DELEUZE, DIAGRAMS, AND THE GENESIS OF FORM

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The study of diagrams and of diagrammatic thinking is currently enjoying a revival in several disciplines. On one hand, there are historians of technology who, in attempting to rescue engineering knowledge from its status as a minor branch of applied science, have stressed the relative autonomy of its goals and, more importantly, its means. In this context, what is emphasized is the existence of a peculiar type of knowledge – visual knowledge – and the role that it has played in the development of the engineering sciences.[1] On the other, there are cognitive scientists and researchers in artificial intelligence who have recently expanded the reservoir of representational resources that they use to give their models (or their robots) problem-solving abilities. Here too, it is the specifically visual aspect of diagrams that is emphasized, for example, the ability of geometric representations to rapidly convey to a problem-solver some of the crucial aspects defining a particular problem, and hence, to suggest possible solutions.[2]

There are several differences between these approaches to the question of diagrams and the one advocated by Gilles Deleuze, the least important of which is that for Deleuze, diagrams have no intrinsic connection with visual representations. The truly significant difference, on the other hand, is that for Deleuze the problem-solving activity in which diagrams are involved is not necessarily performed by humans or robots, but may be instantiated in even simple material and energetic systems. To take an example from physics, a population of interacting physical entities, such as the molecules in a thin layer of soap, may be constrained energetically to adopt a form which minimizes free energy. Here the "problem" (for the population of molecules) is to find this minimal point of energy, a problem solved differently by the molecules in soap bubbles (which collectively minimize surface tension) and by the molecules in crystalline structures (which collectively minimize bonding energy).

The question of the objective existence of problems (and their defining diagrams) is a crucial issue in Deleuze's philosophy of matter and form, a philosophy which attempts to replace essentialist views of the genesis of form (which imply a conception of matter as an inert receptacle for forms that come from the outside) with one in which matter is already pregnant with morphogenetic capabilities, therefore capable of generating form on its own. To return to our previous examples, the spherical form of a soap bubble emerges out of the interactions among its constituent molecules as these are constrained energetically to "seek" the point at which surface tension is minimized. In this case, there is no question of an essence of "soap-bubbleness" somehow imposing itself from the outside, an ideal geometric form (a sphere) shaping an inert collection of molecules. Rather, an endogenous *topological form* (a point in the space of energetic possibilities for this molecular assemblage) governs the collective behavior of the individual soap molecules and results in the emergence of a spherical shape. Moreover, the same topological form, the same minimal point, can guide the processes that generate many other geometrical forms. For example, if instead of molecules of soap we have the atomic components of an ordinary salt crystal, the form that emerges from minimizing energy (bonding energy in this case) is a cube. Other materials, in turn, yield still other forms.

A similar point applies to other topological forms which inhabit these diagrammatic spaces of energetic possibilities. For example, these spaces may contain closed loops (technically called limit cycles or *periodic attractors*), in which case the possible physical instantiations of this space will all display isomorphic behavior, an endogenously generated tendency to oscillate in a stable way. Whether one is dealing with a socio-technological structure (such as a radio transmitter or a radar machine), a biological one (a cyclic metabolism), or a physical one (a convection cell in the atmosphere), it is a single immanent resource that is involved in their different oscillating behavior. As if an "abstract oscillating machine" were incarnated or actualized in all these physical assemblages:

> An abstract machine in itself is not physical or corporeal, any more than it is semiotic; it is diagrammatic (it knows nothing of the distinctions between the artificial and the natural either). It operates by matter, not by substance; by function, not by form.... The abstract machine is pure Matter-Function – a diagram independent of the forms and substances, expressions and contents it will distribute.[3]

Deleuze calls this ability of topological forms (and other abstract machines) to give rise to many different physical instantiations a process of "divergent actualization," taking the idea from French philosopher Henri Bergson who, at the turn of the century, wrote a series of texts where he criticized the inability of the science of his time to think the new, the truly novel. The first obstacle was, according to Bergson, a mechanical and linear view of causality and the rigid determinism that it implied. Clearly, if the future is already given in the past, if the future is merely that modality of time where previously determined possibilities become realized, then true innovation is impossible. To avoid this mistake, he thought, we must struggle to model the future as open-ended, and the past and the present as pregnant not only with *possibilities which become real*, but with *virtualities which become actual*.

