

Chapter 2: The Moebius Strip

At issue is a physical object that can be easily constructed. It suffices to take a strip of paper and to stick its ends together while impressing in it the movement of a twist. We thus obtain, starting with an ordinary rectangular surface, a surface that presents several paradoxical phenomena. This object, held so easily in the hand, nonetheless opposes in diverse ways our habitual experience of physical objects.

Effecting a half-turn on the strip that we started with, before joining it end to end, is a very simple sleight of hand, which, let us insist, subverts, properly speaking, our everyday space of representation.

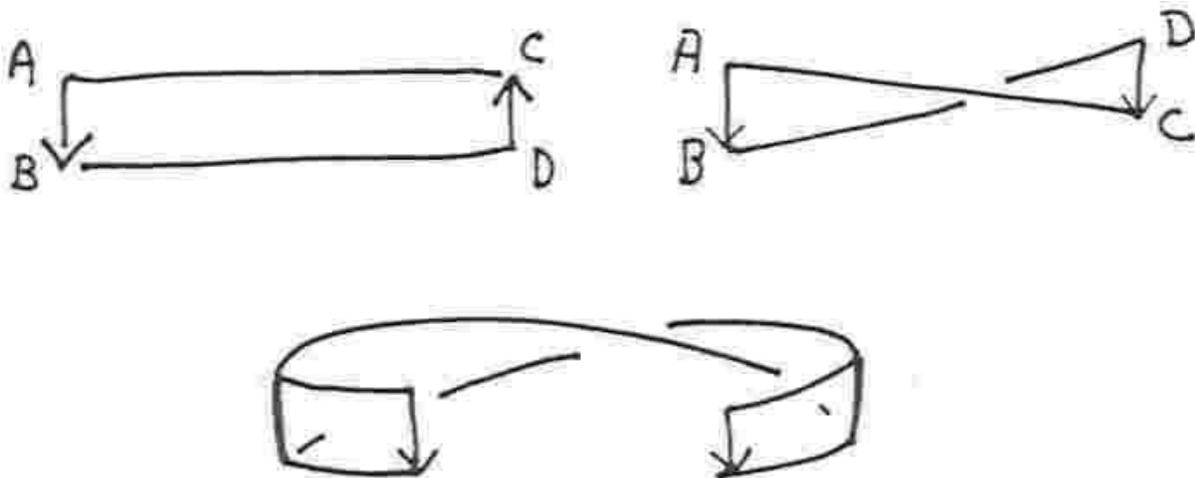
This operation brings to light a number of different paradoxes:

After the sleight of hand we have just described, the topside and underside of this strip of paper are found to be continuous. The common usage of "head or tails" is subverted. The topside and the underside are continuous with one another. A little gentleman or an ant that walked along one of the sides of this surface would find himself upside down on the other side without even perceiving this incongruity. A finger that follows the surface of the strip will be found, after a complete turn, and without having been lifted, without crossing the edge, on the underside of its point of departure. After a second complete turn it will return to this point, on the topside.

Only a temporal event differentiates the topside and the bottom side, which are separated by the time it takes to make a supplementary turn. The dichotomy between the two notions, underside and topside, only reappears at the price of the intervention of a new dimension, that of time. Time, as continuity, makes the difference between the two faces. If there are no longer two measures for the surface, but only an edge, time imposes itself as accounting for the strip.

The existence of a single edge is essential, since one of the topological definitions of the Moebius strip is supported by this paradox.

