Concerning Matila C. Ghyka and Visual Beauty (IV)

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Abstract:

Selected from a more extensive research paper ("Matila C. Ghyka and Visual Beauty"), this study includes a few details about Matila C. Ghyka (b.13.09.1881, Jassy – d. 14.07.1965, London) and visual beauty, considered as a whole as an expression of the golden number (phi=1,618...) and of harmonious characteristics, both in his aesthetic vision and in general. This section contains a series of references to conceptual antecedents and enduring significances of compositional harmony that converge when considering beauty from a mathematical perspective. By its very abstract system, the scientific approach certifies for Matila C. Ghyka the permanence and the plurality of harmony in the visual medium, within which the golden number has an essential and invariable function as a constitutive factor, both for natural and artistic beauty.

Keywords:

The complex issue of visual beauty implies not only overall vision, but also the consideration of concrete values, whether they are local creations or cultural conceptions. In the universal and European context, this fact can provide a fairer assessment of our spirituality since Romanian values or those of Romanian authors still demand both local and foreign research and acknowledgement. Matila Costiescu Ghyka (b.13.09.1881, Iaşi – d.14.07.1965, London), better known in other parts of the world than in his native country, is such an example, because his aesthetic concerns (he was self-taught) make him a pioneer in aesthetic thinking of interest in the first part of the 20th century. We will present different aspects of his activity – carried out on three continents (Europe, Asia, and America) – of this genuine Renaissance *uomo universale* as he actually wanted to be, activity which was also dedicated for a time to Romania, where he could not return after the instauration of the Communist regime. Though deeply rooted in classicism, Matila C. Ghyka

drew knowledge his whole life from one domain or another so as to find out as much as possible, to gather evidence, to make connections and then offer them back to the whole world.

Matila C. Ghyka (the erudite grandson of – on his paternal side – Grigore Ghika V, the last Moldavian ruler, who lived in the nineteenth century before the unification of the principalities) studied, travelled and worked with great tenacity and inner patriotism permeating in all his activities. Engineer, naval officer, mathematician, diplomat, historian, aesthetician, teacher and writer, Matila C. Ghyka (as he is characterized in the well-documented presentation made by Vasile Cornea on Wikipedia.org) may seem to us now, 50 years after his passing, a novel precursor of a post-modern attitude, suggested especially by the florilegium expressing his particular concerns, activities and various writings. Of all, those with aesthetic themes have the merit of bringing back in the public eye a continuous recollection of the arts, from antiquity to modern times, of *the golden number and proportion, of rhythms and structures*, especially geometric structures. Also present in the natural environment, they are all mainly used and highlighted in architecture. From a more extensive research study on Matila C. Ghyka's concerns for visual beauty (Dominte 2008), we have selected only a few ideas while other artistic aspects (fractals etc.) will be presented on other occasions, together with the relationships that Matila C. Ghyka had with personalities from Romania (Pius Servien – Piu Serban Coculescu, G. M. Cantacuzino, maternal grandson of Prince Gh. Bibescu, etc.) and abroad (Paul Vallery, Salvador Dali, etc.).

We may deduce his aesthetic creed, that of natural or created beauty in intimate connection with *the golden number* (the immeasurable *"phi"* = 1.618 ..., a *matrix* of existence, which expresses the golden ratio or proportion that may comprise two correlated parts) from his articles published in *Symmetry*, collected mostly between 1939-1947 (publishing period), by his friend, architect George Matei Cantacuzino, another classicist with far-reaching views. From articles such as *Science and Aesthetics* (Ghyka 1938), *Architecture, Symmetry, Proportion* (Ghyka 1939: 51-53, 55-60, 60-64), we find that structural beauty also implies, besides *the golden number*, rhythms, cadences, eurhythmy, symmetries, and asymmetries, all highlighted by aesthetic ratios and proportions.

Moreover, with regard to the lyrical and scientific language, Matila Ghyka noticed a convergence in literature and the arts and in architecture and music (when the connection between forms and meanings or ideas is made). Especially in music, *the number theory* finds obvious application through sound functions and structures with their differences. "In Matila Ghyka's aesthetics, *pace* arises from the effect of *proportion* on *cadence*, being therefore a function of some proportions and, obviously, of *the golden number*" (Iliescu 1981: 491).

