronous planes that shape the book as another version of the Baroque house.

Introduced with a diagram in chapter 1, the Baroque house is described as having two levels. Deleuze draws the architectural analogy from Leibniz, who in turn draws the figure from Locke's description of a camera obscura. The analogy works as a schematic and is similar to the multiple diagrams that represent faculty psychology in the late Middle Ages and Renaissance. The significant differences in the diagram included in the French and American editions must also be acknowledged [Figure 1]. While the American version is a simple printed diagram, the original is hand-drawn by Deleuze himself. A comparison also shows that the diagrams are scaled in entirely different ways. The three explanatory labels which accompany the diagram are printed in English but handwritten in the French. While the American edition indicates that one side of the roof is missing, the hand-drawn diagram in the French edition shows the structure as completely roofed-in. The difference is important because the printed diagram implies that the Baroque structure has an opening when Leibniz and Deleuze refer to the closed nature of the structure.
The dialogue from which the diagram is constructed provides an instance of figurology or logodrama within the philosophical terrain:

Phil. “The understanding is not much unlike a closet wholly shut from light, with only some little openings left, so let in external visible [images]; would the [images] coming into such a dark room but stay there, and lie so orderly as to be found upon occasion, it would very much resemble the understanding of a man.”

Thos. “To increase the resemblance we should have to postulate that there is a screen in this dark room to receive the species, and that it is not uniform but is diversified by folds representing items of innate knowledge; and what is more, that this screen or membrane, being under tension, has a kind of elasticity or active force, and indeed that it acts (or reacts) in ways which are adapted both to past facts and to new ones coming from impressions of the species. This action would consist in certain vibrations or oscillations, like those we see when a cord under tension is plucked and gives off something of a musical sound. For not only do we receive images and traces in the brain, but we form new ones from them when we bring ‘complex ideas’ to mind, and so the screen which represents our brain must be active and elastic. This analogy would explain reasonably well what goes on in the brain. As for the soul, which is a simple substance or ‘monad’: without being extended it represents these various extended masses and has perceptions of them.” (Leibniz, 2.11, paragraph 144-145)

As Deleuze puts it, “Leibniz constructs a great Baroque montage that moves between the lower floor, pierced with windows, and the upper floor, blind and closed, but on the other hand resonating as if it were a musical salon translating the visible movements below into sounds up above” (1988, p. 4). Deleuze returns to the allegory in chapter 8, where he notices that for Leibniz different and distinct functions must be associated with each floor:

One actualizes the world, the other realizes it [...]. For Leibniz, the two floors are and will remain inseparable; they are really distinct and yet inseparable by dint of a presence of the upper in the lower. The upper floor is ‘folded’ over the lower floor. One is not acting upon the other, but one belongs to the other, in a sense of a double belonging. The soul is the principle of life through its presence and not through its action. (p. 119)

The Leibniz house works as a diagrammatic machine. Rather than a static image that would argue that coherent construction rules will lead to stylistic coherency in a building, Leibniz (and Deleuze) discover in the architectural model a structure that provokes a continuous set of configurations that would devise strategies for rendering the exchange between the two floors. The strategies set forth by Deleuze amount to a progression of diagrams that would navigate between them. Besides the diagram of the Leibniz analogy...
itself, the fifteen diagrams in the book amount to an ongoing diagrammatic commentary on the relation between the two floors. The trace of diagrams also provides glimpses at the set of dynamic relationships that are expressed in the logico-mathematical relationships throughout the book. When we consider these components together, we see that Deleuze shaped the book as a group of mathematically problem sets for which there is no absolute answer. Instead, the problems work as exercises that provide an evolving capacity for insight. « The theater of matter gives way to that of the spirits or of God » (p. 11).

The profusion of diagrammatic and narrative plottings in the book not only demonstrate the essay-like quality of the work but show that its space also functions as a medium for tracing the thought process. Deleuze makes one wonder what Montaigne’s essays would have been like with diagrams! What repeatedly draws Deleuze is a fascination with a thought process unfolded upon itself. Like examples, diagrams can confirm, extend or subvert a thought process. Deleuze and Leibniz remind us that these all happen simultaneously, not simply in our interactions with each other but within our own thought. Rather than thinking of the diagram as a static figure, we should regard it as a trace of a mental process that we may pursue through cognitive or phenomenological analysis. For Deleuze, the form marks the departure point for inquiry into process. For Deleuze and Leibniz, mapping the trace or process of thinking has social implications as well, for figures such as diagram and enthymeme are not only controlled through axiomatic functions but are translated into expressions of social control and authority. Diagrams and enthymemes are important because they can be used to transgress the apparent limits or margins of understanding: « [W]e use theme maxims without having them explicitly in mind. It is rather like the way in which one has implicitly in mind the suppressed premises in enthymemes, which are omitted in our thinking of the argument as well as in our outward expression of it ». (Leibniz, 1.1.4 section 77). In effect, our thought process may be unconsciously shaped by the examples that we have accumulated:

What appears is that we are linked — almost fixed — to requisites: even the definers that we attain, in arithmetic or in geometry (for example, have value only through analogy, and are in fact the inner characters of a presupposed domain (thus the first numbers whose converging series are sought). The theorem, the demonstration as a concatenation of definitions, can appeal to syllogistic form; but we go by « enthymeme », which hold only for syllogism, and which work by means of « inner suppressions », ellipses, and problematic shortcuts.

[...]

Leibniz remarks that concatenations of syllogism or definitions are a « fabric ». But « there exists an infinity of other more composite fabrics », folded like their enthymemes, that are always available for our use. Even the purest syllogistic fabric has been folded according to different speeds in thinking. Ideas are so folded in the soul that we can’t always unfold or develop them, just as things themselves are inextricably wrapped up in nature. (Deleuze, 1988, p. 48-49).

In his book De arte magistica (1643), the seventeenth-century polymath Anastasius Kircher describes a thought experiment in which a statue, located on a stage, is placed on movable pedestal operated by a magnet hidden from the audience [Figure 2]. When the magnet is turned beneath the floor of the stage, a figure standing on a wheel located on the stage floor also turns. To complicate his experiment, Kircher notes that multiple mirrors behind the statue generate a seemingly infinite number of reflected images from the vantage point of individuals seated in the audience. Kircher’s splendid Baroque experiment reminds the reader that there are multiple ways of viewing phenomena but that, unless one comprehends the fundamental elements of cause and effect defined by the magnet, the audience will be kept guessing. The multiple images of the turning figure offer an analogy for the endlessly varied perception of truth: « It is not a variation of truth according to the subject, but the condition in which the truth of a variation appears to the subject. This is the very idea of Baroque perspective ». (Deleuze, 1988, p. 20). The images flickering on the inset mirrors also give an analogy to the multiple principles that attract Leibniz:

Leibniz loves principles, and he is probably the only philosopher who invents them endlessly. He invents them with pleasure and enthusiasm, and he brandishes them like swords. But on the other hand, he plays with principles, multiplies formulas, varies their relations, and incessantly wants to « prove » them as if, loving them too much, his respect for them were lacking. (p. 43-44)

For a moment Deleuze dramatizes the principles and sets them on a stage. « If the principles appear to us as cries, it is because each one signals the presence of a class of beings that are themselves crying and draw attention to themselves by these cries » (p. 44). Those cries are the multiple forms of writing that so attracted Leibniz.
Our work with diagram and metaphor is enveloped in a narrative process that not only carries ideological significance but also registers the cognitive hierarchies in which we think and build. Deleuze is above all interested in scaling the macro and micro phenomena that participate in constitutes a whole. Communication in a traditional sense is only a part of this, for what Deleuze has in mind includes material or physiological relationships that constitute different levels of human life. It is this shifting back and forth between language and mathematics, the shifting between organic and inorganic structures, that makes the book feel so experimental. The book works like a collection of lenses that render visible not one single world picture but the multiple chains of thought which constitute our understanding at any single moment in time. While Deleuze might be regarded as a cryptographer, such an image should not be formed simply from an idea of *ars combinatoria* but should include one adept in reading and constructing multiple circuit diagrams. Deleuze must be viewed as a Faustus-like magus who knows the most secret writing but far more as a Montaigne-like figure who seeks to trace the inscriptions that move before him.

### III. Technologies of Extension

As we move through the conceptual landscapes traced by Deleuze, a continuum emerges that allows us to plot the relationship between diagram and concept. Compared to the vertical continuum or hierarchy of the Leibniz house, still related to seventeenth-century cosmological drawings, the continuum described by Deleuze has a horizontal orientation. Rather than being oriented toward greater abstraction as common representations of the «Chain-of-Being», Deleuze's own use of diagram describes a movement toward increased specificity and even reification. It is a continuum scaled to work not between ideas and God but between ideas and technology. The question of how we think through, translate or extend between different symbolic codes — the problem of shifting between the narrative and diagrammatic matter of mathematical discourse — was of utmost importance for Deleuze. I noticed above how the word diagram bears a notion of the technologies of writing. Diagrams — and here diagrammatics would be more accurate — challenge us to consider more than wax tablets and the cross-mappings of philosophical texts. Rather than thinking of isolated diagrams that so easily conform to an instrumental idea of technology, we need to think of the ways that diagrammatic series embody techno-scientific networks. Because diagrams are always part of a process, whether viewed from a cognitive or social vantage point, they are central to a theory of emergence.