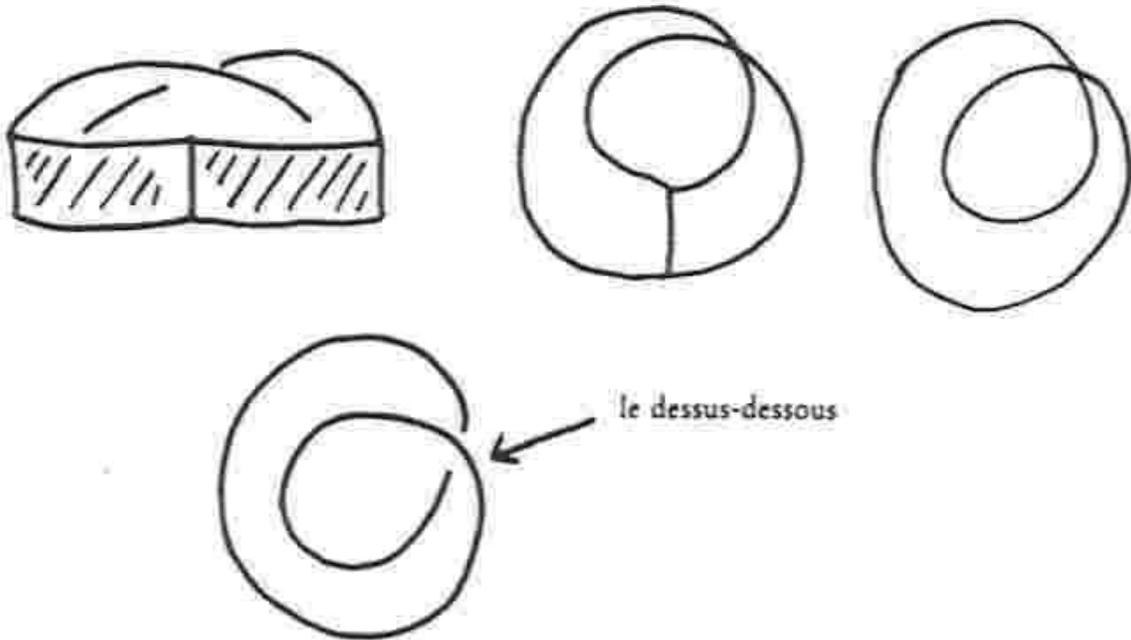
It has only one edge: we have joined the two extremities of the original strip, in reversing their orientation:



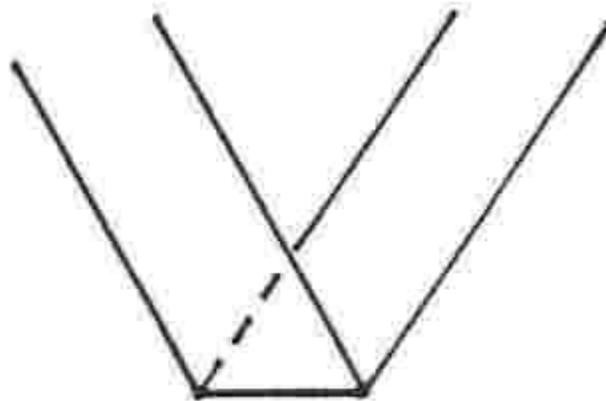
The line AC of the original strip continues into BD. There is only one edge. It traces a figure that resembles an eight that folds back on itself. Lacan gives it the name "double-buckle."

At the same time, to see this design appear, we must perform an operation that topologists call a "putting flat." From the drawing of the first figure that still evokes a three dimensional object represented in ordinary space (length, width, and thickness), with an illusion

of depth, one passes to a two-dimensional drawing, written on a sheet of paper, put flat. Depth is then marked by a crossing of the line over itself, an "above-beneath" (*dessus-dessous*). The discontinuity of the line



does not evoke its interruption, but the passage under the line, at a moment in its trajectory. This above-beneath is necessary for the illusion of depth to disappear. There remains, as a trace of depth in this drawing of the putting flat, only this above-beneath.



Again, there is the necessity of writing a temporal moment. It is marked on the trajectory of the line. Thus the conventions of drawing give to the putting-flat the status of a writing.

