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From Resonance to Interference: The Architecture of Concepts and the Relationships among Philosophy, Art and Science in Deleuze and Deleuze and Guattari

Arkady Plotnitsky

Resonance and Interference in Physics and Philosophy

The foremost business of philosophy, Gilles Deleuze and Félix Guattari tell us in *What is Philosophy?*, is the invention of new concepts or even concepts 'that are always new'.[1] This is how philosophical thought confronts chaos. This confrontation defines all true thought, but it also entails an affinity and alliance with chaos, an alliance that enables thought to confront a yet greater enemy, opinion, *doxa*, which merely wants to protect us from chaos.[2] The cooperative confrontation between thought and chaos is pursued differently in different human endeavours, in particular, philosophy, art and science (including mathematics). Philosophy engages with chaos through the creation of concepts and planes of immanence; art through the creation of sensations (or affects) and planes of composition; and science through the creation of functions (or propositions) and planes of reference or coordination. The specificity of the workings of thought in each field makes them different from each other. Part of the project of *What is Philosophy?* is to explore this specificity and this difference. Deleuze and Guattari go as far as to argue that '*the brain is the junction* – and not the unity – *of the three planes*' through which art, science and philosophy, each in its own way, cut through chaos.[3] In other words, art, science and philosophy or, at least, something that *neurologically* defines each as a particular form of the confrontation between thought and chaos, are seen as primordial forms of thinking, (more) immediately linked to the brain's neural functioning rather than more mediated products of thought. However, the relationships among art, science and philosophy appear to be equally significant for Deleuze and Guattari. This significance compels them to develop, both in the book itself and in their earlier works, a more complex landscape of thought in relation to which these fields are positioned. Both concepts of my title, 'resonance' and 'interference' (which are used by Deleuze and Guattari, and which are, as I shall explain, related), help us to think the nature of these relationships, both in Deleuze and Guattari's work and in general. They help us to do so as *philosophical* concepts, although they come into Deleuze's and Deleuze and Guattari's philosophy from physics. In a kind of *dédoublement*, these concepts are products of the interactions; interactions that contain resonances *and* interferences between physics and philosophy, resonances *and* interferences that are found within *each* concept.

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Deleuze and Guattari's view of philosophy as the invention of new concepts requires a new *concept* of the philosophical concept itself. A philosophical concept is not an entity established by a generalization from particulars or 'any general or abstract idea'.[4] It is instead a multiplicity: 'there are no simple concepts. Every concept has components and is defined by them. It therefore has a combination [*shiffre*]. It is a multiplicity [manifold(ness)] [. . .] There is no concept with only one component'.[5] Each concept is a multi-component conglomeration of concepts (in their conventional senses), figures, metaphors and so forth which, however, have a heterogeneous, if interactive, architecture rather than forming a unity. Concepts are junctures rather than sums of parts. They are forms of vibrations and are defined by resonances, through which they may amplify or temper each other: 'Concepts [in a given philosophical work] are centres of vibrations, each in itself and everyone in relation to all others. This is why they all resonate rather than cohere or correspond with each other'.[6] It may be noted that in physics resonance is a form of coherence but in a sense different from the one, that of the coherence of parts in the whole, used in this statement. Each concept is also seen as a problem, on the *problematic* model of mathematical thinking. This model is defined by posing a problem as the starting point of a given investigation without necessarily tracing this problem to the foundational basis of the field in which it is posed or indeed assuming that such a tracing or even such a foundational basis is possible. The problematic model is *contrasted* with the axiomatic-theorematic model, although not unequivocally opposed since both models share some of their characteristics. On this model, one proceeds by means of well-defined rules which allow one to move from axioms to propositions, from propositions to propositions and, most crucially, to assume that *in principle* it is possible to presuppose the existence of such a trajectory for any given proposition. One rarely needs to, or can, establish such a trajectory in practice. Conversely, in practice, the problematic approach involves rigorously defined propositions and rules of inference. Euclid's *Elements* is arguably the defining paradigmatic case; *the* model of the axiomatic-theorematic approach. Thus, as a problematic entity, Deleuze and Guattari's concept of the philosophical concept involves an interference between mathematics and philosophy, as does the juxtaposition of the problematic and the axiomatic-theorematic. The case is especially notable because this interference enters the very definition of the concept of the philosophical concept. In general, such interferences with mathematics or science are common in philosophical thought. Conversely, philosophical concepts are sometimes found alongside, or in an interference with, scientific concepts and in scientific practice. According to Deleuze:

> There are two sorts of scientific concepts, even though they get mixed up in particular cases. There are concepts that are exact in nature, quantitative, defined by equations, and whose very meaning lies in their exactness: a philosopher or writer can use these only metaphorically, and that's quite wrong, because they belong to exact science. But there are also essentially inexact yet completely rigorous concepts that scientists can't do without, which belong equally to scientists, philosophers, and artists. They have to be made rigorous in a way that's not directly scientific, so that when a scientist manages to do this he becomes a philosopher, an artist, too. This sort of concept's not unspecific because something's missing but because of its nature and content.[7]

Thus, a *philosophical* concept corresponding to a mathematical or scientific object could be discovered by mathematics and science (now also working as philosophy) according to Deleuze and Guattari's definition. Hence, Deleuze is cautious concerning the use of science in philosophy but also defends this use. As he says in *Cinema 2*: 'Of course, we realize the danger of citing scientific propositions outside their own sphere. It is the danger of arbitrary metaphor or of forced application. But perhaps these dangers are averted if we restrict ourselves to taking from scientific operators a particular conceptualizable character which itself refers to nonscientific areas, and converge with science without applying it or making it [simply] a metaphor'.[8] As suggested by the previously cited passage, the situation is both subtler and more reciprocal. Such junctures are meeting points between scientific and philosophical concepts, often enriching both – for example, resonance and interference.

As a classical physical phenomenon, resonance is the tendency of a periodic system, such as a pendulum or a string, to oscillate at larger amplitudes at certain frequencies. These are known as resonant frequencies which are, in general, approximately equal to the natural frequency of a system. At resonant frequencies, even small periodic driving forces can produce large oscillations. This is a form of wave interference which leads to the amplification of wave amplitudes. In the case of resonance (two waves in phase), this simply amounts to adding amplitudes rather than adding and subtracting them at different points. If the two waves are completely out of phase they cancel each other.

Thus, physically, interference is a more general phenomenon, of which resonance is a particular, but important, form. The most crucial point for the present purposes is that a wave pattern of the behaviour of a given system can be amplified even by a small driving force. Considered qualitatively (physics requires the exact mathematical formalism and numerical treatment of resonance behaviour) this 'picture' can be transferred to the behaviour of a conceptual system which may consist of a single concept. 'Resonance frequencies' of a given conceptual system may be 'awakened' by a driving force coming from another system or two such systems may be in resonance. This is, again, an interference-like process which makes the systems 'vibrate'; makes them literally more 'vibrant' in a convergent or divergent fashion. As I have already noted, according to Deleuze and Guattari, resonance is a dominant mode of functioning for philosophical concepts.[9] In this case, words like 'frequency', 'vibration' or 'amplitude' have, again, a qualitative or inexact (although philosophically rigorous) conceptual, rather than physical meaning, in the sense, say, of a certain 'periodicity' of returning to a sufficiently identical conceptual juncture after similar conceptual intervals or durations in the movement of thought. Thus, in both *Difference and Repetition* and *The Logic of Sense*, Deleuze reads series of images or events as resonant, even when these series diverge from each other or when each is divergent in itself, in accordance (yet another interference between mathematics and philosophy) with the mathematical concept of a divergent series.[10] Their resonance can, however, link and amplify both series at the point of resonance. One might also say that *Difference and Repetition* brings in resonance the mathematics of calculus and Deleuze's theory of difference.

Interference is, as I previously suggested, the addition or superposition of two or more waves that results in new wave patterns. Interference usually refers to the interaction of waves that are correlated or coherent with each other, either because they come from the same source or because they have the same, or nearly the same, frequencies. If one has, as in music, two complex multi-periodic wave systems comprised of multiple harmonics which can interfere with each other, we can see a very complex resulting pattern of amplitudes in which the initial amplitudes are added and subtracted in multiple ways.

This complexity is the difference between resonance, which is an amplification of amplitudes, and interference, which might involve resonance but is ultimately a richer play of amplification and the reduction of amplitudes. Interference and resonance can also be considered in the quantum regime. Here they relate to a different epistemological situation wherein we can no longer describe or even conceive of how certain phenomena are possible, even though we must still work with these phenomena under these conditions. Although I can only address the subject in passing here, it is important when considering the idea of nonlocalizable interference between philosophy, art and science in the work of Deleuze and Guattari.[11]

My main point at the moment is the role or, again, the *resonance* of the concept of resonance in Deleuze. It is also a form of interference; an 'extrinsic' or exterior interference, as Deleuze and Guattari have described it.[12] The concept of resonance also thematizes, in the *dédoublement* fashion, the way science primarily works in early Deleuze. That is, by way of resonance or, more generally, extrinsic interference in the service of building philosophical concepts (rather than, as in the later works and especially in his collaborations with Guattari, by way of 'intrinsic' or ultimately 'nonlocalizable' interferences).[13]An intrinsic interference takes philosophy outside philosophy, say, into science or art or makes it difficult, even impossible, to decide to which field a given concept belongs. Nonlocalizable interferences take us beyond any given field – art, science or philosophy – even from within. Just as Deleuze's concept of resonance may be seen as, itself, a product of resonance (or again, intrinsic interference), there is also a *dédoublement* of the concept of interference in *What is Philosophy?* The concept of interference may be seen to exemplify, first, an intrinsic interference, and second, a nonlocalizable interference, when the character of interference becomes quantum-like.

