

Symmetries in the Semiosphere: A Typology

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Abstract: The article points out that the current expansion of the semiotic focus from signs and texts to whole cultures needs the development of a coherent method. It therefore proposes to establish the method through an application of the topological theory of fractals to the analysis of different kinds of symmetries in the semiosphere. Having defined fractals as resemblance between two topological structures, the article first dwells on what “resemblance” means in the comparison of both visual and conceptual patterns; it then proposes a typology of fractal similarities, based on the topological operations of rotation, translation, and reflection. Examples of each typology are given from the fields of cultural and political analysis. The article concludes by hypothesizing that cultural semiotics might evolve into a “pattern science”, challenging the customary disciplinary barriers between the study of regularities in nature and in culture.

Keywords: semiotics; culture; fractals

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标题: 符号域中的对称: 一个类型学研究

摘要: 当前符号学正将关注点从符号和文本转向整个文化,需要开发出一种比较连贯的研究方法。本文试图通过应用针对分形的拓扑学理论,以分析符号域中的各类对称。本文将分形界定为两个拓扑结构之间的相似,通过比较视觉和概念模式,思考所谓的“相似”究竟是什么,并基于对旋转对称、平移对称和反射对称的拓扑学分析,建立分形相似性的类型学。为说明每一种类型,本文从文化和政治领域寻找分析案例。最后假设,文化符号学可以演变成一种“模式科学”,并挑战传统研究中自然和文化的学科分野。

关键词: 符号学; 文化; 分形

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“Quanquam mihi satis ratio appareat, tamen novitate conturbo.”

(Augustine, *De musica*, V, 5, 9)

1. In search of a method.

Throughout its relatively short history, semiotics has progressively enlarged its focus. First conceived as a method for the study of signs, it subsequently

concentrated on discourse, texts, and, from Jurij M. Lotman on, on whole cultures. Whereas, on the one hand, this expansion was necessary, since meaning cannot always be grasped through the analysis of simple units such as signs or texts, on the other hand, though, the methodological soundness of

the discipline was challenged as a consequence of such expansion. Solid grids of categorization, partially derived from structural linguistics, would allow the early semiotician to develop a coherent meta-discourse on signs and texts; as the analyst's attention sought to become more encompassing, and embrace entire cultures, however, the sharpness of the semiotic method somehow blurred, yielding to metaphoric and sometimes even biased interpretations of meaning. The present paper consists in a first attempt at indicating along what direction a cultural semiotics endowed with a rigorous method might unfold: through the application of the topological theory of fractals to the analysis of different kinds of symmetries in cultural semiospheres.

2. Cultures, brains, and maths.

In *L'età neobarocca* (1987) (*Neo-Baroque: A Sign of the Times*, 1992), Italian semiotician Omar Calabrese offers a dense analysis of contemporary aesthetic cultures under the label of "neo-baroque". The book teems with references to a specific trend in the humanities, fashionable especially from the late 1970s onwards, cherishing the idea that cross-fertilization between advanced mathematics and cultural studies (and, in particular, semiotics) could produce groundbreaking insights into the understanding of culture. René Thom's^① attempts at applying topology to the study of cultural phenomena (see *Esquisse*) and Jean Petitot's "meaning physics" (see *Physique*) marked the apex of such trend,^② which then dwindled, when the idea that culture could be underlain by mathematical structures was replaced by the idea that the origin of culture should be looked for not in abstract theoretical structures but in the physiology of the brain. Today, fewer and fewer cultural analysts seek inspiration from the imperishable folds of abstract topology and an increasing number of scientists delve with passion in the folds of brain physiology.^③

One could argue, however, that this trend

inversion is somehow claustrophobic. That should not mean that the brain is a poky place; on the contrary, admiration is due to those researchers that venture in the incredible complexity of its inner structures, seeking to understand what is it, inside us, which determines what is outside us. The claustrophobia, instead, seizes social scientists when they realize that a whole range of human experience is left out of the currently predominant investigation trends, as though all inter-human phenomena could be explained in terms of intra-human phenomena. In the worst cases, there is something quite solipsistic about this idea, almost a desire to enshrine all the slippery complexity of the human predicament into a single, objectified organ.^④ There are brains inside human beings but there are also human beings outside brains; the result of brain activity is constantly deposited in an extra-corporeal space where it accumulates not as internal dream but as external, inter-subjective output. Furthermore, brains produce cultures but culture produces brains too (Leone, "Motility"); the verbal language human beings learn, the dance moves they master, and the music they play deeply shape the physiology itself of their brain. The structural study of cultures, then, should not be abandoned as an obsolete 20th-century trend, but considered as part of the investigation concerning the functioning of human beings, with inclusion of their neurophysiology.^⑤

Omar Calabrese was thus attracted by the mathematical theory of fractals, and in particular to Benoît Mandelbrot's^⑥ version of it (see Mandelbrot, *Les objet*), because he identified in it a philosophical preoccupation that is at the core of semiotics too (and particularly of the semiotics of the fine arts): what is the origin of meaningful regularity? Or, said in an even more abstract way: what is the origin of meaningful patterns? If semiotics is, according to a famous definition by Margaret Mead,^⑦ the study of the patterned nature of communication (Mead 275), then semiotics can carry on not only the basic investigation of what patterns signify in the world, how they signify, and

what they signify; it can also develop into a meta-semiotics, searching for the origin itself of patterns. That is a crucial point of intersection with brain studies: searching for the origin of patterns in culture is mysteriously related to searching for the origin of patterns in nature; the brain naturally^⑧ shapes social regularities but is also culturally shaped by them.