The distinction between the possible and the real assumes a set of predefined forms (or essences) which acquire physical reality as material forms that resemble them. From the morphogenetic point of view, realizing a possibility does not add anything to a predefined form except reality. The distinction between the virtual and the actual, on the other hand, does not involve resemblance of any kind (e.g., our example above, in which a topological point becomes a geometrical sphere), and far from constituting the essential identity of a given structure, a virtual form subverts this identity, since structures as different as spheres and cubes emerge from the same topological point. To quote from what is probably Deleuze's most important book, *Difference and Repetition*:

> Actualisation breaks with resemblance as a process no less than it does with identity as a principle.... In this sense, actualisation or differenciation is always a genuine creation.... For a potential or virtual object, to be actualised is to create divergent lines

1 Eugene S. Ferguson, Engineering and the Mind's Eye (Cambridge, Massachussets: MIT Press, 1993).

2 See, for example, the essays included in Janice Glasgow, Hari Narayanan, and B. Chandrasekaran, eds., Diagrammatic Reasoning. Cognitive and Computational Perspectives (Menlo Park, California: AAAI Press, 1995).

3 Gilles Deleuze and Félix Guattari, A Thousand Plateaus, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 141.

> which correspond to – without resembling – a virtual multiplicity. The virtual possesses the reality of a task to be performed or a problem to be solved.[4]

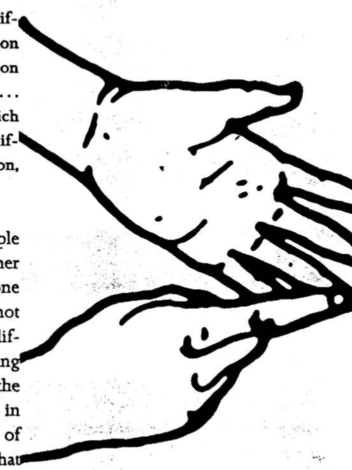
Deleuze goes on to discuss processes of actualization more complex than bubbles or crystals, processes such as embryogenesis, the development of a fully differentiated organism starting from a single cell. In this case, the space of energetic possibilities is more elaborate, involving many virtual topological forms governing complex spatio-temporal dynamisms:

> How does actualisation occur in things themselves? . . . Beneath the actual qualities and extensities [of things themselves] there are spatio-temporal dynamisms. . . . They must be surveyed in every domain, even though they are ordinarily hidden by the constituted qualities and extensities. Embryology shows that the division of an egg into parts is secondary in relation to more significant morphogenetic movements: the augmentation of free surfaces, stretching of cellular layers, invagination by folding, regional displacement of groups. A whole kinematics of the egg appears, which implies a dynamic.[5]

In *Difference and Repetition*, Deleuze repeatedly makes use of these spaces of energetic possibilities (technically referred to as "state spaces" or "phase spaces") and of the topological forms (or "singularities") that shape these spaces. Phase diagrams are, indeed, the very first type of diagram used by Deleuze. We will see below that more complex types are discussed in his later work. Since these ideas reappear in his later work, and since the concepts of phase space and of singularity belong to mathematics, it is safe to say that a crucial component of Deleuzian thought comes from the philosophy of mathematics. Indeed, chapter four of Difference and Repetition is a meditation on the metaphysics of differential and integral calculus. On the other hand, given that phase spaces and singularities become physically significant only in relation to material systems that are traversed by a strong flow of energy, Deleuze's philosophy is also intimately related to the branch of physics that deals with material and energetic flows, that is, with thermodynamics. Chapter five of *Difference and Repetition* is a philosophical critique of 19th-century thermodynamics, an attempt to recover from that discipline some of the key concepts needed for a theory of immanent morphogenesis.

