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Juana Maria Arcelus-Ulibarrena

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**The "number" facing of its terminology and its codes,
impossible interview of Umberto Eco to Pythagoras**
[School of Pythagoras, Kroton, Magna Graecia, VI century BC]
a good and healthy reflection

Juana Maria Arcelus-Ulibarrena
Parthenope University of Naples [Italy]

Abstract:

We consider that our Universe of things can understand as “racional” the essence and principle of God [*deus numerum est*] or any other original principle or the principle of things, but the everlasting Pythagoras was the first to argue that the principle of all things is the “number” and at the same time to predict how a mathematically exact work could serve to demonstrate at the same time that with traditional methods the Pythagorean theorem would not be a clearly scientific work in the long run because it would add nothing to our knowledge and to the truths Mathematics in its own literature, since it is always looking for "training" despite the risk involved in persevering with hypotheses and inevitable errors.

Keywords: *number, cosmology, spiral, principle Humanity, harmony, terminology, symbolism, symmetry, Universe order, substance of things, cyclical time.*

Why the “number”? with what number? The enigma is always lurking every time we try to delve into something that we have always taken for granted because it is always there: the “number”, to explain it I have followed a very unique path through the tunnel of time, a time and a number by means of which God wanted the World to be founded when the idea of “time” was not conceived in elaiety. My intention in this section, although far from “real time” is to make an excursus accompanied by the formidable “impossible” interview of Umberto Eco[1932-2016] with Pythagoras [570-490 BC] because I consider that it is about a literature that ends up enriching us in our reflections, thoughts and in our inner Universe that is looking for more and more reliable answers about our very existence.

If we think minimally of a cyclical conception of the term “time” within our mental capacities, something not very ordered comes to mind and therefore we can plunge into an undesirable dimensionless solution, although it is rather a question of immersing ourselves in a dimensionless solution of our own mental universe until we are able to achieve a minimum symmetry with our own effort, since to think of a hypothetical cosmological constant we also have to discard the idea of “time”, a time that since time immemorial has been represented as a wheel since everything that happens is circumscribed in an incessant circularity and presumably identically.

Our universe can therefore understand as “racional” the essence and the principle of God [*deus numerum est*] or any other original principle or the principle of things and the everlasting Pythagoras was the first to argue that the principle of all things is the “number” but at the same time he devised to propose a mathematically exact work that would serve to demonstrate the Pythagorean theorem with traditional methods, but it would not be a clearly scientific work because it would add nothing to our knowledge and to the mathematical truths in his own literature that he searches with constant solution to “train” over and over again despite the risk of repeating inevitable mistakes. All *spiral*[8] movement is dynamic, it flows, it is not linear, it is constant in its trajectory and any cosmological constant can already be a fundamental constant in itself and we have the sample in the Universe that surrounds us, but this does not prevent it from being found a dimensionless constant in search of a dimensional space [non-dimensional] that

has the necessary symmetry to be able to speak of something constant and cyclical, in this sense the *spiral*[8] collects and aligns, not disperses.

In 1973 Rai [*Italian Radio Television*] produced a program in which some twenty writers pretended to meet famous people who lived one hundred or two thousand years before, asking them questions and imagining their answers. The choice of the character was free as long as he really existed, thus the radio series of impossible interviews was born, and among them was the interview of Umberto Eco with Pythagoras [1], successively in his unique book "Costruire il nemico" [Umberto Eco 2011] makes his appearance "*Le confessioni di un giovane romanziere*" [*"Lectio Magistralis"*, Tel Aviv [2011] 25th *Fiera Internazionale del libro di Gerusalemme* [Israel] an event that will remain constant in the memory because it was then that Umberto Eco updated his previous thesis when preparing the interview with Pythagoras on *Pythagoras Theorem*[PT] and *Fermat's Theorem*[FLT] [or conjecture] that changed from 1994 [2], according to him thanks to the research work carried out by the British mathematician Andrew Wiles [9] published a year later.