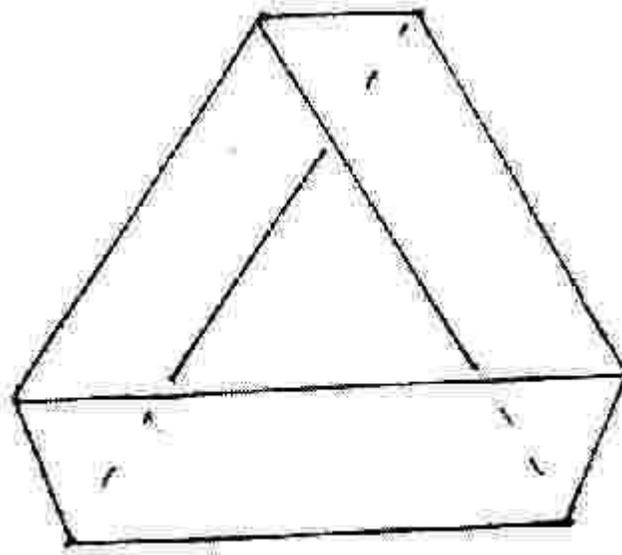
For example, the dashes evoke the continuity of a line, hidden, however, from the gaze of the reader by a surface:

There is a problem: on a paper surface, there has to be, to draw this Moebius strip, which, it also, is only a surface, to represent depth, a third dimension, let us say.

These points of above-beneath, these dashes, are the condition for the Moebius strip to be representable on the surface of a sheet of paper, without bringing in the conventional evidences of perspective. Topologists have in this way obtained an entirely readable drawing, that is, one that does not make a call to the imaginary.

Moreover, although it is a physical object that can be constructed by hand, we no longer establish on the drawing more than a single measurable dimension. It is indeed dimension that is put into question by the Moebius strip. It straddles (*est á cheval*) 1 and 3 dimensions. This paradox is insoluble.

Topologists sometimes represent the Moebius strip in a drawing with a base of straight lines, which multiplies the above-beneaths and makes them dashes. They are perfectly readable on this drawing:

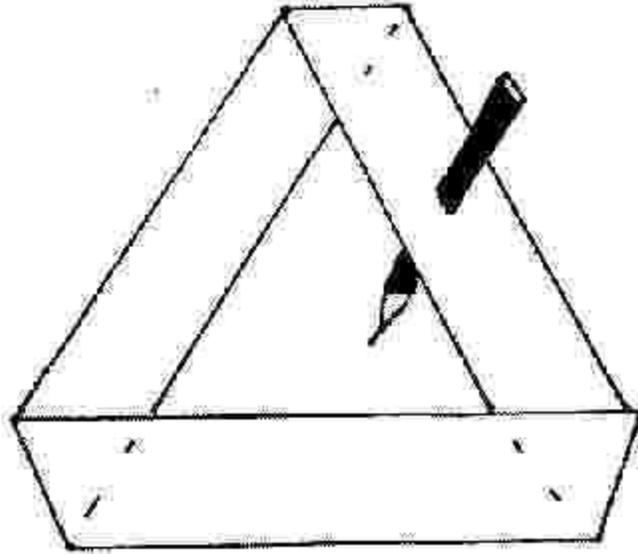


This is how Moebius draws it for the first time in a scientific publication,¹ with straight lines; he calls it a "unilateral surface" (from *unus*: one, and *latus, lateris*: flank, side).

It is a surface with only one face. This single edge, which describes a double-buckle, encloses a surface with a single face.

Let us make this paradox felt by drawing a pencil that passes through the Moebius strip.

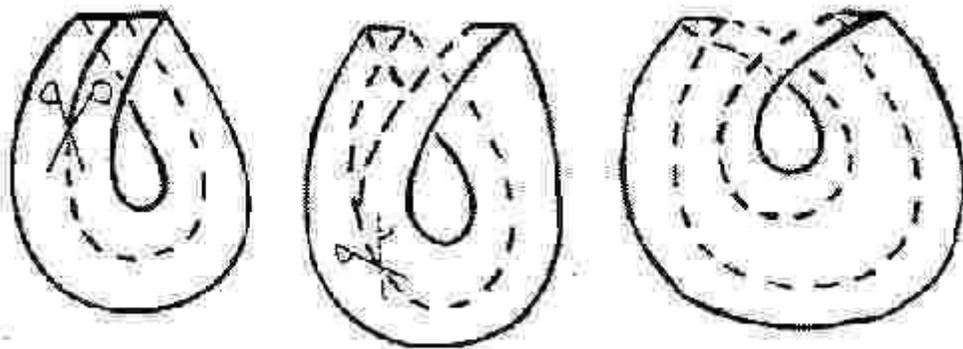
¹ *Ornicar*, nos. 17-18, Spring 1979, "Moebius, la première bande," introductory text by J. A. Miller.