Regardless of the nature of embodiments in natural and created reality, *the number, proportion and harmony* appear as determinative concepts and, at the same time, as investigative results on a course of training and procedural completion.

A century after Matila C. Ghyka's birth, as if validating the effects of his aesthetic endeavours on understanding "the properties of concrete objects," created by man and nature (inanimate or animate) and, implicitly, of works of art, whether constructions or otherwise, H.R. Radian believes that all are expressed by *form* (or *forms*), *proportion* (or *proportions*), a certain *order* (or *ordering*), and, in the case of proper proportioning, a certain *harmony* (pleasant appearance) as well (Radian 1981: 25-26).

> For an inanimate object – for example a work of architecture or fine art, to be well proportioned, so as to have a pleasant appearance, by encasing it in the universal harmony, its creator (architect or artist) must provide harmonic rapport between the parts of the object, each to the other, as well as between those parts and the whole. In common language, this is called placing the object in its *proportion*.

> The etymology of the Romanian word *proportion* is the Latin *proportio*, that Cicero considers synonymous with *comparatio*, which is synonymous with the Greek term *analogia* (*De Univ*., 4). (Radian 1981: 25-26).

In fact, proportioning is encountered everywhere, even when ratios are not necessarily harmonious. "An object which does not appear harmonious also has certain proportions, which do not satisfy the viewer's sense of aesthetics." When "all forms [...] pleasantly impress the eye", harmony is achieved, which is also "a possible trait of the object, different from proportion" (Radian 1981: 25).

The golden proportion amplifies the feeling of *harmony* and, along with other harmonic proportioning, confers to natural or man-made

objects, those beneficial images, which have positive effects both on human beings and other creatures. Just like Matila Ghyka, H. R. Radian monitors the proportions of some outstanding achievements in architecture, noting that many of those that have become benchmarks express, in whole and in detail, *the golden section* or *proportion.*

All these support the expression of the harmony of the parts and of the whole for which Matila C. Ghyka pleaded in all his works. In *From Number to Harmony* (Ghyka 1981: 25), Matila C. Ghyka pointed out that

> When we want to redefine, to imagine again the notion of number, proportion and ratio that are considered elementary, one possible method is to address the Greek sources that deal with the subject. Besides its reduced originality, this method does not lead, in fact, to a mental trajectory of "minimum effort". As such, subsequent references to architecture are preceded and supported by a series of presentations on Number, ratio, proportion. The Pythagorean doctrine is about numbers. Pythagoras, Plato and Nicomachus of Gerasa; pure numbers and scientific numbers; the Tetractys, Pentad, Decade; "the number of the soul of the world" and the theory of harmonic correspondences in *Timeus*; Macrocosm and Microcosm; the harmonic theory of Vitruvius' architecture; analogy, symmetry, eurhythmy. (Ghyka 1981: 25).

Referring to Plato's writings and to "the only complete treatise on the theory of numbers that antiquity passed on to us [...] that of Nicomachus of Gerasa" [1] it is considered "quite clear as to starting and often arrival points as well" (Ghyka 1981: 25), with the modesty of the researcher who is aware of the magnitude that he prospected and that he may express, Matila Ghyka announces his limitation to the presentation of the definitions "as such" and sometimes comments on them.

He proceeds by warning that "it is known that Plato's concept of the Number and the importance he attached to it ("Numbers, he says in *Epinomis*, represent the highest degree of knowledge" [...] then "Number is *Knowledge Itself*") are derived from purely Orthodox Pytagorism [2] (Ghyka 1981: 25, 42).

Nicomachus himself was a Pythagorean or rather, "an acknowledged neo-Pythagorean and his mathematical work is nothing but a carefully-ordered and clearly-drawn compilation of elements borrowed from the works of the brilliant School of Alexandria from which we generally inherited only the titles" (Ghyka 1981: 25). In the Library of Alexandria, in ancient times, many writings with valuable information

were kept, writings which unfortunately did not survive until today. However, the pyramids of Egypt, and not only them, show the presence of *the golden number* in ancient human creations, even in prehistoric ones, whether scattered or belonging to previous cultures. With new investigations and findings, archaeology rewrites history and philosophical and aesthetic inferences can receive extensions and openings to new interpretation valences.

