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Three Notes on Science and Psychoanalysis

Freud and science

In my text I would like to focus on the relation between formalization and psychoanalysis in Lacan's later teaching, wherein I shall discuss the problematic in close relation to Freudian scientism, on one hand, and to the question of contingency, on the other. When entering this topic the first question that might arise is why one should bring together such apparently heterogeneous fields as mathematics and psychoanalysis: Why would psychoanalysts need something like the formulas of sexuation, the graph of desire, the vector of drive, aspheric topology, and Borromean knots, to name the most notorious examples from Lacan's teaching? What is the "use-value" of mathematical formulas, and simultaneously, what is their epistemological lesson?

Here Lacan's interest in mathematical formalization needs to be traced back to a broader question that occupied Freud from the earliest stages of his discovery: how does psychoanalysis relate to the positive sciences? Or more precisely, what scientificity is at stake in the discovery of the unconscious?

In his work Freud formulated a decisive bet that psychoanalytic findings will eventually find their justification in the existing positive sciences. He was addressing physics and biology in particular. In a famous passage from *Introductory Lectures* he claimed that psychoanalysis is the offspring of the modern scientific revolution, a consequence of the epistemological break that had already given birth to modern physics and biology. As we know, this break essentially consists in the progressive decentralization of reality: of the universe in physics, of life in biology, and finally of thinking in psychoanalysis. The discovery of the unconscious and the invention of psychoanalysis are for Freud nothing other than logical consequences of the modern scientific revolution in the psychic life, displacing the decentralization from exteriority to interiority: *Acheronta movebo*, "I shall move the underground," is the famous line from Virgil that

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inaugurates Freud's *The Interpretation of Dreams*. This decentralization, on the other hand, has its specific concretisation in the introduction of contingency in the field of knowledge, an introduction that subverts the classical understanding of not only natural laws, but of lawful necessity as such. But I shall return to this later.

Freudian scientism formulates the bet that the progress of the positive sciences will provide the knowledge and method that will enable an integral translation of psychoanalytic discoveries into the vocabulary of the positive sciences. This already points out the exceptional status of psychoanalysis in the Freudian epistemological trinity. Psychoanalysis is not yet a science, it appears to be a science-in-becoming, or better said, a not-all science.¹ It shows us that there is a specific complication in the asserted passage from the physical and biological real to the real of thinking. The relation between psychoanalysis and science can therefore be approached from a specific angle: does psychoanalysis immanently produce a new type of scientificity, so that the understanding of science as such is modified? But then the Freudian claim for scientificity turns out to be more ambiguous than it appears: it means either that psychoanalytic contents should be translated into scientific contents, or that the link between psychoanalysis and modern science should be sought on the terrain of logic. While Freud chose the first direction, Lacan's response to Freudian scientism will take the second option: the tendency towards formalization means that psychoanalysis articulates its scientific moment in its logical form, and not in its contents. Put differently, it is not the translation of psychoanalytic vocabulary into the jargon of biology, energetics, or cognitive sciences that will make a science of psychoanalysis, but rather the formalization of its own field. Lacan's answer to Freud's scientific ambitions therefore consists in a turn of perspective. The true question one needs to raise is not whether psychoanalysis is a science, but rather what is science that includes psychoanalysis,² that is to say: what modification of sci-

¹ Or as Lacan will later say, *pas science du tout*, not science at all, but also not science of *the all*.

² This turn of perspective is explicitly formulated by Lacan himself in his "Compte rendu du Séminaire *Les quatre concepts fondamentaux de la psychanalyse*", in: *Autres écrits*, Paris: Éditions du Seuil, 2001, p. 187: "The question that makes our project radical has thus persisted: the question that goes from: *Is psychoanalysis a science?* to: *What is science that includes psychoanalysis?*" This is then one way to claim that Freud was not radical enough in thinking the intervention of his own invention in the field of science. All translations from French are my own, unless otherwise indicated.

entificity as such is introduced with the invention of psychoanalysis, how does psychoanalysis change the face of science?

Lacan's teaching will consist in making a turn towards what he perceives to be the "rational kernel" of modern science, thereby following his "*maître*", Koyré: the formalization, or as Jean-Claude Milner has put it, literalization of the real. But the *differentia specifica* of Lacan's approach consists in the fact that he links formalization back to the question of the subject, and hence to the irreconcilable discrepancy between knowledge and truth. The cornerstone of Lacanian epistemology is the identification of the subject of the unconscious and the subject that emerges with modern science. The only problem is that modern science does not speak about the subject; on the contrary, it constitutes itself on its foreclosure. When psychoanalysis reintroduces the notion of the subject in the field of science, and it does so in times when the use of this notion is anything but self-evident, it throws new light on what defines modern science in its very essence: the discrepancy between knowledge and truth. The unconscious is in the end the return of the foreclosed subject of science.³ But let us here take some steps back to Freud.