Architecture offers a laboratory for the study of diagram and emergence, because of the multiple and layered figures that mediate the creation of a structure (cf. Rajchman, 1998 and 2000). Construction plans are not only diagrammatic arrays or compilations but are themselves enabled through their own diagrammatic genealogies. Although a structure embodies not only a design process but a construction process, one continues to be struck by the degree to which the history of architecture has favored the design process — the formation of the aesthetic object — rather than the process of construction. The idea of architecture is strengthened by a fuller understanding of the ways that diagrams function in all aspects of design and construction. Diagrams are crucial to the design process but also mark the regulation of building construc-
tion and its maintenance after completion. Even though diagrams constitute a

time-line that regulates the ganglia of construction, the history of the continuum
also involves an infinite number of diagrammatic changes that become incor-
porated into the process. No matter how formulated or codified a diagrammatic
continuum may appear, it can be written over, marking a moment of change.

The space-syntax vocabulary of Bill Hillier in his book Space is the Machine
(1996) depends utterly on the computer manipulation of diagrams, for without
diagrams there is no vehicle for defining space-syntax. Where the design stage
authorizes multiple narrative tangents, the construction stage works to integrate
diagrams into a common narrative. The looping back is important because it
reminds us that the constructed building becomes a departure point for further
design and further invention. It may be remodeled or become a visual exemplum
within the spatial continuum.

The iterative use of diagrams within architectural practice and construction
coincides with the iterative use of technological extension. Here diagrams
reveal an instrumentality that permits them to move from being agents that
negotiate space to being instruments that manipulate space. The distinction is of
utmost importance not only because it reinforces the diagrammatic continuum
within architecture theory and practice but because it contributes to an under-
standing of technological extension. Technology is an iterative process facilitat-
ted by the continuous use of diagrams, first and foremost by the continuous
interaction of diagrams and speech, not by an interaction of diagrams and writ-
ten language. The distinction carries significance, for our philosophies of tech-
ology have often relied on a conceptual foundation that separates artifacts
and their systematic relations from an idea of written language. Because tech-
nology is often thought of as an external signified, marked, denoted, and
accessed by symbolic signifiers, it has seemed allusive. But our technological
artifacts and systems are better thought of as extensions of the languages with
which we work, to the extent that they should be regarded not as that which is
signified but that which can also signify. The broadly shared architectural
metaphor that technology is written on the landscape — and the implication
that technology as a language may determine meaning — shows how simple
semiotic notions of technology are in a state of dissolution. As Peter Eisenman
(1999) and others have shown, diagram has a central role in the practice and
conceptualization of an architecture that carries broad implications for rethink-
ing the ways we think of technology as well.

I want to conclude by emphasizing another important feature of diagrams
that extends beyond the way that it may be used within any immediate context
of invention or learning. Diagrams also have a temporal dimensionality that
allows us to identify them not only in the present but in the past. Hence,
diagrams offer a means for cognitive archaeology or genealogy. Deleuze
ascribes Foucault’s role in the transformation of the archive to precisely this
kind of diagrammatic archeology 16. From such a vantage point, it is logical to
ask whether we can trace the genealogy of a particular diagram. It is equally
appropriate to ask about the ways that the genealogy or history of a diagram
may contribute to the ways that we project or prefigure what we might antici-
fate in the future. The diagrams associated with the practice of magic as well
as the diagrams associated with astronomy provide examples of the ways that
such short-forms not only explain the what has happened and what has been
seen but what will happen and what will be seen. It is precisely the recognition
of continuity in such visual patterns that explains why visualization technolo-
gies are of such utmost importance in the evolution of shape-logics. The gene-
alogical characteristic of diagram carries much importance for architecture, as
it does for science and technology, precisely because it reminds us that diagram
is present throughout the continuum of architectural design and practice. It is to
the credit of Deleuze that he has registered the outline of topographies that
multiple disciplines continue to explore.