Knowing the past, as much as possible, according to the remains and preserved information, always proves to be full of surprises. Quite often, older and newer discoveries reveal that between now and then there is often a *link*, a more obvious or subtle recurrence, on which only some trends (based on some realities of conjecture but also on appearances induced by transient assumptions) episodically exercised the role of segmentation.

Matila C. Ghyka insists that, although the definitions and comments regarding the Number

> will seem, at the beginning, to the reader that is unfamiliar with Greek mathematics, as if enveloped in an *a priori* metaphysics, discouraging for the honest rationalist that guided our initiation into mathematics [...] step by step, he will notice that the unusual tone of this starting point does not prevent reason from dominating the development and chaining of ideas and that this little mental Greek exercise allows then to trace, without effort, until today, the evolution and vicissitudes of an unusually robust conceptual system, more alive than ever, with all its crystalline core of pure thought. And maybe he will find that the suspicious glint of the metaphysical-philosophical cloud was not only a deceptive twinkle, but the light itself, that the Number Theory of today begins to resemble strangely that of Plato and Nicomachus while our physics and cosmogony would meet that of *Ieros Logos* [3] (Ghyka 1981: 26, 43).

Let us mention first that the very word *Logos* means in Greek rationality, reasoning and ratio (judgment, essential capacity of rational intelligence, in other words, correct perception of the relationship between ideas or things); this term, *Word*, essentially (as, later, "verb" in the Fourth Gospel), also means divine creative intelligence: Nicomachus would call God Creator *o tehnikos logos o tehnites theos*" [4]. (Ghyka 1981: 25, 42).

After a presentation of the two kinds of numbers differentiated by Plato and Nicomachus, "the Divine Number or idea Number and the scientific number", the former naturally being the ideal model of the

latter, of what we perceive in general as number" (Ghyka 1981: 26), it is supposed, in summary, "that both in the perceptible world, where only the structure, shape and rhythm are characterized by reality, and in the field of pure Idea, the number is the essence of Form; or form *par excellence*" (Ghyka 1981: 30); afterwards "the examination of the links or relationship between numbers" (Ghyka 1981: 30) is carried out.

The explanations that follow correlate mathematics and philosophy and prepare the ground for understanding of the concrete, harmoniously expressed in both human and natural creation.

Reversing a progressive order, we shall dwell first on a series of conclusions on the architectural environment, deductions of the applications that correlate the numerical relations within the natural and created reality.

From Matila Ghyka we find that:

> Trying to evoke, in the ancient manner, the notions of number, ratio and proportion, we stumbled however, quite naturally, on the concepts of rhythm (frequency or repetition in time or space, resulting from the series of agreements or proportions) and harmony stemming organically from it and we noticed by chance (if we may call it chance) that for our Greek monitors of "mental gymnastics", the perception of ratios and proportions is the same with the basic act of judgment and creative choice in general and that intelligence, in its function of knowing, or creative synthesis, ended in harmony or was even harmony itself [5] (Ghyka 1981: 39-40, 50).

In short: Beauty, Truth, and Goodness are one in this harmonic conception of Knowledge and Life.

It is natural that this "aesthetic" attitude of general philosophy should be fully reflected, *a fortiori*, in its corresponding Art, especially in the art of architecture, space harmonization; it is more than likely that contemporary architects, together with the thinkers who established rigorous mathematical harmonies and correspondences for some abstractions like the Soul of the World, should have been at least as rigorous in proportioning the temples they built for worship of the so "geometrising" Gods... In fact, these temples speak, or more, as in Valery's phrasing, sing! [6] (Ghyka 1981: 40, 50).