When it comes to science, Freud was betting primarily on the alliance between psychoanalysis and biology. This is probably most clearly formulated in the famous and highly ambiguous claim: "anatomy is destiny", destined to underline the ultimate gravitational point of sexuality. But this destiny seems to be more flexible than it appears, since it also points out an antagonism between the biological and the sexual difference. On another occasion, in *Analysis Terminable and Interminable*, Freud describes the anatomical "sexual" difference with the curious expression *gewachsener Fels*, living rock, thereby bringing together life and the paradigmatic case of the lifeless. Here it is worth noting that this paradoxical formulation already indicates the limits of Freudian biologism and shows us that Freud already indicated a much more conflictual relation between body and thinking. The object of psychoanalysis here assumes the limit position between the field of positive sciences and the field of what we might conditionally call speculation. Let us remember that Popper, Wittgenstein, and

³ For the question of the subject and truth in relation to science, see Jacques Lacan, "La science et la vérité", in: *Écrits*, Paris: Éditions du Seuil, 1966, p. 855 ff. For a systematic discussion of the Lacanian equation "the subject of psychoanalysis = the subject of modern science", see also Jean-Claude Milner, *L'oeuvre claire*, Paris: Éditions du Seuil, 1995, especially Chapter II.

other advocates of scientific positivism criticised psychoanalysis precisely for this reason: its object is too ambiguous, not “empirical” enough; psychoanalysis remains unverifiable because of the speculative character of its object.⁴ This dispute raises the question of the realism of the scientific object, and it is well known that Freud initiated this quarrel by situating the object of psychoanalysis in the grey zone between the biological body and what he continues to call the psychic. The problem here is that the psychic stands for the libidinal and the linguistic body, whose effects are too material to be integrated in the classical opposition between the mind and the body. The Freudian living rock is therefore not simply reducible to the biological body, but is actually aiming at the conflictual split within the body itself. Behind the mind/body problem there is a more fundamental body/body problem, the split in the biological and the libidinal body. Here we encounter the definition of the human body as *Fremdkörper*, the foreign or alienated body that accompanied psychoanalysis from the very beginning.

In his theory Freud insistently underlines the grey zone that remains concealed within classical dualism. This grey zone is constitutive of the drive as such. Let us remember that in *Drives and Their Vicissitudes* the drive is defined as the psychic representative of the bodily stimulus, while the *New Introductory Lectures* compare it to a mythical being, a phantom entity which we can never be entirely certain if we see it clearly. In this second case the drive is not simply a fictional entity, a theoretical illusion or hallucination, but a particular effect or product that springs out of the translation of the bodily stimulus into representation. The drive would then represent the biological body in the signifierized body. Or put differently, being a product of the inscription of language into the living body, the drive names the border between biological materiality and linguistic materiality. This is why Freud thinks it in terms of representation, but one that is essentially productive, precisely because the representation produces within the body a surplus that is irreducible to the biological body. This surplus that divides the biological body from the linguistic body is what Freud named the libido (and Lacan jouissance).

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⁴ For a critique of this critique, see Jean-Claude Milner, “De la linguistique à la linguisterie”, in: *Lacan, l'écrit, l'image*, Paris: Flammarion, 2000, pp. 7=25.

The drive is then an immanent border that traverses and decentralizes the body in relation to itself, thereby problematizing the univocity of the biological, rather than taking it as a solid and positive ground. The drive transforms the understanding of the body, since it is simultaneously too bodily to be purely psychic, and too linguistic to be purely biological. But this problem is not only specific of the drive. It can be related to any other unconscious formation, and finally to the unconscious as such. For instance, the hysteric symptom is bodily, but it nevertheless acts as if anatomy does not exist, something Freud will explicitly claim already in the early stages of his discovery.⁵ The symptom hence testifies, on the contrary, that anatomy is *not* destiny. It should rather be linked with contingency, and this is where the discussion of modern science becomes crucial for psychoanalysis.