At the beginning of that chapter, Deleuze introduces some key distinctions that will figure prominently in his later work (specifically, the concept of "intensity"), but more importantly, he reveals his ontological commitments on the very first page. Since Kant it has been traditional to distinguish between the world as it appears to us humans, that is, the world of phenomena or appearances, and the world as it exists by itself, regardless of whether there is a human observer to interact with it. This world "in itself" is referred to as "noumena." A large number of contemporary thinkers, particularly those who call themselves postmodernists, do not believe in noumena. For them, the world is socially constructed, hence, all it contains are linguistically defined phenomena. Even though many of these thinkers declare themselves to be anti-essentialist, they share with essentialism a view of matter as an inert material, only in their case form does not come from a Platonic heaven, or from the mind of God, but from the minds of humans (or from cultural conventions expressed linguistically). The world is amorphous, and we cut it out into forms using language. Nothing could be further from Deleuzian thought than this postmodern linguistic relativism. Deleuze is indeed a realist philosopher, who not only believes in the autonomous existence of actual forms (the forms of rocks, plants, animals and so on) but in the existence of virtual forms. In the first few lines of chapter five, where Deleuze introduces the notion of "intensity" as a key to understanding the actualization of virtual forms, he writes:

> Difference is not diversity. Diversity is given, but difference is that by which the given is given. . . . Difference is not phenomenon but the noumenon closest to the phenomenon. . . . Every phenomenon refers to an inequality by which it is conditioned. . . . Everything which happens and everything which appears is correlated with orders of differences: differences of level, temperature, pressure, tension, potential, *difference of intensity*.[6]



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Let me illustrate this idea with a familiar example from thermodynamics. If one creates a container separated into two compartments, and one fills one compartment with cold air and the other with hot air, one thereby creates a system embodying a difference in intensity, the intensity in this case being temperature. If one then opens a small hole in the wall dividing the compartments, the difference in intensity causes the onset of a spontaneous flow of air from one side to the other. It is in this sense that intensity differences are morphogenetic, even if in this case the form that emerges is too simple. The examples of the soap bubble and the salt crystal, as well as the more complex foldings and stretchings undergone by an embryo, are generated by similar principles. However, in the page following the above citation, Deleuze argues that, despite this important insight, 19th-century thermodynamics cannot provide the foundation he needs for a philosophy of matter. Why? Because that branch of physics became obsessed with final equilibrium forms at the expense of the difference-driven morphogenetic process that gives rise to those forms. But as Deleuze argues, the role of virtual singularities and of the diagrammatic and problematic nature of reality can only be grasped during the process of morphogenesis, that is, before the final form is actualized, before the difference disappears.

This shortcoming of 19th-century thermodynamics, to overlook the role of intensity differences in morphogenesis, to concentrate on the equilibrium form that emerges only once the original difference has been canceled, has today been repaired in the latest version of this branch of physics, appropriately labeled "far-from-equilibrium thermodynamics." Although Deleuze does not explicitly refer to this new branch of science, it is clear that far-from-equilibrium thermodynamics meets all the objections he raises against its 19th-century counterpart. In particular, the systems studied in this new discipline are continuously traversed by a strong flow of energy and matter, a flow which does not allow dif-

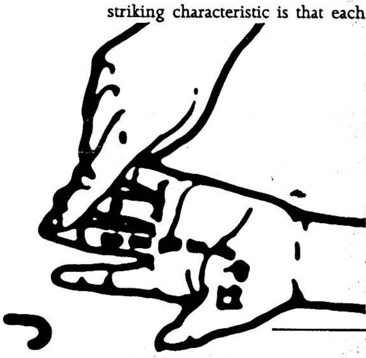
4 Gilles Deleuze, Difference and Repetition, trans. Paul Patton (New York: Columbia University Press, 1994), 212.
5 Ibid., 214.
6 Ibid., 222.