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Notes

1. See, for example, Martin Heidegger, 1993, and John Sallis, 1987.
2. The verb may also be used to describe the movement of planets or projectiles, in
the sense in which this may be thought of as being «inscribed» or «reinscribed»
in the heavens. Planetary trajectories may thus be thought of as being written on
themselves on every orbit.
3. For an important recent work on the axiomatic control of diagrammatic reasoning,
see Magnani, 2001, who stresses the ways in which diagrammatic reasoning
enables rigorous deductive inference.
4. «In 1951 Lacan, Benveniste, Guillaume and Levi-Strauss began to meet to work on
structures and establish links between the social sciences and mathematics [...]
[For twenty-five years Lacan had used all these images [i.e. Möbius strip, torus,
Klein bottle] merely as illustrations, without developing them into theoretical form.
It was his reading of Wittgenstein and his working-out of the notions of rethne
and talange that led him, in 1971, to seek a new terminology that would make it
possible to relate the psychoanalytic to other kinds of discourse » (Rumidesco,
5. «Mental landscapes do not change haphazardly through the ages: a mountain had
to rise here or a river to flow by there again recently for the ground, now dry and
flat, to have a particular appearance and texture. It is true that very old strata can rise to the surface again, can cut a path through the formations that covered them and surface directly on the current stratum to which they impart a new curvature. Furthermore, depending on the regions considered, superimpositions are not necessarily the same and do not have the same order. Philosophical time is thus a grandiose time of coexistence that does not exclude the before and after but superimposes them in a stratigraphic order. It is an infinite becoming of philosophy that crosses its history without being confused by it [...]. Philosophy is becoming, not history; it is the coexistence of planes, not the succession of systems» (Deleuze and Guattari, 1991, p. 39).


8. « Newton's practice of revision shows that the text was under continual surveillance or inspection to see what would emerge from its growing linkages. Combined with its interlinear and marginal commentaries, and its critical marks of text to be added or subtracted, the text has a fluidity or instability that Newton simultaneously seeks to control and use as a vehicle for further meaning. On a fundamental level, the text shows us how Newton's inscriptions are signs or premonitions for meaning that he still seeks to register » (Kneissel, 1999a, p. 193).

9. It is useful to cluster other recent French discussions of Leibniz together with Deleuze. See for example Bouquiaux, 1994, and Duchenneau, 1993.

10. The bibliography on the math-like operations of folding, unfolding, unfolding etc. is extensive. For a preliminary set of examples within a neo-Platonic tradition see Wind, 1998.

11. Deleuze writes: « Clearly the two levels are connected (this being why continuity rises up into the soul). There are souls down below, sensitive, animal; and there even exists a lower level in the souls. The pleats of matter surround and envelope them. When we learn that soul cannot be furnished with windows opening into the outside, we must first of all exclude souls spatial, reasonable ones, who have ascended to the other level («elvation»). It is the upper floor that has no windows. It is a dark room or chamber decorated only with a stretched canvas «diversified by folds», as if it were living beings. On the opaque canvas these folds, cords, or springs represent an innate form of knowledge, but when solicited by matter they move into action. Matter triggers «vibrations or oscillations» at the lower extremity of the cords, through the intermediary of «some little openings» that exists on the lower level» (1988, p. 4).

12. « I pretend not to teach, but to inquire; and therefore cannot but confess here again, that external and internal sensation are the only passages I can find of knowledge to the understanding. These alone, as far as I can discover, are the windows by which light is let into this dark room. For, methinks, the understanding is not much unlike a closet wholly shut from light, with only some little openings left, to let in external visible resemblances, or ideas of things without: I would the pictures coming into such a dark room but stay there; and lie so orderly as to be found upon occasion, it would very much resemble the understanding of a man, in reference to all objects of sight, and the ideas of them» (Locke, 2: 11.17, p. 211-212).

13. The French edition also includes black and white illustrations of Baroque paintings by Fieravino and Botta that are omitted in the American edition.

14. For « logorama » and « figurology », see Michel Guérin (1950) about whom Deleuze and Guattari write: « In contemporary thought, Michel Guérin is one of those who has made the most profound discovery of the existence of conceptual personae at the heart of philosophy » (1991, p. 66).

15. Deleuze takes it as given that one needs to start over to establish rules. But Leibniz understands rules that become encompassed especially when one deals with the world. Leibniz is also writing together a united Germany. This seems to be forgotten. The necessity is to reagent, reintegrate, to continue an idea that existed previously. Does not Deleuze take us to a terrain that is not blank, not fresh, but marked with innumerable scars? It is also in this setting that the question between the individual and the corporation is enacted. It is not a matter of starting over but of taking up the pieces and making connections.


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