Science and contingency

The relation between formalization and contingency is the main point in Lacan's take on modern science, also because he rephrases the question in relation to the "encounter": the encounter that marks the field of sexuality, the relation between body and language, etc. But before I finally outline some specificities of the use of formalization in psychoanalysis, I would like to consider a specific problem with contingency that produces a dilemma both within the scientific discourse and within philosophy. This detour is not unrelated to the discussed topic because it significantly marked Lacan's take on formalization and modern

⁵ In an article originally written in French in 1893: "J'affirme par contre que la lésion des paralyses hystériques doit être tout à fait indépendante de l'anatomie du système nerveux, puisque *l'hystérie se comporte dans ses paralyses et autres manifestations comme si l'anatomie n'existait pas, ou comme si elle n'en avait nulle connaissance.*" Sigmund Freud, "Étude comparative des paralyses motrices organiques et hystériques", in: *Gesammelte Werke*, Vol. 1, Frankfurt am Main: Fischer Verlag, 1999, pp. 50=51 (the last part of the sentence was underlined by Freud). This lesson will soon be repeated and elaborated in *Studies on Hysteria* (Freud and Breuer, 1895). In the very core of hysteria stands a rejection of anatomic and biological knowledge; hysteria does not want to know anything about anatomy or biology. The problem opened up by the discovery of the unconscious then amounts to the substitution of the mind/body problem with the body/body problem. This is the point of the third substance that Lacan introduces in Seminar XX: the enjoying substance (*substance jouissante*), a substance that is no longer reducible to either *res extensa* or *res cogitans*, and which abolishes the Cartesian dualism, without simply landing in monism. If anything, the enjoying substance then points towards an "antagonistic monism".

science: What are the subjective consequences of the scientific introduction of contingency in the field of knowledge?

In addressing this question, I would like to depart from the present day discussions. Catherine Malabou⁶ recently proposed an interesting critical reading of Meillassoux's *After Finitude*, a book that significantly influenced contemporary discussions of modern science. Malabou's critique departs from the distinction between two concurrent understandings of contingency that announce themselves in physics and biology. Here I will not trace her entire argument but I will merely stop at her claim that biology implies a different type of contingency than the one philosophy has deduced from the lessons of Galilean science.

Malabou's critique of Meillassoux consists in pointing out the "Kantian" moment in his understanding of contingency: to be contingent means to be susceptible to change. But there are two ways to think this change. One would be what Malabou calls "occurential contingency", which is the most common and spontaneous understanding of contingency, and which supposedly functions as the point of encounter between speculative realism and transcendental idealism. To this contingency Malabou opposes the "gradual contingency" that she illustrates with the adaptability of the human mind or so-called "mental Darwinism". Thought adapts to the world without noticing the changes taking place behind its back, thereby overlooking contingency as such. The conclusion she draws from this orientation may appear as an infinite judgment: "Change is stability." Instead of remaining caught in the dichotomy between change and stability, she proposes that we speak of the plasticity of laws as a different mode of their stability, one that is no longer grounded on the opposition between necessity and contingency (or between continuity and discontinuity).

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Meillassoux was naturally not the first one to systematically advocate the idea of the contingency of natural laws. The idea was already addressed in 1874, when Émile Boutroux, today a rather marginal figure in the history of French philosophy, published his dissertation entitled precisely *On the Contingency of Natural*

⁶ Catherine Malabou, "It does not have to be like this", *SEP-FEP 2012 Conference*, Manchester, 5 = 7 September 2012. Audio recording available at: <http://backdoorbroadcasting.net/2012/09/sep-fep-2012-conference/> (last accessed on 11 September 2012).

Laws.⁷ In it Boutroux formulated a problem that was of clear philosophical and epistemological relevance, but nevertheless quickly fell into oblivion until the publication of *After Finitude*.⁸ Nevertheless, at the turn of the century his philosophical position stood at the centre of a controversy that involved no other than the mathematician Henri Poincaré.⁹

Lacan referred to this polemic in 1974 during his press conference in Rome. The context of this reference is not unimportant for an understanding of the role of formalization in psychoanalysis. An audience member reproached Lacan that he was using the Kantian notion of the real. Lacan's response to this "provocation" was decisive:

But this notion is absolutely not Kantian. I insist on that. If there is a notion of the real it is extremely complex, and because of this it is ungraspable, ungraspable in a way that would make a whole. It would be an incredibly anticipatory understanding to think that there is a whole of the real.¹⁰

The ungraspable character of the real is in this case not the same as the unreachable character of the Kantian thing in itself. The real is not ungraspable because it is out of reach, but because it does not form a totality. The real is then graspable but not whole. Lacan here rejects two features of the Kantian epistemology. One is the in itself insurmountable division between the thing in itself and phenomenal reality: being non-all, the real also undermines the totalization of the constituted reality in relation to transcendence; and secondly, while the thing in itself cannot be subjected to positive knowledge, the real is inscribed into the field of knowledge precisely through mathematical formalization. The latter constantly demonstrates that the real is not constituted in a way that would form a totality, and also that the non-all is closely intertwined with the question of contingency. It is at this point that Lacan refers to the debate between Boutroux and Poincaré:

⁷ Boutroux discusses the link between contingency and law in modern science in two major works, the already mentioned *De la contingence des lois de la nature* (Paris: Félix Alcan, 1874) and in *L'idée de loi naturelle dans la science et dans la philosophie* (Paris: Vrin, 1895).