My main argument in this essay is as follows: as they explore and construct the concept of resonance, Deleuze's earlier works, specifically *Difference and Repetition* and *The Logic of Sense*, are largely defined by resonances between philosophy and science in the service of the construction of new philosophical concepts. This is the primary task of philosophy as it ultimately came to be defined in *What is Philosophy?* In contrast, his later works, particularly his collaborations with Guattari, are largely defined by a richer and more radical form of interference between philosophy, science and art. Ultimately, Deleuze and Guattari's conception and practice of philosophy reaches the point where, in a nonlocalizable interference, philosophy can be defined by saying 'No' to itself and to art and science. This 'No' reveals an irreducible nonphilosophy within philosophy. This same 'No' has always shaped philosophy as a thought, a

confrontation with chaos, even though philosophy could only function as philosophy when it involved the activity of creating new concepts. Analogous kinds of 'No' can also be found in, and are equally decisive for, art and science. These 'Nos' reveal a different future for thought; a future that will transform philosophy, art and science or perhaps leave them behind. Deleuze and Guattari suggest that this different future of thought has already cast its shadow upon us – the shadow of 'people to come'.[14] For now, however, we need philosophy (as philosophy and as nonphilosophy), art (as art and as nonart) and science (as science and nonscience) to think this future through the 'No' that each says to itself. We also need them, at least for now, to keep alive our cooperative confrontation with chaos in the war that our thought, allied with chaos, must wage against opinion; 'the misfortune of people comes from opinion'.[15]

Resonance and the Architecture of Philosophical Concepts

The philosophical concept of resonance in Deleuze may be seen as a particular case of interference, specifically of the extrinsic interference between philosophy and science (physics); an interference that leaves the resulting concept within a given field, in this case, philosophy.[16] By the same token, extrinsic interferences play a major role in building up philosophical concepts, as the concepts of resonance and interference testify. The concept of resonance performs remarkable work in the conceptual architecture of *Difference and Repetition* and *The Logic of Sense*, by way of a complex and, again, in turn multi-resonance interference of psychoanalysis, mathematics and physics. This approach, particularly within *The Logic of Sense*, may have been influenced by Lacan and his use of mathematics. Lacan's psychoanalytic ideas are certainly in play at this juncture of the book. On the other hand, Deleuze's use of the concept of series, which comes from calculus, is his own and is one of the most unusual and original uses of mathematics in philosophy. As Deleuze says:

> We must therefore distinguish, in the different moments of sexuality, previously considered, very different kind of series. There are, first, the erogenous zones of pregenital sexuality: each of them is organized in a series which converge around a singularity represented most often by an orifice surrounded by a mucous membrane. The serial form is founded in the erogenous zone of the surface, insofar as the latter is defined by the extension of a singularity or, what amounts to the same thing, by the distribution of a difference of potential or intensity, having a maximum and a minimum (the series ends around points which depends upon another series). The serial form of the erogenous zones, therefore, is founded on *a mathematics of singular points* and on *a physics of intensive quantities*.[17]

The passage would be likely to raise some eyebrows among mathematicians and scientists (or philosophers of mathematics and science), were they to encounter it (like Lacan's famous, or to some infamous, association of 'the erectile organ' with imaginary numbers – for example, the square root of -1). However, this type of reaction (to either argument) only reveals a lack of awareness or attention to Deleuze's or Lacan's way of thinking, specifically the more nuanced, rather than

