From *L'être et l'événement* to *Lettre et significant*

A psychoanalytic critique of Badiou's reading of set theory

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Part I.

2- The Undefined Matheme: From Stenography To Abbreviation Symbol

The 'matheme' is a term first coined by Lacan. It has subsequently been interpreted along two different modes, one we will call *philosophical* and *stenographical-poetic* (I), and the other we will call *psychoanalytic* and *abbreviative-mathematic* (II).

Briefly, it is proposed that a construction of a theory requires a mode of literality to be developed rigorously. Thus, we may define a *matheme* intuitively as a minimal unit of savoir inscribable in a cipher, letter, variable, marks, etc. or a combination thereof: **'al*&I',**), **&\$*(^**-, 'abxhxh', '102928', **\$<>a**, are all examples of *mathemes*.

Both (I) and (II) have this minimum in common: the *matheme* will be to *mathematics* as the *phoneme* is to *phonematics* – just as the former is a unit of knowledge (savoir), the latter is a unit of phony.

The crucial question remains, however, how to determine whether a *matheme* is not merely a scribble or jumble of letters. And if it is not, how do we account for its correlation to a minimal unit (-eme) of knowledge (savoir). If this correlation is left at the intuitive level, one can very well seek to respond to such a query by proposing to establish the *effectivity* (Wirlichkeit) of the *matheme* at the level of *transmissibility*. In which case the scope of the term *effectivity* reduces to a mode of stenography: much as a secretary uses certain glyphs to economize longhand or spoken discourse. In which case, just as such a stenography – or brand – maybe used to assure the transmission of the property of a herd of sheep, there is the risk that the Lacanian *matheme*, if left at this level, would only exist to assure the integral transmissibility of a discourse of a School[i]. Whatever one may think of such a claim, at least the position of interpretation (I) is clear:

a) the *matheme* assures the integral transmissibility of a knowledge(savoir);

b) the *matheme* conforms to the paradigm of mathematics;

c) the *matheme* is the basis on which to assure teachings of a School, not as master-disciple of the academy, but as a purely positional transmission of the doctrine of modern mathematics.

It is precisely this stenographic thesis of the *matheme* that is held by founders of *Cahier's de Analyse* and it is the one that J.C. Milner advances as congruous with:

"the strict positional determination of the master articulated in a School. The latter has nothing other than the institutional correlation of the *matheme* and its major function consists in assuring this integral transmission. Thus, the School will have for its expression a collection of *mathemes* entitled *Scilicet* (glossed: 'you can know' scil. 'thanks to the matheme'). In this collection, the pertinence of the rhetorical model of Bourbaki jumps to the eyes […]. In truth, the singular formation manifests a project: to rewrite 'mathematically' psychoanalysis at the same level that Bourbaki would attempt to rewrite 'mathematically' mathematics" [*Oeuvre Claire*; p.127-128].

Indeed, once interpretation (I) is adopted and the reference to Bourbaki is glossed as a 'rhetoric', the actual *effectivity* of the *matheme* is reduced to a heteroclite assembly of letters stenogramming a body of discourse[1]. Again, as contradictory as the proposals below may seem, J.C. Milner is the most eloquent purveyor of such a position:

"Now, what is proper to the *mathemes* of psychoanalysis is that they are not readable between themselves. Not only does each one of them stitch together a heterogeneity, but each is more heterogeneous than the other. The writing of which they form varies. There is not a literal passage from one to the other: it is impossible to calculate a *matheme* from one another by regulation of letters. The permutation that structures the theory of four discourses is internal to the unique *matheme*: the one that constitutes together the four formulas and the rule that allows for the passing from one to the other. None of the four lines of the sexual *mathemes* can be obtained from the transformation of an other; they function in co-presence. From one of these *mathemes* to the other there is no literal transition. In short, *mathemes* are not summed up in a field of science". [*Ibid*; p.131]

Without pausing here to examine either the justness or coherence of Milner's claims, they may be used to situate the interpretation given to a *matheme* by his colleague Badiou[2]. For as Milner has predicted, throughout *LEE* we are given examples of a heterogeneous collection of *mathemes* with no literal transition between them– 'the matheme of infinity', 'the matheme of the event', 'the matheme of the indiscernible', etc. And it is true that in *LEE* the *matheme* itself is never defined, calculated, or recognized in its function as an abbreviator symbol of a unit of knowledge. On the contrary, Badiou's *matheme* only situates points of "impasse" or is strung to together in a 'heteroclite' use of formulas that only put into play an exact correlation to a unit of knowledge to the extent they stenogram propositions made in ordinary language, albeit a language whose intended interpretation is ontological. In spite of the philosophical intent of LEE to be counter the 'linguistic turn' of modern philosophy, the correspondence of Baidou's *matheme* to a unit of

