

Une topologie physique

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trans. Quinn FOERCH

In the margin of his handwritten notes on the *Rat Man*, Freud wrote the name Dick vertically, opposite the passage describing his patient's compulsion to lose weight. Freud provides the "password" to this symptom, in which the subject reveals his inner conflict: it was to avoid being Dick that the Rat Man went to such lengths, "Dick," meaning "fat," being the first name of his cousin, a hated rival in the eyes of his beloved. The symptom represents the subject for a signifier S2, a knowledge that eludes him.

Thus, the symptom proceeds from a purely signifying articulation, hence the attempt to resolve it through an interpretation that plays on ambiguity.

The analyst, assumed to be S2, occupies this position represented by the margin; thus, the question of the topological status of this position immediately arises.

If the symptom, in the psychoanalytic sense, is articulated as a signifier S1 to another signifier S2, then it is inconceivable as such outside the field of transference defined by S2. This, of course, does not exclude symptoms prior to the beginning of analysis, as S2 can be embodied differently, as is the case in our example.

As in quantum physics, the inseparability of the terms involved in the experimental setup does not imply that what happens there escapes the determinisms of the structure. If the psychiatric picture of clinical signs presented to a gaze that would play no part in it is to be rejected, it is not to make way for its exact symmetry as that of an analyst-painter.

On this structure, Lacan, as we know, advanced models that are topological spaces: the torus, the Möbius strip, the Klein bottle, the cross-cap, and finally, the Borromean knot, where the fourth consistency of the "sinthome" binds together the Real, the Symbolic, and the Imaginary; the symptom and the Symbolic forming what Lacan called a "false hole," whose irreducibility marks the lack of a truth about the truth, S2 irremediably referring back to the *Urverdrängt*.

The text entitled "A Physical Topology" attempts to continue the exploration of Lacanian spaces begun in the previous issue of *Nodal*.

In the text *L'étourdit*, dated 1972, Lacan defines topology, the one he presents in this writing, as "the very fabric of psychoanalytic discourse." A journey through

Lacan's seminars and writings reveal, from the very beginning, a constant preoccupation with formalization. While Lacan may have stated in his later years that psychoanalysis was not a science, he nevertheless never ceased seeking a core of scientificity within it; and, beginning

with the 1962 seminar on Identification, the recourse to topological surfaces became the primary instrument of this quest.

It would be easy to demonstrate that Freud himself did not hesitate to draw upon models derived from the sciences of his own time. In "*Instincts and Their Vicissitudes*," Freud underscores the importance—in the constitution of a science—of "abstract ideas drawn from here and there," which are then applied to the material right from the initial description of the phenomena. Subsequently, these phenomena are "gathered, ordered, and fitted into relationships." "These ideas," he observes, "necessarily entail, at first, certain degrees of indeterminacy... and as long as they remain in this state, their meaning is established by multiplying references to the material of experience—material from which they appear to be borrowed, but which, in reality, is subject to them."

Thus, it is these "abstract ideas" that bring order to the materials by subjecting them to their grasp. Yet these ideas are not chosen arbitrarily, but rather by virtue of "their significant relationships to the empirical materials."

In Lacan's work, these "abstract ideas" evolve into that "topological fabric"—that "language of pure matheme"—which, as he asserts, "is the only thing capable of being taught: and this, without recourse to any experience—for experience, being always (whatever its nature) grounded in a discourse, merely permits those locutions which aim, in the final analysis, at nothing other than establishing that very discourse." Since structure is primary relative to experience, the increasingly extensive recourse to topology cannot fail, therefore, to condition the analytic experience itself—even in its most practical consequences.

Topological surfaces—the torus, the Moebius strip, the cross-cap—have been widely utilized by Lacan since the seminar on *Identification* (1962); however, we can observe them at work much earlier—for instance, in "On a Question Preliminary to Any Possible Treatment of Psychosis," a text contemporaneous with the seminar on the *Formations of the Unconscious* (1957–58). Indeed, it is probable that Lacan had such topological figures in mind from the very inception of his seminars—unless, that is, such forms were intrinsically at play within his discourse all along.

