The merciful transformation of God's love

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Cover. As we conclude this series of lectures FROM MODERN SCIENCE TO GOD'S MERCY, as inspired by the Jubilee of Mercy, I would like to thank you, once again, for your presence.

Today's presentation is entitled **The merciful transformation of God's love**. Here it is shown how a geometric approach to natural complexity yields, in a limiting case, a transformation capable of transmuting death into life and a representation of the Most Blessed Trinity.

It is very humbling for me to share this lecture. I never thought that I would be in a position to say anything about the central doctrine of our belief, but certainly God works in mysterious and merciful ways. I am convinced that after listening to this lecture you will be propelled to adore the Most Blessed Trinity, even more.

This presentation is also very special to me, as it was through its contents that I got to experience the living God for the first time in my life, more than 25 years ago. I will refer to such an unforgettable conversion experience later on.

Before I start, let's ask the Holy Spirit to be present during this lecture and may the Immaculate Virgin Mary pray for us all.

Page 2. The thesis of this work is that we humans, with the gift of a soul, may learn from recent advances regarding the geometry of natural complexity, in order to fully grasp the boundless nature of God's mercy and take on the mission to share the good news in a renewed fashion.

Page 3. To set the stage, it is pertinent to start by presenting a simple game of chance introduced by British chemist and mathematician

Michael Barnsley.

To begin, select a triangle and number the vertices according to the sides of a die. Then, mark the point that lies in the middle of the line that joins vertices 1–2 and 3–4 and roll a die.

Page 4. Say that the outcome is a 5. Then, mark the point that lies in the middle of the initial little square and the vertex in the triangle marked with the 5.

Now, keep repeating the notions, moving to the middle of the vertices given by the outcomes of the die, to see what is found.

Page 5. After several *iterations* of such rules, say 500, this is what appears.

Page 6. After 8,000 of them it becomes clear that the procedure converges to the *Sierpinski triangle*, a triangle with its middle triangles excluded, *ad infinitum*.

Page 7. As iterations produce interesting objects, we may change the rules and employ the two simple maps shown here, that take a point in the plane into another point in the plane, as before.

As these are the only equations needed to follow the lecture, please allow me to describe them to you in detail.

First, notice that the x components are decoupled from the y components. While w sub 1 just divides the input value by 2, w sub 2 divides by 2 and then adds to it one half.

Second, observe that the y components, for both maps, are linear combinations of the input x and y values. While a parameter d sub 1 multiplies the y value on the first map, a parameter d sub 2 does so on the second map.

While w sub 1 (in blue) takes the point (0,0) into (0,0) and w sub 2 (in red) (1,0) into (1,0), w sub 1 takes the point (1,0) into (1/2,1) and w sub 2 (0,0) also into (1/2,1), as shown.

This means that w sub 1 operates to the left and w sub 2 to the right of the domain, which goes from 0 to 1.

Page 8. We may now play the chaos game with these simple rules, having d sub 1 equal to minus d sub 2 equal to z egual to 0.5, and using a coin to decide where to move, say w sub 1 to the left if heads and w sub 2 to the right if tails. This page shows the start of the game at the bold middle point.

Page 9. Imagine that heads happen first. Then use map w sub 1 to find a new point to the left, having coordinates one quarter and one half plus one half, or a quarter one, as marked.

Page 10. Toss the coin again, and say heads happen again. Then, move from where you were into the other point to the left, as shown.

Page 11. Toss the coin another time and imagine it is tails. Then move from where you were into the point shown on the right using w sub 2.

The question is: what is obtained repeating the game many times?

Page 12. Here it is what is found after 100 iterations.

Page 13. And here is the final answer after 10,000 dots.

As if by magic, the bombardment of dots produced arranges into a given **wire**, a function, a **mountain** profile, irrespective of chance and of the type of coin used, either fair or biased.

Page 14. It happens that this is how I became interested in these notions at the beginning of my academic career. At that time, one of the key problems in hydrology was to study how river networks evolved, and I thought I could approach such a problem by extending Barnsley's notions to a higher dimension. My idea was to somehow generate mountain surfaces, from which to extract their rivers under distinct circumstances.

