

On the Logical Time of the Diagram

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Symposia

Into the Diagram. On the Legacy of Gilles Châtelet: Between Pragmatism, Mathematics, Transitional Ontology, and Critique of Contemporary Forms of Life

Abstract

In this article, I will focus on the possibility of thinking about relationships and processes of a temporal nature within the concept of the diagram, as articulated by Gilles Châtelet. While the spatial dimension of the diagram is widely recognized, this paper aims to show how the legacy of the French philosopher and mathematician also contains a powerful, yet often implicit, consideration of dynamic-temporal aspects. In particular, I propose to bring the diagram into dialogue with the psychoanalysis of Jacques Lacan and his concept of logical time. This encounter has a dual direction. On the one hand, Lacan's logical time lends itself well to being implemented as a diagram. On the other hand, it in turn illuminates certain aspects of a possible temporal dimension of the diagram understood in Châtelet's sense. After describing the concept of logical time, I therefore propose to implement its essential structure in a particular type of diagram: the cam. In light of this theoretical encounter, the article finally suggests a further direction in which logical time and its diagrammatization might proceed.

[1. Introduction](#)

1I depart from a series of questions that, within the realm of Châtelet's diagrammatology, deserve more attention. Is it possible to describe a temporal logic specific to the diagram? What is the relationship between the generation of the diagrammatic gesture and time? Although we can easily intuit the connection between the diagram and spatiality, what about its temporal dimension?

2In the opening pages of *Les Enjeux du mobile*, Châtelet famously states that a diagram "can immobilize a gesture, put it to rest, long before it curls up into a sign, and this is why contemporary geometers or cosmologists love diagrams and their power of peremptory evocation" (Châtelet 1993: 33). Taking Châtelet's words literally, one cannot help but notice that the diagram has, alongside its intimate relationship with space, also a profound temporal dimension: "immobilizing," "putting to rest," and so on.

3Diagrams are like metaphors, Châtelet adds, insofar as they "leap to create spaces and reduce distances: they sprout with hatches to dominate images already depicted in bold strokes" (*ibid.*). But can we not say that this dynamic dimension (Saint-Ours 2005: 42), intrinsic to the diagrammatic gesture, also implies a temporal dimension? Where the continuous lines of the diagram give way to the dotted (*pointillé*), we are in the presence of "virtualities" that unsettle the image "already available to make room for a new dimension" (Châtelet 1993: 33). Châtelet can therefore state that "this mode of existence of the diagram is such that its genesis is part of its being" (*ibid.*). The diagram is not only a way to think about a process, but is itself a process.

4It is no coincidence that Châtelet speaks in this context not so much of models or schemas transmissible as a whole, but rather of "allusive stratagems" that are "neither rhetorical artifices, nor formal truths" (Châtelet 2016: 64) and which, despite being neither rigid models nor immutable schemas, have the power to induce "thought experiences" (*ibid.*). This is why the diagram lives halfway, inhabiting a constitutive hybrid zone, between schematic allusion and rigid formal truth. Its temporal dimension - if one can be described - must inherit both of these peculiarities: a process that it describes and which in turn develops as a process ("its genesis is part of its being"), the result of a thought but at the same time a stratagem that makes one think.

5In this article, I propose to relate the diagram to a concept formulated by Jacques Lacan: *logical time* (Lacan 1966: 197-213). It is not difficult to imagine the reason for bringing Lacan and Châtelet closer. First of all, Lacan was probably - albeit not always in Châtelet's sense - the most diagrammatic psychoanalyst of the 20th century. His writings and seminars convey concepts through graphs, explanatory diagrams, topological structures, etc. But the reasons for this encounter are in fact even deeper. On the one hand, there are good reasons to think about the temporality of the diagrammatic gesture in terms of Lacan's logical time. On the other hand, and going in the opposite direction, logical time itself can be diagrammatized. The bringing together of the diagram and logical time is such that one illuminates aspects of the other in a reciprocal movement.

6Lacan, who defined logical time as "my own little personal sophism" (Lacan 1961-1962: 136), formulated this idea to highlight different elements. First, given that for Lacan the subject "is not to be confused with the individual" (Lacan 1978: 17), the device of logical time serves to show how becoming a subject is a process. It is its activation that produces, as a result, a series of identifications, supported by the individual's assumption of the I (*je*), which constitutes the terminal moment of logical time. Not only is the subject a reality of process, but it depends entirely on the relationships between signifiers and on the game of intersubjective rebounds that develop at the level of the group. It is no coincidence that Lacan, right at the end of *Le Temps logique*, invites the reader to reread Freud's *Group Psychology and the Analysis of the Ego*: logical time serves to show, using the formula employed there by Lacan, that "the collective is nothing other than the subject of the individual" (Lacan 1966: 213), a formula that will become clearer shortly when I have analyzed the device of logical time itself.

7Thirdly, given the tripartite nature of logical time, as well as its peculiar conception of the relationships between temporality, deduction, and logic, it resonates with a particular type of diagram, recently explored by Desclés and La Mantia (2023), namely that of the cam.

2. Logical Time: The Riddle, the Solution, and its Implications

8To explain the concept of logical time, Lacan uses a riddle, or sophism. Let us imagine a scenario with three prisoners and their guard. The guard calls them and announces that he intends to free one of them. However, the decision of who will actually be freed depends on solving a test administered by the guard. The one who solves the riddle will be freed. The guard has five disks that differ from each other only in color: three are white, two are black.

9After showing the five disks to the prisoners, the guard informs them that he will attach one disk to each of their backs, but without saying which color, i.e., whether it is white or black. Furthermore, the disks are positioned so that the person wearing one cannot see their own, but only those of the others. Also, there are no mirrors or similar tools to peek at the color of the disk on their own back.

10Without being able to communicate verbally with each other, and without using probabilistic reasoning either,

the guard tells the prisoners that the first one to correctly guess the color of the disk attached to their own back will be the one to leave the prison.