ferences in intensity to be canceled, that is, a flow which maintains these differences and keeps them from canceling themselves. It is only in these far-from-equilibrium conditions that the full variety of immanent topological forms appears (steady state, cyclic, or chaotic attractors). It is only in this zone of intensity that difference-driven morphogenesis comes into its own and that matter becomes an active material agent, one which does not need form to impose itself from the outside. To return once more to the example of the developing embryo: the DNA that governs the process does not contain, as was once believed, a blueprint for the generation of the final form of the organism, an idea that implies an inert matter to which genes give form from the outside. The modern understanding of the process pictures genes as teasing form out of an active matter, that is, the function of genes and their products is now seen to be merely constraining and channeling a variety of material processes, occurring in that far-from-equilibrium, diagrammatic zone in which form emerges spontaneously.

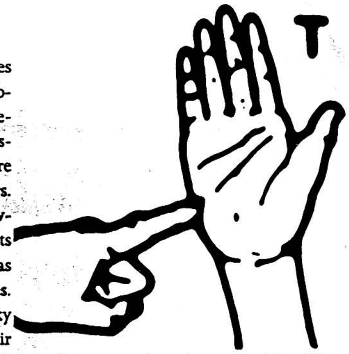
We saw above that in his definition of diagram Deleuze distinguishes between matter and substance and between function and form. We can now give a better characterization of these distinctions. While substance is a formed material, the matter that enters into a diagram is "matter-content having only degrees of intensity, resistance, conductivity, heating, stretching, speed, or tardiness."[7] In other words, it is any material far-from-equilibrium, and with access to the same reservoir of immanent, morphogenetic resources. On the other hand, the vector or tensor field that constitutes a phase space diagram – and the topological singularities that structure it – is a useful image for a diagrammatic function without a definite form, "a function-expression having only tensors, as in a system of mathematical, or musical, language."[8]

To complete my characterization of Deleuze's theory of diagrams and of their role in the genesis of form, I would like to explore the way in which his more recent work in collaboration with Félix Guattari has extended these basic ideas. In their joint book *A Thousand Plateaus* they develop theories of the genesis of two very important types of structures, referred to as "strata" and "self-consistent aggregates" (or, alternatively, "trees" and "rhizomes"). Basically, strata emerge from the articulation of *homogeneous* elements, whereas self-consistent aggregates emerge from the articulation of *heterogeneous* elements as such.

Both processes display the same "divergent actualization" that characterized the simpler processes behind the formation of soap bubbles and salt crystals. In other words, in both processes we have a virtual form (or abstract machine) underlying the isomorphism of the resultant actual forms. Let's begin by briefly describing the process behind the genesis of geological strata, or more specifically, of sedimentary rock, such as sandstone or limestone. When one looks closely at the layers of rock in an exposed mountainside, a striking characteristic is that each layer contains further layers, each composed of small pebbles which are nearly *homogeneous* with respect to size, shape, and chemical composition. These layers are referred to as "strata."



Given that pebbles do not naturally come in standard sizes and shapes, some kind of *sorting mechanism* seems to be needed to explain this highly improbable distribution, some specific device that takes a multiplicity of pebbles with heterogeneous qualities and distributes them into more or less uni-form layers. One possibility uncovered by geologists involves rivers acting as sorting machines. Rivers transport rocky materials from their point of origin to the place in the ocean where these materials will accumulate. In this process, pebbles of variable size, weight, and shape tend to react differently to the water transporting them. These different re-actions to moving water sort out the pebbles, with the small ones reaching the ocean sooner than the large ones. This process is called *sedimentation*. Besides sedimentation, a second operation is necessary to transform these loose collections of pebbles into a larger scale entity: a sedimentary rock. This operation consists of *cementing* the sorted components, an operation carried out by certain substances dissolved in water which penetrates the sediment through the gaps between pebbles. As this percolating solution crystallizes, it consolidates the pebbles' temporary spatial relations into a more or less permanent "architectonic" structure.