⁸ Strangely enough, Boutroux is not mentioned in Meillassoux's book.

⁹ As a biographical note, Boutroux was married to Henri Poincaré's sister, Aline Poincaré. Their son, Pierre Boutroux, would later become a mathematician.

¹⁰ Jacques Lacan, *Le triomphe de la religion*, Paris: Éditions du Seuil, 2004, p. 97.

I came across a short article by Henri Poincaré on the evolution of laws. [...] Émile Boutroux, who was a philosopher, asked himself whether we could not think that laws, too, have an evolution. Poincaré, who was a mathematician, was absolutely opposed to the thought of this evolution, because what scientists search for is precisely a law as something that does not evolve. It is very rare that a philosopher is more intelligent than a mathematician, but here, by chance, a philosopher raised an important question.¹¹

Lacan then concludes: “One absolutely does not see why the real would not support a law that moves,”¹² a dynamic law that is strangely comparable to the Freudian growing rock. We can note that Lacan seems to praise Boutroux not only because he linked natural laws with contingency, but also because this link pointed beyond the dichotomy between contingency and necessity, thereby indicating a differentiation within the understanding of contingency as such. To put it again in Malabou’s terms, the contingency of natural laws is not occurrential but gradual, and the real of these natural laws is constitutively without stability, or as Lacan will say later, without the law, that is, without an underlying stabilizer that would make of the real a predictable and whole entity.

If we return to Poincaré’s response to Boutroux thesis we can quickly notice why scientists themselves cannot welcome this connection of natural laws and contingency as something self-evident, even if this connection is implied by the very foundations of modern science.¹³ Poincaré’s problem with the evolution of natural laws is that it seems to undermine the very foundations of positive science, “the legitimacy and even the possibility of Science.”¹⁴ If Science (*la Sci-*

¹¹ Lacan, *Le triomphe de la religion*, p. 97.

¹² *Ibid.*, p. 98.

¹³ At this press conference Lacan will claim that science is an impossible profession, alongside governing, educating, and psychoanalysing (the Freudian triad of impossible professions). We can see that the impossibility of the scientific profession lies in the fact that the effects of modern science deviate from thinking, thereby reducing scientists themselves to mere *parlêtres*, speaking beings.

¹⁴ Henri Poincaré, “L’evolution des lois”, in: *Dernières pensées*, Paris: Flammarion, 1917, p. 5. It is not a coincidence that Poincaré speaks of Science – the idea of an instable, contingent, or evolutionary natural law would not only imply a non-all image of nature, but it would also undermine the ideal of Science. If the object of science is not totalizable, then science, too, is non-all. In the end, this is the consequence of formalization as such. The three Lacanian negative characteristics of the real, as noted in Seminar XXIII, should be read as logical consequences of contingency and the non-all: the real has no order (it does not form a totality), the

ence) adopts the perspective of instable laws, then the very grounding of science is brought into question. From the perspective of contingent laws, Science does not exist. But this is precisely the logical consequence of mathematical formalization. To say that mathematical logic is “science of the real” (Lacan) means precisely to exclude the possibility of totalization not only from the field of the real, but first and foremost from the field of science. But let us trace Poincaré’s argument against gradual contingency for a bit longer.

Poincaré asks himself a fundamental question: What is a law? He gives the following definition: a law is a “constant link between the antecedent and the consequent, between the actual state of the world and its immediate posterior state.”¹⁵ In other words, a law is grounded on the principle of causality, the continuous causal link between the present and the future. The reference to causality is, of course, classical, and it appears that Poincaré remains at the horizon of Kantian epistemology. He then continues with an example that is also mentioned by Lacan:

Knowing the actual state of every part of the universe, the ideal scientist, who would know all the laws of nature, would possess fixed rules to deduce the state that these same parts would have tomorrow; we understand that this process can be pursued indefinitely. From the state of the world on Monday we will deduce the one on Tuesday, and with the same procedures we will deduce the one on Wednesday, and so on. But that is not all; if there is a constant link between the state on Monday and the one on Tuesday, we will not only be able to deduce the second from the first one, but also the inverse, that is, if we know the state on Tuesday we will be able to deduce the one on Monday; from the state on Monday we will infer the one on Sunday, and so on. We can climb up the course of time, just as we can climb down. With the present and the laws we can predict the future, but we can also predict the past. The process is essentially reversible.¹⁶

Inferring the future from the present and the past from the present is one and the same operation. In this procedure lies the argument against the evolution of the past, and consequently of the contingency of the future, which gives economic

real is without a law (that is, without a *necessary* law), there are only pieces of the real (the real is non-all graspable through formalization).