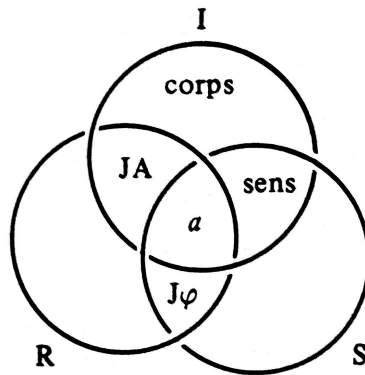
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This anticipatory effect can be observed in relation to the Borromean knot itself—a concept introduced in 1972.

Thus, in the seminar on *Freud's Technical Writings* (1953–54), Lacan speaks in the following terms of the categories—now so well known—of the Symbolic, the Imaginary, and the Real: "elementary categories," he states, "without which we can distinguish nothing in our experience" (p. 297).

"It is doubtless not without reason that there are three of them. There must be a minimal law at work here—one that geometry merely serves to embody in this instance—namely, that if you detach from the plane of the Real a few panels that extend into a third dimension, you cannot construct anything solid without at least two additional panels."

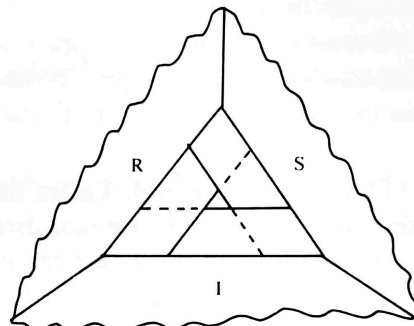
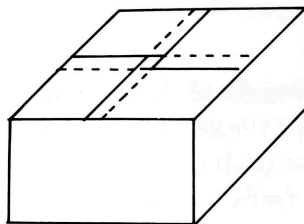
This constitutes a truly luminous prefiguration of the "jamming" effect that governs the structure of the Borromean knot. Let us recall, indeed, that in the Borromean knot, the three consistencies—the Real, the Symbolic, and the Imaginary—hold together in such a way that if any one of the three rings is severed, the other two immediately fall apart.



In Imaginary terms, we might say that each ring passes over a second ring and under a third; yet this third ring possesses the peculiar characteristic of passing under the second ring itself—a configuration that constitutes the specific "jamming" effect inherent to the Borromean knot.

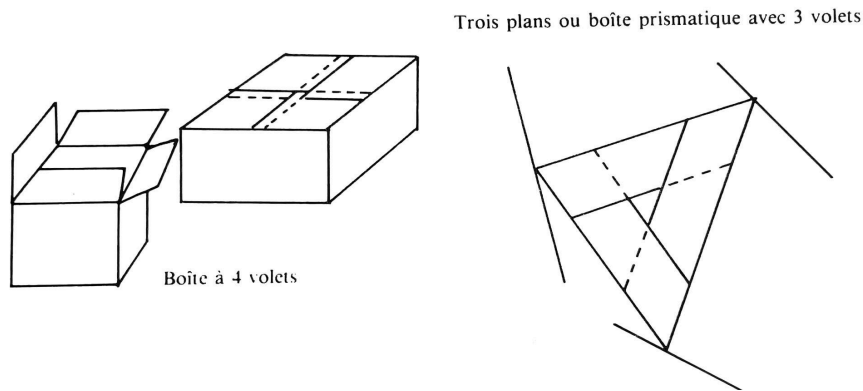
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Boîte à quatre volets



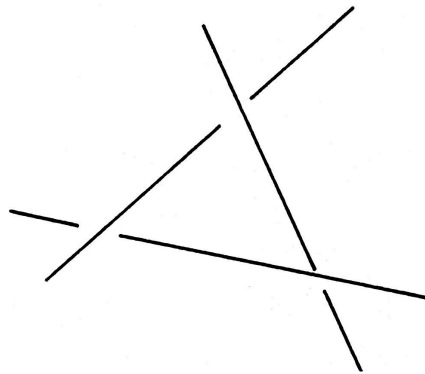
Trois plans ou boîte à trois volets

To visualize the flap model that Lacan presents in this 1954 seminar, one need only imagine—using three flaps—what occurs when closing a cardboard box whose lid consists of four flaps, by interlocking these flaps with one another.



The fundamental figure of the Borromean crossing of three lines—as Lacan would later revisit it—is entirely contained within this model.

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In *L'étourdit*, Lacan provides a condensed summary of his topology—specifically, at the point his discourse has reached, representing his contribution to psychoanalytic discourse. This text is remarkable in that topological figures are entirely absent: transformations and surfaces are described without any recourse to diagrams, even though Lacan regrets being compelled to rely on imagery nonetheless, rather than utilizing pure mathematical formulas. Yet it is within the text as a whole—in the wordplay, in the grammatical structure itself, and in the particularly convoluted sentences that are so difficult to unravel or flatten out—that Lacan attempts to embed the very topology he is explicating.