Jurij M. Lotman's^⑨ understanding of culture can play an essential role in the shaping of this new alliance. One might wonder, however, about the nature of the relation between micro-texts and macro-texts, between the level of analysis of cultural artifacts and the level of analysis of the semiosphere (see Leone, "From Theory"). The general hypothesis that underlies the whole Lotmanian project is that human beings live in a semiosphere that regulates meaning creation, circulation, and suppression according to dynamics that follow complex rules, which are nevertheless logics that can be observed, analyzed, and understood (see Lotman, *Universe*). The whole culture in which humans live, then, breathes according to a rhythm that is similar to that discovered by Saussure in the functioning of language (see Saussure, *Cours*), or by Algirdas J. Greimas in the functioning of texts (see Greimas, *Du sens*): structures guide the life of culture and semiotics is one the most sophisticated meta-languages to capture them.

The embarrassment, however, starts when this grand theoretical hypothesis must be followed by actual analyses permeated by it. It is at this stage that the epistemological dilemma stashed at the kernel of cultural semiotics arises: in what way can a semiotic analysis of culture be performed? Apparently, there is no other empirically and inter-subjectively viable way than focusing on the cultural artifacts that circulate in a society at a given moment of its history, artifacts that the meta-language of semiotics analyzes as texts.^⑩ This operation is already fraught with undesirable epistemological conundrums: how can analysts extract themselves from the multiple cultural ideologies that bias their

gaze and, thus, look with neutral eyes at a signifying phenomenon whatsoever? But even before facing such difficulty, the semiotic analyst must deal with the even more paralyzing question of the representativeness of the analytical corpus (see Rastier, *La mesure*). In simpler words: if culture is a semiosphere and if its internal dynamics supposedly work exactly like those of language, then how can the cultural semiotician select a point of departure of the analysis? What text or series of texts should the analyst choose to observe, analyze, and interpret in order to articulate the faithful depiction of a culture? What proves that a novel, a painting, or a film faithfully reflects the macro-semiotic logics that underpin the creation of meaning in a society? Most cultural semioticians do not ask themselves this question or, if they are asked it, they fumble, leaving the interlocutor with the impression that, deep down, they actually select their corpus guided by a canon that was composed according to non-semiotic logics.

The only way to dodge comprehensible accusations of superficiality is to tackle the fundamental issue of the relation between macro-texts and micro-texts: how can something central about the logics of meaning-production in the macro-text of culture be discovered by analyzing the logics of meaning production in the micro-texts that circulate through it? One could simply discard such hypothesis — and the whole Lotmanian project with it —, claiming that culture as a whole evolves independently from the behavior of its parts, that is, of the texts that compose it (see Lotman, *The Semiotic*; Lotman, Ginsburg, and Uspenskii, *The Semiotics*). If the Lotmanian project is considered an organicist one, though — as its historical genesis indicates it to be — on the one hand, one should be inclined to believe that, in a semiosphere, the whole is more than the parts: by studying texts, or series of texts, one shall not be able to understand regularities that only emerge in the complex holistic interactions of the semiosphere; on the other hand, though, one should also tend to assert the dependence of these

holistic properties on the ingredients from which they stem at the micro-level of texts; the literary semiosphere of a society is not only a juxtaposition of the novels published and read therein, but it cannot be considered as totally severed either, in its internal functioning, from the semiotic structures of these novels. There must be something in texts that mirrors the functioning of cultures, since the latter stem from the former; at the same time, there must be something in cultures that mirrors the functioning of texts, since the former shape the latter. If one accepts the challenge of “pattern sciences”, then, one should also admit that there is something in the functioning of our brain that mirrors both the way in which texts work and the way in which cultures work.

Lotman used to refer to the inner structure of a culture as to the “text of a culture”, that is, the macro-logic that determines the ways in which meaning is produced and exchanged in such culture. The expression itself hints at the fact that the macro-text of culture operates in a way that somehow reflects the dynamics of micro-texts. It is as if, inside each culture, there was a hidden code that generates its meaning, and that is somehow like the micro-texts that are shaped through it (see Lotman, *The Structure*). Dante’s *Divine Comedy* is not “the text” of the Italian medieval culture, meaning that it is not equivalent to the code that generates the Italian medieval semiosphere; its internal structures, however, are closely related to such code, to the “text of culture” of Medieval Italy. That is why, when the cultural semiotician wonders in what way the texts that are analyzed (novels, films, artworks, etc.) are related to the semiospheric text of culture under investigation, a tentative answer might be that culture has a fractal nature: the inner structure of the micro-texts diffused in a culture closely resembles the inner structure of the semiospheric macro-text of that culture. By semiotically analyzing the former, a lot can be discovered on the latter. This hypothesis, however, deserves further investigation. What does it mean, that texts in a semio-

sphere are somehow fractals of that semiosphere? The present paper is an attempt at answering such a question.