naively psychoanalytic, context of their arguments. It is certainly not a question, as some critics have contended, of either a lack of understanding of mathematical and scientific concepts or using the 'authority' of mathematics and science (without properly understanding them) to support nonscientific arguments.[18] As I noted earlier, Deleuze is well aware of 'the danger of citing scientific propositions outside their own sphere'; of 'the danger of arbitrary metaphor or of forced application'. But as I also noted earlier, he also added that 'perhaps these dangers are averted if we restrict ourselves to taking from scientific operators a particular conceptualizable character which itself refers to nonscientific areas, and converges with science without applying it or making it [simply] a metaphor'.[19] This is precisely what happens in the discussion in *The Logic of Sense* currently under consideration. The claim that 'the serial form of the erogenous zones [. . .] is founded on *a mathematics of singular points* and on *a physics of intensive quantities*'[20] should not be taken to mean that the 'mathematics' and the 'physics' in question are disciplinary, technical (i.e. formal or quantitative) mathematics and physics. Instead it means that the disciplinary, technical mathematics which Deleuze's (or Lacan's) philosophical conceptuality extracted from mathematics, share the same philosophical conceptual (sub)stratum. Sometimes this substratum is articulated in philosophical, as well as in technical terms, by mathematicians and physicists themselves. Although less visible in the case of Karl Weierstrass, this can be seen in the work of Bernhard Riemann and Henri Poincaré (arguably the three most important founding figures of the mathematical theories involved). All of these figures influenced Deleuze's thinking in the argument in question. By the same token, both Riemann and Poincaré also became philosophers, in accordance with Deleuze's definition. Thus, rather than lament the misuse or abuse of mathematics and science in the work of Deleuze, Lacan or others, one might celebrate the capacity of mathematical and scientific imagination to relate to 'nonscientific areas' and, as a result, have a major impact on other human endeavours, such as art, philosophy or psychoanalysis.

The mathematical and physical conceptual architecture in question could be roughly outlined as follows, focusing specifically on the *philosophical* aspects of this architecture: Consider a function with two variables $f(x, y)$. At least for a certain class of such functions, each function could be represented by a *mostly* smooth surface in a three dimensional space and defined by a corresponding equation, $z = f(x, y)$. Such a surface could, for example, be a sphere, a torus or a pretzel-like figure with multiple holes. The number of holes, as Riemann discovered, defines the topological and analytical properties of the surface. 'Smooth' means that one can properly define a derivative for the function; that a tangent to the curve is well defined. 'Mostly' means that one can do so at *most* points except for a discrete (usually finite) number of points, known as singularities, where it is not possible to do so or even assign a meaningful value to the function itself, say, on the basis of the formula that defines it. Thus, the function $1/(x + y)$ has a singularity at $x = 0$, $y = 0$, since the division by zero cannot be defined. The nature or structure of singularities is a very important source of information concerning the behaviour of a given function, both locally (in the vicinity of the singularity) and globally. Some singularities, for example, could be 'smoothed-out' in the sense that one can still assign a meaningful value to the function at a point of singularity (some among such points are sometimes known as 'poles'), whereas other singularities cannot be.[21] Such functions

may also be represented by infinite series which, again, *mostly* converge in the sense that, while they are infinite, one can mathematically define the sum of all their elements as finite, except at the points of singularities where series become no longer summable. They become divergent. In some cases, at least, we can also think of these series as being those of harmonic functions; the function in question can be decomposed into the finite or infinite sum of harmonics, in turn convergent at most points, except at the points of singularities.

In some singular points, we can still assign a value to the function, repair the divergence and at others we cannot. If we have two or more such functions, each represented by a series and defining a surface, they can be in complex relations to each other. We can consider algebraic relationships between such functions; their convergent and divergent behaviour which enables one to link regular or singular points of the corresponding surfaces; the corresponding series can enter resonance at points of convergence or even at singular points. In physics, a function of this type can represent a behaviour of a physical system, such as a flow of liquid, an electromagnetic field or a gravitational field. The function is usually seen as defining a potential if its derivative represents the force (or intensity) and gradient (direction[s]) of the flow or the current. The corresponding physics is 'a physics of intensive quantities' insofar as the potential function represents what Deleuze calls the 'virtual'. The virtual, or at least part of it, can be physically actualized in the observable behaviour of a physical system (the 'actual'). These mathematical properties have important implications for physics. Thus, due to a famous theorem of Poincaré, the 'hedgehog theorem', a flow of liquid or current on a sphere cannot be free of singularity, whereas it can be on a torus. The name 'hedgehog theorem' is due the fact that the theorem also tells us that we cannot 'comb' the ideal spherical hedgehog (with a hair growing in each point of the surface). We cannot make each hair exactly tangent to the surface, since at least one hair will stick out, thus revealing at least one point of singularity.

It is this general scheme that Deleuze philosophically deploys in the passage cited above and in related junctures, both in *The Logic of Sense* and elsewhere. The idea of singularity becomes especially important as the nature of singularities shapes, and even defines, the behaviour of a given system. Different types of singularities need to be handled by relating them to other functions, systems and behaviours. In mathematics or physics, the scheme just outlined can be given a mathematically or physically exact, including numerical, content.