The primary significance of these topological surfaces—which are, by their very nature, difficult to apprehend—lies precisely in their capacity to critique what might be termed an implicit topology: the underlying framework of common intuition. They serve to break with the "topology of the sphere"—the model of a sack to be emptied or filled—a paradigm widely employed in imaginary representations of the unconscious.

To appreciate this topology in its full scope and implications, one must conceive of an infinitely flat being traversing the very thickness of these surfaces, thereby observing the paradoxical properties inherent to these two-dimensional spaces.

Among other things, the topology presented in *L'Étourdit* serves to illustrate the process of the psychoanalytic cure.

The utterance of a demand creates a cut within a torus—specifically, the "neurotic torus." This cut subsequently closes back upon itself through the mechanism of interpretation, thereby slicing the torus into a "bipartite Moebius strip." This strip—characterized by two edges and two half-twists—is then re-spliced to itself along one of those edges; in doing so, it comes to encircle the "washer" of object *a*—the object that seals the Moebius strip—thereby constituting the cross-cap.

Thus, our starting point is a cut situated within a toroidal surface. This brings us back to the seminar on *Identification* and to the torus

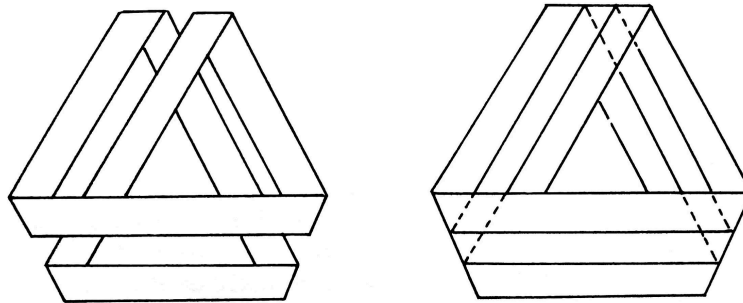
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of demand and desire—demand being represented by the turns around the peripheral hole, and desire by the very cut revolving around the central hole that prefigures object *a*.

The neurotic torus is linked to the torus of the Other; the meridian circle of the one constitutes the parallel circle of the other, and vice versa. This implies that, in neurosis, desire bears upon the demand of the Other—taken as an object—while demand concerns the object of the Other.

Let us note that the only elements at play are, on the one hand, the structure of language—which forms the fabric, the very stuff of the surface—and, on the other, the cut of the saying, which comes to slice through this surface and potentially modify the structure that originally accommodates it. Yet we must go further and assert that it is the cut itself that determines the topology of the surface. It is in this sense that Lacan declares: "The cut is the Moebius strip."

La coupure = la bande de Moebius



It is this paradoxical identity between the Moebius strip and the cut—an identity already hinted at in a 1966 footnote to Schema R—that Lacan endeavors to demonstrate in various ways throughout *L'Étourdit*.

First, the self-closure of one of the edges of a bipartite strip constitutes the Möbius strip, endowing it with its unique structural characteristic: the unification—along its entire length—of its front and back sides. This unification occurs along a single-turn line—imaginarily situated in the middle—which is designated the "*ligne sans points*."

A cut made along this line does not yield two separate parts; rather, it causes the Moebius strip to vanish, thereby recreating the bipartite, two-sided strip.

Second, a double-turn cut made upon the Moebius strip

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detaches a median Moebius strip, which is found linked to a bipartite strip.

Thus, a bipartite strip transforms into a Moebius strip through the closure of one of its two edges upon itself—either directly along the "*ligne sans points*" or by means of another Moebius strip. Conversely, a bipartite strip is obtained from a Moebius strip—equivalently, by a single-turn cut or by detaching a section—hence the identity: cut = Moebius strip.

It is the "*ligne sans points*" that truly constitutes the structure of the Moebius strip—and not the half-twist usually employed to construct this unilateral surface.

A Moebius strip is, therefore, constituted by a series of such "*lignes sans points*."

Let us note that if the transformations described in *L'étourdit* lead from the neurotic torus to the cross-cap—accompanied by the fall of object *a*—it is because the neurotic torus is linked to an Other torus: that of the analyst, characterized by a specific desire—the desire of the analyst. This new linkage is necessary to break free from the neurotic repetition that is otherwise inevitable in any other form of coupling.