It passes through the Möbius strip as it would any surface, but the strip still has only one face. Locally, at the place of the pencil, there are two faces, but the whole (*l'ensemble*) of the strip, as continuous, has only one face. This articulation between "part" and "whole" is entirely new. The Möbius strip allows a subversion, in relation to (*par rapport*) habitual conceptual space, of the rapport between the parts and the whole. The whole, manifestly, is not always equal to the sum of its parts . . . Analysis makes appear in parts another dimension that does not enclose the whole. The pencil allows us to define again, at a given place on the strip, the two faces of an ordinary surface that does not, however, know the Möbius strip.

Between the static and dynamic points of view there necessarily exists an element that disappears. Such a notion has its importance for establishing, in the unrolling of the signifiers, repetition and scansion.

We are now going to show another essential paradox: the cutting of a Möbius strip, along its length, produces a surprising effect that also has served for a definition of this famous strip. This cut does not produce two pieces detached from one another; it describes the path of an interior eight with a single turn and destroys the structure of the strip.

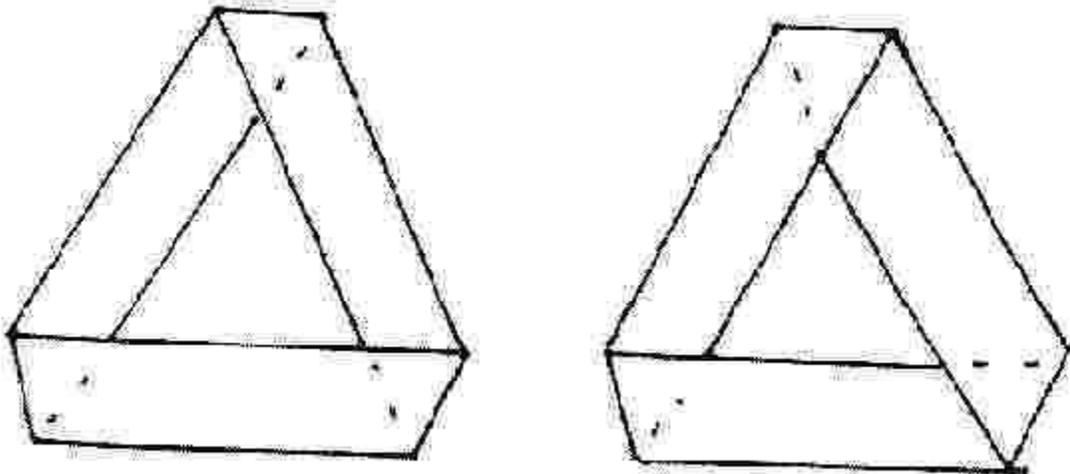


It remains a single strip, two times longer and bearing four half-twists, but which, this time, has an underside and topside. It is a bilateral surface with two edges, resembling an ordinary strip. The essential characteristics of the Moebius strip have disappeared.

This disappearance of the Moebian structure by means of the cut, without destroying the physical object in its unity, allows us to reduce the Moebius strip to its cut. Moreover, since one only makes a single turn with the scissors, the cut defines a path which is that of the interior-eight (in dashes in the drawing), thus we somehow displace into the movement of the scissors itself the characteristics of the Moebius strip. In the drawing, if we pay attention to the discontinuous movement that edges the space of the cut, we can see again in the void born of the cut a Moebian surface. Lacan gives a demonstration of it in *L'Etourdit*. Here, it is only a matter of a "monstration," of an effort to evoke the spatial support of the Moebius strip. Let us note before concluding that it is on this paradox that Lacan bases one the central notions of the analytic cure: that of interpretation. The axiom "interpretation is the cut," allows us to discern how this type of intervention on the part of the analyst discovers the desire of the analysand, masked in his own *dire*.

