
Deleuze on Leibniz: Difference, Continuity, and the Calculus

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Gilles Deleuze once characterized himself as a “classical” philosopher, a statement that no doubt was meant to signal his indebtedness to (and affinities with) the great philosophers of the classic period, notably Spinoza and Leibniz. Spinoza provided Deleuze with a model for a purely immanent ontology, while Leibniz offered him a way of thinking through the problems of individuation and the theory of Ideas. In both cases, however, Deleuze would take up and modify Spinoza’s and Leibniz’s thought in his own manner, such that it is impossible to say that Deleuze is a “Spinozist” or a “Leibnizian” without carefully delineating the use to which he puts each of these thinkers.

In this essay, I examine at least the initial outlines of Deleuze’s reading of Leibniz. Although Deleuze published a book-length study of Leibniz late in his career, *The Fold: Leibniz and the Baroque* (1984),¹ his more profound (and, I believe, more important) engagement with Leibniz had already occurred in *Difference and Repetition* (1968) and *Logic of Sense* (1969).² In these earlier works, Deleuze approached Leibniz from a resolutely post-Kantian point of view, returning to Leibniz in his attempt to redefine the nature of the transcendental field. Following Salomon Maimon, Deleuze had argued that, in order for Kant’s critical philosophy to achieve its own aims, a viewpoint of *internal genesis* needed to be substituted for Kant’s principle of *external conditioning*.³ “Doing this means returning to Leibniz,” Deleuze would later explain, “but on bases other than Leibniz’s. All the elements to create a genesis such as the post-Kantians demand it, all the elements are virtually in Leibniz.”⁴ One of these other “bases” was the formulation of a pure principle of *difference*, which alone would be capable of freeing thought from “representation” (whether finite or infinite), and its concomitant subordination to the principle of identity. As Maimon had shown, whereas identity is the condition of possibility of

thought in general, it is difference that constitutes the genetic condition of *real* thought. In what follows, then, I show how Deleuze uses Leibniz to “deduce” the necessity of a principle of difference by making his way through the four fundamental principles of Leibniz’s philosophy: identity, sufficient reason, indiscernibility, and the law of continuity (see figure 1). What emerges from Deleuze’s reading of Leibniz is, as he himself puts it, “a Leibnizian transcendental philosophy that bears on the event rather than the phenomenon, and replaces the Kantian conditioning.”⁵

The Principle of Identity

We begin with the simplest statement of the principle of identity. The classical formula of the identity principle is “A is A”: “blue is blue,” “a triangle is a triangle,” “God is God.” But such formulae, says Leibniz, “seem to do nothing but repeat the same thing without telling us anything.”⁶ They are certain but empty. A more popular formulation of the principle of identity would be “A thing is what it is.” This formula goes further than the formula “A is A” because it shows us the ontological region governed by the principle of identity: Identity consists in manifesting the identity between the thing and what the thing *is*, what classical philosophy termed the “essence” of a thing. In Leibniz, every principle is a *ratio*, a “reason,” and the principle of identity can be said to be the *ratio* or rule of essences, the *ratio essendi*. It corresponds to the question, “Why is there something rather than nothing?” If there were no identity (an identity conceived as the identity of the thing and what the thing *is*), then there would be nothing. But Leibniz also provides us with a more technical formulation of the principle of identity, derived from logic: “every analytic proposition is true.” What is an analytic proposition? It is a proposition in which the subject and the predicate are identical. “A is A” is an analytical proposition: The predicate A is contained in the subject A, and therefore “A is A” is true. But to complete the detail of Leibniz’s formula, we would have to distinguish between two types of identical propositions: An analytic proposition is true either by reciprocity or by inclusion. An example of a proposition of *reciprocity* is “a triangle has three angles.” This is an identical proposition because the predicate (“three angles”) is the same as the subject (“triangle”) and reciprocates with the subject. The second case, a proposition of *inclusion*, is slightly more complex. In the proposition “a triangle has three sides” there is no identity between the subject and the predicate, yet there is a supposed logical necessity: One cannot conceptualize a single figure having three angles without this figure also having three sides. There is no reciprocity here, but there is a demonstrable in-

clusion or inherence of the predicate in the subject. One could say that analytic propositions of reciprocity are objects of *intuition*, whereas analytic propositions of inclusion are the objects of a *demonstration*. What Leibniz calls *analysis* is the operation that discovers a predicate in a notion taken as a subject. If I show that a given predicate is contained in a notion, then I have done an analysis. All this is basic logic; up to this point, the Leibniz's greatness as a thinker has not yet appeared.

Principle of Sufficient Reason

Leibniz's originality, Deleuze suggests, first emerges with his second great principle, the principle of sufficient reason, which no longer refers to the

Four Principles in Leibniz

Principle of Identity

Reason: *ratio essendi* ("reason for being") ("Why something rather than nothing?")

Popular Formulation: "A thing is what it is."

Technical Formulation: "Every analytic proposition is true."

Principle of Sufficient Reason

Reason: *ratio existendi* ("reason for existing") ("Why this rather than that?")

Popular Formulation: "Everything has a reason."

Technical Formulation: "Every true proposition is analytic."

Principle of Indiscernibles

Reason: *ratio cognoscendi* ("reason for knowing")

Popular Formulation: "No two things are the same."

Technical Formulation: "For every concept, there is one and only one thing."

Law of Continuity

Reason: *ratio fiendi* ("reason for becoming")

Popular Formulation: "Nature never makes leaps."

Technical Formulation: "A singularity is extended over a series of ordinary points until it reaches the neighborhood of another singularity, etc."

