

## **BRANCUSI AND MATHEMATICS INTERFERENCES**

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**Abstract.** Modern art, during the beginning of the 20<sup>th</sup> century, evolved in parallel with modern science revolutionary discoveries. The paper presents the interference between the two apparently separate fields of knowledge, that of science and modern sculpture pioneered by Romanian Constantin Brancusi. It shows how astonishing modern pieces of sculpture are based on antic geometric considerations and we see how his lifelong quest for essential in his work and artistic truth has a similarity in quantum physics.

**Key words.** Brancusi, golden section, endless column.

In 1955, two years before Brancusi, Einstein, the most original and profound personality of the twentieth century-left this world. A decade later, Unesco paid tribute to him using these words which are perfectly suited also for Brancusi who was considered –“the great creator of the 20<sup>th</sup> century sculpture” [Encyclopedia Universalis France], see „the greatest sculptor of the century“[Serge Fauchereau].

But look what they said about Einstein: “There are, like miracles, righteous spirits by their nature” [Ferdinand Gonseth]; “ I had the impression that in a major sense he was the alone man. Many of the great men are solitary; he kept all the time an exceptional purity, childish in a certain way” [Robert Oppenheimer]; “His idea has generated a wave of protests, as it happens when someone proposes a totally new way of seeing, which shocks by the force of things, the old way of thinking” [Louis de Broglie]; “... he was, happily, naïf, but in the same time very revolutionary, very non conformist. I do not see any contradiction: I think that a manifested naivety expressed in an aggressive manner against the traditional thinking is a way of being revolutionary” [Francois le Lionnais].

Putting together the two names-Einstein and Brancusi-belonging to apparently separate fields of knowledge can be surprising. In reality, the resemblance between the two great creative spirits is extremely profound, firstly related to their conceptions, to their overall view over the evolution fields where their contributions, through their thinking and works, has been essential. It is essential for us to reveal the coherence and unity of the two forms of human knowledge-scientific and artistic which Einstein and Brancusi did bring to a peak during the first half of the 20<sup>th</sup> century.

„Some art critics- says Ionel Jianu- see Brancusi as a classic sculptor, some considered him a cubist, while the others considered him a baroque sculptor, while others appreciated him as Byzantine or Gothique, as a disciple of African art or of Buddhism, as the first master of the abstract art or as a promoter of the surrealism”. In other words Brancusi is seen as a paradoxical creator, belonging to all of the art trends and in the same time to no one particularly. “I am neither a surrealist, neither cubist, nothing like that; everything that I have new is coming from the very old ...”.

Like in Einstein’s case, in Brancusi’s case „rarely was such a strong fusion between man and work, between life and its fruits. The righteous and pureness of his attitude it suits perfectly its creation. One lights the other” [Jacques Lassaigne].

The entire work of Brancusi is very hard to categorize, impossible to attach him to certain art tendency or artistic trend. Numerous philosophers have a tendency to place the Brancusi’s work in the fixed world of Plato’s ideas. It is always a “statique, eleatic vision of the world” present in the Brancusi’s works said art critic Dan Haulica.

At the contrary, the same Brancusi it is seen as an artist obsessed for life by the idea of expressing the movement, the flight. His sculpture appears to be cinetic and “pyrique”, as reediting the Heraclitique idea of fire. Another critic, Rene Huyghe, after noticing that for some time, art is concerned with emphasizing the energy, the speed, the dynamism, the tension, he writes: “The sculpture could not miss the opportunity to reflect this surprising evolution: the great forrunner it seems to be Brancusi. It is not him, after all, the first who used the flexed curves and tension in order to describe the poetry of soaring and jet? With him, the sculpture does not remain, like in the case of Rodin and Carpeaux to evoke the movement, but he explains its generator principle....”

So, the best description is done by a Romanian art critic, Eugen Schileru, when he says: “never the impression of eleatism and heracliteanism, in superb silence, have been better confounded in one image with the impression of running, of fluidity, than in Brancusi’s sculptures”.