Although the idea appeared to be good, I ought to say that such did not work very well, for the surfaces I got contained unnatural ridges that made their rivers look strange. However, as you will see, working with these notions turn out to be rather useful, in a different way.

Page 15. One of the features that attracted me to Barnsley's work was the inherent simplicity of the construction of a pattern and the fact that it required few parameters to define it.

So that you appreciate the notions even more, here is how a "mountain" profile may be built without chance.

First, start with three points making up a triangle: the ones shown here on the left, middle, and right, and then join them from left to right via two line segments. Then, from the middle of such segments, go **up** and **down** a quantity **z** (0.5 before) to define two new points.

The quantity **z** is a parameter of the construction together with the placement of the original three points.

Page 16. Now join the five points, the three initial ones and the two acquired on the previous page, via four line segments from left to right, and then define four additional points by going **up**, **down** and the reciprocal **down**, **up**, but now a quantity **z** squared.

Page 17. In a remarkable way, the mountain arises when the process is repeated, adding points by the middle of line segments using a sequence of **ups** and **downs**, in increasing powers of **z**.

Clearly, a limiting profile is found only when the additional details decrease and such imposes the restriction that **z** ought to be a number less than 1.

Page 18. It happens that Barnsley's ideas give rise to other interesting profiles, besides the mountain's. This page shows alternative shapes as defined by other similar constructions, which correspond to **z** equal to 0.5 and to the points of the initial triangle (0,0), (0.5,1), and (1,0).

While the **case + -** corresponds to the previously shown mountain, **case - -** yields a symmetric mountain that comes from an alternating sequence of **ups** and **downs**, in which all points on a given power of **z** behave similarly: first all down, then all up, then all down, and so on, and **case + +** defines a symmetric cloud profile in which all points are obtained going **up** from the lines.

Page 19. As shown here, comparing the constructions for values of **z** equal to 0.5 and 0.8, the profiles on the right require more ink, as they are clearly thicker and have a larger vertical range than the ones on the left.

Such objects, which look indeed like convoluted **wires**, fill more space as **z** increases beyond 0.5, and they have the interesting property that their lengths, from beginning to end, become infinite.

These wires, duly connected, are topologically one-dimensional, but, as they fill distinct amounts of space, they may be assigned **fractal** dimensions which, depending on **z**, could be any number between 1 and 2. In fact, while the objects on the left all have dimension 1, the ones of the right have a dimension equal to 1.68.

The profiles for **case - +** are not shown, as such are simply the mountains of **case + -** flipped.

Page 20. As explained earlier, these profiles may also be obtained iterating the shown simple maps. And it happens that the shown profiles correspond to the sign combinations of d sub 1 and d sub 2.

Page 21. The same mountain pattern is obtaned for any type of coin, fair or biased, but the chaos game induces distinct stable histograms over the pattern: a uniform one for a fair coin and one filled with thorns for the biased case, as implied by a ergodic theorem by John Elton. As such, it became relevant to study how such histograms look over the x and y directions.

Page 22. At about the same time I was trying to generate mountain surfaces, I encountered a lovely article by Charles Meneveau and Katepalli Sreenivasan regarding the uneven structure of turbulence.

As I described in detail in the first lecture of this series, when the inertia of a fluid subjugates the fluid's cohesion, the fluid breaks into an irreversible chain of inwardly rotating **eddies**, which divide into eddies, that divide into eddies, and so on, which leads to an uneven and intermittent concentration of energies that begets natural **violence**.

What Meneveau and Sreenivasan found was that observations of turbulence along a line were **universally** consistent with a permutation of the spiky object shown here, a **multifractal** set defined via a cascading process that progressively **fragments** the energies via a 70-30 proportion, leading to **thorns** of energy arranged by layers and emanating from disperse **dusts**, energies that eventually **dissipate** in the form of heat.

Page 23. It so happens that the spiky **multifractal** set, defining the tomes of a universal blueprint of turbulence, may also be obtained as the **histogram** of points progressively generated by iterating the two maps shown here, w sub 1 and w sub 2, using a **biased coin**, such that w sub 1 is used 70% of the time and w sub 2 is employed the remainder 30% of the time.