3. Fractals and semiotic resemblance.

An intuitive definition of fractals is based on the observation that some structures visually look like some other structures (see Frame and Urry, *Fractal Worlds*). That is an intriguing point of departure but entails two problems. The first concerns the definition itself of fractals in geometrical terms. What does it exactly mean, “to look alike”? The second problem is even more complex and concerns the adaptation of the theoretical framework of fractal geometry to the field of cultural semiotics. “Lotmanian” fractals, indeed, are not necessarily visual but metaphoric or, to say it better, diagrammatic; similarities between fractal forms are to be recognized not directly among visual structures but among visual structures that diagrammatically render conceptual structures. A reasonable criterion of inter-semiotic translation between the language-object (the semiotic dynamics of the semiosphere) and the meta-language (diagrams) should, therefore, be established, before any fractal similarity is singled out as an indicator of the way in which the semiosphere functions.

As regards the first question, that is, the issue of defining what “looking alike” means, it is a paramount one, especially because the whole reliability of observation, description, and interpretation relies on it. How is the cultural semiotician going to be sure that, in affirming the similarity between two visual structures or — even more complex — between two conceptual structures, the form of one of them is not being projected onto the other, pushed by the analyst’s emotional desire of “finding similarities”? An example will clarify the nature of this challenge. Parents who have adopted a baby are sometimes puzzled by the fact that acquaintances whom they meet, ignoring that the child has been adopted, often sincerely proffer the

cliché physiognomic statements that are usually uttered in these circumstances: “he looks entirely like his mother”; “he has the eyes of his father and the mouth of his mother”; etc. Adoptive parents are even more puzzled at observing that these acquaintances seem completely earnest, believing that, indeed, there is a genetic resemblance between the baby and the parents. The resemblance is, of course, spotted as a consequence of the friends’ desire to find it, that is, to reassure themselves and the parents that, indeed, the child is theirs. Scholars know well that, also in controlled research environments, the desire to ascertain that a phenomenon looks like another one often leads to the identification of visual and conceptual similarities that severely distort the truthfulness of observation.

Is there an antidote to such longing for similarity and to the biases that it injects in the observation of reality? It essentially consists in keeping in mind that similarity should be observed not between two phenomena but between two structures, that is, between phenomena that have been already disassembled and reassembled according to the selection rules of a meta-language. Does this happen when friends comment on the fact that the face of a child “looks like” those of the parents? It does, but according to a transformation of the phenomena (visages) into structures of resemblance that is intuitive, primitive, and not guided by any coherent structural method. The comparison, in such case, transforms the visual object into a structure (some elements of the former and only some are retained, such as the eyes, the nose, the mouth or, in more sophisticated comparisons, the shape of the chin, the color of the eyes, etc.) but it does it in a way that a) is not inter-subjectively comparable; b) is not quantitative, meaning that no actual measurement is involved. An important point that the present paper would like to make is that, in order to introduce a serious fractal framework into the semiotic analysis of cultures, the idea should be retained that such introduction is impossible without a quantitative

dimension. In order to determine that a phenomenon looks like another phenomenon without yielding to the pressure of the desires of visual analogy, the meta-language should, first, transform the phenomena under observation into structures through adopting a standard method and, second, shape this transformation in such a way that ensuing structural features can actually be quantitatively compared. Returning to the example above, it is not sufficient to say “he has your nose”; the nose of the baby should be transformed into a sort of triangle, and so should also the noses of the father and the mother; the three noses, then, should be geometrically compared, and quantitatively measured, to ascertain whether the shape of the baby’s nose looks more like that of his father’s or that of his mother’s.

This geometrization of the terms of the visual comparison, however, would solve only the first of the two problems mentioned above, that is, the elaboration of an inter-subjectively reliable method for determining if and to what extent a visual phenomenon looks like another one. This method could be stretched to cover also other non-visual phenomena, provided that they can be perceived and, to a certain extent, measured. Present-day technology, for instance, allows one quite easily to translate voices into diagrams representing their acoustic characteristics, in order to ascertain whether the voice of a child “sounds like” that of the parents. But how should one approach the second of the comparative problems mentioned above, that is, the necessity to establish a commensurability not only among perceptual phenomena but also among conceptual structures? As it is known at least from Kant on, no phenomenon is perceived as a purely perceptive entity; its perception is always filtered by cognitive categories that turn it into a structure; this implicit structure, then, can be further rarefied into the structure created by the projection of the conceptual grid of a meta-language onto the phenomenon. From this point of view, no comparison concerns phenomena per se but always phenomena that are “read” as

structures.