From these serious dilemmas contained by Brancusi’s works we will observe with predilection two related to our subject.

1. Is he a sculptor dedicated to the purity of geometric abstract forms, or is he the sculptor of vital soaring?

In 1925 Lucian Blaga, the famous Romanian philosopher, notices to the sculptor a “negation of reality” in a sense of “soaring for essential”. In 1928, Corneliu Michailescu noticed that the sculptor has a tendency toward using geometric forms as “ ovoid, ellipse, cillinder, etc...” Dan Botta, another art specialist talked in 1926 of a “preference for geometry, a passion for abstract forms: the world seen as a construction of the intelligence”

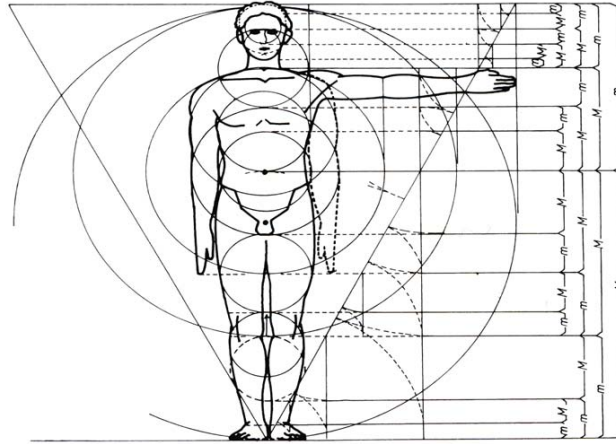
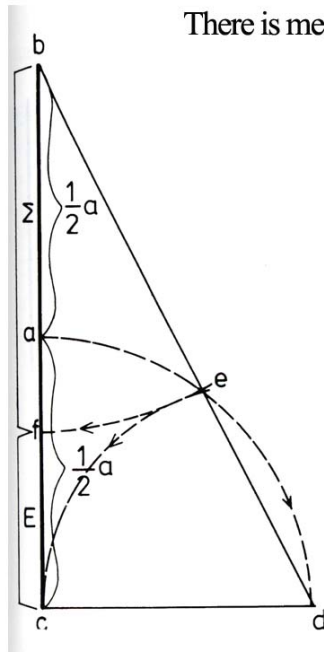
Other category of critics sees in his works their “perfect organique manifesto (despite the fact that they were unfairly considered abstract)[ Ion Frunzetti], the real abstraction of this <<anatomist looking for ontologic misteries>> would be fundamentally his vital soaring: “A seal seen by Brancusi is in the same time more and less than a seal: it is the vital soaring kept by a few lines whose sobriety marks the vital soaring” [Paul André]

The critic’s assurance that there is <<brancusian’s thirst for geometry>> leads to the tendency of looking for messages of his art in geometric decomposed parts, in the analysis of proportions and numbers.

Here we can make a more concrete observation noting that, while searching for essential and truth in his works, he respected the proportions imposed by classical architects and constructors of the antiquity. We know very well that the classical beauty resided in proportions established by the Golden section. Horatio said that there is a measure for everything and that the man, the crown of creation offers clues for that, he, the man being the measuring unit for everything.