The parallel philosophical scheme deployed by Deleuze is, in his terms, 'inexact', but is nevertheless philosophically rigorous. Also, Deleuze only uses this scheme in philosophical, not mathematical or scientific, contexts. I would like to reiterate, however, that Deleuze's scheme shares this 'inexact' conceptuality with mathematics and science which, at least when they are creative, must be both rigorously exact and inexactly rigorous, while philosophy only needs to be the latter. This need not mean that mathematics and science are superior to philosophy. For one thing, creative mathematics and science depend on the inexact rigor of philosophical thought, whereas creative philosophy need not depend on the exact rigor of mathematics and science (although it can extract philosophical concepts

from them). There is a complex interplay of symmetries and asymmetries between philosophy and science and art brings yet more layers into this interplay.

It is not possible within the scope of this article, nor is it my aim here, to assess this rigor or even explicate the ways this scheme works in the case of sexuality or desire in *The Logic of Sense*. I would like to note, even if regrettably only in passing, the significance of divergent series for Deleuze (the concept that is deployed, often via Leibniz, throughout his work). In particular, the resonance between divergent series at points of singularities. This resonance enables Deleuze to define, via Freud and Lacan, his concepts of conjunctive, disjunctive and connective synthesis, within a (more) Oedipal economy of desire.[22] These concepts will become central in *Anti-Oedipus*, where they are amplified by the critique of both Freud and Lacan, even while still using or resonating with aspects of their work, when they move along the anti-Oedipal gradients. What primarily interests me is the role of *resonances* between philosophy and mathematics (or science) in *The Logic of Sense* and elsewhere in Deleuze, in particular in *Difference and Repetition*.

Such resonances may involve particular concepts, including the concept of resonance itself. One might also note a powerful resonance of a similar type ('resonating series'), developed via Lewis Carroll's *The Dynamics of the Parti-cle*, the work in turn shaped by powerful resonances between physics and mathematics.[23] Resonances of this type may also have a more complex character. They involve intricate, sometimes resonating or interfering, clusters of concepts to the point of defining corresponding fields such as calculus or classical mechanics (functions, series, limits, convergence, problematic vs. theorematic approaches, etc.) and a certain form of philosophy of difference. It is this multi-clustered field of disciplinary resonances between calculus and philosophy, along with other resonances and interferences – for example, with dynamic systems theory – and other forms of concept building which defines *Difference and Repetition*. *The Logic of Sense* is, I would argue, defined by an even richer resonance architecture.

Indeed, although one does find examples of this approach in his earlier work, one might argue that Deleuze comes into his own as a major philosopher, a creator of new concepts, in these two books through his deployment of these resonating *extrinsic* interferences as a primary way of philosophical concept building. While retaining this practice as part of their philosophical practice or, as part of the disciplinary specificity of philosophy as the creation of new concepts, Deleuze's collaborations with Guattari extend this way of philosophical thinking to more radical forms of interference, manifesting extrinsic and nonlocalizable interferences. Consequently, this work moves toward a more radical form of philosophical practice which can no longer be contained but also, and more significantly, can no longer be defined by philosophy. Philosophy therefore becomes coextensive with nonphilosophy. As in the case of the concept of resonance in Deleuze's earlier work, the concept of interference becomes, in the *dédoublement* fashion, a reflection of this new practice and understanding of philosophy as defined by irreducibly nonlocalizable interferences; interferences which are nonlocalizable within philosophy. Nor are these interferences localizable in art and science, or in anything that we can define, at least for now. Nonlocalizable interferences can also be found in art and science and

therefore (re)define both by their irreducible co-extensiveness with nonart and nonscience respectively.

Interference and Thinking beyond Philosophy

As noted from the outset, resonance is, both physically and philosophically, a special case of interference. The latter concept plays a particularly significant role in *What is Philosophy?*, especially in its conclusion. My argument itself is applicable to both Deleuze's later works and his collaborations with Guattari. In addition to the role of the idea of interference, Deleuze's philosophy also becomes a philosophy of interference, in which both intrinsic and nonlocalizable interference play crucial roles. In this respect, it may be *contrasted*, *even if not juxtaposed*, to his philosophy of resonance and/as extrinsic interference in *Difference and Repetition* and *The Logic of Sense*. There are, hence the underlined qualification, continuities between both stages: the concepts and practice of resonance and intrinsic interference can be found in Deleuze's later philosophy and, likewise, the concepts and the instances of practice of extrinsic and nonlocalizable interference in his earlier philosophy. Nevertheless, the shift is, I would argue, also significant because it offers insights into the future of philosophy, or of art and science, and ultimately of thought itself as a confrontation with chaos.