Nevertheless, the level of complexity that this comparative reading entails is much inferior to that brought about by the attempt at pinpointing whether not simply perceptual phenomena but actual cultural diagrams look alike. One thing is to determine whether the face of a baby looks more like that of the father or that of the mother; another thing is to ascertain whether, for instance, the structure of the *Divine Comedy* “looks like” that of the Italian medieval culture. What does “looks like” mean in this case? Intuitively, it is difficult not to admit that the resemblance is not of the same kind as the “looking alike” of two faces. Observing likeness, indeed, in this case implies a series of explicit conceptual operations that could be listed as follow: a) according to a certain method, Dante’s *Divine Comedy* is read as a text, that is, not only as a poem, but as a poem in which a methodology guided by a theory can single out the features of a structure, that is, a network of relations that allow this text to signify as it does; b) according to a similar method, the whole semiosphere of the Italian medieval culture is transformed into a text, wherein the Lotmanian theory of culture identifies — or at least hypothesizes the presence of — a structure, which also essentially consists of a series of signifying relations that are distinctive of that culture. Apart from the evident problems of determining the limits of the latter “text” (when in space and time does “the Italian medieval culture” start? When does it end?) and the equally evident dangers of circularity (the structure of the “Italian medieval culture” is determined on the basis of extra-textual elements, like the periodization of chronological time proposed by such or such historical school or the segmentation of geographical space affirmed by national histories), there is also the even thornier question of making sure that the micro-structure *a* and the macro-structure *b* are actually commensurable. If semioticians usually adopt a specific method to single out the structure of a text (the most articulate and powerful of them arguably being that elaborated by

A. J. Greimas and his school), they often rely on another method (usually, the Lotmanian one) to determine the inner structure of a semiosphere; if these two structures are determined through different methods, however, how can they be compared? How can one affirm that the micro-text of the *Divine Comedy* “looks like” the macro-text of the Italian medieval culture, if the word “text”, its conceptualization, and the way in which it guides the operations that turn a cultural phenomenon into a structure, actually differ in the former and in the latter case? When comparing two faces, it is quite self-evident that two comparable objects are being compared and contrasted; furthermore, the theoretical operations through which a structural grid is projected on them — from which projection two conceptually comparable diagrams result — is relatively a simple one. But how do the cultural semioticians know that structures resulting from different semiotic methods are comparable? Moreover, how do analysts know that the theoretical moves that are made in order to turn two complex conceptual entities (a poem, a culture) into structures are actually inter-subjectively acceptable and not, again, guided by the common desire for seeing two pieces of a puzzle perfectly matching together? (里奥尼, “高保真”).

Indeed, if the transformation of the poem of the *Divine Comedy* into a text is already a problematic and controversial one (many non-semiotic schools of reading would, for instance, object that the poem can be rendered as signifying text and not, for instance, as historical artifact or as occasion for subjective responses), the transformation of a whole culture into a text is fraught with an exceeding number of risks and pitfalls: is the scholar’s reading applying a method, or is it fashioning the semiosphere of a culture according to self-fulfilling desires of interpretive transparency? (see Leone, “Forthcoming”). If the first of the two problems mentioned above (ascertaining the resemblance between two phenomena) was solved (or, to be more modest, an indication for solving such problem

was given) in the direction of finding a method for translating perceptual phenomena into commensurable structures, the solution to the second problem involves a more complex method; the “looking alike” of the macro-text of a semiosphere and the micro-text of one of the cultural artifacts circulating through it should be construed as “looking alike” between two structures according to the same method, or at least according to comparable methods; an inter-subjectively reasonable meta-method, then, should be envisaged in order to determine if and to what extent the two structures resemble each other in such a way that the latter can be said representative of the former. A hypothesis that the present paper would like to put forward is that fractal geometry can provide insightful clues to carry on such determination.

4. Semiospheric symmetries.

In order to move forward in the application of fractal geometry to cultural semiotics, one should determine whether symmetries can be observed in the semiosphere. Apparently, the concept itself of semiosphere, and the corresponding topology, immediately imply an idea of symmetry. On the one hand, that is an optical and theoretical illusion introduced by the reference to the geometrical figure of the sphere (see Leone, “La sfera”). Lotman and his school were, on the contrary, careful in underlining that the semiosphere is always an irregular structure, that its borders are deformed by forces whose exact development is often unaccountable for, and that the dynamic nature itself of the semiosphere derives from its being surrounded, defined, protected, but also put in communication with the external non-semiotic space by a permeable, porous diaphragm. If one had to topologically represent, for instance, the semiosphere of the contemporary European culture, then one could hardly resort to the figure of a perfectly symmetric sphere, but should rather visualize the internal and external dynamics of such cultural space with reference to an ovoidal topology,

continuously pulled by both inward and outward agencies (considering, for example, the powerful role of “topology attractor” that currently Russia exerts on eastern European countries).