Appealing to your memory two pages ago and having used the same notation, you may recognize that the two maps here are just the x components of the earlier maps, which operated: w sub 1 to the left and w sub 2 to the right of the domain.

If a coin yields heads 70% of the time and one uses w sub 1 accordingly, one may visualize how the depicted cascade is formed. For instance, at the second level –where the descending arrow ends and the biggest eddy shown rotates– the coin would have been tossed twice and the histogram would account for all possible products of 70% and 30% twice, that is, from left to right, 49, 21, 21 and 9%.

Page 24. As is seen, the previous **wires** and these spiky **textures** are related to one another and one may employ the simple two-dimensional maps –yes the ones given few pages ago– to find at the same time not only a profile but also a spiky multifractal over x.

Once I realized that such was the case, the notions led me to the following questions: How would the implied histograms look over the y component? Could it be that they are useful to describe hydrologic processes related to turbulence, such as rainfall?

Page 25. In the spirit of the discussion, here is, above left, a **fractal wire** and the corresponding histograms over the x and y components, called dx and dy, as found while using a 70-30 coin.

While dx is the previously described blueprint of turbulence, the rather complex-looking derived histogram dy may be understood in **Platonic** and physical ways, as follows.

Page 26. If we think of the wire as a system from x to y, its output *dy* may be thought of as the shadow cast by the wire when such is "illuminated" by the input *dx*, in a manner that resembles Plato's notions in his famous allegory of the caveman in The Republic.

Page 27. As the united wire is a mathematical function from x to y, then a derived histogram *dy* may also be thought of as a physical **transformation** of turbulence, one that rearranges the energies in the original eddies.

Page 28. As shall be illustrated and for my scientific joy, combining fractals and multifractals turned out to be a very good idea, as this construction represents a novel vision to natural complexity, one in which a seemingly-**random** *dy* turns out to be, at the end, an entirely **deterministic** set that may be understood in terms of the few parameters that determine the building blocks: *dx* and the wire.

This geometric construction represents, no doubt, also a romantic Platonic idea in this day and age, that is, in the twenty-first century and after quantum mechanics, but we have been playing with these concepts throughout the years, and we can indeed generate interesting types of complexity without invoking the notion of chance.

Page 29. By now we know that the notions of shadows, or **projections** to be precise, produce, by varying the underlying parameters –including the bias of a coin–, a host of sets that resemble **natural** time series, encompassing the observed statistical features, such as autocorrelations and power spectra.

Page 30. And the Platonic ideas may also be used to approximate specific data sets, such as a rainstorm in Boston shown here on the right.

As is seen, the real and the projected sets, the latter in the middle and given via a wire defined not by three points but by five, although not identical, clearly belongs to the same family, and such happens to be the case as they share similar **statistical** and **chaotic** features.

In an encounter I had with the late Benoit Mandelbrot, the grandfather of fractals, he asked me what was shown on the right of this page and I answered, "rainfall in Boston." He replied, "then, what is next to it is also rainfall," to which I said, "thank you very much."

Page 31. It happens that the ideas may be extended to higher dimensions, iterating simple maps having more coordinates, such that they define fractal wires from one to two or from one to three dimensions.

As illustrated here on the left, a non-trivial wire yields interesting shadows over two dimensions, complex, yet deterministic sets that, again, resemble natural patterns. As is seen on the right, the notions may yield, from a wire in four dimensions, complex patterns over three dimensions that model pollution and also rainfall data in space.

Although these results are quite remarkable, there is even more, as we may study what happens in the **limit** when the key parameters of wires reach their maximum possible values.

Page 32. For a wire over two dimensions with d sub 1 approaching 1 and d sub 2 approaching minus 1, that is, the **case + -**, we see here the surprise that follows.

Page 33. The wire grows such that it densely fills the plane from minus infinity to infinity, it acquires a dimension that tends to two, and, in the process, transmutes the thorns over dust in the input multifractal into the smooth harmonic **Gaussian** normal bell curve with a finite center.