FIGURE 1

domain of essences but the domain of things that actually exist, the domain of existences. The corresponding *ratio* is no longer the *ratio essendi* but the *ratio existendi*, the reason for existing. The corresponding question is no longer, “Why something rather than nothing?” but rather “Why this rather than that?” The popular expression of this principle would be “Everything has a reason.” This is the great cry of rationalism, which Leibniz will attempt to push to its limit. Why does Leibniz need this second principle? Because existing things appear to be completely outside the principle of identity. The principle of identity concerns the identity of the thing and what the thing is, even if the thing itself does not exist. I know that unicorns do not exist, but I can still say what a unicorn is. So Leibniz needs a second principle to make us think in terms of existing beings. Yet how can a principle as seemingly vague as “everything has a reason” make us think of existing beings?

Leibniz explains how in his technical formulation of the principle of sufficient reason, which reads, “all predication has a foundation in the nature of things.” What this means is that everything that is truly predicated of a thing is necessarily included or contained in the concept of the thing. What is said or predicated of a thing? First of all, its essence, and at this level there is no difference between the principle of identity and the principle of sufficient reason, which takes up and presumes everything acquired with the principle of identity. But Leibniz then adds something no philosopher before him had said: What is said or predicated of a thing is not only the essence of the thing but also the totality of the affections and events that happen to or are related to or belong to the thing. For example: Caesar crossed the Rubicon. Since this is a true proposition, Leibniz will say that the predicate “crossed the Rubicon” must be contained in the concept of Caesar (not in Caesar himself, but in the concept of Caesar). “Everything has a reason” means that everything that happens to something—all its “differences”—must be contained or *included* for all eternity in the individual notion of a thing. “If we call an ‘event’ what happens to a thing, whether it submits to it or undertakes it, we will say that sufficient reason is what comprehends the event as one of its predicates: the concept of the thing, or its notion. ‘Predicates or events,’ says Leibniz.”⁷

How does Leibniz arrive at this remarkable claim? He does so, Deleuze suggests, following Couturat, by reconsidering *reciprocity*. The principle of identity gives us a model of truth that is certain and absolute—an analytical proposition is necessarily a true proposition—but it does not make us *think* anything. So Leibniz reverses the formulation of the principle of identity using the principle of reciprocity: A true proposition is necessarily an analytic proposition. The principle of sufficient reason is the reciprocal of the principle of identity, and it allows Leibniz

to conquer a radically new domain, the domain of existing things.⁸ By means of this reversal, the principle of identity forces us to *think* something. The formal formula of the principle of identity (“A is A”) is true because the predicate *reciprocates* with the subject, and Leibniz therefore applies this principle of reciprocity to the principle of identity itself. In its first formulation, however, the reciprocal of “A is A” is simply “A is A,” and in this sense, the *formal* formulation prevents the reversal of the identity principle. The principle of sufficient reason is produced only through a reversal of the *logical* formulation of the principle of identity, but this latter reversal is clearly of a different order: It does not go without saying. Justifying this reversal is the task Leibniz pursues as a philosopher, and it launches him into an infinite and perhaps impossible undertaking. The principle of sufficient reason says not only that the notion of a subject contains everything that happens to the subject—that is, everything that is truly predicated of the subject—but also that we should be able to *demonstrate* that this is the case.

After Leibniz launches himself into the domain of the concept in this way, however, he cannot stop. At one point in the *Metaphysics*, Aristotle—who exerted an extremely strong influence on Leibniz—proposes an exquisite formula: at a certain point in the analysis of concepts, it is necessary to *stop* (*anankstenai*).⁹ This is because, for Aristotle, concepts are *general*, not individual. Classical logic distinguishes between the order of the concept, which refers to a generality, and the order of the individual, which refers to a singularity. By nature, a concept was seen to be something that comprehends a *plurality* of individuals; it went without saying that the individual as such was not comprehensible by concepts. Put differently, philosophers have always considered that *proper names* are not concepts. At a certain point, then, the process of conceptual specification must stop: One reaches the final species, which groups a plurality of individuals. Leibniz, however, does not heed Aristotle’s warning: he does not stop. Instead, he attempts to push the concept all the way to the level of the individual itself; in Leibniz, “Adam” and “Caesar” are concepts and not simply proper names. The cry of sufficient reason—“everything *must* have a reason”—is the problem that will propel Leibniz into an almost hallucinatory conceptual creation. As Deleuze puts it, “Leibniz pushes the presuppositions of classical philosophy as far as he can, down the paths of genius and delirium.”¹⁰ It is never much use to raise objections, to argue against Leibniz, says Deleuze; one has to let oneself go and follow Leibniz in his production of concepts. What then is the delirious chasm into which Leibniz plunges?

If everything I attribute with truth to a subject must be contained in the concept of the subject, then I am forced to include in the notion of the

subject not only the thing I attribute to it with truth, but also *the totality of the world*. Why is this the case? By virtue of a principle that is very different from the principle of sufficient reason, namely, the principle of *causality*. The principle of sufficient reason (“everything has a reason”) is not the same thing as the principle of causality (“everything has a cause”). “Everything has a cause” means that A is caused by B, B is caused by C, and so on—a series of causes and effects that stretches to infinity. “Everything has a reason,” by contrast, means that one has to give a reason for causality itself, namely, that the relation A maintains with B must in some manner be included or comprised in the concept of A.¹¹ This is how the principle of sufficient reason goes beyond the principle of causality: The principle of causality states the *necessary cause* of a thing but not its *sufficient reason*. Sufficient reason expresses the relation of the thing with its own notion, whereas causality simply expresses the relations of the thing with something else. Sufficient reason can be stated in the following manner: For every thing, there is a concept that gives an account both of the thing and of its relations with other things, including its causes and its effects. Thus, after Leibniz says that the predicate “crossing the Rubicon” is included in the notion of Caesar, he cannot stop himself: He is forced to include the totality of the world in Caesar’s concept. This is because “crossing the Rubicon” has multiple causes and multiple effects, such as the establishment of the Roman empire; it stretches to infinity backward and forward by the double play of causes and effects. We therefore cannot say that “crossing the Rubicon” is included in the notion of Caesar without saying that the causes and effects of this event are *also* included in the notion of Caesar. This is no longer the concept of inherence or inclusion but rather the fantastic Leibnizian concept of *expression*: The notion of the subject expresses the totality of the world. Each of us—you, me—in our concept expresses or contains the entirety of the world. This is the first hallucinatory Leibnizian concept that follows from the principle of sufficient reason.