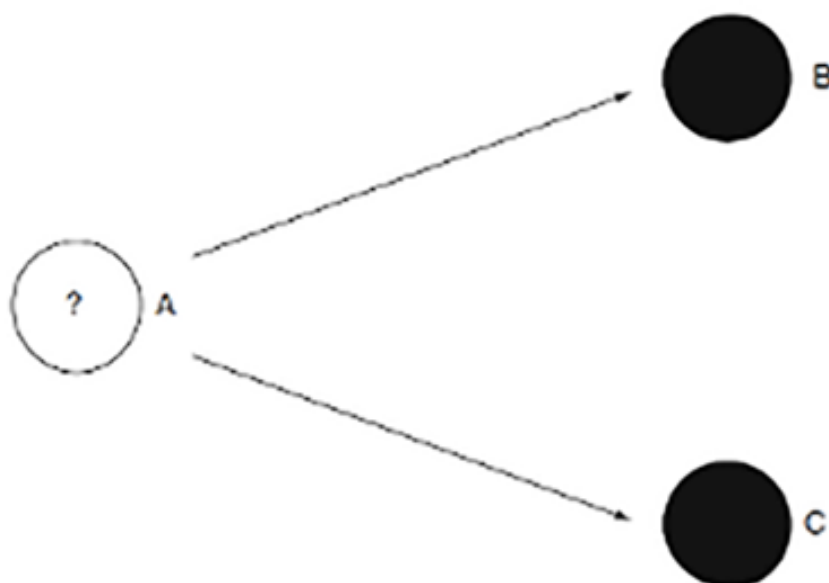
11After stating the rules of the riddle, the guard places the disks on the prisoners' backs, deciding to give each of them a white disk. Let us remember that there are five disks, i.e., three white and two black, and this is the only information available to the prisoners. They do not know the color of the disk placed on their own back, and the first to guess the color leaves the prison. Each of them can only look at the disks on the backs of the other two. We know that they all have a white disk on their back, but how does each of them guess their own color? For brevity, I will first present the process leading to the solution, then I will move on to some theoretical consequences.

12Let us outline the reasoning that each prisoner should develop individually to arrive at the solution. I will call the three prisoners A, B, and C, and let's pretend we are A.

13The first hypothetical scenario is easily imaginable: if the guard had placed two black disks, someone would have immediately run for the exit. In fact, since there are only two black disks in total, the first prisoner who saw two blacks would immediately know they have a white disk. Ergo, they could immediately run to freedom because they had guessed the color of their disk.

14The evidence, in this scenario, would have taken the form of a "time of lightning flash (*temps de fulguration*)" (Lacan 1966: 204) of value "0," says Lacan. In other words, the deductive process is reduced to a minimum. It is exhausted in an instant, in an immediacy. Lacan calls this first moment of the sophism, the instant of the glance (*instant du regard*). This is because everything is understood, precisely, with a single glance.

Figure 1: The first moment of logical time: the instance of the glance



[Zoom Original \(png, 20k\)](#)

Source: Hook (2013: 116).

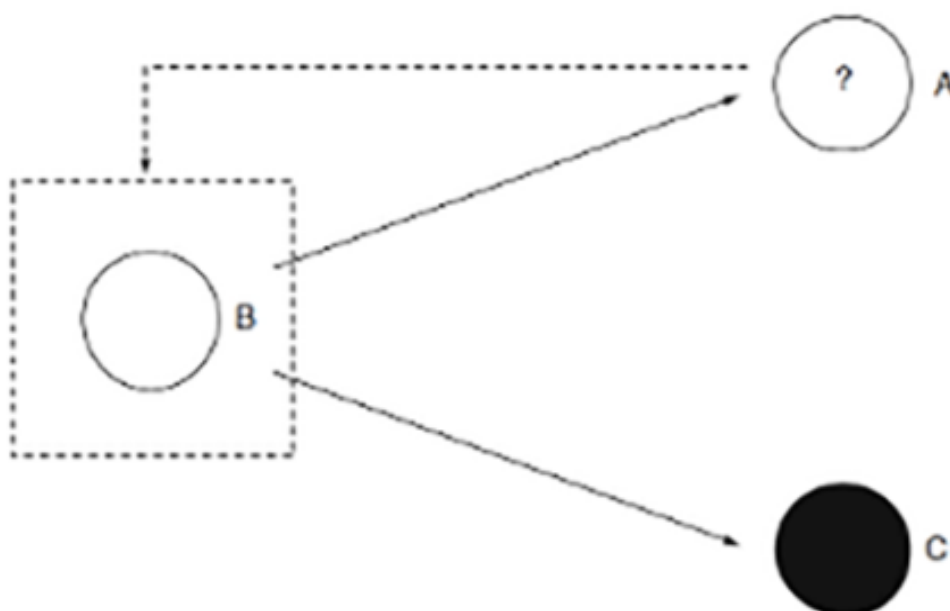
15Therefore, prisoner A, after running through this reasoning in his head ("if there were two blacks, then..."), sees that no one immediately runs for the exit and, naturally, neither does he. On the contrary, there is hesitation. This hesitation is the key element of the entire process, because it is precisely the hesitations - *motions suspendues* - that signal that the hypothesis "two blacks, one white" is false. Consequently, A is forced to consider another hypothesis: one black disk, two white ones.

16A wonders if he himself has the black disk. This is the second possible scenario. If A had the black disk, then B would see one black and one white disk in front of him (A's and C's, respectively). The same would apply to C (who would see A's and B's disks).

17If this were truly the case, B would think: "If A has the black disk and C has the white one, then if I had a black one, C would have run for the exit, but that is not happening." The exact same reasoning would be performed by C, who would symmetrically think: "If A has the black disk and B has the white one, then if I had a black one, B would have run for the exit, but that is not happening." An important aspect of this sub-phase of logical time is that it therefore consists of nested "ifs," an aspect I will return to.

18Thus, B and C mutually conclude in a way (even if they don't say it) that if A is black, their hesitation is the sign that they are both white. As Lacan says, both B and C experience "in the inertia of his fellow, the key to his problem" (Lacan 1966: 205). This second moment of the deductive process is called by Lacan "the time for comprehending" (*le temps pour comprendre*). From the instant of the glance, we move to a time for comprehending. Immediacy gives way to elaboration.

Figure 2: The second moment of logical time: the time for comprehending



[Zoom Original \(png, 34k\)](#)

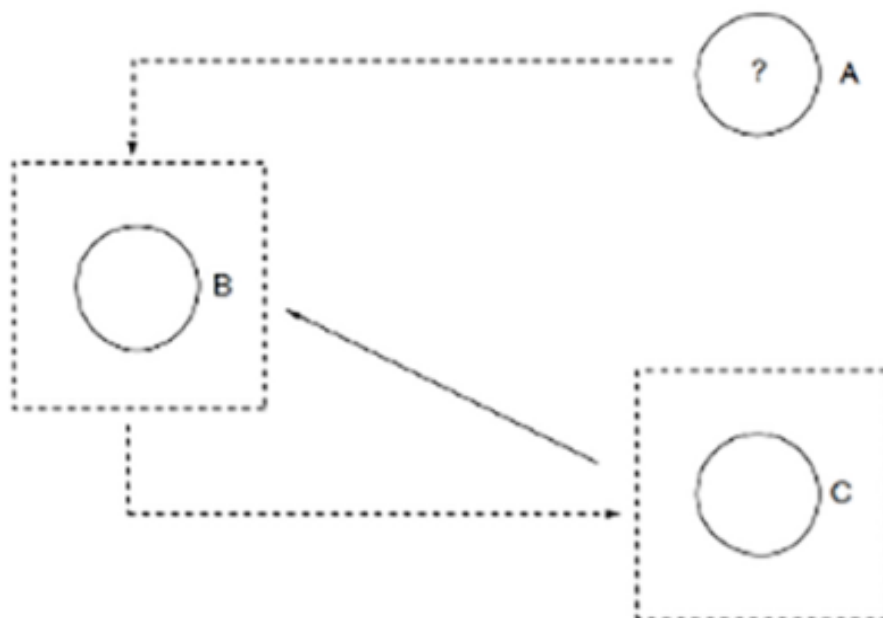
Source: Hook (2013: 117).

