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Abstract

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The Number – Genesis and Structure

The notion of number is ordinarily associated to that of quantity illustrating our orientation towards the concrete's measuring and inventory. In spite of this, along history, the ideas regarding the Number meant something else as well, the Number being a concept that humanity could always refer to, and being always associated to philosophy and magic¹.

An interesting historic phenomenon makes diverse cultures from different geographic spaces and situated at considerable distances one from another to develop very close mythical-symbolic themes. The notion of number is no exception. Therefore, regardless the used number system, different cultures give the numbers, besides their natural being and pragmatic quantitative aspect, spiritual elements.

The historic perspectives from which this phenomenon can be interpreted are multiple and opened to discussions. Though, an extremely interesting approach of the subject has I.P. Culianu who adapts the fractals' theory to the history's reality. For him, History is a general phenomenon consisting of a series of repeated particular histories in a given space and in a limited time. Any event taking place in the space-time continuum is part of these series of histories that contain one another and develop infinite ramifications, reflecting themselves in a space whose dimensions tend to be infinite². History is comparable to a fractal which develops in

¹ Ghiyca, M, C. *Filosofia și Mistica Numărului*, Univers Enciclopedic, București, 1998 pp.9-10

² Eliade, Mircea; Culianu, Ion Petru, *Dicționar al Religiilor*, Editura Humanitas, București, 1993, pp.15-16

the Hilbert's³ space. In other words, from I.P. Culianu's perspective, history is an infinite ramification that complies with a certain rule developed in a space having an infinite number of dimensions. Therefore, the key to decipher history is to find the series of the rules defining this complicated structure that seems to be a fractal.

Certain traditions can offer similar information, in more or less different forms, because they are produced according to a *hermeneutic principle* and not because they would have a common origin in an ancient cultural model⁴. The cognitive hypothesis assumed by Culianu⁵ consists of the fact that „a simple set of rules would generate similar results in people's minds during a virtual infinite period of time”⁶.

From this perspective, the material taken as starting point in elaborate this work, although it derives from the three different cultural traditions (Hellenic – Eastern, vedic and taoist), manages to offer the necessary premise to approach the concept of the number as a generating principle of the rules on which the genesis and the form's structure in particular and of the sensitive world in general is based on.

From Culianu's structural thinking's perspective, the *concept of the number* is part of the *ideal objects*' category. Being described as ideal programs of some concrete manifestations which can take different forms according to the characteristics of the environment where they evolve⁷, they are defined as abstract notions: „the ideal objects are systems that operate within a logical dimension and cannot descend under their premises (as simple as they are)”⁸. The ideal objects can only be thought of, never being perceptible, except through their effects, because they belong to a dimension that is superior to that we live in. Therefore we

³ Hilbert's space is mathematically defined as a space with infinite dimensions.

⁴ Gavriluță, Nicu, *Culianu, jocurile minții și lumile multidimensionale*, Editura Polirom, Iași, 2000, pp.118-120

⁵ The topic is about “the cognitive remittance”'s principle. This, together with “the creative synthesis” principle are the source of the cultural models' generation, always renewed during history.

⁶ Culianu, Ioan Petru, *Călătorii în lumea de dincolo*, Editura Nemira, București, 1994, p.41

⁷ Ioan Petru Culianu, *Arborele Gnozei. Mitologia gnostică de la creștinismul timpuriu la nihilismul modern*, Editura Nemira, București, 1998, p.23

⁸ *Ibidem* p.28.

have to build a system that would allow us a more complete vision of the ideal objects, but only by studying the shapes they take in time: „*the ideal objects exist in their logical space, and their morphodynamic constitutes the correct way of approaching for a comprehensive understanding of the history*”⁹ .

The 1st chapter – *Numerical Principles – The Structure and Dynamic of a Sacred Geometry* – has as a starting point to examples belonging to civilizations whose distance in space is as big as the differences in mentality. In spite of this, both in the taoist tradition and in Pitagora’s one we find the common element of a cosmogony where the concept of the number is the principle that stays at the base of the genesis and the entire Universe’s structure.