A second concept follows immediately. For there is a danger lurking here for Leibniz: If each notion of the subject expresses the totality of the world, that could seem to indicate that there is only a single subject and that individuals are mere appearances of this universal subject (a single substance à la Spinoza, or absolute Spirit à la Hegel). But Leibniz cannot follow such a path without repudiating himself since his entire philosophy remains fixed on the individual and the reconciliation of the concept with the individual. To avoid this danger, Leibniz creates another new concept: Each individual notion comprehends or includes the totality of the world, he says, but from a certain *point of view*. This marks the beginning of “perspectivist” philosophy, which would be taken up by later philosophers such

as Nietzsche (who nonetheless understood perspectivism in a very different manner than did Leibniz). Point of view, however, is such a common notion that one easily risks trivializing Leibniz's conception of perspectivism. Leibniz does *not* say that everything is "relative" to the viewpoint of the subject; this is what Deleuze calls an "idiotic" or "banal" notion of perspectivism. It would imply that the subject is prior to the point of view, whereas in Leibniz it is precisely the opposite: In Leibniz, the point of view is not constituted by the subject; the subject is constituted by the point of view. Points of view, in other words, are the sufficient reason of subjects. The individual notion is the point of view through which the individual expresses the totality of the world.

But here again, Leibniz cannot stop. For what is it, then, that determines this point of view? Each of us may express the totality of the world, Leibniz tells us, but we express most of the world in an obscure and confused manner, as if it were a mere clamor, a background noise, which we perceive in the form of *infinitely small perceptions*. These minute perceptions are like the "differentials" of consciousness, which are not given as such to conscious perception (apperception). However, there is indeed a small, reduced, finite portion of the world that I express clearly and distinctly, and this is precisely that portion of the world that affects my *body*. Leibniz in this manner provides a deduction of the necessity of the body as that which occupies the point of view. I do not express clearly and distinctly the crossing of the Rubicon, since that concerns Caesar's body; but there are other things that concern my body—a certain relation to this room, this computer, this glass of water—which I express clearly. This is how Leibniz defines a point of view: It is the portion or the region of the world expressed clearly by an individual in relation to the totality of the world, which it expresses obscurely in the form of minute perceptions. No two individual substances occupy the same point of view on the world because none have the same clear or distinct zone of expression on the world.

The problem posed by the principle of sufficient reason thus leads Leibniz to create an entire sequence of concepts: expression, point of view, minute perceptions. . . . "In the majority of great philosophers," writes Deleuze, "the concepts they create are inseparable, and are taken in veritable sequences. And if you don't understand the sequence of which a concept is a part, you cannot understand the concept."¹² But the notion of point of view will lead Leibniz into a final set of problems. For the world, Leibniz continues, has no existence outside the points of view that express it. The world is the "expressed" thing common to all individual substances, but what is expressed (the world) has no existence apart from what expresses it (individuals). In other words, there is no world in itself. The difficulty Leibniz faces here is this: Each of these individual notions must

nonetheless express the *same* world. Why is this a problem? The principle of identity allows us to determine what is contradictory, that is, what is *impossible*. A square circle is a circle that is not a circle; it contravenes the principle of identity. But at the level of sufficient reason, things are more complicated. In themselves, Caesar's not crossing the Rubicon and Adam's not sinning are neither contradictory nor impossible. Caesar could have not crossed the Rubicon, and Adam could have not sinned, whereas a circle cannot be square. The truths governed by the principle of sufficient reason are thus not of the same type as the truths governed by the principle of identity. But how, then, can Leibniz at the same time hold that everything Adam did is contained for all time in his individual concept, and that Adam the nonsinner was nonetheless possible? Leibniz's famous response to this problem is this: Adam the nonsinner was possible in itself, but it was *incompossible* with rest of the actualized world. Leibniz here creates an entirely new logical relation of impossibility, a concept that is unique to Leibniz's philosophy and which is irreducible to impossibility or contradiction. At the level of existing things, it is not enough to say that a thing is possible in order to exist; it is also necessary to know with what it is compossible. The conclusion Leibniz draws from this notion is perhaps his most famous doctrine, one which was ridiculed by Voltaire in *Candide* and by the eighteenth century in general: Among the infinity of impossible worlds, God makes a calculation and chooses the "best" of all possible worlds to pass into existence, a world governed by a harmony that is "preestablished" by God. But this rational optimism implies an infinite cruelty: The best world is not necessarily the world in which suffering is the least.

Principle of Indiscernibles

This sets us on the path of the third principle, the principle of indiscernibles, which is the reciprocal of the principle of sufficient reason. The principle of sufficient reason says: For every thing, there is a concept that includes everything that will happen to the thing. The principle of indiscernibles says: For every concept, there is one and only one thing. The principle of indiscernibles is thus the reciprocal of the principle of sufficient reason. Unlike Leibniz's first act of reciprocity, this reciprocation is absolutely necessary. (The move from the principle of identity to the principle of sufficient reason, by contrast, was Leibniz's *coup de force* as a philosopher; he could undertake it only because he created the philosophical means to do so.) Banally, this means that there are no two things that are

absolutely identical: no two drops of water, no two leaves of a tree, no two people. But more profoundly, it also means—and this is what interests Deleuze—that in the final analysis *every difference is a conceptual difference*. If you have two things, there must be two concepts; if not, there are not two things. In other words, if you assign a difference to two things, there is necessarily a difference in their concepts. The principle of indiscernibles consists in saying that we have *knowledge* only by means of concepts, and this can be said to correspond to a third reason, a third *ratio: ratio cognoscendi*, or reason as the reason of knowing.