This double articulation – sorting and consolidation – can also be found in biological species. Species form through the slow accumulation of genetic materials. Genes, of course, are not merely deposited at random but are sorted out by a variety of selection pressures, including climate, the actions of predators and parasites, and the effects of male or female choice during mating. Thus, in a very real sense, genetic materials "sediment" just as pebbles do. Furthermore, these loose collections of genes can be lost (like sedimented pebbles) under drastically changed conditions (such as the onset of an ice age) unless they become consolidated together. This second operation is performed by "reproductive isolation," that is, by the closure of a gene pool, which occurs when a given subset of a reproductive community becomes incapable of mating with the rest. Through selective accumulation and isolative consolidation a population of individual organisms comes to form a larger scale entity: a new individual species.

We can also find these two operations (and hence, this virtual diagram) in the formation of social classes. Roughly, we speak of "social strata" when a given society possesses a variety of differentiated roles that are not equally accessible to everyone, and when a subset of those roles (i.e., those to which a ruling elite alone has access) involves the control of key energetic and material resources. In most societies, roles tend to "sediment" through a variety of sorting or ranking mechanisms, yet rank does not become an *autonomous dimension* of social organization in all of them. In many societies, differentiation of the elites is not extensive (they do not form a center while the rest of the population forms an excluded periphery), surpluses do not accumulate (they may be destroyed in ritual feasts), and primordial relations (of kin and local alliances) tend to prevail. Hence, a second operation is necessary: the informal sorting criteria need to be given a theological interpretation and a legal definition. In short, to transform a loosely ranked accumulation of traditional roles into a social class, the social sediment needs to become consolidated via theological and legal *codification*.[9]

7 Deleuze and Guattari, A Thousand Plateaus, 141.

8 Ibid., 141.

9 See more detailed discussion and references in Manuel De Landa, A Thousand Years of Nonlinear History (New York: Zone Books, 1997), 59–62.

Is there also a virtual diagram behind the genesis of meshworks? In the model proposed by Deleuze and Guattari, there are three elements in this other virtual diagram, two of which are particularly important. First, a set of heterogeneous elements is brought together via an *articulation of superpositions*, that is, an interconnection of diverse but overlapping elements. Second, a special class of operators, or *intercalary elements*, is needed to effect this interlock via local connections. Is it possible to find instances of this diagram in geology, biology, and sociology? Perhaps the clearest example is that of an ecosystem. While a species may be a very homogeneous structure, an ecosystem links together a wide variety of heterogeneous elements (animals and plants of different species), which are articulated through interlock, that is, by their functional complementarities. Since one of the main features of ecosystems is the circulation of energy and matter in the form of food, the complementarities in question are alimentary: prey-predator or parasite-host being two of the most common. In this situation, symbiotic relations can act as intercalary elements aiding the process of building food webs by establishing local couplings. Examples include the bacteria that live in the guts of many animals, allowing them to digest their food, or the fungi and other micro-organisms which form the rhizosphere, the underground food chains that interconnect plant roots and soil.

Geology also contains actualizations of these virtual operations, a good example being that of igneous rocks. Unlike sandstone, igneous rocks such as granite are not the result of sedimentation and cementation but the product of a very different construction process, forming directly from cooling magma. As magma cools down, its different elements begin to separate as they crystallize in sequence, those that solidify earlier serving as containers for those which acquire a crystalline form later. Under these circumstances the result is a complex set of heterogeneous crystals which *interlock* with one another, giving granite its superior strength. Here, the intercalary elements include anything that brings about local articulations from within the crystals, including nucleation centers and certain line defects called dislocations, as well as local articulation between crystals, such as events occurring at the interface between liquids and solids. Thus, granite may be said to be an instance of a meshwork.