Perhaps intuitively, perhaps deliberately, or in a combination of both, Matila C. Ghyka (who lived in times of rapidly changing realities, from sublime to tragic, previous realities induced in a general sense and

actually lived in the time of the two world wars) ends up prospecting particular order and harmony in the beautiful, in directions in which Beauty merges with Goodness, providing Truth to some achievements whose substance usually exclude inspiration from the shadowy areas of existence. Should we refer to Arts, we notice that his preferences are for music (symphonic music), dancing, architecture and poetry to illustrate the presence of the *divine proportion*, rhythms and other factors, mathematically quantifiable that can generate and sustain harmony. He is not concerned to the same extent with exacerbated contrasts, shocks, astounding experiments, feelings of limited states. These are the effects of tensions that mostly feed prose and artistic films, and Matila C. Ghyka is particularly attracted to positive reality and for which, in fact, he pleads in his writings. He seeks and promotes the bright side of existence, even that related to illusion and living on coordinates that tend to the sublime, as a means of countering the aggressive aspects of life, in the spirit of sanity that aesthetics support in nature and art, in what visual beauty, sound and ideas can offer us within a complex whole.

In time, the choices and achievements through harmony provide a lesson for all artistic and functional creators who think about an assumed responsibility regarding the message they send and that is received in connection with their work or achievements, as well as everyday expressions as well [7].

Thus, Matila C. Ghyka proves to be a visionary when returning to the values of the past; for the future to exist, it must have a link from the present with the coordinates of balance and harmony, to which all technologies, whose numerical and therefore mathematical expression requires taking into account those beneficial coordinates and to which they should adhere. In addition, he demonstrates that classical culture does not necessarily mean being stuck in the past, but it provides a solid foundation on which to build usefully, not only now but also for posterity, regardless of the specifics of any certain field.

In *The Geometry of Art and Life*, Matila C. Ghyka includes in *Space Science*, "The Theory of Proportions" (that we shall present in *The Practical Handbook of Geometric Composition and Design*) and a study of regular polyhedra, reminding us of Plato's reasoning, of proportioning "solids and other special volumes." These issues have effects in time, so

that "this science of space" was the basic discipline, the aesthetic framework and the guide for painters and architects of the First Renaissance, also for Dürer (who, in the fall of 1506, came riding from Venice to Bologna, where Luca Pacioli lived in order to be initiated into the mysteries of a "secret perspective.").

Here we try to suggest that what was good enough for him, for Alberti, Leonardo, Vignola, etc., may be good enough for today's painters and architects. Not knowing the rudiments of the geometry of solid bodies is all the more surprising for painters with ideals and "cubist" trend [8].

Architectural beauty, seen through the golden number, rhythms and proportions, reveals its continuity in time and their simultaneity in different geographical coordinates in ancient, medieval, modern and contemporary civilizations. In the line of Matila C. Ghyka's aesthetic writings, in reference to *The golden section*, in *The Book of Proportions* (Principles and applications in architecture and fine arts), H. R Radian mentions that

the stellate Pentagon called *pentagram* occupies a prominent place in the philosophical and theological speculations of Pythagoras and his disciples. Therefore, the Pythagorean school of thought considered that the property of division into extreme and mean ratio – of giving the line of the regular convex decagon and line of the stellate Pentagon (i.e. of the pentagram) – is of divine nature. The Italian mathematician *Luca Pacioli di Borgo* (1445-1514) studied more closely this division into extreme and mean ratio and, amazed by its extraordinary properties, even called it *proportio divina* (divine proportion), resuming, under this name, the Pythagorean concept, reinterpreted, but in a form in which the Renaissance spirit combined with strong reminiscences of medieval mentality. Pacioli published these studies (1496) in a book entitled *De divina proportione* ("About the Divine Proportion"), illustrated by Leonardo da Vinci. But Leonardo, a scientific spirit, does not use in his writings the name *divine proportion* given by Luca Pacioli, but – for the first time in history – the name *the golden section.*" After that, *the golden section* continued to refer to, as in the past, division into extreme and mean ratio. Kepler called it proportional section. In the nineteenth century, mathematician Martin Ohm (1792-1842) – physicist Georg Ohm's brother – resumed in the second volume of his work, *Reine Elementarmathematik* ("Pure Elementary Mathematics"), the name *the golden section*, that is still used today (Radian 1981: 47).