On the other hand, though, a semiosphere cannot be conceived without imagining it as endowed with some sort of center. What does it mean that every semiosphere has a center (although it must not necessarily be a static one, since this center too can be subject to displacements due to cultural forces and movements in the semiosphere)? It means, quite simply, that all cultures tend to single out, identify, and preserve through various strategies of non-genetic memory (handing down of texts from generation to generation, inscription in durable semiotic supports, ritualization, etc.) some signifying elements that such culture deems essential and, therefore, irreplaceable for its homeostasis, that is, for the purpose of maintaining a certain sociocultural equilibrium, which can be visually and diagrammatically rendered as the permanence of a form of the semiosphere.

Again, it is not easy to proclaim a coincidence between national cultures and semiospheres without somehow essentializing the former because of their identification with the latter (see Lotman, *Universe*). Speaking of “French semiosphere” inevitably bends the semiotic meta-language according to the biases of the nationalist project. It is, however, undeniable that, at least from early modernity on, the idea of the possibility of a rational construction of socially shared meaning is a pillar of the French semiosphere, a generating principle that has given rise to a series of both verbal and non-verbal systems of structuration (political institutions, legal provisions, economic strategies, military endeavors, educational tendencies, up to the more rarefied level of artistic production and everyday exchange of meaning), whose ultimate purpose exactly was that of ensuring that this principle could be maintained at the center of the French semiosphere. Currently, the “semiotic panic” by which the French society looks at the eventuality that

religious fundamentalisms might, in the long term, reshape all these structures of signification is provoked precisely by fear that such progressive transformation might result in the inexorable undermining of the definitional principle itself of the French semiosphere (see Leone, *Sémiotique*). In simpler words, one could say — in topological terms — that attempts at introducing religious fundamentalisms in the inner mechanisms of the French semiosphere are seen as initiatives aimed at decentering and re-centering it, thus giving rise to its denaturalization, to the loss of its deepest identity. The apparently irrational anxiety by which issues like the dressing code of Islamic fundamentalist women on French beaches is dealt with could not be entirely understood without considering that such dressing code, or to say it better, the ideology behind it, is seen as a threat to the foundations of the French semiosphere, to the “text of its culture”, to its generating, core principle.

As a consequence, a way to define symmetry and asymmetry in a semiosphere exactly is in relation to the idea that each semiosphere is endowed with a center, and that this center essentially contains and preserves the semiotic core of a culture (see Leone, “Semiotica”).^⑩ On the basis of this principle, identifying both symmetric and asymmetric structures becomes relatively straightforward. Returning to the example above, on the one side, one could identify cultural tendencies that aim at relativizing the “semiotic myth” of the French semiosphere, that is, the idea that its nature and development is essentially defined by a collective effort to find rational solutions to the many problems of life in common. Anthropologists hinting at the existence of “several forms of rationality”, as well as legal scholars suggesting that not all in the French legal system deductively descends from rational axioms — as the national juridical rhetoric, instead, would like to assert — all seek to deform the French semiosphere in the sense of bending its shape so that it acquires a different center, an internal core that is

displaced toward other semiospheres (for instance, that of the societies in which there is more room for the coexistence of a plurality of cosmologies and legal imaginaires). On the other side, other attempts at “re-centering” the French semiosphere might pull it toward the opposite direction of reaffirming the generating capability of its inner core, in the sense of a progressive “rationalization” of deviant phenomena: in the domain of law, for instance, in such case the solution to internal semiospheric tensions does not consist in the introduction of the sharia into the French legal system but in rationalizing the sharia according to the textual hermeneutics of the Enlightenment. When these two centripetal and centrifugal tendencies manifest themselves with equal strength, then a symmetric configuration between polar agencies takes place in the semiosphere; on the contrary, when one of these polar forces exceedingly prevails over the other, then asymmetry of sociocultural trends manifests itself in the semiosphere, radically changing its internal topology.^⑪

To resume: the first step to identify the fractal dynamics of the semiosphere consists in positing its essentially radial nature, meaning that 1) each semiosphere is endowed with a center containing its generating principle and the texts that enshrine it and 2) cultural agencies in the semiosphere can be arranged depending on whether they configure symmetric or asymmetric “fields of force” therein: on the one hand, symmetric fields of force will generate tensions that maintain the topology of the semiosphere (i. e. , they do not alter the position of its center in the diagrammatic representation of a culture); on the other hand, asymmetric fields of force tend to bring about a decentering of the semiosphere itself and, eventually, lead to radical changes in its identity (Leone 2016).