This principle of indiscernibles has two important consequences for Deleuze. First, as we have seen, Leibniz is the first philosopher to say that concepts are proper names, that is, that concepts are *individual* notions. In classical logic, by contrast, concepts are *generalities* which, by their very nature, cannot comprehend the singularity of the individual. But can we not say that the concept “human,” for instance, is a generality that applies to all individual humans, including both Caesar and Adam? Of course you can say that, Leibniz retorts, but only if you have *blocked* the analysis of the concept at a certain point, at a finite moment. But if you push the analysis, if you push the analysis of the concept to infinity, there will be a point at which the concepts of Caesar and Adam are no longer the same. According to Leibniz, this is why a mother sheep can recognize its little lamb: It knows the lamb’s concept, which is individual. This is also why Leibniz cannot have recourse to a universal mind: He has to remain fixed on the singularity, on the individual as such. This is Leibniz’s great originality, the formula of his perpetual refrain: Substance is individual.

Second, in positing the principle of indiscernibles (“every difference is conceptual”), Leibniz is asking us to accept an enormous consequence. For there are other types of difference, apart from conceptual difference, that might allow us to distinguish between individual things. For example, numerical difference: I can fix the concept of water and then distinguish between different drops numerically: one drop, two drops, three drops; I distinguish the drops by number only, disregarding their individuality. A second type of difference is spatio-temporal difference. I have the concept of water but I can distinguish between different drops by their spatio-temporal location (“not *this* drop; *that* drop over there”). A third type is differences of extension and movement. I can have the concept of water and distinguish between drops by their extension and figure (shape and size), or by their movement (fast or slow). These are all non-conceptual differences because they allow us to distinguish between two things that nonetheless have the same concept. Once again, however, Leibniz plunges on; he appears on the scene and calmly tells us, no, these differences are pure appearances, provisional means of expressing a dif-

ference of another nature, and this difference is always conceptual. If there are two drops of water, they do not have the same concept. Non-conceptual differences only serve to translate, in an imperfect manner, a deeper difference that is always conceptual.

It is here that we reach the crux of the matter in Deleuze's reading of Leibniz. Although no one goes further than Leibniz in the exploration of sufficient reason, Leibniz nonetheless subordinates sufficient reason to the requirements of "representation": In reducing all differences to conceptual differences, Leibniz defines sufficient reason by the ability of differences to be represented or mediated in a *concept*. As Deleuze notes, "According to the principle of sufficient reason, there is always one concept per particular thing. According to the reciprocal principle of the identity of indiscernibles, there is one and only one thing per concept. Together, these principles expound a theory of difference as conceptual difference, or develop the account of representation as mediation."¹³ In Aristotle, what "blocks" the specification of the concept beyond the smallest species is the individual itself. Leibniz is able to reconcile the concept and the individual only because he gives the identity of the concept an *infinite* comprehension: Every individual substance, or monad, envelops the infinity of predicates that constitutes the state of the world. Where the extension of the concept = 1, the comprehension of the concept = \hat{n} . It is one and the same thing to say that the concept goes to infinity (sufficient reason) and that the concept is individual (indiscernibility). In pushing the concept to the level of the individual, however, Leibniz simply renders representation (or the concept) infinite while still maintaining the subordination of difference to the principle of identity in the concept.

For Deleuze, this subordination of difference to identity is illegitimate and ungrounded. We have seen that, in Leibniz, the principle of sufficient reason is the reciprocal of the principle of identity and that the principle of indiscernibles is in turn the reciprocal of the principle of sufficient reason. But would not the reciprocal of the reciprocal simply lead us back to the identity principle?¹⁴ The fact that it does *not*, even in Leibniz, points to the irreducibility of the principle of difference to the principle of identity. Deleuze's thesis is that, behind or beneath the functioning of the identical concept, there lies the movement of difference and multiplicity within an *Idea*. "What blocks the concept," writes Deleuze in *Difference and Repetition*, "is always the excess of the Idea, which constitutes the superior positivity that arrests the concept or overturns the requirements of representation."¹⁵ Indeed, *Difference and Repetition* reveals how the roots of sufficient reason can be formulated in terms of a theory of nonrepresentational Ideas. As Deleuze explains there, "the immediate, defined as the 'sub-representative,' is not attained by multiplying representations and points of view. On the contrary, each composing repre-

sentation must be distorted, diverted, and torn from its center”—in order to reveal not the immediacy of the Given but rather the differential mechanisms of the Idea that themselves function as the genetic conditions of the given.¹⁶ Deleuze understands the term “Idea” largely in its Kantian sense, except that Kantian Ideas are totalizing, unifying, and transcendent, whereas Deleuzian Ideas are of necessity differential, genetic, and immanent. It is on the basis of his post-Kantian return to Leibniz that Deleuze develops his revised theory of Ideas in *Difference and Repetition*.

The Law of Continuity

This brings us to the law of continuity. What is the difference between truths of essence (principle of identity) and truths of existence (principles of sufficient reason and indiscernibility)? With truths of essence, says Leibniz, the analysis is *finite*, such that inclusion of the predicate in the subject can be demonstrated by a finite series of determinate operations (such that one can say, “q.e.d.”).¹⁷ The analysis of truths of existence, by contrast, is necessarily *infinite*: The domain of existences is the domain of *infinite analysis*. Why is this the case? Because if the predicate “sinner” is contained in the concept of Adam, then if we follow the causes back and track down the effects, the entire world must be contained in the notion of Adam. When I perform the analysis, I pass from Adam the sinner to Eve the temptress, and from Eve the temptress to the evil serpent, and from the evil serpent to the forbidden fruit, and so on. Moving forward, I show that there is a direct connection between Adam’s sin and the Incarnation and Redemption by Christ. There are *series* that are going to begin to fit into each other across the differences of time and space. (This is the aim of Leibniz’s *Theodicy*: to justify God’s choice of *this* world, with its interlocking series.) Such an analysis is *infinite* because it has to pass through the entire series of elements that constitute the world, which is actually infinite; it is an *analysis* because it demonstrates the inclusion of the predicate “sinner” in the individual notion “Adam.” “In the domain of existences, we cannot stop ourselves, because the series are prolongable and must be prolonged, because the inclusion is not localizable.”¹⁸ This is the Leibnizian move that matters to Deleuze: At the level of truths of existence, an infinite analysis that demonstrates the inclusion of the predicate (“sinner”) in the subject (“Adam”) does *not* proceed by the demonstration of an identity. What matters at the level of truths of existence is not the *identity* of the predicate and the subject but rather that one passes from one predicate to another, from the second to a third, from the third to a fourth, and so on. Put succinctly: *If truths of essence are governed by identity,*