Allow me from now on to consider and ask from the humanistic field the background of *Fermat's Last Theorem* [FLT] seen through a hypothetical and at the same time real interview with Pythagoras conducted by Umberto Eco. Indeed, *Fermat's Last Theorem*[FLT] with which Simon Singh [7] -following in the footsteps of Andrew Wiles[9]- transformed a "formula" into a "literary case" continues to call us to reflect over and over again if we think that mathematical proofs are based on a logical procedure and that will continue to remain true until the end of the times of the *History of Humanity* without ever forgetting that scientific evidence is based on observation and perception, both of which are considered fallible to the point of being permanently installed as sources of "provisional truth" and in any case approximate; this is really the point because arithmetically speaking both the question and even the curiosity to hear answers about mathematical truths is never indifferent to us.

The enigma of *prime numbers* [Bur] written by the American mathematician Marcus du Satoy [6] had more or less considered *a priori* his desire to find the rule to predict the sequence of prime numbers, since it would be the only way to prove no longer the "existence of God" but at least the "possibility of God" as if mathematics could be the true religion *lato sensu* and the rest was superstition. In order to better observe all this problem with the "clinical eye" of Umberto Eco, I am going to carry out an *excursus* that I aspire to travel hand in hand with Umberto Eco and I invite the benevolent reader of this my research study to accompany me in this original and necessary attempt to use an imaginary teleporter towards the World of the "Philosophical-Religious School of Pitágoras" of Kroton in the *Magna Graecia* of the 6th century BC, a journey that can also enrich our Inner Universe and our vision of the Outer World on "*the number is the substance of all things*" and the "*sublime harmony of number*" considering also the fact that it is an interview that begins with all the honors required by the use of good gallantry and with good *savoir-faire* on the part of the interviewer of Pythagoras. So let's continue the progress of the interview and stage everything through our imagination:

We find ourselves in the middle of a southern afternoon in distant Magna Graecia and in the distance the waves of the sea, there are barking dogs and a cane pipe for the interviewer.

Pythagoras has a lazy and calm accent, typical of a southern intellectual who drinks anise water. The writer Umberto Eco interviews the philosopher and mathematician Pythagoras [570-495 BC. about]

UMBERTO ECO - Good morning great Master.

PYTHAGORAS - Health and harmony for you.

UMBERTO ECO - Pythagoras... It gives me a certain emotion to pronounce this name, which was sacred to many, since you, great Master, were considered by your disciples as a god...

PYTHAGORAS - Not without reason.

UMBERTO ECO - I see. All the more reason... I was saying: a certain emotion. But I wonder if for many others who listen to us his name evokes only unpleasant memories: the multiplication table, the Pythagorean Theorem...

PYTHAGORAS - Why are you ungrateful? They are two small applications, and what you say worries me, that for many my fame has been identified with these secondary artifices. But even in them the sublime harmony of the number shines. Think of the table: an elementary matrix from which you can generate all the possible marriages between number and number, given once and for all without fear of making a mistake because the rule of this magic square is the same that governs harmony of the Universe from the widest circle of the celestial spheres to the abyss of the infinitely small.

THE NUMBER SUBSTANCE OF THINGS

UMBERTO ECO - I understand, great Master. His thought was so simple and clear that even today many confuse it with four trivial rules of calculation for use by surveyors or accountants.

PYTHAGORAS - I notice a tinge of contempt in the way you say "surveyors" and "accountants" Is there perhaps nobler trade than those who measure the admirable symmetries of spaces or who multiply, subtract, divide and add numbers?

UMBERTO ECO - Of course not! But it's just that today... But it's hard to explain, I don't know if you can understand... In fact, I wonder how it doesn't surprise you to find yourself here, in front of me, so far from the days you lived, in a world so immeasurably different.