In the socio-economic sphere, precapitalist markets may be considered examples of cultural meshworks. In many cultures weekly markets have traditionally been meeting places for people with heterogeneous needs and offers. Markets connect people by matching complementary demands, that is, by interlocking them on the basis of their needs and offers. Money, even primitive money such as salt blocks or cowry shells, may be said to perform the function of intercalary elements: while in pure barter the possibility of two exactly matching demands meeting by chance is very low, when money is present those chance encounters become unnecessary, and complementary demands may find each other at a distance, so to speak.[10]

Thus, much as sandstone, animal species, and social classes may be said to be divergent actualizations of a virtual process of "double articulation" that brings homogeneous components together, granite, ecosystems, and markets are actualizations of a virtual process that links heterogeneous elements through interlock and intercalation. Moreover, the diagram behind the genesis of meshworks is directly related by Deleuze and Guattari to the simpler abstract machines animating intense, far-from-equilibrium matter. As they write:

> It is no longer a question of imposing a form upon a matter but of elaborating an increasingly rich and consistent material, the better to tap increasingly intense forces. What makes a material increasingly rich is the same as what holds heterogeneities together without their ceasing to be heterogeneous.[11]

Given the close connection between intense matter and the concept of the diagrammatic, we may seem to have an opposition between stratified and diagram-embodying structures. Yet, as Deleuze and Guattari argue, it is important not to treat the dichotomy of strata and self-consistent aggregates as embodying a static typology. Neither meshworks nor strata occur in pure form, and more often than not we are confronted with mixtures and hybrids of the two. Beyond that, self-organizing, diagrammatic processes participate in the creation of strata (e.g., the rivers that sort the pebbles or the crystallizations of the percolating solution that cements them together), and sorted, homogenized elements can sometimes function as intercalary elements (here one can offer the Internet as an example, a true meshwork of networks made possible by the existence of homogeneous standards, such as those for HTML). Hence, it is better to picture this dichotomy as a continuum, characterized at one end by the most hierarchical, stratified structures and at the other end by pure, intense matter at its limit of destratification, that is, the plane of consistency. As Deleuze and Guattari put it:

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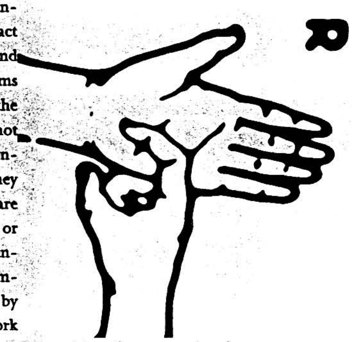
> We cannot, however, content ourselves with a dualism between the plane of consistency and its diagrams and abstract machines on the one hand, and the strata and their programs and concrete assemblages on the other. Abstract machines do not exist only on the plane of consistency, upon which they develop diagrams; they are already present, enveloped or "encasted" in the strata in general. ... Thus there are two complementary movements, one by which abstract machines work the strata and are constantly setting things loose, another by which they are effectively stratified, effectively captured by the strata. On the one hand, strata could never organize them-selves if they did not harness diagrammatic matters or functions and formalize them. ... *On the other hand*, abstract machines would never be present, even on the strata, if they did not have the power or potentiality to extract and accelerate destratified particle-signs (the passage to the absolute).[12]



It should be clear by now that talk of the "stratification" of abstract machines is simply another way of discussing the actualization of the virtual, or in other words, that the theory of diagrams developed in *A Thousand Plateaus* was already present in Deleuze's early work. Indeed, I would go so far as to say that this theory was developed in greater detail in *Difference and Repetition*, and that it is this book that constitutes the main reservoir of conceptual resources needed to approach diagrammatic thinking. In the preface to the English edition, Deleuze calls *Difference and Repetition* the first book where he speaks in his own voice and asserts that everything else he had written (including his collaborations with