truths of existence, by contrast, are governed by continuity. What is a world? A world is defined by its continuity. What separates two impossible worlds? The fact that there is a discontinuity between the two worlds. What defines the best of all possible worlds, the world that God will cause to pass into existence? The fact that it realizes *the maximum of continuity for a maximum of difference.*

Now this notion of an *infinite analysis* is absolutely original with Leibniz; he invented it. It seems to go without saying, though, that we, as finite beings, are incapable of undertaking an infinite analysis; in order to situate ourselves in the domain of truths of existence, we have to wait for experience: We know through experience that Caesar crossed the Rubicon or that Adam sinned. Infinite analysis is possible for God, to be sure, whose divine understanding is without limits and infinite. But this is hardly a satisfactory answer. God may indeed be able to undertake an infinite analysis, and we're happy for God, but then we would wonder why Leibniz went to such trouble to present this whole story about analytical truths and infinite analysis if it were only to say that such an analysis is inaccessible to us as finite beings.

It's here that we begin to approach the originality of Deleuze's interpretation of Leibniz; for according to Deleuze, Leibniz indeed attempts to provide us finite humans with an artifice that is capable of undertaking a well-founded approximation of what happens in God's understanding, and this artifice is precisely the technique of the infinitesimal calculus or differential analysis. We as humans can undertake an infinite analysis thanks to the symbolism of the *differential calculus*. Now the calculus brings us into a complex domain, having to do not only with the relation of Leibniz to Newton but also the debates on the mathematical foundations of the calculus, which were not resolved until the development of the limit-concept by Cauchy and Weierstrass in the late nineteenth and early twentieth century—debates that lie beyond the scope of this paper.¹⁹ In what follows, I focus on two aspects of Leibniz's work on the metaphysics of the calculus that come to the fore in Deleuze's own reading of Leibniz: the differential relation and the theory of singularities. These are two theories that allow us to think the presence of the infinite within the finite.

The Differential Relation

Let us turn first to the differential relation. At stake in an infinite analysis is not so much the fact that there is an actually existing set of infinite elements in the world, for if there are two elements—for example, Adam the

sinner and Eve the temptress—then there is still a *difference* between these two elements. What then does it mean to say that there is a continuity between the seduction of Eve and Adam’s sin (and not simply an identity)? It means that the relation between the two elements is an infinitely small relation, or rather, that *the difference between the two is a difference that tends to disappear*. This is the definition of the continuum: Continuity is defined as the act of a difference insofar as the difference tends to disappear. Continuity, in short, is a *disappearing* or *vanishing difference*. Between sinner and Adam I will never be able to demonstrate a logical identity, but I will be able to demonstrate (and here the word “demonstration” obviously changes meaning) a continuity, that is, one or more vanishing differences.

What, then, is a vanishing difference? In 1701, Leibniz wrote a three-page text entitled “Justification of the Infinitesimal Calculus by that of Ordinary Algebra,” in which he tries to explain that, in a certain manner, the differential calculus was already functioning before it was discovered, even at the level of the most ordinary algebra.²⁰ Leibniz presents us with a fairly simple geometrical figure (see figure 2).

Two right triangles—ZEF and ZHI—meet at their apex, point Z. Since the two triangles ZEF and ZHI are similar, it follows that the ratio of straight lines y/x is equal to $(Y - y)/X$. Now if the straight line EI increasingly approaches point F, always preserving the same angle at the variable point Z, the length of the lines x and y will obviously diminish steadily, yet the ratio of x to y will remain constant. What happens when the straight

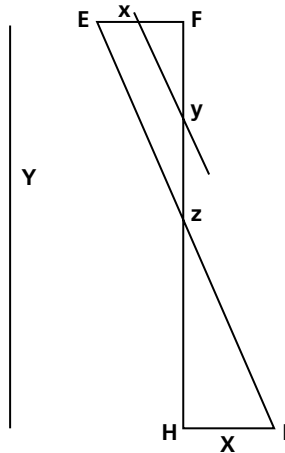


FIGURE 2

line EI passes through F itself? It is obvious that the points Z and E will fall directly on F and that the straight lines x and y will vanish; they will become equal to zero. And yet, Leibniz says, even though x and y are equal to zero, they still maintain an *algebraic* relation to each other, which is expressed in the relation of X to Y . In other words, when the line EI passes through Z, it is not the case that the triangle ZEF has “disappeared” in the common sense of that word. The triangle ZEF is still “there,” but only virtually, since the relation x/y continues to exist even when the terms have vanished. Rather than say that the triangle ZEF has disappeared, Leibniz says, we should say that it has become unassignable and yet is perfectly determined, since in this case although $x=0$ and $y=0$, the relation x/y is not equal to zero, since it is a perfectly determinable relation equal to X/Y . Unassignable, yet perfectly determined—this is what the term “vanishing difference” means: the relation continues even when the terms of the relation have disappeared. The relation x/y continues when Z and E have disappeared. This is why the differential relation is such a great mathematical discovery; the miracle is that the differential relation dx/dy is not equal to zero but rather has a perfectly expressible *finite* quantity, which is the differential derived from the relation of X to Y .