The fact that the cutting of a Moebius strip makes a strip with four half-twists appear, which is not Moebian this time, introduces a final characteristic of the Moebius strip. To create a Moebius strip the number of half-twists must be odd. In Moebius's original notes, the first strip drawn is a strip with three half-twists. And Lacan, in the course of his theoretical elaboration, makes use more and more of the strip with three half-twists. This pregnancy of the Moebius strip with three half-twists can be explained, but it remains surprising.

In fact, at the moment of the putting-flat, in the drawing where one effects it with straight lines, it appears that the strip with one half-twist is drawn as a strip with three half-twists of which one is toward the left and two are toward the right, or visa-versa. Thus, the three is already present; we therefore prefer to draw a strip with three half-twists leftward or rightward, identical in any case:



The presentation of the material, physical object that is the Moebius strip, can appear a little unordered: the presented phenomena have not found their place in a formalized and complete theory. It is not impossible that the problems posed will remain without a solution. The character of subversion of everyday space that the Moebian surface puts to work cannot, in fact, be reduced insofar as it is a question of a real that precisely has not yet found its sense.

On these multiple paradoxes Lacan suspends different notions, depending on whether he wishes to reunify two separate concepts, or wishes to represent a certain type of relation between two notions. Often, for example, he supports a concept by one definition of the Moebius strip; then, by making use of another, he overturns our understanding of this concept. In doing so, he give a logical leap to notions identical to the topological leap that consists in seeing in a drawing the path of an interior eight, the putting-flat of a Moebian surface, or an illusion of perspective.

Thus he is lead to consider the drawing itself of the Moebius strip as a writing that situates a real, that writes a matheme. A drawing is a matheme in the sense that it is transmitted as it is, beyond the different effects of sense that it can produce. This notion of a writing gives birth to a usage that Lacan expresses crudely, apropos of the Borromean knot, in his seminar *R.S.I.*: "we must use it stupidly,"² which is to say, somehow, we must not too much concern ourselves with the problem of topology's epistemological status.

Let us take up again some different usages. Saussure had supported the dichotomy between signifier and signified and the force of their relations, nonetheless arbitrary, with the two sides of a sheet of paper. Lacan took up the same metaphor when, in the seminar on Identification, he supports two laws of the signifier with the Moebius strip: "A signifier cannot signify itself" and another aspect of this law: "a signifier represents a subject for another signifier."³ In question here is a symptomatic Lacanian topological practice. The Moebius strip in fact subverts this signifier-signified opposition inscribed on the two sides of a sheet of paper, since the topside and underside continue one into the other. The temporal turn, the additional turn that we must make to the underside to return to our point of departure on the topside, allows us to redefine some relations between signifier and signified, which, if they still remain arbitrary, are nonetheless marked by this paradox. We will begin with the following commentary: locally, at each instant of our progress on the strip, two sides are distinguishable. To this extent the signifier and the signified are opposed, but in fact their difference is only supported by a temporal factor. A signifier signifies something at a given moment, in a certain discursive context, but one cannot give a signifier its signified at the same instant. The signifier never stops slipping to the underside and, finally, once a complete turn has been effected, it is another signifier, at the place that at this time defines the first. A signifier only ever returns to another signifier; it represents a subject, for another signifier.

A contrario, a signifier cannot signify itself. This law is intuitively perceptible in the repetition of a signifier; it is never anodine, nor deprived of sense. Thus, in the sentence "a man is a man," it is felt that between the two words "man" there is a splitting (*partage*) of an identical signified. A meaning (*signification*) of the sentence imposes itself, whether it be a matter of a tautology, or whether it be a matter of differentiating apropos of the term "man" the general concept and the isolated individual. The first "man" is not the same as the second. Between the two is necessarily inscribed a difference, a space. Lacan supports this difference with the line of the interior eight. The word is repeated, the buckle closes on itself, but however small the space left, there is always between the two circles the space of a Moebius strip, and, because of this, one finds, at the center of these two circles, a void. If the interior eight is seen in space, the interior of the circles is empty. At this place, there is no surface.