¹⁵ Poincaré, *Dernières pensées*, p. 7.

¹⁶ *Ibid.*, pp. 7–8.

speculation such headaches.¹⁷ Poincaré admits that scientific conclusions are possible only under the presupposition that the laws are stable and unchangeable; and the other way around, if the laws are changeable and instable, that is to say, if we admit the possibility of their evolution, they are no longer laws, that is, they do not support the continuous link between the present and the future – they do not support causality, and thereby they do not promise any future: the univocal and unambiguous character that makes them something “true” is undermined: truth and knowledge drift away in separate directions. The functioning of the real can be equated with the functioning of the law only under the condition that science is grounded on positive knowledge, that it is supposed to know, and additionally that scientific truth does not deceive.

The quoted passage begins rather unusually because Poincaré introduces his entire argument by speaking of the *ideal scientist*. The ideal scientist is here very clearly presented as the position from which it is supposedly possible to totalize the field of natural laws, from which the natural real itself appears as susceptible to totalization; and also the position from which science, as such, is supposed to know. It is for this reason that Lacan will claim that mathematicians tend to treat mathematics as a person.

This position is again the perfect counterpart to the figure of knowledge that is at work both in the unconscious and in mathematics.¹⁸ Let us recall that Freud discovers in the unconscious the connection between knowledge and labour. Lacan translates this connection as the *ideal worker* because labour in the production of unconscious formations does not involve thinking, calculating, or judging. To quote the famous passage from *The Interpretation of Dreams*:

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The dream-work is not simply more careless, more irrational, more forgetful and more incomplete than waking thought; it is completely different from it qualitatively

¹⁷ See Pierre-Noël Giraud, *Le commerce des promesses*, Paris: Éditions du Seuil, 2011. We could say that capitalists and scientists share the same belief in the necessity of laws, and the same anxiety: what if contingency cannot be integrally formalized? But here, again, the understanding of contingency remains occurrential.

¹⁸ “As language that is most appropriate for scientific discourse, mathematics is science without consciousness [...]” Jacques Lacan, “L’étourdit”, in: *Autres écrits*, Paris: Éditions du Seuil, 2001, p. 453.

and for that reason not immediately comparable with it. It does not think, calculate or judge in any way at all; it restricts itself to giving things a new form.¹⁹

The double character of such unconscious labour is not irrelevant for understanding under which presupposition Poincaré rejects Boutroux. Freud underlines that this labour takes place on two different levels and produces two effects that appear to be mutually connected but in fact operate in completely different registers and follow two separate logics. The primary level is that of condensation and displacement, the two fundamental operations of unconscious labour that Freud will call the “skilled workers”, the cornerstones of unconscious production leading to the satisfaction of unconscious desire. But there are two other operations of unconscious labour, consideration of representability and secondary elaboration. If the first two processes formalize the dream material – not only by giving the material a new form, but also by ignoring the tendency to closure and finalization – then the second two precisely totalize the dream. The second level of dream formation “fills the holes” in dream products, thereby creating the appearance of coherence, consistency, and linear narration. In order to demonstrate the point of this second level of unconscious labour, Freud quotes the famous lines from Heine, where the latter mocks the philosopher as someone who stuffs the holes in reality with pieces of his morning gown (the very same lines that will serve Freud three decades later to criticize philosophy). Poincaré thus seems to be making a step in the direction of this “spontaneous philosophy”, presupposing a totality of natural laws, or rather a totality of the natural real based on which one can support the predictability of natural phenomena: the real functions according to stable and unchangeable laws; in the real there is, supposedly, knowledge, and this knowledge is discovered by scientific procedures, be it experimentation or mathematical formalization. Poincaré’s Science does not play dice, in other words, there is no contingency in natural laws. But again, in both cases there seems to be a misunderstanding of contingency, in its external opposition with necessity and stability.

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In Boutroux we find an interesting specification of his understanding of contingency, one that reveals that there is something fantasmatic in the occurrential understanding of contingency. In his discussion he claims the following:

¹⁹ Sigmund Freud, *Standard Edition*, Vol. IV, London: Hogarth Press and The Institute of Psychoanalysis, p. 506.