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[1] In adopting position (I), Milner proposes that it is only the letter that is responsible for a transmission, while the signifier is non-transmissible: "*Being capable of being displaced and seized, the letter is transmissible; by this transmissibility proper, it transmits of which it is, at the heart of a discourse, the support; a signifier transmits nothing: it represents, at the point of the chains where it is encountered, the subject for another signifier*" (Ibid; p.129). If one were to begin to introduce the insistence of the signifier in a transmission, then one would not only have made room for position (II), but resolved the problems Milner's *Oeuvre Clair* exhibits in coming to terms with the transmission, *après coup*, of the psychoanalytic clinic.

[2] A folklore interpolation may help clarify matters here. The editors of *Cahiers pour l'analyse* (CA) J. A. Miller, A. Badiou, and J.C. Milner were part of a public clarification of a Lacanian discourse whose thought had begun with a programmatic statement in Lacan's *Discours de Rome(1953)*. Extending from 1953 to 1970s, the program of CA represents an attempt to integrate an analytic transmission in the form of the *matheme* to the university. This push stems from Lacan's departure from St. Anne and the awakening of a university following of marxist-philosophical-linguist students at Normale Superieure. For a long time in France, the position of CA was heralded as the authoritative interpretation of Lacan, and it is the one that Badiou and Miller brought to America and England in the form of a university discourse on psychoanalysis. The considerable influence this style of reading Lacan has exercised on Lacanian scholarship is well-known, and can be stenogrammed under what Milner [OC;p.77] has called the 'first classicism' of Lacan dating from 1953 to 1970. Adopting this periodization of Lacan as a guide to the folklore we follow Milner when he writes "*The program for the Cahiers pour l'Analyse is not due to Lacan; he did not make it his, but he did not disavow it either (cf. Discours a' EFP, Sc., 2/3, p.17). One can use it to reveal things; one recognizes it as a more adventurous form and, from this fact, more readable...*" [Ibid;p.111]. It is this "more readable" Lacan which until the 1970's held sway, and would later, according to Milner, find its formal realization in the desire for an integral university transmission of psychoanalysis. Following Milner's account here to schematize, let us agree to call the rupture in the 1970's indicating the passage from Lacan's linguistic to his logico-mathematical models, a 'second classicism'. It denotes the institutional will in which a certain stylization of Lacanian psychoanalysis is transmitted with a stenographic notion of the *matheme* and a university formation of the *L'Ecole de la Cause Freudienne*. It is important to note that Milner calls the introduction of Lacan's theory of knots in 1971 (*ou Pire*), the "deconstruction" of his classcissisms [Ibid;p.171-172]. Yet, Milner's narration of a decline from classicism to deconstruction can only be valid if the stenographic and institutional notion of the *matheme* is interpreted by thesis (I). Interpreted from within (II), his periodization is nothing other than a way of historizing a structural argument: if the interpretation of the *matheme* is posed as a mere stenogram of spoken language or heteroclite fixation of non-calculable formulas as posed by the classcisisms of (I), then it simply contradicts itself and no "deconstruction" is required. On the contrary if the *matheme* is a calculable symbol of abbreviation according to thesis (II), then no deconstruction is required in passing to a knot theory. On the contrary, it is a logical consequence. Indeed, it was precisely in a topological construction that Lacan achieves his first presentation of psychoanalysis in an open public forum at the Pantheon in 1969, beyond the *matheme* of the school. From this moment onward, the public, not to mention the private, transmission of Lacan's psychoanalysis was implicated by the problem of a topological presentation of the knot and an abbreviative use of the *matheme*. One passes from the school as context to the clinic.

knowledge is left at the level of a stenography of sentences, having no effective calculation or deduction of their own (see the example of our next section).

Be that as it may, without too much effort it can be shown how Badiou's use of the *matheme* falls under interpretation (I). The use of philo-poetic stenograms is not new to the transmissions of an academy, and Badiou's writings ₁ exhibit the qualities of coming under its philosophical heritage. Needless to say, not only does such an interpretation bypass the indications of how Lacan constructs the *matheme*, but makes it impossible to follow just how Lacan's *matheme* maintains a relation to the Clinic, and not simply a School. This oversight is important because it brings into play a problem of transmission centered not simply on knowledge, but ignorance and truth. Indeed, one may well ask at what point the transmission of a *matheme* not only supports an integral transmission of knowledge, but poses a problem of ignorance signaled by the well known phrase of the Greeks: *your pathemata is your mathemata*. As I will not have the time to bring out this pathetic dimension of the *matheme* or explicitly formulate the oppositions between the Clinic-School and Ignorance-Knowledge, I will only focus my attention on the methodological avoidance that position (I) reveals in the reading of Lacan and *LEE*.