Not only is there no join between signifier and signified, as in a relation "A=B," of mathematical or logical equivalence, but their relationship is constructed around a void, which is

² *Séminaire de Jacques Lacan du 17 dec. 1974, RSI*, published in *Ornicar* n. 2.

³ *Séminaire du 9 mai 1962, Identification*, unpublished.

that of reference. It is necessarily only for another signifier that a first signifier means (*vouloir dire*) something, and the meaning (*signification*) is always marked by the void it encloses.

In this part of Lacanian teaching, the status of the Moebius strip is defined as "a model of a transcendental aesthetic"; later, he speaks of it more simply as "an intuitive and im-agin-ative support."⁴ He uses it in this way to illustrate the trajectory of repetition.

In the seminar on "the logic of the fantasy," the "topology of the return of repetition" (2/15/67) is inscribed by Lacan on the line of the interior eight. This parallel is supported by several traits that Lacan brings to light one after the other.

The doubling of the circle, which buckles itself after the second turn, leaves a trace: that of a crossing, an above-beneath. It is also what allows the subject to exist. Thus in the repetition of an act, of a behavior or a symptom, there is a trace: "what is repeated in the repeating is found at the origin, this trace, which based on this fact, from then on, marks the repeated as such" (2/15/67). This trace resembles the trace left by the line in its return over itself.

This buckle is also the drawing of the putting flat of a Moebius strip; between the two circles extends the Moebian surface. The retroaction of one buckle over the other still delimits a difference between the one and the other, a space. On this difference, Lacan supports the progressive effect of repetition. Although it repeats, the element is not the same; this makes felt the progressive effect of what one calls regression. However, regression, because it is a repetition, is precisely not the same thing as what it repeats. Between the repeated and the repeating, there is the Moebian space, inasmuch as it reveals an element that is unmeasurable, and uncountable, but present structurally as a fundamental support, although it remains ignored. It puts us on the path of this "one-in-addition, one-too-much (*un en plus, un en trop*)" that we forget to count because it is only defined starting from the void and time. In question is what Lacan describes as "this unmeasurable element that is called the one-in-addition, the one-too-much--desire" (2/15/67). This drawing thus illustrates the material on which analysis will operate: repetition, manifestation in the cure of a desire. The act of the analyst will aim at making this space felt.

Let us remark that beginning with this drawing of the interior eight a notion finds itself at once decomposed into diverse acceptations (regression and progression) and unified as a concept. The multiplicity of readings of a concept is accorded its true richness; it is not that a concept has several senses, it is that it is the unique representative of a complex material analyzable in several effects.

In this line of the interior eight, we read repetition and the difference of the repeated from the repeating. Once we have recalled its "put-flat" aspect, we can evoke the point of self-crossing as a stroke (*trait*) of recognition. Finally, this drawing reveals the ignored space of the surface of the strip, which is related to desire. This manner of bringing an "ignored" to light, which was nonetheless always there in its effects, is parallel to the unconscious's mode of existence. Thanks to the cure and its apparatus, there is repetition as putting-flat. It is for the analyst to read there, thanks to a certain immersion, unconscious desire, until then ignored as space . . . The relationship exposed in this fashion between topology and psychoanalysis--is it still metaphoric, or is it a question of an "intuitive support"?

Beginning at this degree of *rapprochement* something breaks down in the formulation. In fact, it is the status of topology as intuitive support that is put in question. To pose this utilization of the Moebius strip as metaphor, or even as didactic, seems to me unacceptable.

⁴ *Séminaire du 15 fev. 1967, La Logique du phantasme*, unpublished.

Lacan tends to reduce the metaphor; it is not necessary to pose it because there is an equivalence between the one and the other. Between topology and the analytic experience are established some relations that the words "intuitive support" do not define, or, rather, the intuition refers to topology as the mode of approach of this geometry. Henri Poincaré, the great topologist of the beginning of the twentieth century, defines it as follows:

"What interests us in this 'analysis situs' (a name given to topology at the beginning of its existence) is that it is here that the geometric intuition truly intervenes."⁵ He later adds that this intuition is of another nature than "the algebraic intuition."