The differential relation is thus not only a relation that is *external* to its terms but also in a certain sense *constitutes* its terms. It provides Deleuze with a mathematical model for thinking “difference-in-itself” (the title of the second chapter of *Difference and Repetition*). The differential relation signifies nothing concrete in relation to what it is derived from, that is, in relation to x and y , but it signifies something else concrete, namely a z , which is something *new*, and this is how it assures the passage to limits. Thus, to consider several famous examples, Leibniz can comprehend rest as an infinitely small movement, coincidence as an infinitely small distance, equality as the limit of inequalities, and the circle as the limit of a polygon the sides of which increase to infinity. The reason of the law of continuity is thus the *ratio fiendi*, the reason of becoming. Things *become* through continuity: Movement becomes rest; the polygon, by multiplying its sides, becomes a circle. This is the source of the popular formulation of the law of continuity in Leibniz: Nature never makes leaps (there is no discontinuity in nature). What, then, is an infinite analysis? An infinite analysis fills the following condition: there is an infinite analysis, and a material for infinite analysis, when I find myself before a domain that is no longer directly ruled by identity but by continuity and vanishing differences.

Now to understand what this theory of the differential relation means in concrete terms, consider the corresponding theory of perception that Leibniz develops in relation to it.²¹ Leibniz observes that we often perceive things of which we are not consciously aware. We recall a

familiar scene and become aware of a detail we did not notice at the time; the background noise of a dripping faucet suddenly enters our consciousness at night. Leibniz therefore draws a distinction between conscious perceptions (“apperceptions,” or molar perceptions) and unconscious perceptions (“minute” or molecular perceptions), and argues that our conscious perceptions must be related not simply to recognizable objects in space and time but rather to the minute and unconscious perceptions of which they are composed. I apprehend the noise of the sea or the murmur of a group of people, for instance, but not the sound of each wave or the voice of each person that composes them. These unconscious minute perceptions are related to conscious “molar” perceptions, not as parts to a whole but as what is ordinary to what is noticeable or remarkable: A conscious perception is produced when at least two of these minute and “virtual” perceptions enter into a differential relation that determines a singularity, that is, a conscious perception. Consider the noise of the sea. At least two waves must be minutely perceived as nascent and “virtual” in order to enter into a differential relation capable of determining a third, which excels over the others and becomes conscious. Or, consider the color green. Yellow and blue can be perceived, but if the difference between them vanishes by approaching zero, then they enter into a differential relation ($db/dy = G$) that determines the color green; in turn, yellow or blue, each on its own account, may be determined by the differential relation of two colors we cannot detect ($dy/dx = Y$). The calculus thus functions in Leibniz as the psychic mechanism of perception, a kind of automatism that determines my finite zone of clarity on the world, my point of view. Every conscious perception constitutes a threshold, and the minute or virtual perceptions (infinitely small perceptions) constitute the obscure dust of the world, its background noise. They are not “parts” of conscious perception but rather the “ideal genetic elements” of perception, or what Maimon called the “differentials of consciousness.” The virtual multiplicity of genetic elements, and the system of connections or differential relations that are established between them, is what Deleuze terms the “Idea” of sensibility. The differential relations between these infinitely small perceptions are what draw them into clarity; they “actualize” a clear perception (such as green) out of certain obscure, evanescent perceptions (such as yellow and blue). “The Idea of the world or the Idea of the sea are systems of differential equations, of which each monad only actualizes a partial solution.”²²

In Leibniz, the differential calculus refers to a domain that is both mathematical and psychological, a psycho-mathematical domain: There are differentials of consciousness just as there are differentials of a curve. Several important consequences follow. Space and time here cease to be

pure a priori givens (as in Kant) but are determined *genetically* by the ensemble or nexus of these differential relations in the subject. Similarly, objects themselves cease to be empirical givens and become the product of these relations in conscious perception. Moreover, Descartes' principle of the "clear and distinct" ideas is broken down into two irreducible values, which can never be reunited to constitute a "natural light": Conscious perceptions are necessarily clear but confused (not distinct), whereas unconscious perceptions (Ideas) are distinct but necessarily obscure (not clear). Kant had already objected that Maimon, by returning to Leibniz, thereby reintroduced the duality between finite understanding (consciousness) and infinite understanding (the divine) that the entire Kantian critique had attempted to eliminate.²³ Against Kant, however, Deleuze argues that

the infinite here is only the presence of an *unconscious* in the finite understanding, an unthought in finite thought, a non-self in the finite self (whose presence Kant himself was forced to discover when he hollowed out the difference between a determining ego and a determinable ego). For Maimon as for Leibniz, the reciprocal determination of differentials does not refer to a divine understanding, but to minute perceptions as the representatives of the world in the finite self.²⁴

Indeed, Leibniz can be said to have developed one of the first theories of the unconscious, a theory that is very different from the one developed by Freud. The difference is that Freud conceived of unconscious in a *conflictual* or *oppositional* relationship to consciousness, and not a *differential* relationship. In this sense, Freud was dependent on Kant, Hegel, and their successors, who explicitly oriented the unconscious in the direction of a conflict of will and no longer a differential of perception. The theory of the unconscious proposed by Deleuze and Guattari in *Anti-Oedipus* is a differential and genetic unconscious and thus thoroughly inspired by Leibniz.²⁵

The Theory of Singularities

There is a final problem that Deleuze points to in Leibniz's thought. On the surface, there would appear to be a contradiction between the principle of indiscernibles and the law of continuity. On the one hand, the principle of indiscernibles tells us that every difference is conceptual, that no two things have the same concept. To every thing there corresponds a

determinate difference, which is not only determinate but also assignable in the concept. On the other hand, the principle of continuity tells us that things proceed via vanishing differences, infinitely small differences, that is, unassignable differences. Thus, Leibniz seems to be saying, at one and the same time, that everything proceeds by an unassignable difference and that every difference is assignable and must be assigned in the concept. So the question is: Is it possible to reconcile the principle of indiscernibles with the law of continuity?