Let us return to the concept of the cut and to the topology of the symbolic field. To raise the question of a topology of the symbolic is entirely legitimate; indeed, does Saussure himself not refer to a topology that is quite explicit? This topology rests, in effect, upon the linear character of the signifying chain, and upon the arrangement of signifiers and signifieds on the *recto* and *verso* of a sheet of paper.

The dependence of this Saussurean topology upon writing is glaringly obvious. Lacan noted that while the linearity of the chain is justified by virtue of the unfolding of speech in time, the line in question cannot be singular; rather, multiple synchronous lines—a musical staff—would better account for the process.

Saussure's topology is, therefore, Euclidean: a Euclidean plane with a *recto* and a *verso*.

Let us, then, attempt to characterize the topology of the Symbolic more precisely.

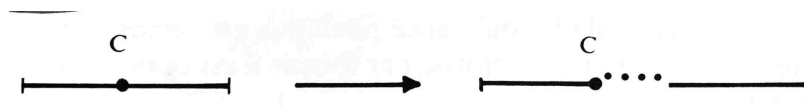
Contrary to appearances—particularly those of written text—the Symbolic possesses a connected structure; that is to say, it is "glued together." This stems from the fact that, as Saussure puts it, "in a tongue, there are only differences without positive terms." In a tongue, no signifier can be isolated.

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In a tongue, no signifier is isolable; even in its most microscopic constituents, a tongue is formed of complex terms—of differences. Thus, no element can be extracted "naturally" from among others—like a marble from a bag of marbles; it must truly be torn out, pried loose.

When a space is connected and divided in two, one space is open and the other is closed.

At the level of the cut, the boundary adheres to one of the two parts. Thus, the cutting of a segment of real numbers at a specific point C implies that this number C belongs to one of the resulting segments and not to the other. This is due to the connected structure of the segment.



The other segment will possess an "open" extremity; at this extremity, an infinite series of numbers will converge toward C without ever reaching it.

The Symbolic is connected; were this not the case, it would be separable—a natural division would exist, and consequently, a sexual relation would be possible between a male part and a female part that were exactly equivalent.

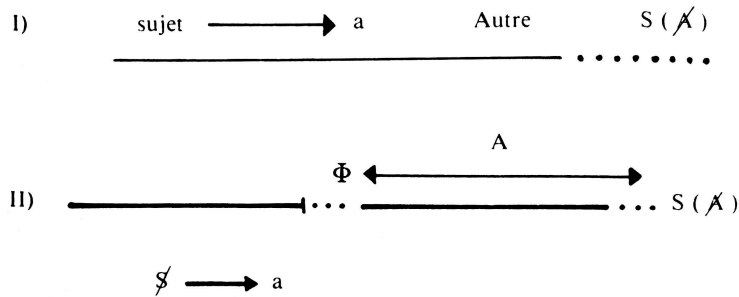
In fact, the division of *parlêtres* is not at all symmetrical; it implies a closure on one side and an openness on the other. This division of the Symbolic is the effect of castration, which serves to compensate for the absence of a sexual relation.

If the symbolic field is connected, it is also open: indeed, since every signifier refers back to another signifier, the truth cannot be fully articulated; there exists a primordial repression (*Urverdrängt*) that cannot pass into speech—this is what is symbolized by: S(A).

The Symbolic is open, lacking: A. The object *a* comes to imaginarily—and inadequately—plug this opening. The subject \$ is the sliding effect of the signifier; the subject—embarking upon the path of enunciation and desire—revolves around a latent nomination: S(A), the void of the *Urverdrängt*. S(A) is the unpronounceable signifier for which all other signifiers represent the subject.

It is this missing signifier (–I) that is supported by the phallic signifier Φ—the signifier without a signified—which the metaphor of the Name-of-the-Father establishes.

We can schematize this topology as follows:



Castration divides the symbolic realm into a closed, bounded, and compact space on the one hand, and an open space on the other.

The closed space of phallic jouissance is vectored by the  $\Phi$ ; the space of the Other is also vectored by  $\Phi$ , but it is additionally polarized by the  $S(\mathcal{A})$ .

The  $\Phi$  thus serves to stabilize the symbolic order by endowing it with meaning; it anchors it.