We can easily recognize Pitagora’s teraktis’ description, *The Sacred Ten* in the birth of the *ten thousand things* from Lao Zi’s *Dao De Jing* – two almost identical manifestations of the same „ideal object” that condenses within the concept of the number and a decimal number system. Within the determination’s frame created by a decimal number system, the numbers from 1 to 10, understood as principles of structuring the Universe, form a series of ideal objects system subordinated to a more comprehensive ideal object associated to the general concept of Number. They can be considered as morphological parts of an universal grammar, and these elements’ relation rules circumscribe this grammar’s syntax.

Along this work’s 1st chapter, the ten fundamental elements of this grammar will be defined as independent units having a specific information content, each element being situated in a succession capable to reveal both each element’s specificity and the interdependence between them. The number becomes the coherent element of a continuously growing/changing Universe.

The path in making a complete „panel” of each number as well as of the geometry associated with it consists of the elements and notions coming from different domains, such as Mathematics, Philosophy, Natural sciences, Arithmosophy and Gnosis.

⁹ Ibidem. p. 38

Bringing together concepts belonging to domains that usually don't get along very well, may be seen now from the ideal objects morphodynamics' perspective, the concepts connected with the number in each domain being perceived as different forms of development, on diverse holders of mental and cognitive organization of the same truth. This process pursues to define these principles building a general image of them, as we would build the image of a three-dimensional object using the descriptive geometry's methods, starting with its plane projections.

Along the description of the ten numeric principles from the 1st chapter, the author pursues that the rapprochement of the symbolic Universe of each number be done from the perspective of their relation with the world of forms, the way of doing this being the number's approach from the perspective of the figurate numbers. Generalizing Umberto Eco's definition of the tetraktis, the figurate numbers can be defined as figures that *„perfectly and exemplary condense the number's reducibility to spatial, and arithmetic to geometrical”*¹⁰. From this perspective, each number's description contains a reference both the numerical principle and to its transfer potential into the world of forms.

Figurate numbers start practically with triangle numbers whose arrangement that respects the triangle's structure defines their characteristics. Next to them we have square, pentagon, hexagon numbers, etc., each of these numbers undertaking the structural character of the proper polygon – square, pentagon, hexagon, etc. Figurate representations of the numbers require a reference to the convex regular polygons from the perspective that they can be cyclic polygons.

Within this context figurate numbers' reference to the circle has a particular importance because it allows the geometrical formalization of the numbers 1 and 2. We attributed the circle to the number 1 and the circle sectioned by its diameter to the number 2. For the rest of the figurative numbers' representation the infinite series of the cyclic polygons that can be wrote in a circle follows.

¹⁰ *Istoria Frumuseții*, Ediție îngrijită de Umberto Eco, Editura Enciclopedia Rao, București, 2005, p.64

We give a special attention to the circle's division and to the operation of passing from the one to the multiple. The measurable result of the circle's division process is the regular polygon having more and more sides. The infinite division of the circle's circumference leads us to getting a polygon with an infinite number of sides.

The obtained polygon's sides' continuity tends to remake the curve line of the circle's circumference. The circumference with infinite sides can be considered the passage from a geometry based on the broken line (specific for the polygon like constructions) to the closed inside curved line's geometry (generating the circular form). This way it becomes the symbol of the multiple's reinstatement in the one. The number 1 becomes a concept - symbol of the Unity that contains within the infinity of the existential aspects.

If the number One states the existence in itself, the number Two „dissociates” from this allowing the potential manifestation that results from the One and has the purpose of separating the subject from the object. This first dissociation in the divine conscience is reflected in the Creation in the form of the polar opposite principles, either in antagonistic or complementary relation.

The number 3 is considered in all the cultures a number that expresses in a synthetic way the complex organization of the Universe. It reveals the triple unity of the living creature and results from the number one's and two's union. It represents the ONE's neutrality capable to attenuate the excess of each polarity. The number 3 is constituted as a threshold, a bridge between the first stage of the manifestation, where the creature organizes itself, and where the universe-cosmos is structured.