Anti-Oedipus, Deleuze and Guattari's first major joint work, reflects this shift at the most immediate level. Although the book is a major work of both philosophy and psychoanalysis, interferences between both fields are more intrinsic than extrinsic because the corresponding philosophical and psychoanalytic planes of thought continually slide into each, making the resulting plane undecidable vis-à-vis either determination. There are also many particular junctures of intrinsic interferences between and among philosophy, art and science. Furthermore, psychoanalysis itself must be positioned in relation to, or as a (possible interfering) combination of, philosophy, art and science. The play of interferences becomes even richer and more complex in Deleuze and Guattari's subsequent works, culminating in *What is Philosophy?*

First of all, the book's *flow* is marked by wave and interference conceptuality, sometimes at work indirectly and sometimes appearing expressly at key junctures. A subtler example of the former is an appeal to 'harmonics', inhabiting certain designations of concepts: 'some concepts must be indicated by an extraordinary and sometimes even barbarous or shocking word, whereas others make do with an ordinary, everyday word that is filled with *harmonics* so distant that they risk being imperceptible to a nonphilosophical ear'.[24] In other words, the term designating such a concept is a combination, or a Fourier-like series, of harmonics and their interferences. An example of the latter is offered by the relationships between philosophical concepts and the plane of immanence, beginning with the resonance nature of the relationships between concepts.[25] These relationships are irreducible in philosophical thought and are crucial to it; even though the plane of immanence must be regarded as pre-philosophical, the image of thought itself, but also, in a certain sense, as more philosophical than philosophy itself.[26] Then, there is

'THE plane of immanence,' which, Deleuze and Guattari argue, was glimpsed for the first time by Spinoza and in relation to which all possible planes of immanence must be considered. This plane is 'at the same time that which must be thought and that which cannot be thought. It is the nonthought within thought'.[27] THE plane is analogous to the plane of quantum-mechanical thought and the latter may be philosophical (epistemological) rather than physical: the ultimate nature of quantum objects, such as electrons and photons, must be thought and yet cannot be thought by quantum theory. THE plane is also responsible for nonlocalizable interferences which are, in fact, defined as bringing in that which must be thought and yet cannot be thought. For the moment, 'concepts are multiple waves, rising and falling, but the plane of immanence is the single wave that rolls [concepts] up and unrolls them'[28] thus conceptualizing, in a philosophical concept of the plane of immanence, philosophical thinking as a particularly structured wave process.

As I noted at the outset, Deleuze and Guattari argue that '*the brain is the junction* – and not the unity – *of the three planes*' through which art, science and philosophy, each in its own way, cut through chaos.[29] In other words, art, science and philosophy or, at least, something that *neurologically* defines each as a particular form of the confrontation between thought and chaos, are seen as more primordial forms of thinking, more immediately linked to the brain's neural functioning rather than more mediated products of thought. As far as other human endeavours, for example psychoanalysis, are concerned, they must, on this view, be seen as a particular combination or interference between philosophy, art and science. Both Freud and Lacan would, I think, have agreed, given their insistence on a rigorously scientific nature of psychoanalysis. There is, of course, also multiplicity to philosophy, art or science in their own right. But each corresponding instance of the multiple would still conform to the architecture of the corresponding planes – those of immanence, composition, and reference – and defining elements – concepts, percepts (or affects) and functives – of a given field.

These planes are (neurologically) irreducible and yet they also may, even must, interfere with each other at certain points. As Deleuze and Guattari say: 'The three planes, along with their elements, are irreducible: *plane of immanence [or consistency] of philosophy*, *plane of composition of art*, *plane of reference or coordination of science; form of concept*, *force of sensation*, *function of knowledge; concept and conceptual personae*, *sensations and aesthetic figures*, *figures and partial observers* [...] But what to us seem more important now are the problems of interference between the planes that join up in the brain'.[30] They define first extrinsic interferences which, in the case of philosophy, may, and in their own work often do, take the form of resonance leading to a new philosophical concept. Deleuze and Guattari write:

> A first type of interference appears when a philosopher attempts to create the concept of a sensation or a function (for example, a concept peculiar to Riemannian space or to an irrational number); or when a scientist tries to create functions of sensations, like Fechner or in theories of colour or sound, and even functions of concepts, as Lautman demonstrates for mathematics insofar as the latter actualizes virtual concepts; and when an artist creates pure sensations of concepts

> or functions, as we see in variety of abstract art or in Klee. In all these cases the rule is that the interfering discipline must proceed with its own methods [. . .] The function must be grasped within a sensation that gives it percepts and affects composed exclusively by art, on a specific plane of creation that wrests it from any reference (the intersection of two black lines or the thickness of colour in the right angles of Mondrian or the approach of chaos through the sensation of strange attractors in Noland and Shirley Jaffe) [. . .] These, then, are extrinsic interferences because each discipline remains on its own plane and utilizes its own elements.[31]

'But', they add, 'there is a second, intrinsic type of interference when concepts and conceptual personae seem to leave a plane of immanence that would correspond to them, so as to slip in among the functions and partial observers of science [. . .] on another plane; and similarly in other cases. These slidings are so subtle, like those of Zarathustra in Nietzsche's philosophy or of Igitur in Mallarmé's poetry, that we find ourselves on complex planes that are difficult to qualify'.[32] A resonance can occur in such cases as well, but if it does it amplifies the difficulty of qualifying a given plane. One might say that, in intrinsic interferences, we deal with more radical types of singularities than in the case of extrinsic singularities, insofar as a problem posed to a philosophical thought can no longer be resolved by a new concept. Instead, it requires two planes and two corresponding types of elements, philosophical and artistic or philosophical and scientific, sliding into each other. The parallel situation would obtain in the workings of intrinsic interference in art and science as well.