This signifier  $\Phi$  is radically excluded in psychosis. The psychotic subject, therefore, deals directly with an infinite Other—infininitely distant or infinitely near.

The void of  $S(\mathcal{A})$  constitutes a vertiginous abyss, a summons; on the imaginary plane, the subject offers up his own fragmented body to fill this void.

And castration, in the case of the psychotic subject, must always be understood as real castration.

On the symbolic plane, no signifier  $\Phi$  has intervened to order the signifying chains or to vector the process of signification.

Since castration has failed to stably divide the symbolic realm, the cut—the division—may operate anywhere within the field of signifiers, isolating elements down to the level of the phoneme; the symbolic space thus loses its property of connectedness and fragments just as the body does.

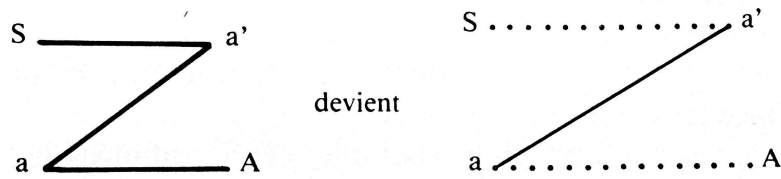
This is precisely what the case of Schreber illustrates. The opening—the void—that appears within the symbolic  $S(\mathcal{A})$  at the terminus of the signifying chains here shifts inward, penetrating the very structure of sentences. Much like the segment of the real number line mentioned earlier, the signifiers are fractured—placed "in suspension."

In schizophrenia, this process of the disintegration of signifiers may progress to the point of agrammatism—a mere sequence of phonemes—culminating in sheer nonsense that, paradoxically, points toward an absolute signification.

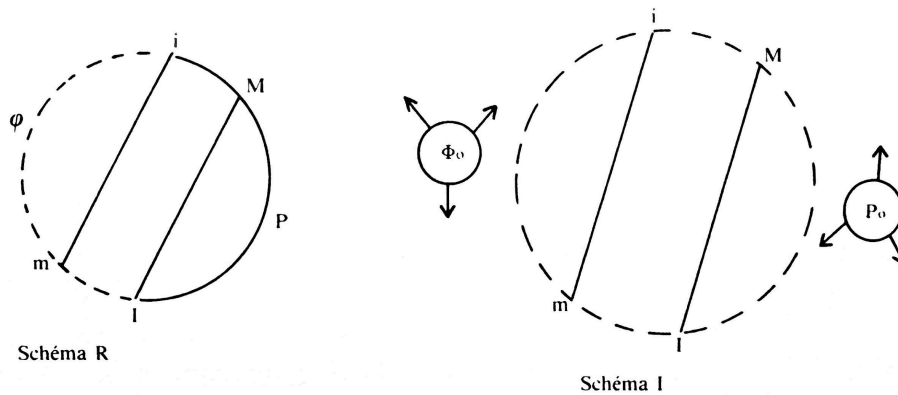
In this veritable act of the symbolic realm devouring itself, it is the phoneme that emerges as the chosen object *a*.

In Schreber's case, hallucinatory sentences are reduced to the shifter: "Now, I am going to..." Rather than looping back upon its completion through feedback on its meaning, the sentence—or the signifier—interrupts itself and suspends the sense, thereby creating, through anticipation, a veritable call. It is this same asymptotic movement that seizes the subject as well. Subject and Other are cast into infinity.

The L-schema is thereby transformed:



The result is a radical difference between the normal structure (the male norm)—that is, the structure organized by the phallus—and the psychotic structure.



While Schema R is to be read as an unfolded projective plane—in which the dotted line is glued back onto the solid line at its antipode—Schema I remains irremediably unfolded; that is to say, it is hyperbolic.

Schema R can be transformed into a disk wherein the self-rejoining of the boundary circle (with each point connecting to its antipodal point) results in the projective plane, specifically the cross-cap.

Schema I is comparable to the interior of a disk, with the boundary circle excluded (much like point C was excluded from the line segment in the one-dimensional example described above) and posited at infinity. In the vicinity of this excluded boundary, points converge toward infinity;

this open disk serves as a model of the hyperbolic plane, wherein the chords of the disk that intersect at the same point on the infinite circle represent parallel asymptotic lines.

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Let us note that the antipodal closure of the disk's boundary—which constitutes the projective plane—can be maximally reduced to a single point: a "Moebian point." "The asphere"—or the projective plane—is a sphere in which one of the points has been replaced by "such a Moebian point."