This wondrous result happens to be universal as bells are found from the same wire, not only while using fair or arbitrarily biased coins, but also for any non-discrete input dx, including spiky objects defined over infinite and disperse dusts, as found in previous lectures.

Page 34. As these results imply a non-intuitive transformation of the **dissipation** of turbulence into the **conduction** of heat, implicit in the bell via Fourier's law –and not the other way around as in the common passage from order into chaos– , this unexpected discovery urged me to think about the ultimate meaning of a limiting wire capable of converting spiky violence into diffusive calmness.

Though resisting the "unscientific" thought at first, I finally concluded that such a space-filling transformation was somehow related to **love**. For what else could transform dust and dissipation into something harmonic and conducting but love?

This is how, in a rather surprising but wonderful way, I finally applied the appointed algorithm for our reconciliation, and upon forgiving and asking for forgiveness of all I could remember, that is, my "ups" and "downs," I begged Jesus to reveal himself to bring meaning to my life, and, right after that, and accompanied by tears of joy, I experienced the delightful heat of the bell in my heart.

How wonderful it was to experience Easter after such a long lent! God's ways are indeed rather mysterious and I can add that He is also quite merciful!

Page 35. Now, leaving the case when both d sub 1 and d sub 2 are positive for later, it is worth noticing that when both parameters are negative and approach -1, the construction does not define a single bell, but rather oscillations between two bells, in a periodic fashion.

Page 36. It occurs that Gaussian shapes are also found for wires defined over higher dimensions.

In a suitable limit, the corresponding wires fill up now volumes and, in this superior dimension close to 3, they cast shadows of **bells** independently of non-discrete illuminations dx.

As is seen here, a multifractal dx –drawn in the lower center– enlightens a limiting wire from x to the plane (y, z), depicted to the right in its two components from x to y and from x to z, to define a two-dimensional circular bell on the left, as shown from above in dyz and on the sides in dy and dz.

Page 37. Even though circular bells are the most common, depending on the signs of higher-dimensional equivalents of d sub 1 and d sub 2 that require of distances and angles in polar coordinates, the limiting projection may also be either an **elliptical** bell or an **oscillation** between many bells, whose centers dance around or inside a circle.

These Platonic notions generate in the limit **Gaussians everywhere**, a notation inspired by Barnsley's lovely book "Fractals everywhere."

Page 38. Interestingly, even if one were to consider only half of such a wire, one would still encounter bells as shadows, and this regenerating property happens to be true for even smaller parts, *ad infinitum*.

Page 39. Eventually, we proved the Gaussian result in the one-dimensional case, but the two-dimensional counterpart remains elusive, even to this day. As such and as it occurred to my collaborator Aaron Klebanoff, we decided to study how the concentric circles were formed, drawing not the final summary of all the iterations as done here, but rather plotting successive groups of, say, 2,000 points.

Page 40. What we found is quite lovely and is showcased here. The iteration of simple linear maps defines, in a suitable limit, exotic decompositions of the two-dimensional circular bell.

Page 41. Yes, the superposition of the patterns on the left –for angle parameters equal to 90 degrees– , and many more not shown, gives a circular bell. And the same happens on the right for angles of 60 degrees.

The two galleries of **treasures** shown here are just examples of an infinitude of patterns that magically interlock with one another to form **perfect circles** and truthful bells.

The geometries obtained depend on the precise sequence used to guide the iterations, that is, on the specific outcomes of a coin, and on other parameters that dictate the number of tips the patterns have.

Page 42. As is seen, in this rather geometric central limit there is hidden **order** in **chance**, and the exquisite sets happen as if "from glory to glory," reflecting love and inciting due praises.[1]

Next time you hear a bell just remember that the melody it makes to call attention is made of incredible beauty!

Page 43. The treasures are certainly varied, and we know by now that all **ice crystals**, as on the left, and several biochemical rosettes, including the one of **DNA**, as on the right, are mathematical **designs** living inside the bell.

The ice crystals shown here were grown by my lovely wife Marta, filling up templates of photographed flakes using limiting maps yielding

[1] 2 Cor 3:18, Ps 139:17–18

patterns with six tips, as in nature via the process of diffusion.