MANUEL DE LANDA IS THE AUTHOR of *War in the Age of Intelligent Machines* (Zone,1991) and

10 Ibid., 62–66.

11 Deleuze and Guattari, A Thousand Plateaus, 329.

12 Ibid., 144.

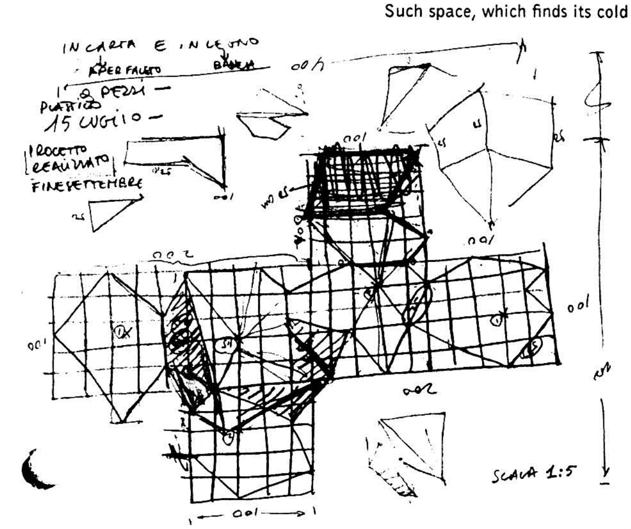
Guattari) leads back to this volume. Indeed, he speaks of chapter three of this book (where he presents his own "image of thought") as "the most necessary and the most concrete, and which serves to introduce subsequent books."[13] In this chapter, Deleuze proposes that thinking consists not in problem-solving (as most treatments of diagrams and diagrammatic reasoning suggest), but on the contrary, that given the real (though virtual) existence of problems in the world itself, true thinking consists in problem-posing, that is, in framing the right problems rather than solving them. It is only through skillful problem-posing that we can begin to think diagrammatically.

13 Deleuze, Difference and Repetition, xvii.

OF THE DIAGRAM IN ART

Christine Buci-Glucksman
Translated from the French by Josh Wise

"I draw on chance." It is in these terms that Duchamp enunciated the specificity and power of the diagram. That is, to bring about co-existence through drawing, the light lines of the aleatory, to harness the complex in all its possibilities in order to better grasp the "in-between" dimensions of reality. In contrast to retinal modernist abstraction, the diagram in art presupposes a "thin" abstraction composed of inflections and virtualities. We soon understand that the cognitive detour necessary to the development of **The Bride Stripped Bare by Her Bachelors, Even** required a digrammatic and cartographic abstraction: a space of projection and transfer which leaves the lone perspectival model in favor of a weightless, aerial space – that of the Bride. Such space, which finds its cold symbolism in the glass and the "mirror-like," is "the virtual as fourth dimension," as Duchamp put it. Schemas of body without flesh, bachelors reduced to simple deliveries, "in-betweens" and "operations"; do all of these aim to construct an "abtract machine" or modern Eros? Thanks to this transference [plan-transfert], the painting becomes "a Diagram of the Idea."



Sol LeWitt, Working Drawing for Complex Form, c. 1988; Pencil on paper; 8.25 x 10". LeWitt Collection, Chester, Connecticut.

No diagram exists without the in-betweens necessary to an abstract machine, in which the points of separation and the convergences of lines and trajectories define a mental processing of figures and a modeling of the real. By operating through the construction of abstracts and analogical structures, the diagram recalls Wittgenstein's definition of the wiring diagram of a radio as a "bunch of lines." As Gilles Deleuze showed in his book devoted to Michel Foucault's disciplinary diagrams, the diagram is intimately linked with cartography: "A diagram is a map, or rather a superimposition of maps."[1]