19Yet again, however, prisoner A sees that B and C are not, in fact, moving toward the exit. Here too, A observes another hesitation.

20The first hesitation was that of the first scenario (" if two blacks and one white"). This, however, is the hesitation relative to the second scenario (" if one black and two whites"). A consequently deduces that he has a white disk.

21We thus arrive at the third and final moment of the process, which Lacan calls the moment of concluding (*moment de conclure*), in which A discovers that he has the white disk.

Figure 3: The third moment of logical time: the moment of concluding



[Zoom Original \(png, 38k\)](#)

Source: Hook (2013: 118).

22Based on the previous hesitations, A rushes to declare himself as having the white disk. The process thus concludes with a subjective assertion by A, who promptly declares that he has the white disk in order to leave the prison.

23It is important to note that the entire process is *collective* only in appearance, since it emerges without the members of this collective - the three prisoners - having communicated anything. There is no relation between them (Lacan 1973-1974: 79). It is an event that emerges despite the members of this collectivity not having communicated anything amongst themselves. As Hook has noted, it is not so much a matter of *intersubjectivity*, but rather "of a universal logic that - bearing in mind a minimal degree of intersubjective awareness - transcends the requirements of multiple interpersonal exchanges to yield instead a rudimentary instance of *interobjectivity*" (Hook 2013: 114; our italics).

24Another important aspect to emphasize is that A rushes with haste to his subjective assertion (I have a white disk!) "for fear that (the lagging behind might engender error)" (Lacan 1966: 207). This expression, formulated in this way, reveals the "ontological form of anxiety" (*ibid.*), which characterizes the haste A has in affirming his position.

25Here, the rush we're talking about is the one manifested by the subject in precipitating identification, the rush to choose an identification before the others do, "for fear that..." The final moment of the process consists of a change in the nature of temporality itself: the time for comprehending fades away and leaves its place to the rush to put forth "an act which separates, an act which changes the perspective" (Nominé 2009: 46). This is why logical time is also a collective logic: my identification depends on an act which posits me as an "I" and, in a

certain sense, in opposition to the group.

26Lacan compares the entire process to the phenomenon of a lunar eclipse: the more the shadow advances, the more the sliver or fault line at the edge of the eclipse manifests a growing illumination. This luminous fault corresponds to the passage from the time for comprehending to the moment of conclusion. The more the eclipsed celestial body is covered, the stronger the light emanating from the remaining portion.

27In the same way, the closer the deduction process of the disk dilemma gets to its end, the more the subject is pushed and feels compelled to assert himself in the *moment of concluding*: the need to precipitate identification - I have the white disk! - becomes all the more urgent the closer the deductive process is to its end.

28An essential aspect of logical time is the idea of a logical process in which time is a constitutive and not an accidental factor. Lacan, in fact, asserts the need to refute the idea, typical of classical logic, that the deductive process can be "seen in a single glance" (Lacan 1966: 207) and that the concretely developed deduction is a factor entirely external to the logical deduction itself. According to the classical view of logic, a deductive process leading from premises to conclusions could occur in an instant, given, naturally, the ideal condition where there is no *friction* due to the cognitive or material limitations of the one performing the deduction: an ideal machine would deduce everything instantaneously. In a sense, we could say that Lacan is instead uniting *hot causes* (the glances, the hesitations, etc.) with *cold causes* (the "if...then" statements). The two suspended movements that the prisoner sees become *signifiers*, "their role here being to disclose to the subjects something about what they do not see" (Fink 1988: 23). As Fink noted, "sense experience - sight in this case - gives way to significations" (*ibid.*). It is, moreover, in these terms that we can frame the fact that Lacan links "*ce fameux signifiant*" to what Freud, in the famous Letter 52 to Fliess, calls "*Wahrnehmungszeichen (wz)*," i.e., perceptual signs (Lacan 1971: 118).

29The pulsations of the signifiers become crystallized in a logical space, which however depends in its essence on the suspended movements and the reciprocal gaze.

30Contrary to the classical logician, who considers the time of the deductive process as an accidental externality and not as a constitutive ingredient of the deduction itself, logical time is an invitation to think of a hybrid dimension in which the logical and the affective-bodily are two aspects of the same process. This is a hybrid process, far more real than the ideal abstractions of a logical process "in vitro," because in it the reality of the logical in the concrete is recognized. Logical time is subversive because it explains an event by bringing together "hot" type of causality - that is, the different affects of the prisoners - with a "cold" type of causality - the eminently logical-combinatorial solution to the riddle.

31For these reasons, logical time is a variation of Hegelian time, that is, of the dialectical time of Spirit. The Spirit of the world, Hegel says, "has time enough" because it is "outside of time, it is eternal" (Hegel 1993: 35). For the Spirit, a thousand years are like a day, says Hegel (*ibid.*), quoting the Bible, specifically Psalms 90:4. The relationship between material time and the time of Spirit is such that the latter develops by exploiting the former: it exploits the series of generations and historical events insofar as it has at its disposal nations and concrete individuals who, with their slow doing, become its support. The Spirit unfolds historically in local manifestations (peoples, thinkers, regions, etc.), but its development does not coincide with them. Once again, Spirit (cold causes) exploits and moves through material beings (hot causes).