In regards to the DNA rosette, the pattern shown below is a representation found iterating two suitable linear maps yielding ten tips, while guided by the binary expansion of π. Remarkably, spokes and rings are on the right places when compared to the image on top as it appears in biochemistry textbooks, and this improbable finding, requiring the alignment of 40,000 bits of π, hints not at a "blind watchmaker" but rather at an extremely capable visionary.

Page 44. Even though these results are clearly beautiful and intriguing, there are yet more surprises when considering the ever-positive case on a two-dimensional wire.

Page 45. When both d sub 1 and d sub 2 approach plus 1, we obtain a fractal wire shaped as a cloud and not as a mountain, and the Platonic ideas define yet another bell, but now centered, or concentrated, at **infinity**.

What is shown here is not the ultimate limit, but what is found when the parameters equal 0.99. As such numbers tend to 1, the bulk of the cloud elevates to infinity and the mean –the center– and the variance –the spread– of the histogram over y both tend to infinity.

But the ratio of the square root of the variance over the mean tends to zero, indicating, with all probability, the limiting presence of an infinite spiky bell at infinity.

Page 46. With due imagination, we may see how, in a "mystical" manner, this powerful wire, **maximally positive** and also thick as two-dimensional space, raises it all to the clouds, filtering any kind of disorder, thorns, and dust –except for a discrete input– into an improbable condition of plenitude without entropy, yet reflected by the melodic bell.

How not to recognize here a manifestation of freedom and true divine **LOVE**? For, in comparison, the previous wire of the case + -, containing ups and also downs, turns out to be just a rather imperfect imitation, as it has a finite center.

Page 47. How not to appreciate here an essential call to the eternal? For in the directionality of the diagram, from x into y, and in the passage from obscure dissipation to luminous conduction at infinity, we may exclaim with Saint Paul: "Where, O death, is your victory? Where, O death, is your sting?"[2]

Page 48. To further emphasize the vitality of the limiting and merciful positive wire, it ought to be added that manifestations of violent processes may be used as **dx** to be filtered into the bell concentrated at infinity.

This includes any data yielding the **power-law** distributions as named on the first lecture, probability densities that decay slowly in the form of a cutoff x raised to a negative exponent c, "heavy tails" in negative lines in doubly logarithmic scales.

Page 49. As mentioned during our first encounter, these laws are prominently found in natural and man-made **complexity** and typically produce violence. These encompass the famous Gutenberg-Richter law of earthquakes, Richardson's relationship for conflicts and wars, and Pareto distributions defining wealth inequalities of nations and among nations.

To make it very clear, a **redeeming transformation** does exist, but such works only in the limit when the key parameters tend to unity. If such a limit is not invoked, then the entropy in an input

[2] 1 Cor 15:55

leads, via a sub-optimal wire, to entropy in the output, and, hence, the selfish, negative and heavy power of power-laws still dominates.

Page 50. In this very spirit of merciful redemption, how not to celebrate a most beautiful diagram, one illuminated by steady equilibrium, that is, obtained via a fair coin, which completes a **majestic trilogy**?

For here we may witness, symbolically of course and with due humility also, the **Father**, powerful in heaven, conducting and diffusing perfect infinite love; the **Son**, always constant and positive, as in the very shape of the cross, and the clear geometric solution of "filling the valleys and cutting the mountains;"[3] and the **Holy Spirit** that proceeds from them both and whose love fully transforms us if we allow it.

Page 51. For this same limiting diagram also allows us to visualize some key events in the life of Jesus Christ and yet other important symbols, as follows.

Page 52. From y into x we may envision Jesus' divine **birth**, for as said in Scripture, the Spirit overshadowed Mary and He came to be,[4] and also the same power that allowed Him to perform His many **miracles**.[5]

Regarding the miracles, such include prominently the daily transformation of bread and wine into His body and blood in the **Eucharist**,[6] which, in its smallness, is still as infinite and powerful, for just a tiny piece of the whole positive wire, by its superior dimension, also gifts the same bell at infinity.