Still, this diagrammatic cartography is most ambiguous. Indeed, the current movement away from a culture of objects toward a culture of networks and flux seems to blur the distinction between two conceptions of the diagram present in Deleuze's own work: the diagram as "relationship of forces," and the diagram as ideal and virtual, as paradigm of a new abstraction – a post-abstraction.[2]

To be certain, the diagram as "relationship of forces" implies an abstract machine that grids the social and engenders an "intersocial in the making." The diagram is unstable, formless, and fluctuating, always subject to "micro-movements," variations, and points of resistance. And yet this relationship of forces is virtual, that is to say, only manifest in its effects. The battles of micro-powers "modify the diagram" since every force carries a potential dependent upon its place in the diagram. The diagram is always a composite of the ordered and the aleatory, of place and nonplace. It is guided by a kind of causality that Deleuze borrowed from Spinoza: an immanent cause, internally expressive of its own effects.[3]

We find a slightly different version of the diagram in Deleuze's analysis of Francis Bacon's paintings. Here it is no longer an "intersocial" diagram. Using Bacon's own terms, Deleuze develops a theory of diagram as "an operating group of splotches, lines, and zones" in a painting. The diagram is at the threshold of painting as "chaos-germ." Better yet, "it is quite a chaos, a catastrophe, but also a germ of order and rhythm."[4] This dialectic of the aleatory and the ordered shifts toward the dialectic of the plan and of chaos in Deleuze and Guattari's **What is Philosophy?** Little remains of the diagram as material and rhythmic, as Paul Klee understod it; Klee never ceased his exploration of vectoral diagrams of dimension and form, as in his "atmospheric" paintings. Even while he helps to make painting "the analogical art par excellence," his art is not abstract as such. Deleuze opposes diagrammatic painting (Cézanne or Bacon) to "abstract" painting composed of codes and binaries.

As we can see, the question of the diagram, through its many roles in the sciences, architecture, and the arts, poses the more general question of the status of abstraction. In place of the "subtractive" understanding of abstraction, which opposes the abstract and the figurative, it would be useful to develop a newer extractive and projective conception of abstraction – Duchampian, if you will. The hazards of the diagram, of its fluctuations and retracings, are no accident. Rather, they are the formulation of a new type of mental imaging that I call "Icarian" in my **L'oeil cartographique de l'art**, devoted to the history of the map in art.[5] In constrast to the single, privileged viewpoint of the perspectival gaze, the Icarian gaze sees from above, much like the gaze between "site" and "nonsite" that Robert Smithson analyzed in **Aerial Art**, his project for the Dallas airport. Vision is antivision; architecture, disarchitecture; order, entropy. "Visibility is often marked by both menal and atmospheric turbidity."[6] As in New York architecture of the 1930s, **Aerial Art** injects time into space. But the time of **Aerial Art** is a nonorganic time in which the aesthetic is simply "the airport as idea." In the tradition of Duchamp, the displacement of vision introduces the diagram of the idea, a nonvisual, mental cartography composed of the conjunction and disjunction of fluid or suspended spaces. In this, the diagram resembles contemporary numerical maps which seem to realize Borges's dream of a map expanded to the scale of the territory.

1 Gilles Deleuze, Foucault (Paris: Editions de Minuit, 1986), 51.
2 Ibid., 42.
3 Ibid., 44.
4 Gilles Deleuze, Francis Bacon: Logique de la Sensation, (Paris: Éditions de la Difference, 1981), 66.
5 I refer the reader to my book L'oeil cartographique de l'art (Paris: Galilee, 1998) where I reconstruct the history of the cartographic "eye," its geoaesthetic and its reality effect from the 16th century up to the contemporary cartorama. On this question, see my essay "Abstraction: from Marcel Duchamp to Cartography" in trans (New York: 1997) and the catalogue of the Linz and Bergen exhibitions, Atlas Mapping (Turia Kant, 1997).
6 Robert Smithson, The Collected Writings, ed. Jack Flan (Berkeley, University of California Press, 1996), 177.