From the history of *the golden section* we find out that it was considered by Kepler, who calls it "divine section", one of "the two treasures of geometry", the other being the Pythagorean theorem. Kepler

is also the one who places *the golden number or section* "in connection with the Fibonacci Sequence, with the growth of plants and cosmography." Statistical research in which Germany is involved in the nineteenth century gives to Zeising the satisfaction of the retrieval of the divine section in that report of dividing, through the navel, the height of a mature man. Through statistics of aesthetic appreciation of rectangles, Fechner and then Timerding found that most people's preference is for a rectangle whose lines have as result of their ratio *the golden number*.

> Further research, through measurements and geometric trails, of ancient architecture, Gothic cathedrals, etc., confirm either the conscious use of that proportion or the intrinsic and natural link between the most successful artistic creations and the human aesthetic sense. In the early 20th century, many researches were done in America: D'Arcy W. Thompson (1917), on the forms of growth, Jay Hambidge (1920), on the geometric lines on Greek vases, [and] T. Cook (1922) [...] introduces for the golden section the name "the golden number", noting it Φ. In Europe, Moessel and Lund (1921) are in charge of the proportions of Gothic cathedrals. Le Corbusier himself and the applied arts movement, including architecture, called Bauhaus (1920), used geometric lines based on the golden section. But the works of synthesis, including connections and analogies between different areas – mathematics, physics, philosophy, art – belong to the Romanian Matila C. Ghyka, *Esthétique des proportions dans la nature et dans les arts* (1927) and *Le nombre d'or* (1931). Recently, various researches and studies have been undertaken by English (Schalfield, Tons Brunes) and German authors (Hagenmaier, Wedepohl). Including the golden section in the more general issue of symmetry, in the line of Jaeger (1917), mathematician Hermann Weyl wrote, in 1952, a brief, *Symmetry* (Romanian translation, 1966). In our country, since 1960, there have been studies on geometric proportions and lines for architecture and in particular for Romanian folk architecture and Brâncuşi's sculpture (*Dicţionar de matematici generale* 1974: 256-257).

This golden section as well as the symmetries, rhythms, modulations, basic geometric shapes, fullness and emptiness etc. are often found in various places around the world.

Matila C. Ghyka particularly likes those of the Mediterranean and European areas, exporting to the New World of America styles and technologies. There, they become composite or go through spectacular leaps in virgin areas, where everything can be built again, experimentally, without the necessary connections to tradition.

Yet, in the very structures of systematization and adaptation of form to function, already established principles such as the squareness of the

access roads in an urban area are observed; the model is taken over from antiquity, when architect Hippodamos proposed it for new cities of the Greek colonies. Thus, aesthetics and functionality coexisted for the benefit of those who wanted not only to live well but to pass on material accomplishments of value to other generations.

In the event of reduced survival conditions, man-made beauty can only be parsimonious and synthetic because almost his entire mental and physical effort is mainly directed towards ensuring its existence and means of endurance.

Environmental conditions, religious beliefs and social, political, and economic situations influence the perception and achievement of beauty, the architectural reflecting more obviously the stages of the development of mankind.

If, from the point of view of the professional and of the profession as such, the essential principles of architecture are "mass, space and light" (Michelis 1982: 23), Matila C. Ghyka is particularly and in an abstract sense concerned with the detection in the built medium of the mathematical incidence, of numbers, proportions and geometric figures that are consistently found in different places and times. Matila C. Ghyka is not interested in the rudimentary, primitive and modest beauty, in its grandeur, but in the crafted, aristocratic, far-reaching beauty, in which he seeks the continuity of the *golden proportion* in time and space, like Ariadne's thread connecting antiquity to the present on behalf of harmony.

Thus, beside the terms we have mentioned and others that are connected to them, the Macrocosm and Microcosm, Man and Universe appear again and again in Matila C. Ghyka's language, who strives to convince us philosophically, aesthetically, and mathematically that the primordial springs of form can be found in an abstract register, detached from historical fluctuations.

Matila C. Ghyka's aesthetic writings, starting with highlighting the importance of the number and revolving around the orbit of *the golden number*, are considered as foreshadowing *informational aesthetics*, founded in 1956-1957 by the West German aesthetician Max Bense (b. 1920) and the French psychologist and aesthetician Abraham Moles (1920-1992).

The human feeling that he may be universal becomes clearer when he touches coordinates other than those of provenance or those he was used to. Regarding Matila C. Ghyka, the curiosity of prospecting in multiple directions and the influence of methods and procedures from realistic and humanistic fields highlight not only an example of interdisciplinary approach, but the very connection to the desired and boundless *universality*.