PYTHAGORAS Please, simple man! You are talking to Pythagoras. You know that "my soul" has transmigrated into many bodies; You know that once I was the hero Euphorbus and that, Centuries later, when I saw my shield in the temple of Apollo, I recognized it and I cried. The body, you see, is like a tomb that retains "our spirit" and submits it to numerous ties but in them is the "beginning of purification" as long as you know how to incline this body to silence, to abstinence, to the practice of sacrifice so that the mind rises in the "delights of contemplation". And after you have completed your path of melee redemption, you will be able to contemplate - as it happens to me now- the "Harmony of the Cosmos" and the admirable concatenation of times, so that your present does not cause me great astonishment as it does not it was the past, both derived from the calibrated and multiple dance of the Cosmic Cycles. In my time I have visited Egypt, where I learned the mysteries cultivated by those Priests, and Persia, and Gaul, and Crete. How do you want your world to surprise me and make it new?

UMBERTO ECO - And after these trips -at the age of forty- he emigrated to the [current] Italian coast, to Kroton. We were in the 6th Century BC. And here he founded his School [School of Pythagoras]. Adored by his disciples [they even said that you, divine, had a golden femur], they accepted a very rigid discipline and only the chosen ones were admitted to the knowledge of the superior mysteries of his Doctrine. It was a Monastic-type community, -we would say today- that produced thinkers who spread their Theories throughout the Ancient World. What did you teach, great Master, to the most faithful of the faithful, there in Kroton?

PYTHAGORAS - Number, substance of all things.

UMBERTO ECO - In what sense, substance?

PYTHAGORAS - You must have heard of those first Natural Philosophers who sought the explanation of the phenomena of the World not in the lying image of the gods but in the first principle. They were not stupid, they understood that knowing means finding a single principle that explains the origin, development and organization of all existing things. Only their minds were weak, their imagination heavy and they searched for this First Principle in the Physical elements, water, air, fire. It was I [Pythagoras] who first understood that the Principle and the norm of things were "a single force" and this force was a "mathematical force". They are the "mathematical principles" that regulate the "Life of the Universe" which are its origin, law, reason for subsistence and reason for beauty. The "number is the substance of things".

UMBERTO ECO - But what does this mean? What things are numbers? Or that things imitate numbers? Or that things are governed by numbers?

PYTHAGORAS- You ask too much of me. Some have had to live in the shadow of "my truth" for a lifetime to understand and they don't always understand. At best they repeated. They said about my words: "Autòs èfa - Ipse dixit - The Master said it, it is not discussed". And in obedience, in humility, Knowledge was born. And you want me to tell you the truth all of a sudden? Rather, look at this figure.

UMBERTO ECO - I know... And the Tetraktys, the magic triangle made up of points. Three sides, each with four points, and a point in the center, so that it also seems to be composed of four rows of points, one of four, one of three, one of two, and one of one.

PYTHAGORAS - And in him, if you know how to understand, “the truth of number” already smiles at you. One plus two plus three plus four equals ten. A point in the center origin of all the others. Four points on the sides, four, the number of perfection, strength, justice and solidity. Three sets of four points form the equilateral triangle, a symbol of “perfect equality”. The sum of the points gives ten, and with the first ten numbers you can express all the other infinite numbers that inhabit the Universe. And if you look at the triangle from the vertex to the base, it shows you the number of points, alternate, odd and even. The pair, symbol of Infinity, because you will never be able to identify in an even dotted line the point that divides it into two equal parts. The odd, with a center that separates two equal halves And finally the one, even and odd number at the same time, origin of both even and odd numbers, which with its mere presence can make odd and odd pairs [3] [4].

Don't you see, man, in this elemental symbol all the Wisdom of the Universe, all the Mathematical Laws that make up the World?

UMBERTO ECO - Yes, in the abstract... But physical objects?

PYTHAGORAS - And what are physical objects, where do you think they get their consistency from if not from a different spatial and numerical arrangement of their infinitesimal elements? If the fire meanders so quickly and stings and penetrates, it is because from the generation of the elemental triangles solid bodies are generated in the form of a pyramid that precisely stings and penetrates. While the other elements will be formed by octahedrons, icosahedrons and dodecahedrons. And these, which regulate the infinitesimal life of the Microcosm, are the principles of the Macrocosm, which regulate the trajectory of the celestial spheres and the rotation of the Planets.