Finally, however, 'there are [also] interferences that cannot be localized'.[33] These interferences reveal singularities of a more radical type, unresolvable by any means provided by philosophy, art and science, their combination or sliding. 'This is because each discipline is, in its own way, in relation with a negative: even science has a relation with a nonscience that echoes its effects. [. . .] Each of the disciplines is, on its own behalf, in an essential relationship with the 'No' that concerns us':

> The plane of philosophy is prephilosophical insofar as we consider it independently of the concepts that come to occupy it, but nonphilosophy is found where the plain confronts chaos. *Philosophy needs a nonphilosophy that comprehends it; it needs a nonphilosophical comprehension just as art needs nonart and science needs nonscience*. They do not need the No as beginning, or as the end in which they would be called upon to disappear by being realized [it is not the question of the end of history], but at every moment of their becoming or their development. Now, if the three 'No's are still distinct in relation to the cerebral plane, they are no longer distinct in relation to chaos in which the brain plunges. In this submersion it seems that there is extracted from chaos the shadow of 'people to come' in the form that art, but also philosophy and science, summon forth, but which leaves all three behind: mass-people, world-people, brain-people, chaos-people – nonthinking thought that lodges in the three, like Klee's nonconceptual concept or Kandinsky's internal silence.[34]

To this, one could add that Heisenberg's and Bohr's unthinkable quantum objects are nonlocalizable interferences which are themselves quantum-like as we can no longer describe, or even conceive of, the ultimate nature of quantum objects, even though we must still work with these inconceivable objects which must be thought and cannot be thought. One could also add the undecidable nature of certain mathematical propositions in mathematics; that is, propositions that cannot be proven as either true or false by means of a system of axioms in which they are formulated (although some of them may be seen as true). Kurt Gödel was first to demonstrate the existence of such propositions in most working mathematical systems – i.e. those rich enough to contain the standard arithmetic – in 1931. He also proved that the statement that any such system is consistent is also undecidable, and hence the consistency of most mathematics cannot be guaranteed, although it could, in principle, be shown to be inconsistent. Gödelian undecidability might even be on Deleuze and Guattari's mind here, or at least be shaping their thoughts from the unconscious. Indeed the idea of undecidability enters next by way of an interference between philosophy and mathematics, in this case an extrinsic interference since the statement may also be seen as a philosophical proposition. They say, closing the book: 'It is here that concepts, sensations and functions becomes undecidable, at the same time as philosophy, art and science become indiscernible, as if they shared the same shadow that extends itself across their different nature and constantly accompanies them'.[35]

We stop here, like the book itself, to assess where the book ultimately brings us, or perhaps where it has been all along, extending the trajectory or plane first entered by *Anti-Oedipus*. Let us recall that the plane of immanence, and especially THE plane of immanence, while more philosophical than philosophy, was, as the image of thought, seen as nonphilosophical from the outset. The same may also be said for the planes of art (composition) and science (reference), as respectively nonartistic and nonscientific. Indeed THE plane is that which must be thought and yet cannot be thought, the nonthought within thought, just as Klee's 'nonconceptual concept' is.

In Deleuze's earlier works, particularly *Difference and Repetition* and *The Logic of Sense*, interferences mainly take the form of extrinsic interferences and are in the service of philosophy and of creation of concepts. This role is still in place and the corresponding practice qua *philosophical* practice defines *What is Philosophy?* which has its plane of immanence and creates new concepts, beginning with that of concept. But because philosophy must also say 'No' to itself, philosophy is more fundamentally, *most* fundamentally, something else which is perhaps why the book's title is still a question: 'What is Philosophy?'