[3] Is 40:4, Lk 3:5–6
[4] Lk 1:34–35
[5] Mt 12:28
[6] Mt 26:26–28

Page 53. From both y into x and x into y, we may appreciate the **unity** Jesus has with God the Father,[7] the nature of His reconciling **baptism** with spirit and fire,[8] that is, the conduction of heat that I experienced, and the awesome event of His **transfiguration**.[9]

From x into y, we may appreciate His glorious **resurrection** from death –even if from a spiky multifractal denoting our sins–,[10] and vividly, His subsequent **ascension** into Heaven.[11]

Page 54. In the same directionality from x to y, we may also grasp the **Assumption** of Our Mother, the blessed Virgin Mary to Heaven, certainly aided by the unitive power of the Holy Spirit, and the appointed **rapture** of the **Church** when those being alive shall meet the returning Lord Jesus in the clouds.[12]

Also based on the diagram, although not drawn to scale as the range of the wire in y grows to infinity, we may reflect on the lovely encounter between St. Augustine and the little boy at the beach. Do you remember it?

As the transformation herein is indeed capable of taking all the ocean –in the black rectangle– into a single point centered at infinity, the little boy was certainly hinting at an unlikely possibility, little bucket by little bucket, in order to explain the mystery of the Most Holy Trinity to the Saint, something that in modern terms may be referred to as a reversal of the big bang.

Page 55. Continuing with due imagination, the special limiting diagram, but based on a multifractal input reflecting our cascading sinfulness in imbalances and holes, may also be used to portray other

[7] Jn 14:11
[8] Mt 3:11
[9] Lk 9:29
[10] Lk 24:5–6
[11] Lk 24:50–51
[12] 1 Thes 4:16–17

relevant matters of our faith.

Page 56. Besides the aforementioned statement by St. Paul regarding life's victory over death, this diagram potently expresses the liturgical invocation during the communion rite when the priest asks Jesus, "Look not on our **sins**, but on the **faith** of your Church," that is, look not on the dissipative and deadly dx, but on the limiting wire, which guarantees our peace and salvation in dy.

Page 57. Quite vividly the diagram also shows why **Love**, in the infinite wire, covers a multitude of **sins** in dx[13] and how the **flesh**, symbolizing sin, produces the dissipation of **death** in dx, but the Spirit **life**, and life eternal in dy.[14]

Page 58. Similarly, the diagram portrays why indeed the **law**, represented by a uniform dx that Jesus fulfilled, is only a **shadow** of good things to come in the spiritual realm and in eternity in dy.[15]

In addition, we may appreciate from the diagram why the one blaspheming against the Holy Spirit is guilty of an everlasting sin,[16] as without the positive limiting wire –the one that mercifully redeems– the output simply can not reach infinity, as it also happens with a discrete dx.

Page 59. To further appreciate the nature of the key spiritual wire, its surprisingly simple construction is emphasized here once again.

We start with the three points as indicated by the squares. Then, after joining them with straight lines, we find two points going up a quantity **z** from the middle of such segments. Then, we join the

[13] 1 Pt 4:8
[14] Rom 8:13, Jn 6:63
[15] Heb 10:1
[16] Mk 3:29

original points and the ones just defined, left to right, and from the middle of these segments we go up a quantity **z** squared to find four additional points. Then, we continue the process *ad infinitum* to fill in the gaps by mid-point additions, going up, in increasing powers of **z**.

Page 60. When **z** and all powers of **z** tend to 1, the key cloud of the plus plus case is found, a **transformation** that coincidentally is shaped, for smaller values of **z**, as angel wings or like the wings of a dove.

In the limit, this object contains indeed **infinite unity**.

Page 61. Furthermore, given that $1 = 0.999\ldots$, such unity also reflects an absolutely infinite **symphony** of love in the outward and positive spiral of number 9, as Jesus died for us at the 9th hour, as covered during our first encounter.

Page 62. Such a loving trait is also seen geometrically in the spiral shape and meaning of the irrational number e, for, after all, the **calculus of love**, in Jesus' command to love one another via "integration without differentiation," is only achieved in the exponential function, e raised to a positive value x.