After all, *the golden number* (1.618033...), so retrievable at any level, both praised and controversial in certain situations, is actually an *infinite number* that is irrational, but included, paradoxically, in concrete finitude. It is in the artistic finitude that we see permanent facets of the manifestations of visual beauty.

Notes:

[1] Nicomachus of Gerasa (Gerasa, Greek colony in Palestine, founded by Alexander's veterans, γεροντες). Called "the Pythagorean", Nicomachus lived in 1st century AD and probably studied in Alexandria. Two of his works were preserved entirely: a *Handbook of Harmony* and *Introduction to Arithmetic*s (᾿Αριθμηιχη Εισαγωγη), many of his writings, *Arithmetic Theologumena* (*Arithmology* or *The Mysticism of the Number*) were also preserved in a compilation thanks to Iamblichus (4th century AD), author of the famous *Pythagoras' Life*, who also wrote an important commentary on Nicomachus' *Introduction to Arithmetics*. The most famous translation of this work is that of Boethius (Rome, 5th century AD) who had an enormous influence throughout the Middle Ages (Ghyka 1981: 25, 42).

[2] We would be tempted to say that Plato (427-347 BC) was an initiated man who took a vow of silence (Ghyka 1981: 25, 42).

[3] *Ieros Logos* (Ιεγος Λογος) or The Sacred Discourse, attributed to Pytagoras, but probably written after his death, during the Crotone period (beginning of the 5th century BC) from which Delatte (*Etudes sur la Litterature pythagoricienne*, Paris, 1919) was able to restore a number of lines (Ghyka 1981: 25, 43).

[4] *Τεχνιτης*: the one that artfully creates, creation may simply be a rearrangement of chaos, choice (Ghyka 1981: 25, 43).

[5] In a field of intelligence very strange for harmony at a first glance, the art of war, let us notice the most "symphonic" battle in history, the Battle of France in 1918. Foch lived it as rhythm: "... But no! I was not only head of the orchestra. Of an enormous orchestra, obviously. Suppose I kept the beat!" ... His contempt turns to those about whom he says: "This is a minor music." (*Revue Universelle*, 15 avril 1929) (Ghyka 1981: 39-40, 50). Such quote reminds us of the contemporary emotional detachment from a possible real suffering, detachment experienced by those who, involved in computer games, only statistically appreciate the wins and losses in matters

of war. The players are not, like Foch, real (but only virtual) conductors of orchestras who direct the course of hostilities. In simulations there is, mentally, an inherent support of the protected state, so there will never be the same feelings and experiences in real life as compared to those of a game, however powerful and attractive, since a possible war brings concrete loss of life and property in both parties. Although playing develops more or less useful skills, it may prove harmful when, taken prisoner, the human being is no longer aware of all aspects of reality as they really are. Art, being as well in so many aspects connected to the state of playing, can also include deviant manifestations, sometimes being differently received or even in an opposing manner compared to what the author imagined. With all the invariant structuring of a work, its expressive covering has the last word as a garment that covers the body, carrying its meanings with it. Therefore, any form of expression in itself first captures the attention to the external appearance or of the first glance of its perceiving.

[6] Goethe asserts in the second Faust: "Der saulenschaft, auch die Trigluphe Klingt/Ich glaube gar, der gauze Tempel singt! (In the row of columns, even the triglyphs sounds/ I'd believe that the entire temple chants!)" (Ghyka 1981: 40, 50).

[7] Perhaps it is the case now to overcome the phase of influence, of externalizing and repeatedly bringing into discussion negativity, offering it a reduced place compared to the positive and constructive aspects that can motivate us to think and act beneficially in a more comprehensive area.

[8] The most impressive "cubist" manifestation was that of Plato, in *Philebus*: "But by the beauty of form I want you to understand not what most mean by this term, such as the beauty of living beings or of the paintings that represent them, but something that is alternately straight and circular, the surfaces and the solids that one can make (manufacture) from what is rectilinear and circular, with the compass, the square and the ruler. For these things are not like others, conditionally beautiful, but beautiful in themselves."

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