The reality of change is not less evident than the reality of permanence; and if one can conceive that the two changes operated in an inverse sense engender permanence, it is unintelligible that the absolute permanence encourages the change. It is therefore the change that is the principle: the permanence is merely a result: so things need to admit the change in their most immediate relations.²⁰

Permanence is a retroactive effect of change, or to refer back to Malabou, change is stability. But the “is” between change and stability is not reflexive or reversible. Change may be stability but stability is not change. If that were the case we would again fall back into the hypostasis of necessity under contingencies. Boutroux then continues:

The cause as such is indifferent to harmony and to disorder: causes, left to themselves, evolve only by fighting each other and give results that are identical to the ones of chance.²¹

There are two regulative fantasies at work here that Boutroux seems to expose and play out with the thesis of the contingency of natural laws: chaos and harmony, undoubtedly two of the oldest fantasies in the field of cognition. Contingency undermines the understanding of the real in terms of harmonic totalization, which would be the regulative ideal of the pre-modern cosmologies; but contingency does not simply imply anarchy either. It is precisely for this reason that Lacan in his Seminar on Joyce firmly rejected the question of whether he was an anarchist – which would be the opposite of the transcendental idealism that was attributed to him in Rome. In this case, too, the question was addressed to him because of his notion of the real. The three fundamental features of the real which Lacan’s teaching amounts to in the late seminars are only apparently anarchist: the real is without a law, the real forecloses sense, the real is non-all. What is truly at stake is the connection between formalization and contingency that Lacan describes as a deadlock. It may therefore appear unusual that he brings together psychoanalysis and formalization on the terrain of sexuality, of something that would be the paradigmatic case of the impossible-to-formalize.

²⁰ Émile Boutroux, *Sur la contingence des lois de la nature*, p. 27.

²¹ *Ibid.*, p. 42.

Physics and psychoanalysis

For psychoanalysis, the question at stake in formalization is how to transmit the experience of the impossible that traverses the unconscious and language, without simply falling back into the frames of necessity and order, something that the case of Poincaré testifies to. The doctrine of transmissibility should be understood as one of the main efforts of Lacan's teaching, notably because his contemporary readers often claim that Lacan's later teaching culminates in an irreducible deadlock and dichotomy between formalization (*matheme*) and *jouissance* (*lalangue*).²² But if psychoanalysis is not a mere "autism in two", as Lacan wonders in Seminar XXIV, then a minimum of transmissibility needs to be *forced* within its field. The *matheme* doctrine, no matter from which angle we take it, was conceived in order to provide a minimum of such transmissibility. Of course, Lacan introduced the *matheme* in order to theorize transmission as something that concerns psychoanalytic knowledge, and in this respect the *matheme* is modelled on the way formalization is supposed to work in modern science. This is also how psychoanalysts themselves usually understand the *matheme*. Very soon, though, Lacan started to accentuate the moment of the impasse in formalization, thereby orienting it towards the dimension of truth and towards the impossibility of knowledge and truth to form a whole. It was for this reason that Lacan progressively "dramatized" the question of transmission by claiming that psychoanalysis appears to him as something non-transmissible. Namely, what is transmitted is not some supposed knowledge in the real, but the very deadlock of the impossible. The shift from knowledge to truth can be best situated in relation to a famous passage from Seminar XX, where Lacan

²² To name only two influential examples: Jean-Claude Milner (*L'oeuvre claire*, pp. 159–171) concludes his brilliant book with the rather hastily asserted dichotomy between Wittgenstein (topology) and Joyce (literature), the numb showing, on one hand, and the endless babbling of *lalangue*, on the other; Collete Soler (*Les affects lacaniens*, Paris: P.U.F., 2011) constructs her reading of the later Lacan around the tension between the *matheme* and the poem, concluding that Lacan's final doctrine of interpretation was to orientate psychoanalysis towards poetry. It does not need to be added that both positions risk pushing psychoanalysis into some sort of esoteric mysticism of clinical experience. This does not mean that the opposite direction, where the "essence" of psychoanalysis is the *matheme*, the theory, is better. I cannot elaborate further on this question here, but I would like to add that what Lacan calls "transmission" should not be understood exclusively in relation to the *matheme*, but in relation to the *letter* (the "*littoral*"), that is to say, the transmission takes place in the space in-between formalization and poetization, so that for Lacan both Wittgenstein and Joyce are names of two psychoanalytic *problems* and not of two concurrent psychoanalytic doctrines.

provides a strong image for the functioning of formalization and for the use of mathematical letters:

If I were allowed to give an image for this, I would easily take that which, in nature, seems to most closely approximate the reduction to the dimensions of the surface writing requires [...] the textual work that comes out of the spider's belly, its web. It is a truly miraculous function to see, on the very surface emerging from an opaque point of this strange being, the trace of these writings taking form, in which one can grasp the limits, impasses, and dead ends that show the real acceding to the symbolic.²³