32The device of logical time is also based on the distinction between a chronological or biographical time of life, understood as a flow of events, and a time marked by the signifier. But the way in which the scansions of the signifier are spread over the chronological or biographical flow can vary. They can unfold very distantly from one

another over a long duration, or they can be densely packed within a localized interaction. According to Ahmad (2012), the very temporal logic of the Oedipus complex is an instance of logical time. The breaking of the Oedipal spell coincides with a first moment of disappointment in which the infant realizes that his or her parents are not the all-powerful and omniscient entities he/she believed they were (*ibid.*: 45). This is tantamount to the first moment of logical exclusion ("they're not all-powerful"). It follows then a long period during which the infant questions herself about how to place the Other, how to reconfigure his identification in relation to the Other. This is the moment of reciprocity, in which the subject tries to envisage how do people recognize each other, and hence how to occupy the space of interactions (*ibid.*). And finally, we have a strong and often rebellious moment - as we all know - in which the adolescent decrees his/her parents as not fit to incarnate the Other (*ibid.*).

33But what does logical time essentially show? It shows, first and foremost, how becoming a subject is a logical process and that this process, which has signifiers as its very material, is intrinsically intersubjective or, more precisely, *interobjective*, as Hook says (2013: 114).

34The conclusive assertion occurs as a reaction and opposition to the relation of reciprocity (the second phase of the sophism). Lacan indeed states: "The 'I' [*je*], subject of the concluding assertion, isolates itself by a beat of logical time from the other, that is to say, from the relation of reciprocity. This movement of the logical genesis of the 'I' through a decantation of its own logical time is quite parallel to its psychological birth" (Lacan 1966: 208). The implicit reference here is to the Lacanian reading of the so-called Binet test. The latter is a psychometric test that allows for an approximate understanding of a child's stage of mental development. A child who, when asked about the members of his family, formulates a sentence like "I have three brothers: Paolo, Ernesto, and I," fails the Binet test (Lacan 2013: 92). The error consists, clearly, in the fact that the child counts himself among his own brothers. In Lacanian terms, he has not yet learned to exclude himself from the discourse of the Other. The psychological birth (*naissance psychologique*) to which Lacan thus links the first-person assertion "I" corresponds to this genetic and fundamental moment of considering oneself outside of the count.

3. Logical Time as Diagrammatic Cell: On the Cam

35A fundamental property of logical time - the fact that it is, so to speak, "spreadable" over the subject's ordinary or vital time - stems from the fact that, as Eidelsztein has noted, in psychoanalysis "[...] external processes are continuous, but they are registered psychically as discontinuous. Internal stimuli are continuous and are registered psychically as discontinuous" (Eidelsztein 2015: 38). This is, as Eidelsztein also states, one of the reasons that leads Lacan to adopt topology: "in topology, no function of measurable magnitude or distance is taken into consideration. In psychoanalysis, we extend this property to time and space" (*ibid.*: 19). Eidelsztein adds that "an instant can be longer than many years" (*ibid.*). For example, "who would not suspect - even without being a psychoanalyst - that the separation between a son and a father in conflict is dubious if the son has gone to America, for instance. Many thousands of kilometers may serve no function. The problem is that conceiving of separation at the level of space - its measurement in kilometers, for example - does not resolve the conflict; and in topology, it doesn't either" (*ibid.*).

36This reasoning can also be extended to time. The process of logical time does not depend so much on the individual's presumed chronological or biological maturity. It depends on the "ticking" or "pulsations" of the signifiers. Time, therefore, is also topological.

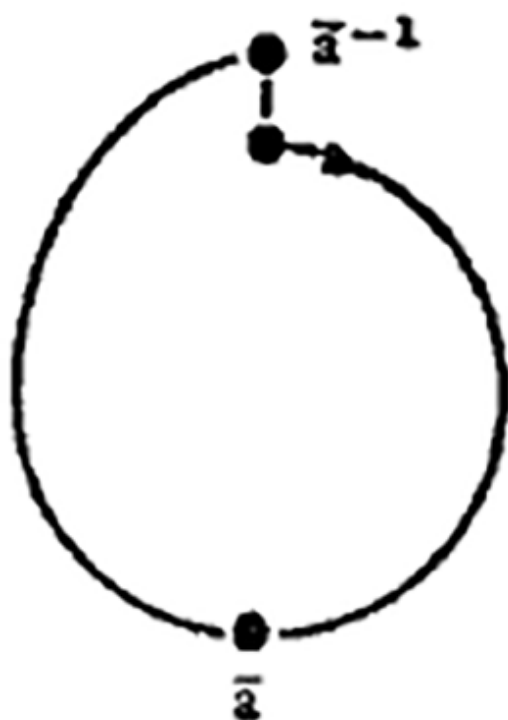
37In *Les Enjeux du mobile*, Châtelet observes that "one does not construct space by assembling shapes like the pieces of a Meccano set (one would then take the articulations for granted)" (Châtelet 1993: 159), and adds that "

it is not, moreover, a question of constructing space, but of letting oneself be enchanted by a *rhythm*: the one that knots and weaves together homogeneous elements saturated with tensions" (*ibid.*). The first assertion also holds true for time: one does not construct it by juxtaposing and summing blocks of it. This is even more valid in light of the second assertion, where spatiality is traced back to a rhythmic and thus temporal development, which results from the interplay of tensions. Similarly, logical time is not to be confused with the sum or flow of biographical moments, but is instead marked and syncopated by the tensions and their corresponding affective tones (haste, anxiety, reciprocity). The diagrammatization of logical time therefore also depends on this second aspect, namely the possibility of representing the relationships between tensions and moments diagrammatically. As Alunni emphasizes, a diagram is the manifestation of a structure bristling with potential differences that generate tension (Alunni 2005: 85), an aspect that perfectly coincides with the pulsating engine of logical time.

38How, then, is it possible to diagrammatize logical time? I believe a particular type of diagram is suited to this operation: the cam. To discuss it, I will refer to the recent work of Desclés and La Mantia on this specific diagram. The cam is, the two authors note, "a particular case of a diagram" (Desclés & La Mantia 2023: 24). It is a "strange loop," that is, a "geometric" or "topological diagram" (*ibid.*: 27).

39It has the form of a ring open at one of its points, whose resulting ends are moved apart or offset from one another. Although the cam appears in different fields, the primary use belongs to the linguistic field by Antoine Culioli, whose version of the cam is precisely the starting point for the reflections of Desclés and La Mantia:

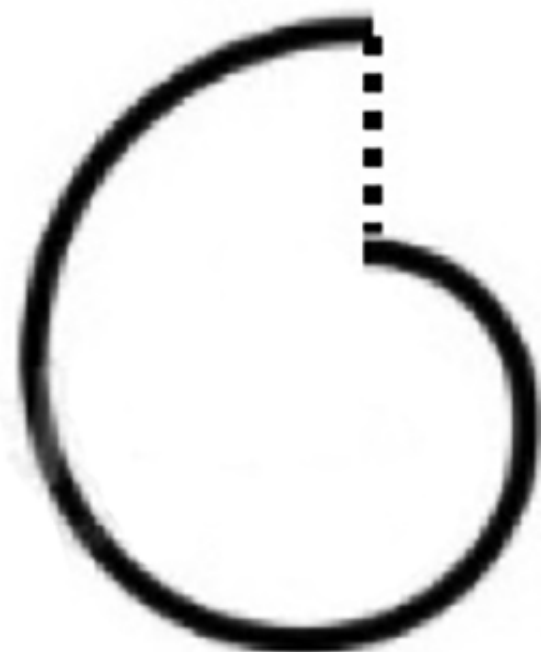
Figure 4: Cam structure



[Zoom Original \(png, 26k\)](#)

Source: Culioli (1968: 115).