Intuition, under the pen of Lacan, refers to the qualities proper to topology as a global apprehension of space. Psychoanalysis, as the bringing to light of the structure of the speakingbeing, stages the space itself wherein topology develops (*enchaine*) its phenomena.

It is in this context that Lacan links one of the absolutely essential notions of the analytic practice to another paradox of the Moebius strip. As we have already sketched out, he finds interpretation, the analytic act *par excellence*, on the cutting of the Moebius strip.

At the center of the Moebius strip, in the direction of its length, one can with a single cut (*trait*) of a pair of scissors, trace an interior eight that divides it without cutting it into two pieces. The structure of the surface changes without modifying its material, its physical consistency. This cut is the act.

At the same time, at the moment of the utilization of the scissors, because it describes in its progress a circle, one can say that the signifier is equal to itself. The act is thus equivalent to its sense. This equality can be exemplified by this sentence: "the fact that I walk signifies that I walk" (2/15/67). Such a condensation defines the true act. In this moment of the cut, because it persists in tracing a double-buckle, the subject of this act remains divided. Lacan comments as follows on the sentence just cited: "For the fact that I walk to become an act, the fact that I walk must signify that I walk as such or that I say it as such." The act is in itself the double-buckle of the signifier. "One could say," Lacan continues, "and this would be to deceive oneself, that in its act the signifier signifies itself; we know that this is impossible. It is no less true that it is as close as possible to this operation" (2/15/67). In the act, if the subject is equivalent to his signifier, he remains no less divided. The Moebius strip in its cutting illustrates this series of paradoxical relations; it allows us to evoke these different paradoxes of the act.

To the extent that it is analytic, the act must be situated in language. It finds its efficacy on the side of the signifying equivoke. Thanks to this, a single proffering of the signifier can make felt two turns, two times the opposition signifier/signified. One sees how this operation detaches the signifier from the signified, to make the signifying chain appear as enclosing a void, a space, that of desire as unnamable. The trajectory of the pair of scissors creates a void that, as we have seen, is again a Moebius strip. Interpretation is the operation of the cut; it points to desire. It is situated in the "field of desire,"⁶ in the space left between the two circles of the double-buckle. However, this cut has changed the topological structure of the strip. After the cut, we have a strip with two faces: if the act is repetition as interior eight, it remains no less true that it produces some effects of structure. It makes appear the space of the desire of the subject, all in destroying this space at the same moment. The cut in time where it is effected shows the surface of the strip. It is a question of this time of which Lacan says that it is ignored and uncountable as such before the operation. However, this operation has made the structure of this space disappear: an effect of fading, opening and closing of the unconscious, missed encounter,

⁵ Henri Poincaré, *Dernières pensées* (Paris: Bibliothèque scientifique, Ernest Flammarion, 1913).

⁶ Jacques Lacan, "The Four Fundamental Concepts of Psychoanalysis."

aphanisis; there are for the subject always effects of this order. The space shows itself in disappearing.

Lacan supported the analytic situation with the interior-eight, sometimes as a perimeter rolling back on itself, sometimes as a surface with one face, sometimes as a trap of duration, sometimes as place of a paradoxical cut. In the same order of idea, the usage made by Lacan of the cross-cap⁷ also holds to the paradoxes that the Moebius strip lays out for us.

The Moebius strip keeps, in fact, in our space, this status of a representative (*représentant*) of the unrepresentable. This paradoxical function is a necessity, because of the debility of our perception and of our intuitive imagination of space.

It is useful to recall, before bringing in other topological objects, that only the Moebius strip is really constructable and manipulable as a unilateral* object. Thus this object allows for the representation of an abstraction knotted to a real. It allows us to acquire an assurance on which Lacan will draw later when he introduces the Borromean knot.

⁷ Cf. Chapter 4.