In the projective plane, points M and m on the one hand, and i and I on the other, do not merge; rather, they position themselves precisely on the front and back sides of the surface.

Thus, I and S lie on the front and back; yet, on the cross-cap, this recto and verso are capable of joining at every point—there is but a single face. It is the cut introduced by interpretation that constitutes the unconscious as the "reverse side."

In Schema I—the hyperbolic plane—I and S are infinitely close yet disjoint, spread out across a boundless plane; m and M, as well as i and I, do not settle stably onto a front and back side, but rather tend—in an infinite trajectory—toward an asymptotic conjunction. The holes marked  $\Phi_0$  and  $P_0$  symbolize the exclusion of the disk's boundary; one might say that, in the case of the projective plane, I serves to compactify the open disk—it is a point at infinity included within the surface—a "Moebian" point possessing the property of flipping any line that traverses it from the right side to the reverse side.

It is this very point that is foreclosed in Schema I.

Let us illustrate this: in psychosis, the transformation undergone by the signifier is, in effect, entirely isomorphic to the work of the unconscious as described by Freud—for instance, in the forgetting of the name "Signorelli." However, in the case of an unconscious formation—such as an instance of forgetting or a slip of the tongue—we begin with a surface where, at every point, there is access to its reverse side: the unconscious formation manifests within actual discourse; it is only after the cut of interpretation that this surface becomes endowed with a front and a back—in this sense, interpretation constitutes the unconscious.

In psychosis, this work of the signifier is found, from the very outset, to be spread out—laid flat.

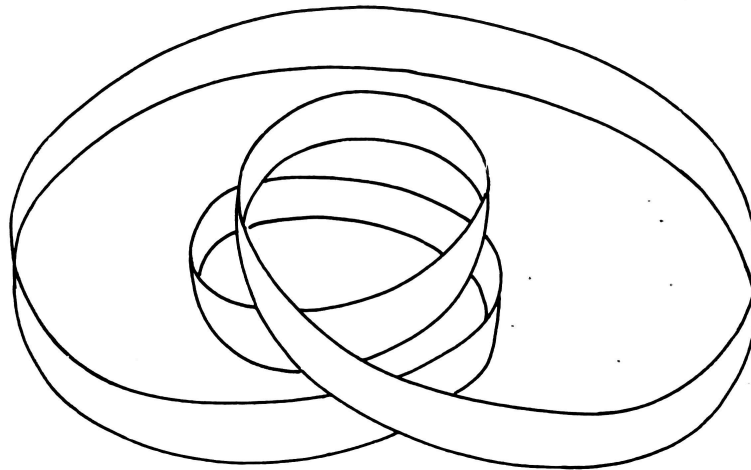
If the Symbolic in psychosis thus reveals itself in its starkest crudity—as essentially parasitic—it does so at the cost of the subject's asymptotic flight.

Lacan's topology strikes us as essentially physical; whether in the text of *L'étourdit* or in his use of knots, this topology comes into play through the actual manipulation of models made of paper or string.

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Thus, in *L'étourdit*, it is impossible to understand—without physical manipulation—how the bipartite Moebius strip can be mapped onto a torus; specifically, "to understand this as two coils

of the same orientation and one of the opposite orientation, or, equivalently: as being derived from the same source—three coils of the same orientation" (p. 27).