If the number 3 is the creature's inner space's number, the number 4 is connected with what is considered to be the exterior to the creature. It organizes the exterior space and becomes, as we shall see, the instrument of orientation within the three-dimensional space. The number 4's symbols are connected with the idea of stability and overlap the geometrical figure's symbolism – the

SQUARE. The basic characteristic of the square is the **right angle** considered to be a consequence of the number 4 in the form's world.

If the number THREE permitted and determined the construction of a plane figure (the triangle), starting with the number 4 we can leave the plane's bi-dimensionality. Four equidistant and no coplanar points define a three-dimensional figure.

Within the stability and order governed by the number 4, a refine of the creation is made through the number 5. The number 5 introduces in the world of forms the dynamic harmony between the part and the whole. The geometrical representation of the number 5, the pentagon, brings into the discussion a particular proportion known as the **golden section**.

Formed of two times the number 3, 6 bring the entire symbolism of the double numbers which is also reflected in the star shaped hexagon that consists of two superposed triangles. The numbers 2 and 3's product, unlike their sum, cumulates the qualities of the two numbers in a way characterized by **balance**.

David's star is the symbol which, due to the two triangles' different orientation, reveals the simultaneous transcendent and immanence of the UNIQUE in its manifestation.

If until the number 6 we assisted to a process of "emerging from the inner self", of exteriorization, starting with the number 7 we are confronted with a change of direction. The number 7 marks the path towards the initial unity's remaking which naturally appeared when the creature self-evaluates itself. The number 7 is the balance point between the potential diversity of the exteriority and the interiority's unity.

From the human being's perspective, number 7's relation with the primordial unity symbolized by the circle is very special due to the fact that the circle cannot be exactly divided by 7 using geometrical means. The fundamental and universal significance of the number 7 is, with no cultural exception, the sacred.

As well as the other double numbers, the number 8 marks a principle of the opposites' reconciliation. The star shaped octagon, obtained by overlapping two squares rotated with a 45° angle one from another, is a geometrical structure where the dynamic and static balance is mutually intensify, the number 8 being considered everywhere the cosmic balance's number.

If the square symbolizes more the visible aspect of the physical world, the octagon and the star shaped octagon's varieties involve, among „tangible” things, the subtle aspects of the creation, being a synthesis of all „the seen and unseen” things.

The number 8 closes a cycle of seven, being considered a new beginning. An image of a spiral development is given, where each „eight day” is in the same time a day for resting, overlapping the number seven's symbolism, but being also, in this context, a day to initiate a new process found on a superior level of understanding. Seen in this way, the number 8 can be considered a gate between two worlds with different vibrating frequencies, marking the passage from one manifestation's octave of vibration to another, from a level of understanding the Universe to a superior one.

The number 9 is the symbol of the Universe's completeness and perfection, being the sum of the three worlds $3 + 3 + 3 = 9$ – heaven, earth, and hell. Being the last number from the decimal series, 9 is in the same time a number from whose perspective the entire process of the Number's understanding as a structuring element of the Creation can be seen and understood.

After 8, the symbol of the balance but in the same time of the passage from one octave of knowledge to another, number 9 is the number of all **understanding**. Being considered the end of the cycle, it contains the qualities of the previous numbers. Allendy¹¹ considers number 9 to be „*the complete number of the total analyze*”. From this point of view the enneagram's symbol is one of the most complete instruments of analyzing the knowledge in any field of activity.

¹¹ Allendy, Rene, *Le symbolisme des nombres*, Paris, 1948

The number 10 reflects the perfection of the entire manifestation which, at this level, becomes unitary again. It is perceived here as a return to the uniqueness which is understood from the perspective of knowing all the aspects connected with the multiple's covering. Through the decade the creation's diversity is seen from the perspective of the initial uniqueness. The knowledge becomes complete and the cycle of the two previous numbers is fulfilled. The number 10 is considered a limit of the numbers because beyond it the numbers do not continue, they begin again¹². The DECAGON, the geometrical expression of the number 10, is the figure that in diverse ways restarts the proportion already seen in the pentagon: *the golden section*.