Deleuze's thesis is that the solution to this problem has to be posed in terms of a theory of *singularities*, which naturally extends the theory of differential equations. In logic, the notion of the "singular" has long been understood in relation to the "universal"; in mathematics, however, the singular is related to a very different set of notions. The singular is distinguished from or opposed to the regular; the singular is what escapes the regularity of the rule. More important, mathematics distinguishes between points that are singular or remarkable and those that are ordinary. Geometrical figures can be classified by the types of singular points that determine them. A square, for instance, has four singular points, its four corners, and an infinity of ordinary points that compose each side of the square (the calculus of *extremum*). Simple curves, such as the arc of circle, are determined by a single singularity, which is either a maximum or minimum or both simultaneously (the calculus of *maxima* and *minima*).²⁶ The differential calculus deals with the more difficult case of complex curves: The singularities of a complex curve are the points in the neighborhood of which the differential relation changes sign (focal points, saddle points, knots, and so on): The curve increases; the curve decreases. These points of increase or decrease are the singular points of the curve; the ordinary points are what constitute the series between the two singularities. The theory of singularities provides Deleuze with his final, more technical definition of the law of continuity: The continuum is the prolongation of a singularity over an ordinary series of points until it reaches the neighborhood of the following singularity, at which point the differential relation changes sign and either diverges from or converges with the next singularity. The continuum is thus inseparable from a theory or an activity of prolongation; there is a composition of the continuum because the continuum is a product.

In this way, the theory of singularities also provides Deleuze with a model of individuation or determination; one can say of any determination in general (any "thing") that it is *a combination of the singular and the ordinary*, that is, a "multiplicity" constituted by its singular and ordinary points. Just as mathematical curves are determined by their points of inflection (extrema, minima and maxima, and so on), so physical states of

affairs can be said to be determined by singularities that mark a change of phase (boiling points, points of condensation, fusion, coagulation, crystallization, and so forth) and psychological persons by their “sensitive” points (points of tears and joy, sickness and health, fatigue and vitality, hope and anxiety, and so on). But such singularities, Deleuze insists, can be considered *apart from* their actualization in a physical state of affairs or a psychological person.²⁷ Deleuze here reaches a domain that is distinct from, and logically prior to, the three domains that Kant would later denounce as transcendental illusions or Ideas: the Self, the World, and God. Each of these Ideas has a determinate place in Leibniz’s philosophy: God is the Being who, faced with the infinity of possible worlds, chose to actualize this World, a world that exists only in its individual monads or Selves, which express the world from their own point of view. But what this Leibnizian schema presupposes, Deleuze argues, is the determination of a “transcendental field” that is prior to God, World, and Self, a field populated by singularities that are atheological, acosmic, and preindividual. It implies a transcendental logic of singularities that is irreducible to the formal logic of predication. Here, for example, are three singularities of the individual “Adam,” expressed in logical form: “to be the first man,” “to live in a garden of pleasure,” “to have a woman come out of one’s rib.” And then a fourth singularity: “to sin.” We can prolong each of these four singular points over a series of ordinary points such that they all have common values in both directions: A continuity is established between them. But then add a fifth singularity: “to resist the temptation.” The lines of prolongation between this fifth singularity and the first three are no longer convergent, that is, they do not pass through common values; there is a bifurcation in the series at this singularity, a *discontinuity* is introduced. Adam the nonsinner is thus impossible with this world because Adam’s being a nonsinner implies a singularity that diverges with this world.

The theory of singularities thus plays a double role in Deleuze’s work on Leibniz. On the one hand, it allows Deleuze to solve the riddle posed by the relation between indiscernibility and continuity within Leibniz’s own philosophy. The world “in itself” is indeed governed by the law of continuity since continuity is nothing other than the composition of singularities insofar as they are prolonged over the series of ordinaries that depend on them. But the world does not exist “in itself”; it exists only in the individuals who express it. And the real definition of the individual is: *the accumulation or coincidence of a certain number of preindividual singularities* that are extracted from the curve of the world, each of them being discontinuous and unique and hence governed by the principle of indis-

cernibles. Individuation, in other words, “does not move from a genus to smaller and smaller species, in accordance with a rule of differentiation; it goes from singularity to singularity, in accordance with the rule of convergence or prolongation that links the individual to such and such a world.”²⁸ On the other hand, Deleuze is not content simply to provide a reading of Leibniz. “These impersonal and preindividual nomadic singularities,” Deleuze writes, speaking in his own name, “are what constitute the *real* transcendental field.”²⁹ *Difference and Repetition* and *Logic of Sense* are Deleuze’s attempt to define the nature of this transcendental field, freed from the limitations of Leibniz’s theological presuppositions and using his own conceptual vocabulary (multiplicity, singularity, virtuality, problematic, event, and so on). In Deleuze, the Ideas of God, World, and Self take on completely different demeanors. God is no longer a Being who chooses the richest compossible world but is now a pure Process that makes *all* virtualities pass into existence, forming an infinite web of divergent and convergent series; the World is no longer a continuous curve defined by its preestablished harmony but is a chaotic universe in which divergent series trace endlessly bifurcating paths, giving rise to violent discords; and the Self, rather than beclosed on the compossible world it expresses from within, is now torn open by the divergent series and impossible ensembles that continually pull it outside itself (the monadic subject, as Deleuze puts it, becomes the nomadic subject).³⁰ It is at this point that Deleuze’s reading of Leibniz would end and one’s own reading of Deleuze’s philosophy would have to begin.