There is measure in everything

Horatio



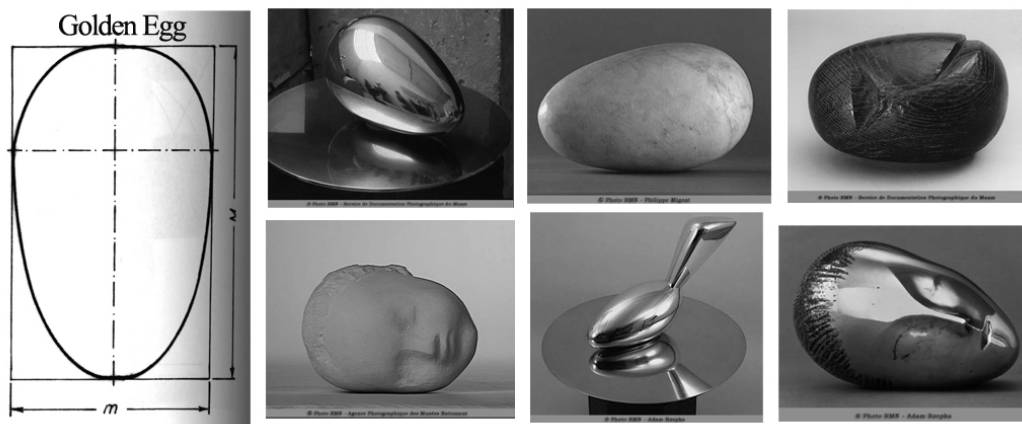
Golden Triangle  $M/m=0,618$

Man is the measure of all things

Courtesy of Sorana Georgescu Gorjan

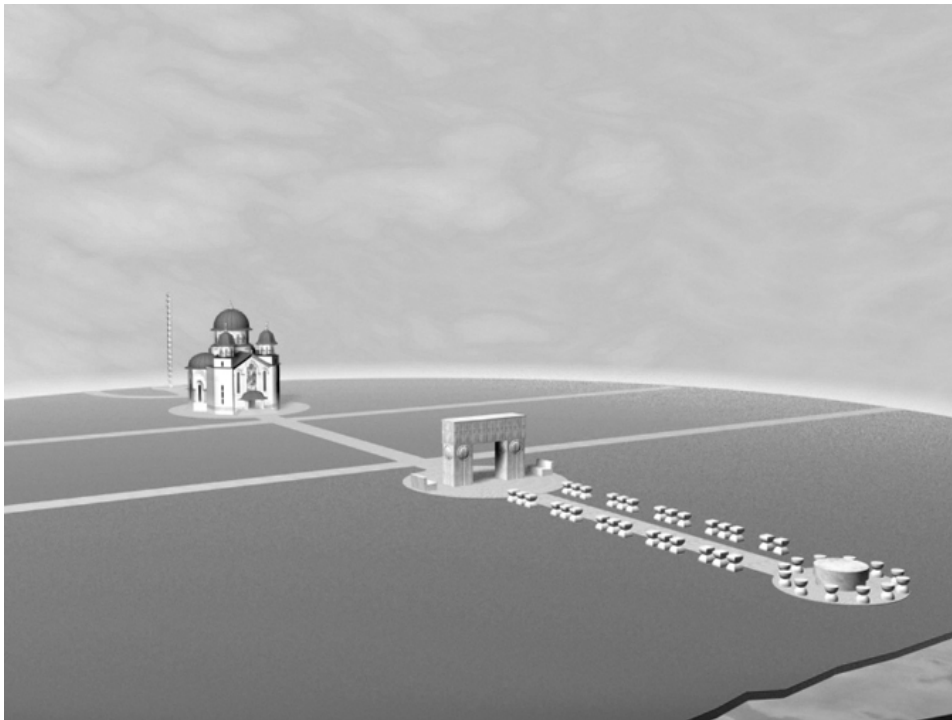
Some consider that Brancusi, the sculptor coming from rural area of Romania did not know these geometric considerations and he carved his works using his profound artistic intuition. Others consider that his studies at the School of Arts and Crafts from Craiova and the National School of Fine Art from Bucharest learned him these basics.

However, we cannot but observe, following the pertinent analyze of Stefan Georgescu Gorjan, the engineer who offered Brancusi technical support for erecting the column in Targu Jiu, that “25 of Brancusi’s ovoid works respects the norm of golden section. From these, at 5 the ratio is 0,617 and 0,620 compared with this ideal ratio of 0,618. At 13 from the remained 17, this ratio is respected with a tolerance of 1% and only at 4, there is a deviation of 2-3% from the nominal value” [Am lucrat cu Brancusi, Stefan Georgescu Gorjan, Ed. Universalia București 2004]



Above are presented a few of Brancusi's works that respect the golden rule of harmonious proportions. Perfect works of art belonging to the modern world of art, expressing the essence of things, contemporary with the most abstract trends and tendencies and with revolutionary evolutions in science are based of a rule as old as the world, that of harmonious proportions. In this context is more easily understood Brancusi's statement "everything that I have new is coming from the very old ...".