Page 63. For it happens that the essence of the Spirit e and the cross x may also be found in Jesus' celebrated parable of the **vine** and the **branches** –you remember it of course in the Gospel of St. John chapter 15,[17] which may be translated mathematically as follows.

Of course, Jesus is the vine, the essence, and if we could assign Him a number, such would have to be 1. He is the only divine son of God, the only one that did not sin, our Lamb through whom our sins are

[17] Jn 15:1–10

expiated, and certainly number 1 of those who follow Him, for not even our parents may be more important than Him.[18]

Page 64. As He calls us to abandon ourselves, that is, summons us to continue picking the cross of truth on a daily basis,[19] we, the branches, correspond to the expression, one over x, in which by growing our cross x, we eventually arrive to the zero that expresses the halo of sanctity.

Page 65. But of course, this is not yet complete. We ought to remain with Him and Him in us and then such gives rise to the equation, one plus one over x that expresses in the plus sign –or in another cross– that we cannot do anything by ourselves but only with Him.

Page 66. But this is not the end either, for if we remain in Him and vice versa, then God gives us what we ask, He gives us power, and such a power or exponent is precisely the cross, giving rise to the final expression, one plus one over x all to the power x.

Page 67. And this, when the cross grows to infinity, besides giving us our sanctity, produces, via the merciful pruning of the Father, the famous number e, the essential fruit that allows us to love as God does: the **Holy Spirit**.

This is not the love of "soap operas," as Pope Francis commented some time ago while speaking about the related first letter of John!

Page 68. At the end, the limiting trinitarian diagram and the equation just explained allow us to contemplate the Eucharistic doxology: "Through **Christ**, one over x, with Him, one plus one over x, and

[18] Jn 1:18, 1 Pt 2:22, 1 Pt 2:24, Mt 10:37
[19] Mt 16:24

in Him, one plus one over x to the x, **O God, almighty Father**, as x tends to infinity, in the unity of the **Holy Spirit**, e, all glory and honor is yours, forever and ever, AMEN."

When listening to the priest next time, or when celebrating yourself the most wonderful sacrifice, realize that the unity of the Holy Spirit is not just a nice saying, but a truly mighty reality worthy of all praise.

How not to sing for joy at these geometric facts, as the Spirit guides us in truth and leads us to salvation?[20]

Page 69. It happens that the glorious limiting diagram may also be associated with key symbolic **trinitarian numbers**, as follows.

On each one of the three blocks we may recognize the numbers 0, 1 and infinity. The perfect uniform reflects obvious unity, contains no deviations, and is dynamically built by a fifty-fifty cascade forever. As mentioned before, the transformation denoting the Holy Spirit contains infinite unity everywhere; and the bell at infinity closes into a single spike with no variation.

Page 70. The famous irrational numbers π, the square root of two, and e turn out to allegorically describe the three members of the Most Holy Trinity.

In addition to the connection of e with the Spirit just explained, the square root of two denotes Jesus in the distance of the 45 degree ramp obtained by accumulating the uniform law from left to right, that is, the hypotenuse of the first lecture, and having an equation $Y = X$, in which we also see, as mentioned earlier, His silhouette on the cross.

Finally, π, the most celebrated number in the history of mankind, symbolizes God the Father, as its shape potently reflects the halo of

[20] Is 12:6

His everlasting sanctity and, coincidentally, the very symbol of the Origin.

Page 71. Consistently, these irrational numbers are part of the very formula of the bell, that also symbolizes our true **freedom** in the practice of love and away from sin.

Page 72. The notions on this presentation, by their contrasting of limiting infinite cases or not, allow us to identify some of **our options**. Those are: conduction or dissipation, infiniteness or finiteness, plenitude or solitude, trust in God or disbelief,

Page 73. faith or doubts about Him, freedom or slavery, living one day at a time to fulfill an implicit central limit or suffering under anxiety, harmony or intermittency,

Page 74. light or darkness, the heavenly or the earthly, the always positive or a bit of a negative, and at the end, true **love** or else.