Bourbaki's Tau-Square Symbolism

In order to re-orient the reading of the *matheme*, we should refer to Lacan's references to Bourbaki's [2] '**τ**' and '**◻**' symbolism inherited from the tradition of Hilbert's epsilon calculus [3]. It is in *Encore* that Lacan began to indicate that there is another less poetic reading of the *matheme*, which he calls a '*usage stricte*':
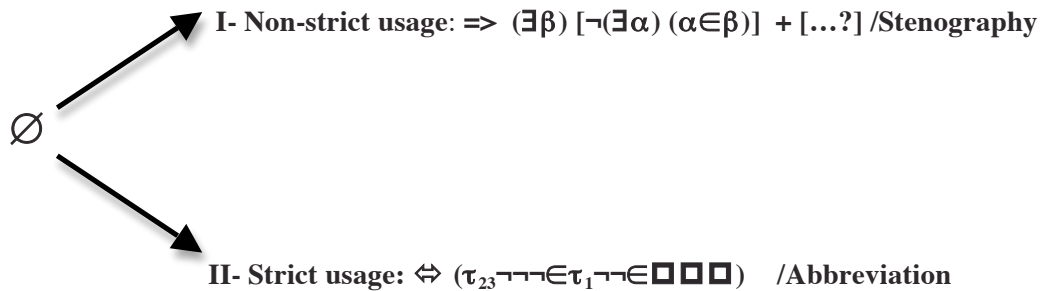
To permit the explanation of the function of this discourse I advanced the usage of a certain number of letters. First of all the, the a, what I call the object, but which is nothing more than a letter. Then the A, that I make function in what of the proposition only has the function of a written formula, and that has produced mathematical logic. I designate of it what is first of all a topos (lieu), a place. I have said – *the place of the Other*. In what can this letter serve to designate a place? It is clear that there is something there abusive. When you open, for example, the first page of what has been finally reunited under the form of a definitive version under the *Theory of Sets*, and under the fictive author's name of Nicolas Bourbaki, what you see, is the putting into place of a certain amount of logical signs. One of them designates the function of place as such. It is written with a small square – **◻**. I did not make a strict usage of the letter when I said that the place of the Other is symbolized by A. On the contrary, I marked it by redoubling the **S** which is a signifier of **A** such that it is barred – **S(Abar).** *[Encore;p.30-31]*

Such an example, one among many, constantly brings out that by the time of the latter period of Lacan's work – from 1970 to 1980 – there is a *nonstrict* and *strict* usage of the *matheme*: the first, interpretation (I), is a poetic shorthand where the letter **A** stenograms the place of the Other and leaves the correlation of this letter to knowledge vaguely described through descriptive language and speech; the second, interpretation (II) is a psychoanalytic and logico-mathematical abbreviator symbol where the letter **A** stands for a strict **◻** calculation in the manner of Bourbaki. It is this fixation of a signifier through an *abbreviation* that gives rise to a writing procedure for effectively constructing an object about which one only *knows* that it satisfies certain conditions imposed in advance, even if the object referred to does not exist or can not be described. No doubt, it is not a question in analysis of remaining at the level of a purely functional use of the letter, but it is not a question of bypassing it either. What is important to note for where we are at, is that the capital letter **A** and **S** are 'stand ins' – abbreviations – that have both a nonstrict and a strict usage in the manner of *square* and *tau* calculations of Bourbaki. Schematically, these distinctions may be written as:

Nonstrict usage	A	S
Strict usage	□	τ

The situation would be comparable to the *matheme* '∫' having been used for a long time to describe 'fluxions' or the 'ghosts of departed qualities' until A. Robinson's *nonstandard analysis* showed how the symbol can be made precise as the *abbreviation* of an actual mathematical object. I can only say the psychoanalytic situation 'would be comparable' because as Milner's and Badiou's comments make evident, it is not sure that the notion of the Lacanian *matheme* in the sense of (II) has ever been transmitted that well in the *Grandes Écoles* or elsewhere[3].