If within the first chapter the references to different cultural spaces are structured on the pitagoric figurative number's concept, the second one, **Arithmetic and Geometry**, restricts the reference perimeter to traditions belonging to India's cultural space¹³.

The numeric principles previously described are included in the so called „Vedic Square”, a numeric matrix that presents the numbers in a relation of dynamic and creative interdependence.

Geometrical formalizations associated here with the numeric principles present a specific influenced by their reference to the square's structure, being totally different from the geometrical solutions presented in the first chapter, which derived from the reference of the same principles to the circle's geometry.

In a first stage the two approached modalities in our research regarding the possibilities of finding geometrical equivalents of the numeric principles appear as different directions, having no common points.

The second and the third part of the second chapter give us a surprise which can be considered as an authentic contribution that the author brings by this work revealing an indisputable connection between arithmetic and geometry.

¹² Abbe Désire Marchand, *La Science des nombres d'après la tradition de la science*, Paris, G. Tegui, 1877,

¹³ The tackled material comes from the tantric numerology's tradition but it cannot be separated from the larger frame given by the samkhya philosophy.

It is demonstrated that the „Vedic Square”, being known to the mathematicians captivated by arithmetic as a table that systematizes the remnant of the division by 9 in a decimal numeric system, describes through the numbers’ succession included in its columns all the geometrical possibilities (the convex variant and all the star shaped variants) of the regular polygon having 9 tops (cyclic polygon).

The demonstration is extended later to other squares obtained similar to the Vedic Squares, but where the calculation algorithm is done using other **number bases**, different from the decimal one. The relation between the numbers (from the columns or the lines of these tables)’s succession describes each time the regular polygon’s structure that has the tops’ number equal with the maximum number of the numeration system used as a calculation base.

The theoretical development of this part of the work proves to be an unquestionable reason regarding the correctness of the association, within the first chapter, between the numeric principles derived from the unity and the regular polygons’ geometry resulted from the circle’s division.

According to us the theoretical reasons developed in the first two chapters circumscribe the works’ thematic described in the third chapter. Under the generic title **The explicit and the implicit number in the work of art**, based on the visual material created and commented by the author, three different attitudes regarding the way in which the Number can be involved in the artistic creation can be devolved.

The first three works presented in this chapter’s content „Windows“, „Devices for watching the sky” and „Vedic solids”, deriving from the Vedic Square, recommend a series of objects where the numeric principles lead directly to a geometry strictly and rigorously determined by precise rules of organizing the form, the obtained result being a series of compositions with an abstract character. In a dialogue with the recommended plastic means of their formalization, the works, carrying the entire baggage of information and symbols of the numeric principle they derived from, have the chance to be transformed into real visual metaphors.

The next two works, „Sacrifice” and „Chrysalides”, the Number doesn't necessarily impose a certain geometry for the compositional structure. In these works' case, the compositional organization is tributary not to an algorithm of transfer, more or less objective, but to the symbolic content that the number has. The work of art opens toward a plastic formalization that allows not only abstract representations, but also figurative.

The third way in which the number's presence can be found in the work of art may be characterized as the reverse of the process through which the numeric principles lead to the form. In this case, deciphering an object's or a plastic composition's structure sends to a subordination to a numeric principle. The particular case of the work „Light and Nature”, starting with the geometric structure imposed to the plastic composition of the different ways of constructing the perspective in painting, develops a dialogue of such notions as zero and infinite.

We have to admit that the three ways of approaching the plastic composition from the perspective of the logic that involves the presence of the number, implicit or explicit, pursues, each in its specific way, the approaching of an aesthetic ideal according to which art's purpose is not to be an imitation of nature, but an artistic step, surpassing the temptation of the sensitive imitation and tending to reach the pure essences of the real.