To give another example, the present-day evolution of the political arenas of many European countries such as Italy, Spain, France, Portugal, Greece, etc. manifests quite a dramatic switch from symmetrical to asymmetrical semiospheres. In the

past, in most of these countries, political macro-agencies would arrange themselves along grand polarizations, whose internal tensions would contribute to the dynamic nature of the political semiosphere but at the same time would not generally entail the displacement of its center. The topology of most of these political arenas would characteristically feature two diverging wings along opposite but essentially symmetric directions. In the second decade of the 21st century, the bi-dimensionality of this symmetry has been complicated by the massive introduction of an alternative polarization; that between opposite hermeneutics of the democratic principle at the core of post-WWII political semiospheres has been increasingly accompanied by a polarization opposing pro- and anti- system political forces. The addition of this polarization, though, has not generated a further symmetric field of political forces but has deformed the pre-existing polarization. In many European countries, today, citizens can adhere to either pro-system or anti-system right-wing ideologies as well as to either pro-system or anti-system left-wing ideologies. The encroaching of the meta-polarization (pro- or anti-system) on the subjacent ideological polarization (left or right) does not simply generate a four-possibility combinatorics but the progressive deformation of the entire semiosphere and the consequent displacement of its center; the principle of political representation, for instance, seems to be more and more ousted from the semiosphere, entailing a radical disruption of its topology. The difficulty by which many European societies reach a democratic majority, capable to express a stable government, is dramatically different from the difficulty that the same societies would face in the past in this domain. In the past, a majority was not found because opposite political agencies around the center of the semiosphere would exert equally powerful forces, leading to a forestalling that, usually, new elections run according to renewed propaganda strategies could unblock. Presently, a majority is not found not because equally powerful

agencies pull the political semiosphere toward symmetrically opposite directions but because some of these agencies do not recognize the center itself of the semiosphere anymore; that is, they actually work for a radical mutation of the political topology.

5. A typology of symmetries in the semiosphere.

Given the possibility of distinguishing symmetrical and asymmetrical dynamics of meaning in the semiosphere, the next step consists in articulating a typology of symmetries. In geometry, symmetry can be observed under *rotation*, *translation*, and *reflection*. Topology under rotation is observed when rotating a circle around its center does not change the circle in any way. It is not difficult to apply such a definition of symmetry to the semiospheric diagram. As it was pointed out earlier, there is no semiosphere without a center. Verifying that a semiosphere manifests symmetry under rotation means realizing that its internal structure is not altered by a more or less dramatic change in the direction of its external polarizations, that is, the position that the semiosphere holds in relation to the external world of meaning (or absence of it). Often, national cultures undergo this “rotation” when they pass from the sphere of influence of a certain geopolitical superpower to another. This passage usually diametrically changes the orientation of the national semiosphere in relation to the external semiotic world (an Asian country and its society, for instance, ceases to be in the sphere of influence of Japan and starts to be in that of China); however, in certain circumstances, this transition is not interpreted as an occasion to completely restructure the internal logics of the semiosphere (for instance, from a pro-capitalist to an anti-capitalist ideology of meaning), but as a re-orientation that, on the contrary, precisely serves the purpose of maintaining the essential and definitional core of the semiosphere unaltered. The semiosphere rotates on itself but the positioning of its center in relation to the peripheries

does not change.

The case of symmetry under translation is different. It implies that displaying the focus of observation from a point *a* of the semiosphere to a point *b* will not lead to observe any substantial change in the structure of the semiosphere itself. Symmetry under translation in a semiosphere, therefore, can be observed mainly in societies whose organization of meaning does not imply a noticeable difference between the center and the periphery. In simpler, visual metaphoric words, these semiospheres are organized like a honeycomb, in which one can still recognize a topological center but cannot recognize a structural center anymore, since the entire configuration of the semiosphere reproduces all over again the same hexagonal pattern. Semiospheres that reveal symmetry under translation are usually small and compact, such as those of tribal societies or those of societies whose dictatorial central power has had the capacity of permeating the entire structure of meaning of the semiosphere. From an external point of view, for instance, one might expect that the present-day culture of heavily despotic societies such as contemporary North Korea semiotically functions as a honeycomb, in which the generating principle maintained in the core of the semiosphere itself (namely, the ideology of “*juche*” ([주체], “self-reliance”)) gives shape to every cultural manifestation therein, without leaving any room for divergent or idiosyncratic meaning formations. It is not hard to understand why despotic regimes bring about semiospheres that manifest symmetry under translation: in a semiosphere, creativity and change are provoked by the fact that the structuring power of the center — where the “text of the culture” lies — progressively “loses grip” on the circulation of meaning in the semiosphere itself as one proceeds from this center toward the peripheries, where the production, diffusion, and even destruction of meaning are more and more influenced by alternative, competing semiospheres situated beyond the translating filter of the semiospheric frontier.

This phenomenon can often, although not always, be observed in relation to geopolitical boundaries: as one approaches the frontier between Italy and Austria, for instance, one realizes that the grip of the semiotic ideology of the national culture on this part of its controlled territory and its meaning production becomes looser, to the point that not only a different natural language, German, but also different conceptions of life as a whole start to predominate. In a democratic society, the political expression of the center recognizes the physiology of this phenomenon (the dwindling, throughout the semiosphere, of its power of determination) by translating it into suitable political compromises, such as the attribution of relative political autonomy or the emplacement of a federal state. On the contrary, in a despotic country like North Korea, the space of the semiosphere that is closer to the both cultural and geopolitical frontier of society (for instance, the borderline with South Korea) is exactly that in which the most vigorous control is exerted, so that this liminal area too faithfully reproduces — like in a honeycomb, indeed — the meaning configuration of the center.