Bipartite strip featuring three coils of the same sense

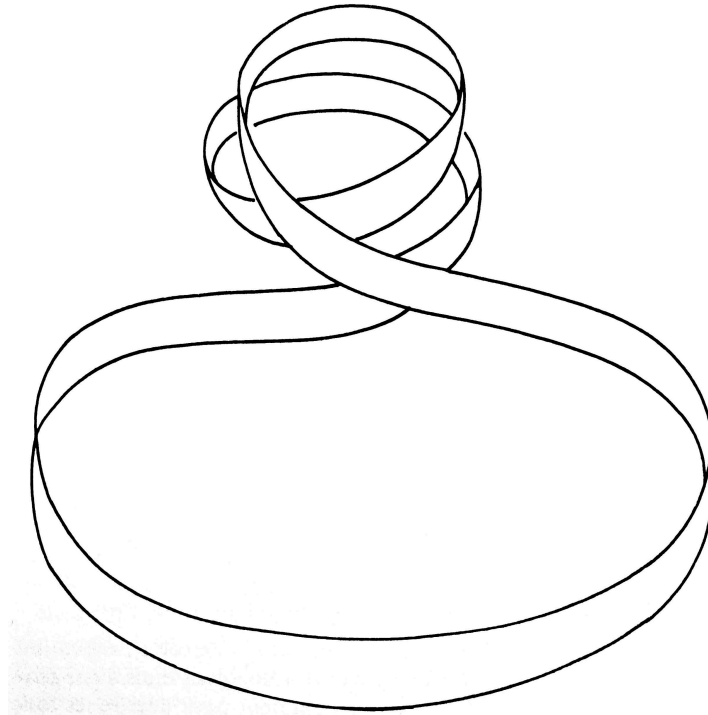
Indeed, a mathematical grasp of this explanation requires concepts that are not only topological but also geometrical—concepts, moreover, that were developed quite recently to describe the forms of supercoiled DNA. Only the concept of linking [*enlacement*] is strictly topological; one can state that the linking number of a two-edged bipartite strip is 2, regardless of the strip's specific configuration in space. However, if one considers—as Lacan does here—that specific configuration, it becomes necessary to introduce two additional geometrical concepts: twist [*tortillement*], which measures the rotation of a vector along the strip's central axis; and writhe [*vriillage*], which measures the strip's deformation in space—a phenomenon corresponding to what Lacan terms a "coil."

Linking (L), twist (T), and writhe (W) are interrelated by the formula:  $W = L - T$ .

Thus, when the bipartite strip is unconstrained, it assumes a configuration in which the twist may be zero, yet the writhe is +2.

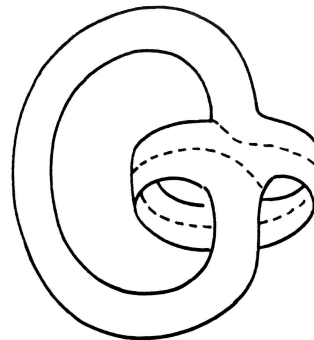
In other words, the strip executes turns in space—a phenomenon corresponding to the three coils of the same sense, or to the two coils of the same

sense, plus one roller of the opposite direction; a twist corresponding to zero torsion may be positive or negative.



Bipartite strip comprising two rollers of the same sense and one of the opposite sense; this strip is applicable to a torus.

Tore troué



We acknowledge that such a "physical" approach to topology is problematic and epistemologically difficult to sustain.

However, the aim of such manipulations is to approach the very structure of psychoanalytic discourse—a structure that is, in itself, topological.

This is not without direct consequences for the practice of the psychoanalytic cure; as Contardo Calligaris has demonstrated, conceiving of structure as topological leads to a radically specific conception of the analytic act. Indeed, it is no longer a matter of emptying a bag—the unconscious—down to the very last marble (the primordial signifier-formula) through a process that could, *a priori*, be standardized or bureaucratized (provided one simply devotes enough

time to it), and in which the analyst's responsibility is limited. Rather, it concerns a singular experience of transference during which a modification of topological structure is at stake—an experience for which the analyst is entirely responsible.

Consequently, the concept of primordial repression is inevitably modified. Admittedly, certain crossroads signifier-formulas are encountered during the cure; however, they serve merely to materialize the topological transformation currently underway. If the subject circles around a latent nomination, this nomination functions less as the negative image of an identifiable proper name than as a pure topological void—a void entailed by the very structure itself.

#### BIBLIOGRAPHY

C. Calligaris, *Hypothèse sur le fantasme*, Paris, Seuil, 1983.

M. Czermak, "Ployure du langage," *Mi-Dit*, no. 2–3.

M. Darmon, "L'inconscient nodal," *Nodal*, no. 1.

S. Freud, *Triebe und Triebchicksale*, G.W. X. "Instincts and Their Vicissitudes," *Metapsychology*, Paris, Gallimard, 1968.

J. Lacan, "*Freud's Technical Writings*" (1953–1954), Paris, Seuil, 1973.

"*Formations of the Unconscious*" (1957–1958).

"*Identification*" (1961–1962).

"*L'étourdit*," *Scilicet*, No. 4, Paris, Seuil, 1973.

F. de Saussure, *Course in General Linguistics*, Paris, Payot, 1972.

W. Bauer, F. Crick, and J. White, "Supercoiled DNA," *Pour la Science*, No. 35, September 1980.