Figure 5: Cam structure



[Zoom Original \(png, 40k\)](#)

Source: from De Vogüe (2021: 119); modified by the Author.

40As can be seen from the image, the ring is open at one point, and the two resulting ends are connected vertically by a line segment. In the diagrammatic terms of Châtelet, this vertical segment constitutes the dotted (*pointillé*) or dashed line. The resulting strange loop is therefore a path - which can be traversed clockwise or counterclockwise - that, starting from one end, follows the curved line of the ring, only to end at the other end, which is, however, connected to the starting point via the dotted line.

41It is the presence of the dotted line that implies the difference between the cam and a mere loop or closed ring. In the latter case, in fact, the endpoint of the path is identical to the starting point. The cam thus distinguishes itself from an inert diagram like the loop by not being "neither a noose nor a spiral" (Desclés & La Mantia 2023: 35). The dotted line allows the cam to change, vibrating, from one form to the other: it can refer to the loop as well as to the spiral. On one hand, there are identifications between the elements - namely, the two points brought into contact by the dotted line - and thus an allusion to identity. On the other hand, however, the two planes are also in rupture with each other, and thus there is a reference to the spiral. On one side, identity and closure; on the other, a spiral-like drift and alterity. In La Mantia's words, we can say that "this dual condition, of connection in

difference and vice versa, is proper to the cam as a topological device that mixes identity and alterity, gap and connection" (*ibid.*: 39).

42The cam simultaneously combines the idea of a path that returns to the starting point and the idea of a path that instead leads to something new. Right from its usage in Culioli's work, we are dealing, as De Vogüé has noted, with *idem* and *ipse*: "Initially, this model serves to account for the properly dialectical dimension of the very notion of identity: with values varying from *idem*, which identifies, to *ipse*, which singularizes, identity turns out to be a matter of variable weightings between identification [...] and alterity" (De Vogüé 2021: 117).

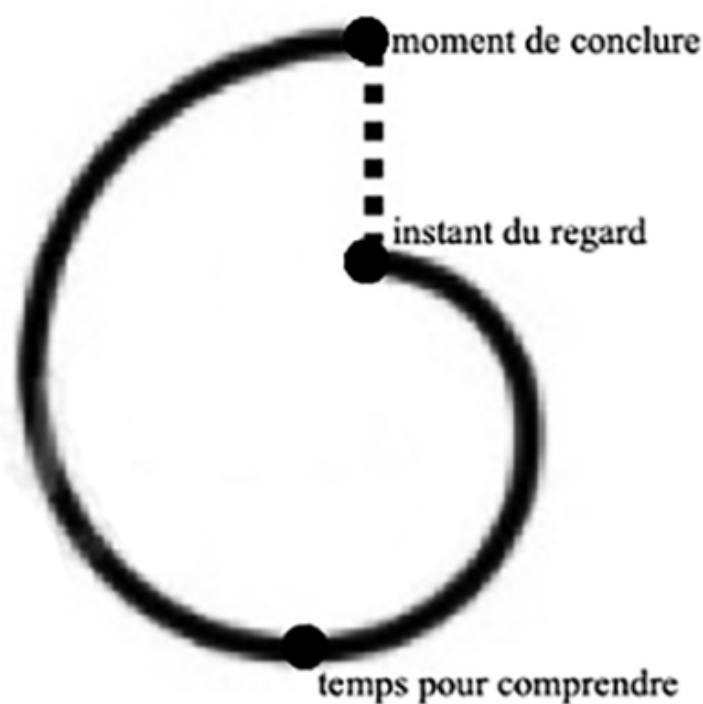
43The notion of *idem* implies an inevitable relation of alterity that the process of identification must presuppose precisely in order to annul it. In the notion of *ipseity*, "alterity and identity also intervene, but it is then to mutually found each other, with a singular identity whose foundation is the insurmountable alterity of the considered entity, alterity in relation to every other entity: one is identical to oneself, and to oneself alone" (*ibid.*).

44Similarly, as Porge has emphasized, in the case of logical time, "it is a question [...] of the tension between two poles of intersubjectivity: a relation between subjects and a relation of the subject to 'himself'" (Porge 2024: 81-2). It feels like reading Lacan's own words commenting on his logical time. The closer the process of the dilemma gets to its end, the stronger the urgency of the subject to assert himself in opposition to the other two; the *idem* asymptotically approaches the *ipse*. The achievement of identification - that is, the *on est identique à soi, et à soi seul* mentioned by De Vogüé - is only possible by passing through the progressive saturation of the intermediate moments. In logical time, too, it is an asymptotic tendency that thus does not cancel out identity and alterity, but pushes the subject to establish his singular identity as the result of a genuine haste, as a hiccup or final logical bottleneck of the process.

45It is also worth recalling, as La Mantia notes, that no metric "is defined on the open loop, so no length is associated with the arcs of the corresponding graph" (Desclés & La Mantia 2023: 27). However, the translatability of the graph into a cam is possible precisely because, drawing inspiration from Bachelard's *Dialectique de la durée*, our knowledge of causal and temporal phenomena is produced by a *stroboscopy*: "duration is the stroboscopic aspect of a general change" (Bachelard 1936: 77). This means that the continuous is the result of a stroboscopic effect of discontinuities packed together more or less densely.

46This also holds true for the rendering of logical time in the cam, which I propose to visualize in the following way:

Figure 6: The cam of logical time



[Zoom Original \(png, 68k\)](#)

Source: elaborated by the Author.

47The cam of the three moments - *instant du regard*, *temps pour comprendre*, *moment de conclure* - is clockwise for the following reason: when the subject arrives, through the path, from the instant of the glance to the moment of concluding, he realizes that he has *always* had a white disk on his back, and that therefore he could have left right from the start. But naturally, as Lacan says, "it is only in the *après-coup* of the scansions" (Lacan 1973-1974: 193) that the prisoners in the dilemma can make them function as proof. The subject cannot arrive at the realization of his position without passing through the intermediate phases of the nested "if...then" statements and, in a sense, only discarding the entire process at the end. The dotted line is therefore the site of this *après-coup*, of this subjective realization which is *nachträglich*.