Pages 75-76. At this time, I would like to share a song with you, one entitled **The amazing bell**:

The bell peals silent, o o
reflecting its peace,
and inside it gathers
lovely masterpiece.

Symmetric pure beauty, o o
o mighty delight,
this limit in fullness
stores life's designs.

Such vessel contains, o o
alephs of all tastes,
diatoms and crystals

including DNA.

But there is a case, o o
reason to this call:
the forward selection
that raises it all.

There is clear choice
that rotates the 8,
by loving sincerely
we surely converge.

Notice, this is cogent:
the bell's central theme,
by living in freedom
one fulfills the dream.

There is transformation
that kindles the heart,
by loving in plenitude
we become smart.

For love mends the spiky
and takes to the clouds,
by living the present
one joins blessed crowd.

O see, this is truthful:
the plus all the way,
by loving the enemy
we learn how to play.

Dimensional growth,
oh essence of life,
by living in harmony
one nails normal plan.

O notice the symbols,
oh irrational might,

by loving simplicity
we experience the light.

O listen, you colleague,
let's go out the cave,
by living in unity
we shall all prevail.

O notice, my friend,
the plea from a bell,
by loving and loving
joy will have no end.

Page 77. Now, very close to the end, and to continue summarizing and praising, here is a poem called **The antidote**:

From x into y
as unnatural flow,
mapping immensity
leaving dust below.

From x into y
inspiring all awe,
o plus of liberty
forever aglow.

From x into y
only a tiny piece,
wired to totality
o normal release.

From x into y
o infinite fleece,
by packing vitality
no thorns but peace.

From x into y

singular the dough,
symphony of unity
breeding single row.

From x into y
by breaking a spell,
amazing simplicity
o refuge from hell.

From x into y
from holy plateau,
perennial immunity
o spirit on the go.

From x into y
triune is the cell,
omnipotent divinity
o sacred God's bell.

Pages 78-81. And now, really to finish, I would like to invite you to praise our Lord Jesus Christ via the following song.

Y = X
is justice that illuminates,
is balance that fascinates:
Y = X.

Y = X
is the practical alliance,
is the precious reliance:
Y = X.

Y = X
is true word that matures,
is a spiral that endures:
Y = X.

Y = X

is the spotless resting place,
is the state of mighty grace:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is smoothness that esteems,
is a lovely dove that gleams:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the short and precious root,
is the weaving of the truth:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is a future that forgives,
is crowned science that is:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the ever tender tune,
is the impartial tribune:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is all innocence that heeds,
is a garden with no weeds:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the simple clear sign,
is the majestic design:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is brotherhood that heals,
is diversity that shields:

$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the real chaste embrace,
is the goodness of a yes:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is a smile that edifies,
is a spin that rectifies:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is all gentleness in us,
is the everlasting plus:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is inspiration that calls,
is growing to be small:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the forgotten territory,
is the improbable story:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is revelation that nests,
is surrendering the rest:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is the dustless short incline,
is the faithful narrow line:
$\mathbf{Y = X.}$

$\mathbf{Y = X}$
is renouncing all spears,

is experiencing no fears:
Y = X.

Y = X
is the perennial giveaway,
is pure life with no decay:
Y = X.

Y = X
is the only perfect remedy,
is loving, even the enemy:
Y = X.

Page 82. And the letters J, X and Y as in Jesus, the cross, and his silhouette, were recently identified on the holograms made by Petrus Soons on an oval stone placed under the chin of the man on the Shroud, which you may see searching on the web!

Page 83. It has really been an honor and a great joy for me to be here and I would like to thank you again for your presence.

I certainly hope that these reflections may help you appreciate how modern science ends up reminding us of the greatness and uniqueness of the love of God through Our Lord Jesus Christ. I also hope that what I have shared would inspire a merciful New Evangelization that includes all credos.[21]

Page 84. There is a bit more in my God-given books, but all has been said: all praise and honor be to our artful and merciful Triune God. Amen.

[21] Jn 14:6, Phil 2:10, Phil 2:11, Lk 13:24, Jn 10:9, Jn 10:11, Mk 16:15-16