The third type of symmetry is observed in a semiosphere when it undergoes an operation of reflection. Such operation implies that the semiosphere contains not only a center, but also an axis, an imaginary line created by the symmetry of fields of semiotic forces created by contrasting but parallel agencies around the center. The division between Guelphs and Ghibellines, that is, the factions supporting the Pope and the Holy Roman Emperor, respectively, in the Italian city-states of Central and Northern Italy, was largely one configuring a semiosphere characterized by symmetry under reflection; the axis dividing these two orientations, indeed, would not separate different political systems, but different choices in attributing the same power, with essentially the same modalities, to either the Pope or the Emperor. Whereas the opposition between the monarchic and the republican factions in the history of many

contemporary European states would separate radically different ways of conceiving and attributing political power (by dynasty *versus* by democratic election), Guelphs and Ghibellins would symmetrically differ in the way in which they identified the supreme authority but would substantially endorse the same modalities and principles of its attribution (although in specular ways, like in a reflection, indeed).

A fourth, crucial way of observing symmetry in a semiosphere is under *magnification*. That is the characteristic operation that reveals fractal structures: when magnified by an appropriate factor, a small part of an object looks very much like the whole object. In order to verify the possible fractal nature of a semiosphere, or even of *all* semiospheres, one should make sure that:

1) The semiosphere has a topology whose diagrammatic representation is not simply bi-dimensional but tridimensional; in other words, in order for a “meta-semiotic eye” to be able to “zoom in” into the structure of a semiosphere and discover that one of its parts features the same pattern as the whole, the semiosphere itself must be conceived as a layered configuration, which can be observed from far — as a whole — or from near, as a series of parts;

2) The idea of “looking like” should not be interpreted as identity, but as deep structural resemblance; a literary text cannot exactly “look like” the semiosphere in which it circulates, for the simple fact that the former is a narrative artifact endowed with a verbal signifier articulated in several superimposed layers of meaning, whereas the latter is a topological diagram whose essential discourse is visual (although it is commented upon by a usually non-narrative verbal meta-discourse).

Introducing fractal symmetry implies that, although a semiosphere that is rotated, translated, or flipped does not manifest any symmetry, such symmetry can be revealed, nevertheless, by magnification, that is, by comparing patterns of signification at hierarchical discrepant levels of its tridimensional structure.

For instance, the present-day Spanish semiosphere might not feature any symmetry in terms of rotation (for its re-orientation from Franco’s substantial autocracy or inclination toward despotic powers toward the US sphere of influence has deeply rearranged its internal dynamics), in terms of translation (for the Catalan territory, as well as the Basque one, show configurations of meaning and structuring ideologies that radically diverge from those in the center, to the point of being on the verge of configuring new frontiers, with new centers), or in terms of reflection (as it was pointed out earlier, in Spain too, the traditional political polarization between left and right, socialists and liberals is deformed by the new opposition between pro- and anti-system forces); symmetry, however, can still be found upon an operation of magnification. If the “semiotic eye” zooms in on the discourse of present-day Spanish fashion, for instance, it will find configurations of meaning (the exuberance of colors, the discovery of natural materials, the reuse of marginal or local traditions, the echo of Moorish or gypsy visual cultures, the overall lighthearted, cheerfully ironic allure) that manifest in visual and textural terms a “form of life” permeating the entire Spanish semiosphere — and deeply affecting also the Latin one — a form of life in which a semiotic and temporal ideology of defiance toward the existential adversities that the future prepares, or even a certain insouciance toward them, predominates.

Brands like “Desigual” and “Camper” are quintessential vestimentary specimens of the Spanish semiosphere exactly because their inner semiotic mechanism — that thanks to which they are able to produce clothes and shoes — structurally resembles

that thanks to which the whole Spanish semiosphere produces its cultural artifacts and, more generally, its forms of life. The recognition of this symmetry under magnification allows, then, the semiotic meta-discourse to ascertain that fractals of a superior level of the semiospheric hierarchy are themselves mutually fractal; for instance, although the textual and narrative complexity of the Quixote is incomparable with that of Desigual clothes, they are somehow fractals of each other since they both partake (although to different extents) of the same hierarchically superior semiotic ideology and form of life, which the meta-discourse of semiotics could tentatively define as “a nervously ironic look on meaning”.

6. Conclusion: fractal symmetries between culture and nature.

Cultural semiotics should aim at transforming the impressionistic perception of these relations into the schemes of a rigorous meta-language, able to univocally describe the operations according to which, by magnifying the structure of a semiosphere, fractal patterns can be singled out in the folds of its lower hierarchies. This meta-operation, as well as those that allow the researcher to recognize other semiospheric symmetries, is of course complicated and risky, fraught with all the multiple biases that the application of a structural meta-language to such a complex object as “culture” can entail. The ambition of transforming the recognition of cultural patterns into a methodic and even metric observation, however, is essential not only in order to fulfill the scientific and empirical self-definition of semiotics, but also to link its analytical endeavors with those of the “naturalistic pattern sciences”.