48As Hoens has noted, "the three logical formulae, corresponding to the three times Lacan differentiates, imply three different forms of subjectivity: an impersonal 'one,' a personal 'ego,' and a subjective 'I' (*je*)" (Hoens 2022: 24).

49The two points connected by the dotted line, *instant du regard* and *moment de conclure*, are thus homologous because they realize what was in fact always true (i.e., having a white disk). It is the curved part of the cam, the one corresponding to the time for comprehending, that has the special status of containing, as intermediate stages, the various "if...then" deductions, connected to their respective affective tones ("for fear that," anxiety, haste, etc.). Châtelet emphasizes how the dotted (*pointillé*) implies a "calculated categorical error and a kind of veracity effect stemming from a patent falsity" (Châtelet 2016: 71).

50In terms of subjective positions, Lacan sometimes uses logical time to indicate how the various clinical structures - the obsessive, the hysteric, the pervert - inhabit it. Some of these clinical figures are normally comfortable inhabiting the condition of reciprocity (*temps pour comprendre*) and postpone the resolution (*moment de conclure*). In other cases, like the clinical case of Dora, we witness the subject collapsing the time for comprehending into the moment of conclusion, in a sudden gesture of exit: the reciprocity between the father and Mr. K. and Dora's rebellion against both (including, in reality, Freud himself).

51Bachelard, speaking of this discontinuity that inhabits us, says "our temporal hesitation is ontological" (Bachelard 1936: 40). Let us remember that logical time is based precisely on hesitations. In another particularly pregnant Bachelardian passage, we read: "Our personal history is therefore only the story of our disjointed actions and, in telling it, it is through reasons, not through duration, shattering at every instant our love, our faith, our will, our thought" (*ibid.*: 45). In Lacanian terms, we might substitute the expression "our disjointed actions" with "our signifiers." In the text *Fonction et champ*, revisiting the conception of time in psychoanalysis and, in particular, his work on logical time, Lacan expressly speaks of "clicks of time" (Lacan 1966: 287), which we can thus liken to Bachelardian stroboscopy.

52During the seminar session of May 16, 1962, Lacan links this essential discontinuity of the signifier to logical time:

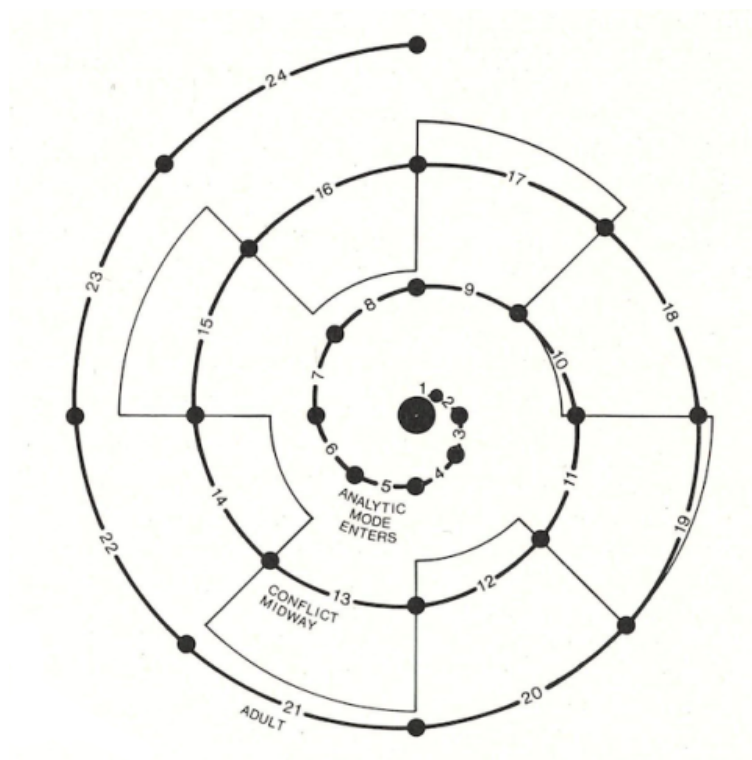
Why is it that the signifier, in its *corporeal incarnation* - that is to say, the *vocal* one - has always presented itself to us as being of a discontinuous essence? We therefore did not need the surface: *discontinuity constitutes it; interruption within the successive is part of its structure*. This *temporal dimension* of the functioning of the *signifying chain*, which I first articulated for you as *succession*, has as its consequence that the division introduced by modulatory interruption brings in *the haste* that I have inserted as logical haste. It is an old piece of work: *Logical Time*. (Lacan 1961-1962: 448)

53We can imagine the cam of logical time as constituted by the scansion of the prisoners' signifiers, or perceptions. Taken as a model for the psychoanalytic treatment itself, logical time placed within the cam illustrates the fact that subjects' exits from analysis vary from individual to individual precisely because the "metrication" can be more or less dense, more or less deferred in time (with intervals between one moment and the next being more or less dilated). The pulsations of the signifier are syncopated and spread out differently in each individual case. But above all: the person in analysis needs to retrace the cam of their logical time more than once. All of this is probably something to add to the reasons why some analyses last incomparably longer than others.

54This means that the time of life and the time of the signifier, although not the same thing, interact insofar as the latter must necessarily pass through the former in order to establish itself. The discontinuities of the signifier parasitize the fabric of life to the extent that they capriciously use its rhythm to graft themselves onto it.

55In their book *Diagram*, Albarn and Smith have proposed using a spiral to indicate the process of an individual's maturation:

Figure 7: the "Torus of maturation"



[Zoom Original \(png, 318k\)](#)

Source: Albarn & Smith (1977: 119).

56The numbers represent years of life. The spiral of life is also marked by periodizations or particular phases: from the moment the child develops analytical capacities ("analytic mode enters"), to the conflictual phase of adolescence ("conflict midway"), etc.

57As Desclés has emphasized, "temporality organized in the form of a spiral, where everything returns at once similar and different, is projected onto a cyclical temporality (cycle of alternations between day and night, cycle of seasons, cycle of years...)" (Desclés & La Mantia 2023: 166). Consequently, he adds, "[the] spiral structuring of temporality cannot be reduced to a purely cyclical temporality, which, instead, is a certain form of identity" (*ibid.*).