If Lacan proposed that *mathemes* are "*indices of an absolute signification*" [E; p.314, Sheridan Tr.], it is because there can be completely meaningless signifiers of a discourse that, once placed, are true on the condition that they satisfy certain conditions. These first level signifiers are not *mathemes* themselves, rather a *matheme* is a writing of the *condition of these conditions*, in the same way that a *mytheme* is not itself a signifier that fulfill certain conditions of a myth, but a writing of the conditions of how these conditions structure what is readable in the discourse of myth and its theory (or mythology). At this level an abbreviator symbol is no longer a mere convenience of stenography as in the case where one replaces U.S.A with United States of America. Rather we must look towards a more complex problem of abbreviation as it is used and calculated in linguistics, logic, and mathematics (see section *§-5*). Let us give just one example here of what will occupy us in detail later.

Bourbaki uses the empty set $\varnothing$ to abbreviate a one-line formula in the *square-tau* symbolism:

$$\varnothing \Leftrightarrow (\tau_{23}\neg\neg\in\tau_1,\neg\neg\in\square\,\square\,\square)^4.$$

No ontological commitments are required to write the empty set. It is nothing other than the abbreviation of a grammatical formula. Leaving until Part II to make this formula precise, what is important here is to note how the absence of such a strict usage of a *matheme* leads to impasses that can be avoided. This is important, because there are other impasses that can't.

For example, Badiou, in the lack of an adequate scriptural system, not only must postulate the existence of the empty set in an axiom in the manner of Zermelo (Z), but he insists that it is this axiom alone that is the true existential (How could it be otherwise in adopting the ontological byways of being and nonbeing?) Thus, he writes two chapters seventeen pages long – *The Void: The Proper Name of Being* & *The Mark: $\varnothing$* – initiating the reader to the mysteries of the empty set. Yet, when it comes to the humble problem of writing it out in the system of Z, we are told that this is a technical problem ("formulation technique", p.81). Far from being a technical problem, it is a writing problem and one that must be carefully attended to in order not to fall into certain absurdities.

For instance, here is a writing problem in *LEE* from p.81-82: by adopting the system of Z, Badiou can not assume the uniqueness of the void – there may be two nonbeings and that would spoil

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[3] -An interesting exception is the work of J.Petitot on Hilbert's *epsilon calculus*.
[4] - A more precise construction of this problem is found in Part II- 5§. For the moment it suffices to note that the subscripts to the Greek letter *tau* are not used by Bourbaki. He uses instead lines or traits that connect each *tau* to one or more squares where a letter would go. Our subscripts are only used here as the lines present a typographical problem. See Part II-5§ for *tau*-subscript rules.

things – so one must deduce it from the extension axiom. Which presents another ontological non-imaginable: how can the void be deduced as unique from an axiom comparing extensions? It is not our aim to respond to these problems here, rather it suffices for our argument to show that in the lack of an adequate system of writing, certain impasses of the imagination occur. Or again, in the lack of a strict usage of a *matheme*, a symptom is developed that tries to write, but doesn't. This is because Badiou wants to assume the uniqueness of the void, but never writes it into his axiomatic system, because he rejects the empty set can be properly deduced using an axiom of extension. Perhaps this is true, but then one should write it. For as it stands in *LEE*, the empty set is neither properly axiomatized nor deduced. All that is done, is to use the empty set to stenogram a verbal *flatis vocis*:

$$\varnothing \Rightarrow (\exists \beta) [\neg (\exists \alpha) (\alpha \in \beta)] + [...?]$$

What is important to recognize here in this non-achievement of a writing **[…]**, is how a strict usage of an abbreviator symbol in the sense of Bourbaki avoids an ontological impasse by turning it into a simple grammatical construction and a proof by letters[5]. Schematizing our argument in a diagram we have:

I- Non-strict usage: $\Rightarrow (\exists \beta) [\neg (\exists \alpha) (\alpha \in \beta)] + [...?]$ /Stenography

$\varnothing$

II- Strict usage: $\Leftrightarrow (\tau_{23} \neg \neg \in \tau_1 \neg \neg \in \square \square \square)$ /Abbreviation

It is precisely in this manner, as we will show in Part II, that Lacan's formalization of the place $\square$ of the signifier **S** will itself begin to be written in a topological writing of *mathemes*. Once this is recognized, it will be easy to show, contrary to Milner's assertions, not only do *mathemes* have a calculation and interconnection, but they must calculate and interconnect to avoid an impasse. A few examples among many – see Lacan's work in *D'un Autre a' l'autre* (1968-69) where I/a is calculated in terms of the Fibonacci series; see the 4+1 discourses that have well known transformations not only in a theory of discordant permutations, but at the level of projective geometry and topology. Finally, what must be brought to the fore is that Lacan's *Logic of Sexuation* only receives the status of a *matheme* in correspondence to their use as abbreviators of a generalized *tau-square* definition[6].