Classical reason, says Deleuze, collapsed under the blow of divergences, discordances, and impossibilities, and Leibniz’s philosophy was one of the last attempts to reconstitute a classical reason. It did so by *multiplying its principles*, relegating divergences to so many possible worlds, making impossibilities so many frontiers between worlds, and resolving the discords that appear in this world into the melodic lines of the preestablished harmony. But Leibniz’s Baroque reconstitution could be only temporary, and with the collapse of classical reason, the task of philosophy would be to think without principles, to start *neither* with the identity of God, the Self, or the World but rather with a transcendental field of differences and singularities that conditions the construction of empirical selves and the actual world. This is the task that Deleuze adopts as his own: “We seek to determine an impersonal and preindividual transcendental field that does not resemble the corresponding empirical fields.”³¹ It is a thoroughly contemporary project, but one that allows Deleuze to dip back into the history of philosophy and make *use* of Leibniz’s philosophy and Leibniz’s concepts in the pursuit of his own philosophical aims.

Notes

1. Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (Minneapolis: University of Minnesota Press, 1993). References to the original French edition, *Le Pli: Leibniz et le Baroque* (Paris: Minuit, 1988) are also included.

2. Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994); *Logic of Sense*, trans. Mark Lester with Charles Stivale; ed. Constantin Boundas (New York: Columbia University Press, 1990).

3. For a discussion of Deleuze's relation to Maimon and the post-Kantian tradition, see my "Deleuze, Hegel, and the Post-Kantian Tradition," in *Philosophy Today* (Supplement 2001), 126–38.

4. Deleuze, seminar of 20 May 1980. Deleuze's seminars on Leibniz can be found online at <http://www.webdeleuze.fr>; transcribed by Richard Pinhas and translated into English by Charles Stivale. I follow closely the conceptual deduction Deleuze presents in his 1980 seminars.

5. Deleuze, *Fold*, 122; *Pli*, 163.

6. Gottfried Wilhelm Leibniz, *New Essays on Human Understanding*, 2d ed., ed. Peter Remnant and Jonathan Bennett (Cambridge: Cambridge University Press, 1997), 361.

7. Deleuze, *Fold*, 41; *Pli*, 55, translation modified.

8. See Louis Couturat, "On Leibniz's Metaphysics," in *Leibniz: A Collection of Critical Essays*, ed. Harry G. Frankfurt (Garden City, N.Y.: Anchor Books, 1972), 19–45. "The principle of identity states: every identity (analytic) proposition is true. The principle of reason affirms, on the contrary: every true proposition is an identity (analytic)" (22).

9. See Aristotle, *Metaphysics*, book 2, chapter 2, 994b24, in *The Basic Works of Aristotle*, ed. Richard McKeon (New York: Random House, 1941), 714.

10. Deleuze, seminar of 20 May 1980.

11. See Benson Mates, *The Philosophy of Leibniz: Metaphysics and Language* (Oxford: Oxford University Press, 1986), 157: "To discover the reason for the truth of the essential proposition 'A is B' is to analyze the concept A far enough to reveal the concept B as contained in it." Deleuze, however, would disagree with Mates' statement that Leibniz "appears to use the terms 'reason' and 'cause' interchangeably" (158).

12. Deleuze, seminar of 26 November 1980.

13. Deleuze, *Difference and Repetition*, 12. On the relation of difference and repetition in the classical theory of the concept, see *Difference and Repetition*, 288: difference is always inscribed within the identity of the concept in general, and repetition is defined as a difference *without* a concept, that is, in terms of the numerically distinct exemplars or individuals that are subsumed under the generality of the concept (x1, x2, x3, . . . xn), and which block further conceptual specification.

14. Deleuze, seminar of 6 May 1980.

15. Deleuze, *Difference and Repetition*, 289.

16. *Ibid.*, 56. See also 222: "Difference is not diversity. Diversity is given, but difference is that by which the given is given as diverse."

17. However, Deleuze will argue, against Leibniz himself, that the analysis of essences must itself be infinite since it is inseparable from the infinity of God. See *Fold*, 42; *Pli*, 56–57.

18. Deleuze, *Fold*, 51; *Pli*, 69, translation modified.

19. For an analysis of Deleuze's relation to the history of the calculus, see my "Mathematics and the Theory of Multiplicities: Badiou and Deleuze Revisited," *Southern Journal of Philosophy* 41 (2003), pp. 411–49.

20. Gottfried Wilhelm Leibniz, "Justification of the Infinitesimal Calculus by that of Ordinary Algebra," in *Philosophical Papers and Letters*, 2nd ed., ed. Leroy E. Loemker (Dordrecht: D. Reidel, 1956), 545–46.

21. Deleuze analyzes this theory in an important chapter entitled "Perception in the Folds," in *Fold*, 85–99; *Pli*, 113–32.

22. Alberto Gualandi, *Deleuze* (Paris: Les Belles Lettres, 1998), 49.

23. Immanuel Kant, letter to Marcus Herz, 26 May 1789, in *Immanuel Kant: Philosophical Correspondence, 1759–99*, ed. Arnulf Zweig (Chicago: University of Chicago Press, 1967), 150–56.

24. *Fold*, 89; *Pli*, 118–19, translation modified. See also *Difference and Repetition*, 192–93.

25. Gilles Deleuze and Félix Guattari, *Anti-Oedipus*, trans. Robert Hurley, Mark Seem, and Helen R. Lane (New York: Viking, 1977). See also *Difference and Repetition*, 106–8, for Deleuze's most explicit advocacy of a differential unconscious (Leibniz, Fechner) over a conflictual unconscious (Freud).

26. See Leibniz's analysis of simple curves in "Tentamen Anagogicum: An Analogical Essay in the Investigation of Causes," in *Philosophical Papers and Letters*, 477–85.

27. See Deleuze, *Logic of Sense*, 52.

28. Deleuze, *Fold*, 64; *Pli*, 86, translation modified.

29. Deleuze, *Logic of Sense*, 109, translation modified.

30. *Ibid.*, 174: "Instead of a certain number of predicates being excluded by a thing by virtue of the identity of its concept, each 'thing' is open to the infinity of predicates through which it passes, and at the same time it loses its center, that is to say, its identity as a concept and as a self."

31. *Ibid.*, 102.