58Keeping in mind this representation of the individual's vital or biographical time, we must imagine logical time as a time which, while not being cyclical, can install itself repeatedly along the path of the spiral. In this sense, the spiral is not only characterized by periodizations and events like the analytical phase, adolescence, etc., but also by the signifiers of logical time and by how they will pulse along its path.

59If, as Alunni says, the diagram has an intrinsic capacity to "compact one or several gestures" (Alunni 2010: 51), the time of life is also determined by the density and the re-occurrence of the "clicks of time" of each individual's logical time. This is the sense in which Lacan emphasizes that "psychoanalytic anamnesis" (Lacan 1966: 256) is not concerned with the reality of life, but with the truth of the subject. Lacan indicates how Freud "declares it legitimate in the analysis of processes to elide the intervals of time in which the event remains latent in

the subject" (*ibid.*). What is relevant is not so much the progression of the spiral of life, i.e., the development through successive phases of maturity. What matters, rather, is the way in which the loops of logical time have installed and distributed themselves on this spiral. Lacan himself reads the Freudian case of *The Wolf Man* in light of logical time, showing how it develops following its tripartite scansion:

First, there is the moment of seeing: it is the evidence graspable in an *instant of a glance*, staged in the dream of the wolves. The second stage is that of the *time for comprehending* the problem, occupied by the long work of cogitation of the working through in the first period of the analysis. Finally, there is the *moment of concluding*, with the element of haste and urgency introduced into the analysis by the temporal pressure that Freud resolves to exert. (Lacan 2021: 20; our italics)

4. Smooth and Striated Time

60As I said before, for Châtelet, space is not composed by juxtaposing its parts. As Petitot has noted, almost echoing Châtelet's words, "it is well known that until Riemann [...] it was taken for granted that objects existed and moved within an autonomous space, provided a priori with an independent metric" (Petitot 1990: 65). If until Newton space could be conceived of as a "cubicle" containing objects, i.e., a volume inhabited by different entities, then the Riemannian revolution consists in thinking of metric relations as coming from the very matter that occupies that space. No longer, therefore, an always-identical container into which objects are placed with their extensions, but rather a *space coextensive with its objects* (SCO from now on).

61In the chapter of *A Thousand Plateaus* dedicated to "the smooth and the striated," Deleuze and Guattari take up this idea of difference and compare Riemannian space to a patchwork: "Riemannian space is a pure patchwork. It has tactile connections and liaisons. It has rhythmic values that are not to be found elsewhere, even though they can be translated into a metric space" (Deleuze & Guattari 1980: 606). In an SCO, or patchwork, it is the materials themselves that dictate the coordinates within which they move. We could say that the coordinates are thus produced by the objects. The idea of SCO actually appears earlier, in a different way, in some previous Deleuzian passages. In *Logic of Sense*, we can read that "the event is coextensive with becoming" (Deleuze 2004: 11) and that "there are no pre-existing rules, each move invents its own rules; it bears upon its own rule" (*ibid.*: 70).

62The textile metaphor leads Deleuze and Guattari to oppose the patchwork to weaving (or the warp), where the latter would represent striated space. In this second case, we have warp and weft, harmony and melody, longitude and latitude (Deleuze & Guattari 1980: 666). On one side, smooth, Riemannian space, made of intensities and heterogeneity, an SCO. On the other side, the striated space of the warp, of the weft. Homogeneity results from the striation of space. Conversely, the smooth is intrinsically heterogeneous:

Indeed, in every model, the smooth has appeared to us to belong to a fundamental heterogeneity: felt or patchwork and not weaving, rhythmic values and not harmony-melody, Riemannian space and not Euclidean space, continuous variation that surpasses any distribution of constants and variables, liberations of a line that does not pass between two points and of a plane that does not proceed by parallel and perpendicular lines. (*Ibid.*: 667)

63In light of the reflections on logical time - namely, on the fact that it occurs as stroboscopy (clicks of time), pulsations of the signifier - I propose to speak then of *smooth* and *striated* time.

64Signifiers do not correspond to the striated time of clocks, calendars, or any system that codifies time. Signifiers distribute themselves, as Lacan says (see above), as discontinuity and affective modulation.

65The subject is thus entangled in these two weaves. On one hand, the striated time is constituted of calendars, anniversaries, seasonal alternations. On the other hand, the smooth time of the signifier, which is made of pulsations - Lacan speaks precisely of " interruptions" - of the signifier. But striated time and smooth time are not isolated from one another. Striated time can provoke and invoke - for example, at crucial life stages, in liminal periods between two seasons - the pulsatile action of the signifier. Thus, the orderly ticking of striated time can be parasitized, so to speak, by signifiers, which then proceed to disrupt the apparent immaculate order of the former. Striated time can attract the subject's logical time into its basin, and, in doing so, the intensities of the signifiers can come to coincide or synchronize with the cyclicities and regularities of striated time.

5. Logical Time and Mathematical Formalization. Towards a Diagrammatic Psychoanalysis

66As an " allusive stratagem" (Châtelet 1997: 154), the diagram allows one to " define a new type of systematicity" (*ibid.*). This new systematicity, which conjugates the singularity of the diagram and of metaphor, allows us to enter into physico-mathematical intuition and the " discipline of the gestures that precede and accompany 'formalization'" (*ibid.*).

67As I have tried to show, logical time and the diagram can perhaps illuminate certain aspects of each other. As an abstract diagrammatic cell, logical time also functions as a metaphorical device for different types of processes in which intensive or smooth time proves more relevant than extensive or striated time.

68Keeping Châtelet's words on the intimate relationship between the allusive capacity of the diagram and the potential for formalization firmly in mind, it is worth mentioning in these concluding remarks that Lacan himself indicates, albeit en passant, the possibility of formalizing logical time.

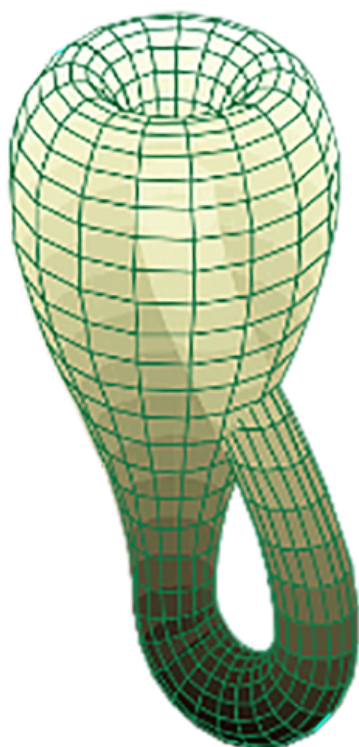
69In his text *Function and Field*, Lacan speaks of the fact that " mathematics can symbolize another time, namely the intersubjective time that structures human action, for which game theory, also called strategy, and which would be better called *stochastic*, begins to give us the formulas" (Lacan 1966: 287). Immediately following this, after mentioning his sophism of logical time, he adds that " one understands how the mathematical formalization that inspired Boolean logic, or set theory, can confer upon the science of human action that structure of intersubjective time which the psychoanalytic conjecture needs to guarantee its rigor" (*ibid.*).