Furthermore, we can extend the analysis to the Monumental ensemble of Targu Jiu, Romania. It is well known that this ensemble has been built by Brancusi for honoring the heroes who fought against the enemies during the first world war. It is a manifesto of Brancusi's credo, a gift to his native country, the first integration of a sculptural ensemble in a public space (in 1937) "integrating the idea of a road of heroes, long and difficult, starting from the river, and the Table of Silence, passing through the Gate of Kiss and reaching the Endless Column that "brings us to the infinite and beyond" [Hulten et al. Brancusi 1995, p.230].



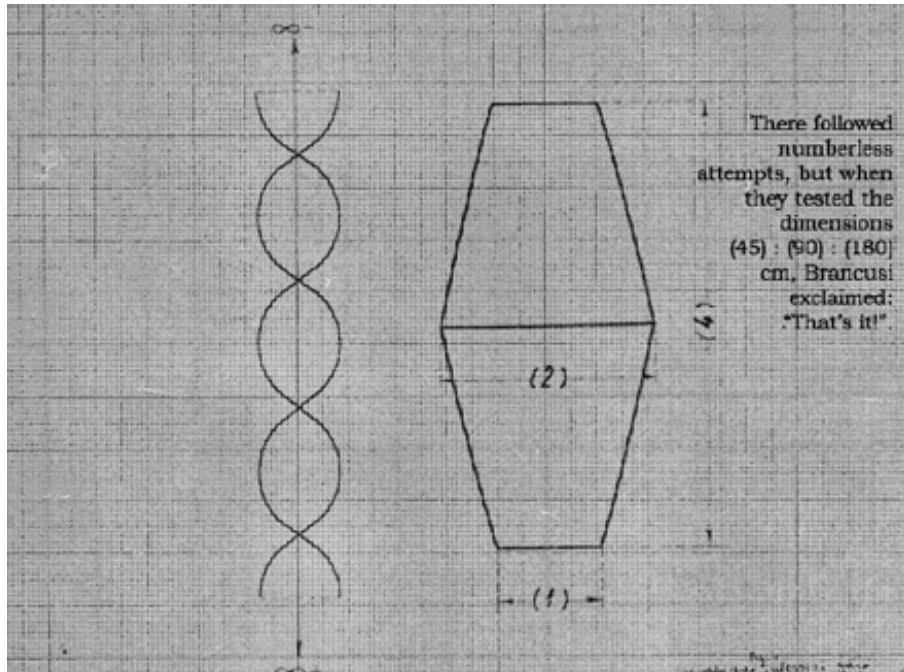
Courtesy of ITC

It is easily observed that the internal harmony of the Targu Jiu Ensemble is given by certain proportions of the volumes, in the successive repetition or to the distance between pieces of every part, to the grouping of the elements corresponding to key numbers, in their order, as well in the distance between them relative to their height. [Ion Mocioi]. In the name of discovering of a supposed numeric symbolism, it is believed that the secret behind Brancusi's forms relies on certain rapports and dimensions.

The works of Georgescu Gorjan related to the column, being the only who stood next to Brancusi in his artistic effort of creation of the Endless Column, are of important significance and again help us to go deeper in the analysis.

First of all, Brancusi's columns respect a factor of slenderness. Relative to their height, there are known columns with 3 module and two half modules, 6 modules and two half modules, 9 modules and two half modules. The Targu Jiu column has 15 modules and two half modules. Despite the fact

that it is not known a column with 12 modules, we can consider that Brancusi followed this rule of harmony which lead him to a perfect slenderness of the columns. Relative to the dimensions of the module, again Stefan Georgescu Gorjan gave us useful information. The modules respect the law of harmonious proportions. The dimensions of the module are in proportions of 1:2:4, that means 45 cm: 90 cm:180 cm.