The more or less manifest moments of interference may be rare and, in the cases of nonlocalizable interferences, even exceptional, but they reveal a different, more radical, type of singularity that is in essence always in place, even if by way of 'more distant harmonics'. The correspondingly analogous situations and singularities are found in art and science. The irresolvable nature of such singularities, irresolvable by any means that philosophy, art and science can provide, is especially manifest in Klee's language of 'nonconceptual concept'; it is pronounced throughout this elaboration. Accordingly, a different form of thought becomes necessary. The book and the philosophy it offers already reveal and, as it were, teleo-poetically enact the future of

thought in question. In so doing, they enter the world, no longer only a shadow, of the people to come. These people to come are here now. They were there even in 1991, when the book was originally published, and are even more present now, two decades later. The book therefore enacts the future of philosophy and it does so in part because philosophy, art and science, have always, along with confronting chaos, had to say 'No' to themselves. It might be added that, as a philosophy of the brain, the philosophy practiced in the book does so by way of an interference and resonance with modern neuroscience.[36] Something does change, of course, since it is not a matter of an implied teleology of philosophy, but only of the nature of thought, and of planes of thought, or of THE plane of thought, in which nonthought in thought makes itself felt without ever showing itself. What does change is an actual philosophical, or philosophical-nonphilosophical, practice. The book offers a possible intimation of this change, but over which it still puts a question mark: 'What is Philosophy?'

Doubling, then, the question mark (indeed tripling it, since the 'answer' to be given is still a question, but a new question); what is, then, philosophy? What has it always been, most fundamentally, according to *What is Philosophy?* Philosophy is a particular form of interference between philosophy and nonphilosophy, as science is a particular form of interference between science and nonscience, and art a particular form of interference between art and nonart (which may, but need not, include philosophy and science). It is indeed true that, at points of nonlocalizable interferences, 'philosophy, art and science become indiscernible, as if they shared the same shadow that extends itself across their different nature and constantly accompanies them'. But this shadow, or rather this *thought* itself, a *thought* plunging into chaos and extracting itself from it, also, and most fundamentally, defines philosophy, art, and science, each against itself. In so doing, however, this thought poses new questions for us and invites us to think of new forms of practice in philosophy, art and science, and of new interferences and resonances between them that take us beyond them.

Notes

[1] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, trans. Hugh Tomlinson and Graham Burchell (New York: Columbia University Press, 1994), p.5.
[2] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.208–10.
[3] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.208.
[4] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.11–12.
[5] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.16.
[6] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.23.
[7] Gilles Deleuze, *Negotiations*, trans. Martin Joughin (New York: Columbia University Press, 1995), p.29 (translation modified).
[8] Gilles Deleuze, *Cinema 2: The Time-Image*, trans. Hugh Tomlinson and Robert Galeta (Minneapolis: University of Minnesota Press, 1995), p.129.
[9] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.23.
[10] Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton, (New York: Columbia University Press, 1993); *The Logic of Sense*, ed. Constantin Boundas, trans. Mark Lester, (New York: Columbia University Press, 1990).
[11] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp. 217–18. I have previously discussed quantum theory from this perspective in Arkady Plotnitsky, 'Chaosmologies: Chaos and Thought in Gilles Deleuze and Félix Guattari's *What is Philosophy*, with Quantum Field Theory', *Paragraph* 29.2 (2006) pp.40–56.
[12] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.217.
[13] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.216–18.

[14] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.218.
[15] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.206.
[16] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.217.
[17] Gilles Deleuze, *The Logic of Sense*, ed. Constantin V. Boundas and trans. Mark Lester with Charles Stivale (New York: Columbia University Press, 1990), pp. 224–25.
[18] For further discussion of the subject see Arkady Plotnitsky, *The Knowable and the Unknowble: Modern Science, Nonclassical Theory, and the 'Two Cultures'* (Ann-Arbor: University of Michigan Press, 2002).
[19] Gilles Deleuze, *Cinema 2*, p.129.
[20] Gilles Deleuze, *The Logic of Sense*, pp. 224–25.
[21] Technically, the machinery described here pertains to the function, $f(z)$, of the so-called complex variables, written in the form $z = x + yi$, where x and y are real numbers (usually represented by coordinate points on the straight line) and i is the square root of -1. Complex numbers can be represented as points on a coordinated two-dimensional plane. Every such function may also be seen as a function of two real variables. Yet the opposite is not true since functions of complex variables have special properties and some of these properties significantly affect singularities of such functions. The sketch given here unavoidably simplifies both the mathematics and physics involved. In particular, while physics sometimes uses functions of complex variables, all physical phenomena described are represented by functions of real variables. However, these nuances do not affect the key philosophical points under discussion.
[22] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.226–233.
[23] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.54–56.
[24] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.8 (my emphasis).
[25] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p 23.
[26] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.37–41.
[27] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.59.
[28] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.36.
[29] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.208.
[30] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.216.
[31] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.217.
[32] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.217.
[33] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.217.
[34] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.218.
[35] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, p.218.
[36] Gilles Deleuze and Félix Guattari, *What is Philosophy?*, pp.202–218.

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