Contingency stands precisely for this transcription of the real in formalization, and Lacan focuses not so much on what the spider is constructing, but on the opaque point within structure, where the symbolic is internally broken, perforated, hence non-all. Lacan then emphasises that this procedure needs to be related to truth rather than knowledge:

That is why I do not believe that it was in vain that I eventually came up with the inscriptions a , the \$ of the signifier, A, and Φ . Their very writing constitutes a support that goes beyond speech, without going beyond language's actual effects. Its value lies in centering the symbolic, on the condition of knowing how to use it, for what? To retain a congruous truth – not the truth that claims to be whole, but that of the half-saying.²⁴

What needs to be retained in this procedure is the half-saying of truth, that is, truth that holds on to the real²⁵ and that goes against its traditional understanding in terms of *adaequatio* (the truth of cognition that is supposed to be one with knowledge). The encounter of truth and the real is not something that would simply occur but something that traverses the symbolic. As Lacan explicitly states, formalization helps one to go beyond speech, without therefore claiming to go beyond the effects of language, or put differently, without forming a metalanguage. It is not difficult to spot the role of contingency in relation to

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²³ Jacques Lacan, *Seminar*, Book XX, *Encore*, New York: Norton, 1999, p. 93.

²⁴ Lacan, *Seminar*, Book XX, *Encore*, p. 93. Translation modified.

²⁵ Recall the beginning of *Television*: "I always say the truth, not all truth, because we never arrive at saying it all. To say it all is materially impossible: for this the words are lacking. It is even through this impossibility that truth holds on to the real." Jacques Lacan, "Télévision", in: *Autres écrits*, p. 509.

this traversing. Contingency is one of the four possible “vicissitudes of the letter”: necessity, possibility, contingency, and impossibility. Let us recall Lacan’s translation of these modalities in Seminar XX. The necessary is defined as something that does not cease to write itself, while its opposite, the impossible, is translated as something that does not cease *not* to write itself. In this context, contingency does not simply disrupt the necessary or abolish the impossible. It also does not simply translate the impossible into the necessary, or make the impossible possible. On the contrary, what is translated as something that ceases to not to write itself contingency is a modality of writing that transcribes the very persistence of non-writing.

These vicissitudes of the letter show that formalization does not demonstrate a functioning but rather aims at a dysfunctioning within apparent functioning. It does not serve to bridge the gap that separates the necessary from the impossible, but instead transcribes it, because it operates on the opaque point within language where the structure is not simply a system of signifying differences, but something that is capable of producing real effects precisely for being non-all. Formalization uncovers a discrepancy between the appearance and the real within the appearance, and this uncovering is the fundamental lesson that Lacan draws from modern science, notably from Kepler, who is for him the true epistemological revolutionary:

The true turn takes place thanks to Kepler and, I insist, in the subversion, the only one worthy of the name, that constitutes the passage [...] from the imaginary of the so-called perfect form, the circle, to the articulation of the conic, and occasionally of the ellipse, in mathematical terms.²⁶

And the same point with a slightly different emphasis:

What is crucial, as some people have noticed, is not Copernicus, but more specifically Kepler, due to the fact that in his work it does not turn in the same way – it turns in an ellipse, and that already throws into question the function of the center. That toward which it falls in Kepler’s work is a point of the ellipse that is called a focus,

²⁶ Jacques Lacan, “Radiophonie”, in: *Autres écrits*, p. 431.

and in the symmetrical point there is nothing. That is assuredly a corrective to the image of the center.²⁷

The question of science and thinking needs to be situated in this passage from correct forms to the *mathematization of the non-all*. Formalization moves not so much the underground, but the surface, the appearance, or the semblant. The semblant is here simply the observable, the empiric – the circular movement, its repetition that supports the prediction of future events and for the totalization of the real; whereas the real is not some transcendent exteriority but the distortion of the correct form itself. With this use of formalization modern science inaugurates the decentralization of the space of thinking. For this reason Lacan insists on the necessity of differentiating two revolutions within the emergence of modern science, of which only one can be understood in terms of subversion. The Copernican, for instance, still remains within the old epistemological paradigm:

The strangest thing is that no one, namely: the specialists with the exception of Koyré, emphasises that Copernicus's "revolutions" do not concern the stellar bodies but the spheres.²⁸

Movement, in particular circular movement, is the presence of the semblant in nature. Saying "It moves." is therefore not enough to produce an epistemological revolution because this movement continues to be represented in correct forms. Copernicus thus remains within the space of thinking defined by the Ptolomaic cosmology. Newton and Kepler, on the other hand, break out of this paradigm by substituting, respectively, the circle with the ellipse and turning with falling:

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Hypotheses non fingo, Newton believed he could say, "I assume nothing". But it was on the basis of a hypothesis that the famous revolution – which wasn't at all Copernican, but rather Newtonian – hinged, substituting "it falls" for "it turns". The Newtonian hypothesis consisted in positing that the astral turning is the same as falling.²⁹

Scientific thinking does not aim at the observable but at what within the observable remains symptomatic, the distortions of the semblant. In Newton's case,

²⁷ Jacques Lacan, *Seminar*, Book XX, *Encore*, p. 43.