Courtesy of Sorana Georgescu Gorjan

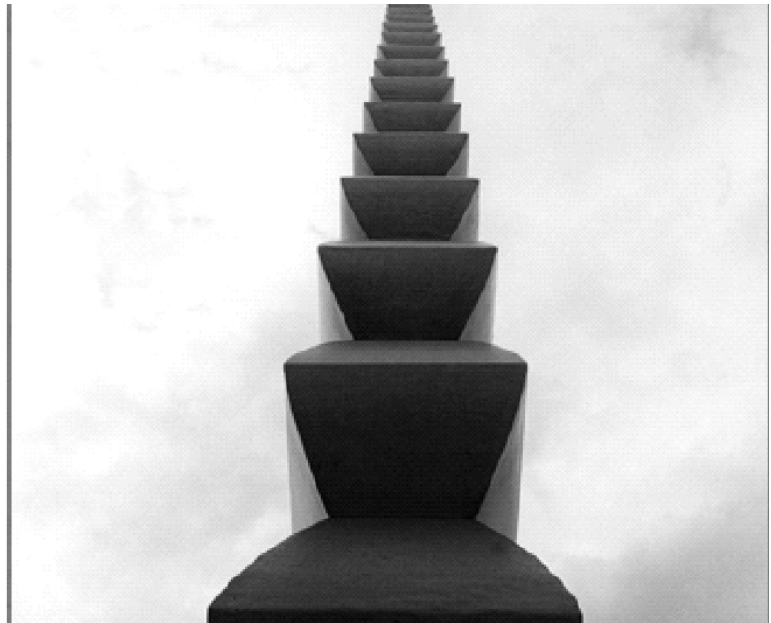
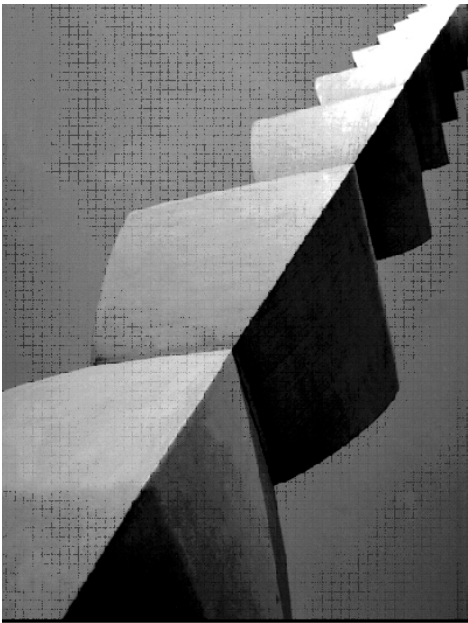
It is then better to see Brancusi's work as a continuous balance between rational and shadowed zone. It makes appeal to the <<mother-ideas>>, to the goethean conception of primary plant, to the archetype.

Are their forms geometric or biotic then?

Jack Burnham divides methodically the modern sculpture in geometric and vitalist and says the following about Brancusi:

<<The history of modern sculpture from Rodin to Moore is the history of an absurd conflict between the two principles: vitalism and geometry-fight brought sometimes inside the artist's conscience. This was the case of Brancusi>> and Burham mentions a number of Brancusi's works being <<in the same time geometric and biotic>>.

Referring to this, another critic says: <<There is a geometry which does not kill life, but on the contrary is integrating it. It is the geometry of decorative art of Romanians. In this way, the geometry of Romanian folklore is organic as the objects created by Brancusi.