What if, by appropriately “zooming in” into the semiosphere, fractal structures will be found not only in the texts that circulate through it but also, even more surprisingly, in the cognitive dispositions that have given rise to such texts? What if the Quixote

did not express only adhesion to the general patterning “mode of existence” of the Spanish culture at a crucial moment of its history but also a “cognitive typology” that manifests itself in that mode, as one of the possible “patterning styles” that the human brain can express?

Introducing a topological perspective, and specifically a systematic attention to the presence and role of fractal patterns in the semiotics of culture, will serve a both theoretical and practical purpose. On the one hand, it will allow researchers to detect and formalize parallels and divergences among the different layers that compose not only texts, but also entire semiospheres. If singling out the “text of a culture” of a society, that is, its signifying formula, is the ultimate goal of cultural semiotics, that will be more easily reached by adopting a common and dynamic analytical framework at both the macro- and the micro- textual level. On the other hand, the topological theory of fractals, even at a relatively superficial level of its mathematical understanding, will provide researchers with the ability to inter-subjectively formalize their hypotheses about how the internal structure of a semiosphere evolves under the pressure of both external cultural influence and internal rearrangement.

Notes

① Montbéliard, France 2 September 1923 - Bures-sur-Yvette, France, 25 October 2002.

② René Thom formulated the hypothesis that mathematical models for the description of abstract topological configurations might apply to the study of both natural phenomena and semio-linguistic dynamics, considered as the formal interface between nature and culture. Developing some of the formal conceptions of language and meaning first conceived by Danish linguist and glossematic Louis T. Hjelmslev, Thom thought that the forms of language could be grasped through a topological and morphological perspective; Jean Petitot further explored this hypothesis, through linking the universal schemes of meaning generation of Algirdas J. Greimas’s semiotics with both the empirical research of cognitive and neurosciences and the mathematical modeling

tools offered by abstract topology.

③ One could mention the impressive epistemological influence of the theory of “mirror neurons”, first formulated by Giacomo Rizzolatti and Vittorio Gallese, and applied to meaning and language by Michael Arbib and a number of present-day cognitive scientists (see Arbib and Rizzolatti, “Language”).

④ The brain is certainly the physiological source of human language, but its activity produces traces not only within the brain but also outside of it, in the form of culture shared, memorized, and reproduced by a culture throughout time and well beyond an individual brain’s span of life.

⑤ As the present paper will argue in several passages, cultural analysis should inquire not only about culture meant as deposit of symbolical forms non-genetically transmitted by human groups throughout time, and not only about nature, that is, that which lies outside the domain of language and semiosis, but also about “second nature”. Second nature is that particular aspect or dimension of the natural world that is brought about precisely because of the presence and permanence of linguistic and cultural activity.

⑥ Warsaw, 20 November 1924 – Cambridge, MA, 14 October 2010.

⑦ Philadelphia, PA, 16 December 1901 – New York, NY, 15 November 1978.

⑧ The brain is an element of nature whose peculiarity is that of changing its material structure as a consequence of its own activity and interaction with the environment. That is why brains bring about cultures but the opposite is also true.

⑨ Petrograd, current Saint Petersburg, 28 February 1922 – Tartu, 28 October 1993.

⑩ In order to analyze artifacts as “texts”, however, semiotics and cultural analysis should adopt a non-strictly literary definition of this concept; in structural semiotics, “text” is whatever orderly arrangement of material signifiers that the analyst, in accordance with a certain hermeneutic culture, isolates as significant in relation to a con-text. The study of textuality, therefore, includes that of materiality, since no material is significant without entering in a cultural matrix of semantic associations and connotations (iron, for instance, does not mean anything per se, as material product of a certain subatomic and chemical structure, but as element of nature that is re-written by a given culture).

⑪ This position is tantamount to a form of semiotic essentialism if and only if this is nuanced through awareness that nothing is naturally and permanently at the core of a semiosphere, but lies there as a result of a complex historical

and cultural negotiation which, as a consequence of more or less dramatic cultural change, could give rise to radical and sometimes revolutionary dislocation of the semiosphere’s kernel. The essentialist effect is a byproduct of the particular perspective that most members of a society adopt in relation to the semiosphere that surrounds them, and that often changes in such a steady but slow and imperceptible way as to give them the impression to be an immobile, almost natural symbolical environment.

⑫ Cultural semiotics and the analysis of meaningful patterns through fractal topology leads, therefore, to a formalization of what a more impressionistic philosophy of culture would call “dialectics”: dialectics between opposite and rival cultural forces often take place in a society, yet their result is different depending on whether balance or unbalance characterizes the strength of the cultural agencies at stake.

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