70Lacan alludes to a potential formalization of logical time by evoking Boolean logic and game theory. The reference to the former is quite intuitive: the values of the disks are binary - black or white - and as such can be implemented as " 1" and " 0." The second reference, to game theory, is also quite obvious: logical time is an example of intersubjectivity and also a game of strategy. As Porge has noted, it is precisely starting from the psychoanalyst's intent, in 1956, to frame analysis as a " science of action and decision" that Lacan begins to frame the laws of intersubjectivity as mathematical laws (Porge 2024: 71). As Porge notes, Lacan's interest in Von Neumann's and Morgenstern's *Theory of Games and Economic Behavior* stems from sharing the idea that the

point is not "to define the being of the individual but the formal conditions of human relations in which a subject is pushed to form an opinion, to decide, to act" (*ibid.*: 72).

71Being at once a combinatorial logic and a game theory, logical time not only has great potential for diagrammatization, but also - precisely for the reasons evoked by Châtelet - a notable potential for formalization. Although Lacan enthusiastically admits this possibility, nowhere does he propose a mathematization of logical time, limiting himself to saying that the path to do so must presumably pass through Boolean logic. The only exception is the sketch of a mathematization of logical time in terms of a topological object, and specifically the Klein bottle:

Figure 8: Klein bottle



[Zoom Original \(png, 179k\)](#)

Source: Wikimedia Commons.

72The reason the Klein bottle is well-suited to illustrate logical time is that, as Porge notes, it cannot be grasped "in a single glance (*d'un seul coup*)" (Porge 2024: 72), an element which is constitutive of logical time, as the deductive process requires the temporal dimension to unfold.

73In conclusion, I will only venture to suggest a possible direction for the mathematization of logical time. If formalization and diagrammatization are possible for logical time, one aspect that must be preserved is the

blending of a logical-combinatorial dynamic and a topological one. In short, *it is a matter of installing a logical lattice on a stretchable surface*. This is, evidently, a strange violation, but a necessary and hopefully fruitful one. The peculiar violation consists of a mixing of types of thought or spaces: on one hand, a process composed of discrete steps and binary values, on the other, a space that allows for elastic transformations and modifications. Logical time is simultaneously a deductive process and a series of intensities and affective tones that blend into one another.

74Its potential future formalization must take both aspects into account and, so to speak, spread the discrete elements of the combinations onto an elastic space of intensities. The compressions, distensions, hesitations, etc. - that is, the changes in intensity within the elastic and intensive space - must translate into discrete transitions in the space of discrete elements.

75Although there is no space here to develop this possibility, I will merely indicate that a promising tool for this purpose is - more so than the Boolean logic mentioned by Lacan - precisely category theory (Lawvere & Schanuel 2009). The objects from which category theory starts are relations. Relations are more important than the objects themselves (Saint-Ours 2005: 40). Very schematically, the diagrammatic core of categories consists of objects and arrows connecting them. These arrows, called *maps*, satisfy particular properties and allow for *compositions* with one another. The elements of this particular mathematical theory are not only literally diagrams, but above all they foreground relations rather than being. Let us remember that the three times of logical time " are not linked individually to the characters A, B, C, but to the relations that these characters maintain among themselves, each one being in turn A, B, and C" (Porge 2024: 34). Literally, the three times are modes of being, i.e., types of possible relation. If, in a metaphorical sense, there is a " time" in category theory, it is not a normal time, but rather a succession of steps (as happens in the composition of maps).

76Moreover, some intrinsic features of category theory, such as the so-called " determination" (or extension) problem and the " choice" (or lifting) problem (Lawvere & Schanuel 2009: 45), describe processes akin to what happens in the Lacanian dilemma. It is therefore not difficult to imagine how the identification processes described by logical time could find a potential ally in this powerful mathematical tool. This, however, while keeping in mind the caveat that, by itself, category theory would only allow for the formalization of the logical-combinatorial side and not, properly, the intensive and topological one, and that it would therefore need to be integrated with a formal apparatus that, by causing the aforementioned violation, *vectorializes*, so to speak, logical relations by mapping changes in intensity to changes in discrete binary values. More specifically, category theory will not, alone, be sufficient for this task. What looks promising is its interaction with what is more specifically known as sheaf theory (Rosiak 2022). It is precisely the formal powers of the latter which could allow the enmeshing of those two dimensions of logical time, namely the mapping of changes in intensity in a perceptual field upon a discrete logical grid of maps between " Boolean" type of values.

77A broader aspect to be underlined concerns the possible future clinical and theoretical implications for psychoanalysis of its encounter with diagrammatic thought. As I have tried to show, there is plenty of room to deepen the links between Châtelet and Lacan or, more generally, between a theory of diagrams and psychoanalysis. In clinical practice, more specifically, diagrammatic thought can be a powerful tool precisely to render more vividly the dynamics described by Freud and Lacan. But more specifically still, it is the interplay between the continuous and the dotted (*pointillé*) lines of the diagram that allows for the dynamic visualization of relationships between elements in the psychoanalytical field, be it signifiers and temporal hesitations, the symbolic and the imaginary, the temporal après-coup of each individual's development, and so on.

[Top of page](#)

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[Top of page](#)

List of illustrations

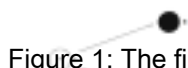


Figure 1: The first moment of logical time: the instance of the glance

Source: Hook (2013: 116).

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Figure 2: The second moment of logical time: the time for comprehending

Source: Hook (2013: 117).

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image/png, 34k

Figure 3: The third moment of logical time: the moment of concluding

Source: Hook (2013: 118).

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Figure 4: Cam structure

Source: Culioli (1968: 115).

<http://journals.openedition.org/ejpap/docannexe/image/6655/img-4.png>
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Figure 5: Cam structure

Source: from De Vogüé (2021: 119); modified by the Author.

<http://journals.openedition.org/ejpap/docannexe/image/6655/img-5.png>
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Figure 6: The cam of logical time

Source: elaborated by the Author.

<http://journals.openedition.org/ejpap/docannexe/image/6655/img-6.png>
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Figure 7: the "Torus of maturation"

Source: Albarn & Smith (1977: 119).

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Figure 8: Klein bottle

Source: Wikimedia Commons.

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[Top of page](#)

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