UMBERTO ECO - I understand, Great Master, that you anticipated by centuries the fundamental intuitions of Modern Science: not only that the World can be explained in Mathematical terms, but also that both the Universe of Galaxies and that of “subatomic particles” are two aspects of the same machine explainable in terms of calculation. But You, Great Master, who gave such a profoundly religious tone to your community, did not foresee the objection that someone could still make to you today: that is, that “number” explains the structure of the Physical World but not “life”. .. how to say... of the “soul”, of the “spirit”. But then, what is the “soul” of which you speak that transmigrates from body to body until purification? What is the Music, that you liked so much, the Art, the Poetry?

PYTHAGORAS – “I am the number”. Number. What other thing? The same number that makes up the pyramids of fire, the same game of even and odd, finite and unlimited that governs the Generation of Mathematical Quantities. Here, here I have seven glasses of the same size and each one is filled with water, but in a different measure. Now I tap this metal rod on each glass, in series... Do you hear? [A succession of sounds is heard, not a “diatonic scale”, but rather a “chromatic scale” or the succession of black keys on the piano] What is this?

UMBERTO ECO - Yes... Music. At least, the beginning of the music.

PYTHAGORAS - And what do the intervals and the recognizable [and amiable] differences between the sounds depend on if not on the measurable amount of water in each glass? And now you see this rope: you know! it is the principle that allows many musical instruments to work. If you press it at this point making it shorter you get one sound, if you press it later and make it shorter again the sound will be higher [two sounds are heard] You know, every musician knows that every little difference in the sound is you can measure by relating it proportionally to the length of the chord. A Mathematical Formula governs the life of each musical event.

UMBERTO ECO - Yes, but I said: and the “soul”?

PYTHAGORAS - Responds to the Laws of Music, it is a pure “game of numerical relations”. I remember one afternoon in Taormina [Sicily] A drunken young man at the height of his anger was about to break down the door of a house where a woman lived, no one could stop him until I understood. It was not so much the wine that excited him as the Music that the shin guards

played in the Phrygian manner, which excites and tenses muscles and nerves, out of sympathy between “the numbers” that regulate one phenomenon and another. And I ordered the players to switch to the “hypophrygian mode” and immediately the young man calmed down. Instead, we ourselves in the School of Kroton [*Magna Graecia*] would fall asleep to the sound of some very calculated crooning and then -when we woke up to regain lucidity- we would resort to other modulations. But you know it and your mother knew it -when you were an children- that she resorted with great wisdom to the right lullaby to calm your tears! Without having studied it, he felt from the bottom of his “soul” the numbers that could well dispose of yours, and he translated them into Music! I don't know what else “the soul” is for you and if it is something else. And what do you admire in the Temple or in the statue if not the “symmetry”, the “order” and the correspondence of one part with all the others [8], and the “rhythm”, the same that you love in Poetry?

UMBERTO ECO - I think that Great Master is right, and that his thought is much more religious than that of those who oppose “Spirit” and “Matter” as if they were two incommensurable entities. But maybe you've taken your Religion of Numbers too far.

PYTHAGORAS What is wrong with my Astronomical Doctrine? Around the central fire revolve the ten Celestial Bodies. The sky of the fixed stars, Jupiter, Saturn, Mercury, Venus, Mars, the Sun, the Moon, the Earth and the Anti-Earth.

UMBERTO ECO - Exactly! His Astronomical Doctrine was revolutionary, he anticipated the Copernican one because he did not believe that the Planets revolved around the Earth. But why Anti-Earth, a body no one has ever seen?

PYTHAGORAS - But because this is the only way to reach the “perfect number” of ten!

UMBERTO ECO - So you see that only for “love of theory”, to Mathematical Perfection you have built a Universe to your measure that does not correspond to the truth of the facts.

PYTHAGORAS - Does it not correspond to the truth of the facts? What does it mean? The truth is Mathematical Theory. If the Mathematical Theory postulates the presence of the Anti-Earth, the Anti-Earth must exist and worse for us that we are not able to see it. Perhaps no new Planets have been discovered in your time?

UMBERTO ECO - Sure! The satellites of Uranus, Pluto and Jupiter...

PYTHAGORAS - And how did they discover them? Have you seen them?