²⁸ Lacan, "Radiophonie", p. 430.

²⁹ Lacan, *Seminar*, Book XX, *Encore*, p. 141.

the semblant of turning is replaced with falling. But this replacement would not necessarily produce a revolution if it were not for what Lacan calls Newton's hypothesis, the equivalence of turning and falling. Only this equivalence decentralizes the semblant because it continues the line opened up by Kepler's mathematization of the elliptic movement, that is, of movement that does not presuppose a fixed central point. The last revolution in this line is for Lacan the Freudian introduction of the unconscious, which is in itself also a hypothesis that concerns the decentralization of knowledge and thinking:

We can see that the unconscious is merely a metaphoric expression to describe knowledge that supports itself only by presenting itself as impossible, so that from this I confirmed it to be real (namely real discourse).³⁰

The unconscious, or knowledge that does not know itself, is possible only under the paradigm of modern science. We can note that Lacan's accent on formalization implicitly attacks the philosophical ideal of thinking of thinking. The unconscious as decentralized thinking is possible only as far as there is no such thing as thinking of thinking: there is no unconscious in the Aristotelian paradigm, but there is one in Descartes, whose philosophy is already a reaction to the action of thinking in modern science. The problem is then not whether science thinks or does not think. For Lacan it is clear that science thinks (this would be his "*a priori*" anti-Heideggerianism). But the *differentia specifica* of modern science is that it is precisely thinking that does not think itself, or to paraphrase Lacan's point concerning mathematics, *science is thinking without consciousness*, thinking marked by non-identity with itself, hence decentralized thinking.

It is no coincidence that Lacan's central lesson regarding formalization is found in Seminar XX, where he finalizes his two-year development of the formulas of sexualization. The formalization of sexual difference is undoubtedly an unusual project. It brings together two extremes, mathematics and sexuality, thereby responding to the Freudian attempts to reduce sexual drives to biological frames. Looking at the development of the formulas, it becomes more and more obvious that what is formalized is not something positive but an irreducible negativity, the real of psychoanalysis that Lacan condenses in the axiom "There is

³⁰ *Ibid.*, p. 425.

no sexual relation.” To formalize the impossibility of the relation that traverses sexuality also involves the formalization of the irreducible split between the biological and the sexual, the split that is produced together with the inscription of the signifier in the living body and with the constitution of the subject as a speaking being.

If Meillassoux recently summed up the fundamental lesson of formalization in the idea that it enables us to think the Absolute, something that exists independently of life and thinking, then Lacan’s use of formalization involves an unusual twist. Here formalization does not aim at something that exists independently outside life and thinking, but rather at something that inexists within life and thinking, not an external exteriority (the great Outdoors), but internal exteriority: the *extimate*, which would be the great Outdoors, that is first and foremost outside of itself, and only afterwards outside subjectivated life and thinking. The point of the inexistence of sexual relation is that it produces real effects precisely as inexistence. Sexual non-relation is an effective inexistence that presents itself as “independent” from the subject: independent in the sense that it deprives the subject’s life and thinking of the possibility of their centralization. Both the unconscious and sexuality can be considered as the great Outdoors *within* the subject.³¹

³¹ For the speaking being, sexuality and the unconscious mean being expelled from its own interiority, and this is where psychoanalysis again encounters contingency: “I incarnated contingency in the expression “stops not being written”. For here there is nothing but encounter, the encounter in the partner of symptoms and affects, of everything that marks in each of us the trace of his exile – not as subject but as speaking – his exile from the sexual relationship.” Lacan, *Seminar*, Book XX, *Encore*, p. 145. If for Freud biology was the last resort for a scientific foundation of his theory of sexuality, Lacan’s example for thinking the paradoxes of sexuality was modern physics. Just like the notion of the fall and the elliptic model of the planetary orbits revolutionized the field of knowledge, another fall revolutionized the understanding of sexuality: the fall that is etymologically inscribed in the notion of the symptom: the Greek *ptōma* means precisely the fall. Contingency and the symptom are here brought together because they both assume the position of “ceasing not to write itself”.