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[5] - See Part II, section §-5 for the *tau-square* development of the empty set. From Viète and Descartes to Bourbaki, the abbreviation of a proof of letters by a figure has a long history in the French tradition. Today, the same development proceeds on at least three different fronts: in geometry, in the development of a *geometric algebra* (not to be confused with algebraic geometry!); in topology, in the development of a *topological algebra* (not to be confused with algebraic topology!); and in logic, with the development of *free* and *combinatory* logics.

[6] -This statement proposes there is a direct and simple counterexample to Milner's assertion above: " *None of the four lines of the sexual mathemes can be obtain from the transformation of an other; they function in co-presence. From one of these mathemes to the other there is no literal transition*". For explicit counter-examples see: R.Groome, *The Phantom of Freud in Classical Logic*, Umbra (2000); Andrea Loparic, *Les Negations et les Univers du discours*, in *Lacan et les philosophes*, Albin Michel, (p.239-264), (1991); J.M. Vappereau, *Lectures des formules de la sexuation*, preprint (2007).

In the end, to say that the *mathemes* of Lacan are a series of "heteroclite" formulas or that this is part of the programmatic structure of psychoanalysis, ends up saying less about Lacan than how far some of the best professors of the French university have been able to go into the discourse of analysis. Their scholastic endeavors, perhaps best stenogrammed by the work of the *Cahier's d'Analyse*, neither exhausts the clinical or structural questions nor determines the scope and limits of the *matheme*. What they do, in fact, show is how an interpretation of the *matheme* on the basis of position (I) is untenable. Beyond a transmission of brands and stenograms, what must be demonstrated is a use of the *matheme* such that its symbolic dimension knots the imaginary and real.

We are now in the position to take a better look at the position of *LEE*. It is obvious that Badiou has remained within the philosophical-poetic stenography of the school as the *matheme* is neither used to abbreviate a deduction nor to rigorously establish a reference to the place of its signification. Instead, the *matheme* is used to stenography a relation to knowledge through long paragraphs of philosophical themes. No doubt, it may be objected that Lacan could be accused of doing worse: manipulating a host of mathematical symbols of which he had no or little knowledge of their proper use. For at least, it is said, that Badiou would seem to be trying to write things out in a more readable style.

In an initial probe, such objections may well seem true, yet one must not disregard the fact that Lacan's *matheme* is datable and has a context: it was created first and foremost not in the tradition of schools harking back to Plato, but in the discourse of analysis and the relatively recent clinic of psychoanalysis – it is only the academicians who have sought to pass it off as a pure formalization in the stenographic sense of schools. This being said, does reintroducing the clinical dimension of the *matheme – pathemata mathemata –* shed a new light on Russell's celebrated quip that a mathematical discourse doesn't' know what it is talking about, nor whether what it is saying is true? No doubt, the tradition of philosophy and mathematics cuts through the analytic field, but neither its source nor point of application arise there. So let us propose, then, a strategy of reading from this moment forward. Let us consider an intersection of philosophy and psychoanalysis – that one does not understand Lacan, Badiou, or the *matheme* in the same way one does not understand a mathematical text: such texts are not something to be merely read and understood, but must be constructed and explained with regard to what one does not or can not understand. But then let us add this precaution: unlike the philosopher's *mathemata*, the *matheme* of analysis does not claim to "teach with excellence what you already know", but to transmit what you do not already know, but can. This slight gap admits a certain ignorance – and not merely 'error' – as inherent to the truth of any mathematical transmission[7]. It is a place where any mathematician deserving of the name can acquire a *style* in the assumption of the writing of a knowledge. In the discourse of analysis, this gap makes room for a place – a clinic – where the analyst can begin to disengage this question of *style* in a writing of the symptom and the elaboration of an object.

My aim is, we see, analytic: the analytic aim of investigating how by preserving the focus of the place and construction of the *matheme*, a book that is apparently written on *Being* and *Event* in the grand style of philosophy, can be read more humbly as a book struggling with the *Letter* and *Signifier* in the style – or *sinthome* – of Alain Badiou.

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[7] If left to the banal notion that the *matheme* is a transmission of a minimal unit of knowledge, should we not ask what any school child already knows: is what transmits itself best in an academic transmission of mathematics best called 'error' ? What is the function of 'error' in a mathematical education? What is at the root of the Greek *pathemata mathemata* or 'learning from mistakes'? The response to such questions have been reserved for a future publication.