UMBERTO ECO - No, not at first. At first, to verify certain Astronomical Theories, to explain certain anomalies in the movement of Celestial Bodies, it was necessary to assume that they existed, then we went looking for them with increasingly refined instruments and then...

PYTHAGORAS - You see then that it is the Theory that has provided the elements for the truth, the confidence in the Mathematical Law of the Universe, the postulate of the Regularity of the Phenomena!

UMBERTO ECO- You're right. But then he went to check.

PYTHAGORAS - And what need was there if your confidence in the Eternal Rule already told you that there had to be? But don't you feel the beauty of this Eternal Rule of Number? Each Planet rotating at different speeds around the Central Focus produces a sound of the Musical Range and all together generate a very sweet concert, a harmony that perpetually sings in the Universe.

UMBERTO ECO - That we did not hear.

PYTHAGORAS - Sure! because our hearing is accustomed from birth. Have you ever noticed in the charm of certain nights the sound of silence? But only in moments of grace can you listen to it.

UMBERTO ECO - Yes, but if all the ten Planets each produce a note of the Musical Scale, all together they do not create harmony but a tremendous dissonance, as if suddenly the entire keyboard of the piano were pressed, as if all the notes were torn from the strings of a “harp” in an instant...

PYTHAGORAS - But Music is not given by sounds but by relationships between sounds, even a deaf person can enjoy Music as long as they think about it, while someone who listens to it without thinking about it does not enjoy it.

UMBERTO ECO - Once again this contempt for the concrete!!!

PYTHAGORAS - But I see the Mathematical Soul of the concrete.

UMBERTO ECO - Yes, but the teenager from Taormina [*Magna Graecia*] calmed down with the music that sounded, not with the Mathematical thought of musical intervals.

PYTHAGORAS - It was "pure dialogue between numbers" integrating opposites, tensions composing in harmony. It was not necessary for the young man to know and understand this. This was how it had to happen.

UMBERTO ECO - This is how it had to happen... Look great Master, what I reproach you for is your Mathematician optimism, His faith in a kind of "harmonic fatality" that regulates the evolution of the Universe. You have bequeathed to our time great scientific knowledge but at the same time you have bequeathed a terrible temptation, the temptation to contemplate an entirely theoretical "abstract harmony" without being able to take into account the contradiction, the pain, those entirely terrestrial events in which the Numbers fail and "Human action" must intervene to reestablish a Law or impose a new one. The History of our Science is also made of "erroneous calculations" and of experiments that have contradicted the calculations, and of calculations that have redone previous calculations...

PYTHAGORAS - But you have never been able to prove me wrong.

UMBERTO ECO - I don't know. Maybe she was right when she was wrong, when she was denied her Numbers to look for other Numbers...

PYTHAGORAS - They are always the same. The Rule is at the beginning.

UMBERTO ECO - But take this attitude to Social and Political Life. What is born of it? An aristocratic and conservative vision. It is not by chance that you had to flee from Kroton [*Magna Graecia*] because the Democratic Party saw in your School a Center of Aristocratic and Reactionary Thought, in your confidence in the Eternal Laws of the World you -the Pythagoreans- could not understand the mutation, not you were able to intuit what Heraclitus intuited after you, that everything flows, that "he never bathes twice in the same river" that reality also arises from pain, from struggle; that Harmony is a point of arrival -always provisional- but poor to consider it a definitive starting point

PYTHAGORAS - So you don't understand.

UMBERTO ECO - No great Master, I understood that you have probably offered us "only one side of the truth" and that there is also another, and that in the tension between these "two truths", what one of our Poets called the double battle of Order and Adventure, this is our "Human truth"

PYTHAGORAS - So you don't understand.

UMBERTO ECO - Yes, I understood that your role was to offer us "your truth" and never doubt it. Our thing is to question it and believe it at the same time.

PYTHAGORAS - So you don't understand.

UMBERTO ECO - Good morning great Master. Thank you for giving me this Interview.

PYTHAGORAS - You don't understand.

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Pitagore
[de «La vie des hommes
illustres» de Thévet]