Courtesy of ITC

The slender Endless Column from Targu Jiu pointing to the sky

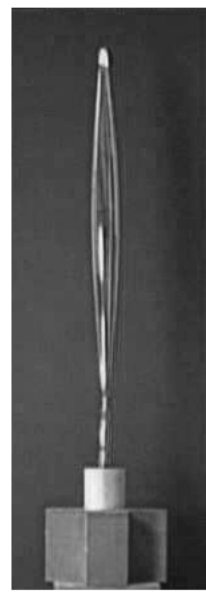
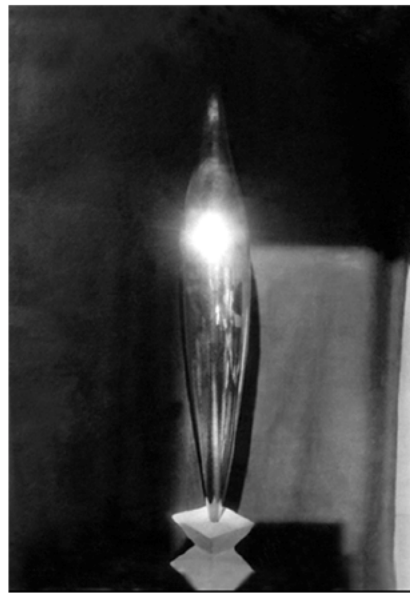
2. The second for us relevant dilemma in our quest to discover interferences with science is the one related to the realism and abstractionism of his art.

Talking about abstract art, it is impossible not to observe that Brancusi's art enlarges and modernizes the frames of Art itself going to its object. If, speaking in a general manner, it is true that "science, in its cognitive approach has the tendency of eliminating the subject and subjectivity considering as factors of perturbation and of incertitude, while art in its relation object-subject not only intends not to eliminate the subject, but on the contrary, fights to enforce it, because, its motivation stays in discovering the subject, knowing it in its relation with the object". When we speak about Brancusi, we observe that his art has a greater aim, that of knowing artistically the World-which includes Man, when he reoccupies its natural place. In this way, the spirit of Art can be very nearly to the spirit of Science despite the different ways it uses to reach this goal.

If we regard the new style of modern scientific thinking, imposed by the revolutionary conquests of Physics of the beginning of the 20<sup>th</sup> century we have the revelation that they are in synchronism with Brancusi's search for essential. The genius science of nature researchers tried to put in evidence other essences of the world, not less generators of "unforeseeable" and paradox. In this way, despite the fact that the nature and its corps give us the impression of stability, of static, their interior is dynamic, unstable, agitated, something like a swarming of the born matter, a forever becoming. The apparent real, called by philosophers "sensible" falling under senses incidence, is born from the atoms, from the quantum and is naturally for the two worlds to be in "correspondence" [Max Born, La Physique atomique, En roumain, Ed Științifică, Bucarest 1973, p.151].

Being infinitely big, our world is born from the quantic, from essential, and here is a process marked by a quantum leap.

From here we can say, using the analogy, that brancusian's work being „essential“ (a nuclear condensed visual representation of our world)-presents a direct correspondence with real. If the Miraculous Bird (Miastra) continues to be a natural bird, little by little, it is melting (by a qualitative jump) into its (simple) symbol, with "The Bird in Space"



The Birds evolution from form to idea.

“The Miastra-writes Serge Fauchereau-it is reduced to the essential; there are no more feathers, feet, wings and open beak...[...] the bird of Brancusi evolves toward a gradually greater abstraction, to the point when it is no more than flight and song”.

Following his quest for essential during his entire life, in his series of birds, we notice Brancusi's words "...It is not a bird that I want to represent: I want to present its quality in itself, the flight, the soaring. I doubt that I will do it.... Meanwhile the days, the years pass. And I am still looking for a definitive form.”

Similarly, not being directly accessible to the sensible, the quantum world of physics cannot be perceived instantly. We can arrive by a complementary manner; that means adding to the first

impressions (observations) the next, recorded under different angle. In this way appears the exhaustive image of the micro object.

The analogy with Brancusi's way of discovering the essential and the truth in sculpture it is evident.

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