

Therefore Fermat is Right

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It was *Fermat's* idea to investigate how many numbers would fulfill the equation according to the *Pythagorean Theorem* if the exponent were increased at random, e.g. to $a^3+b^3=c^3$. His question became therefore: are there two whole numbers the cubes of which add up to the volume of the cube of a third whole number? He posed this same question, of course, for all kinds of higher exponents, so that the equation could be generalized: is there an integral solution for the equation $a^n + b^n = c^n$, if "n" is higher than 2? Although in 1993, the English mathematician *Andrew Wiles* was able to produce an *arithmetical proof* for Fermat's famous theorem, I will show that there is a simple *logical explanation* which is also pragmatic and plausible and what is the result of a fundamental alternative idea of how our world seems to be constructed.

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Where indeed lies the hidden the secret of *Fermat's* "Last Theorem"? *Pierre de Fermat* was a French amateur mathematician who lived during the 17th century (1607-1665). Before I will come to his famous "Last Theorem" and a geometrical approval, I recall minding the famous "Pythagorean Theorem". I believe that this theorem is of utmost importance if we want to understand our physical world. It says: $a^2+b^2=c^2$, i.e. in a right-angled triangle the area of the square on the hypotenuse is equal to the sum of the areas of the squares on the other two sides. The first three integers fulfilling these conditions are the numbers 3, 4 and 5, which are known, therefore, as the Pythagorean numbers. *Pythagoras* was able to prove that there is an infinite number of integers which fulfill this equation.

It was now *Fermat's* idea to investigate how many numbers would fulfill the equation if the exponent were increased at random, e.g. to $a^3+b^3=c^3$. Figuratively speaking, this would no longer involve squares but cubes. His question

became therefore: are there two whole numbers the cubes of which add up to the volume of the cube of a third whole number?

He posed this same question, of course, for all kinds of higher exponents, so that the equation could be generalized: is there an integral solution for the equation $a^n + b^n = c^n$, if "n" is higher than 2? Fermat established in the end that no single whole number higher than 2 would fulfill this equation. But there are infinitely many which are very close to the required result, as the example with cubes shows in the following illustration (Figure 1).

Of course, he made it known to all his colleagues that he himself was able to prove all this but, alas, he did not reveal his proof. Until a few years ago nobody has been able to prove his theory. Over a period of three hundred years the mathematicians of this world racked their brains in vain. At long last, in 1993, the English mathematician *Andrew Wiles* was able to produce an *arithmetical proof* for Fermat's famous theorem.

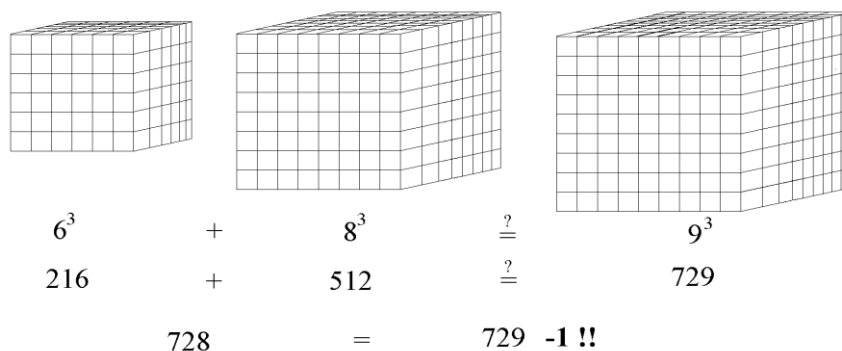


Figure 1: The example of cubes with side lengths of 6 and 8 is typical: There are no two cubes the added volumes of which result in the volume of a matching third. For the equation of Fermat's great theorem (here: $a^3+b^3=c^3$, or generalized with an exponent higher than 2) there is no integral solution.

It certainly seems absolutely amazing that for the exponent 2 an infinite amount of integral solutions exists but for all higher exponents there are none at all but many 'close' solutions! That reminds me of the famous novel *"Miss Smilla's Feeling for Snow"* by Peter Høeg (1992): Nature repeatedly confronts us with manifestations which clearly remind us that they are based on an *optimal program* which actually never fully materializes. On the other hand it also reminds me of the German mathematician, *Leopold Kronecker (1823-1891)*. He once said "the natural numbers were made by God; everything else was made by humans."

Mr. Kronecker assumed that the entire field of mathematics may be traced back to integers. In my last article for this magazine, "Why natural constants are as they are?" (2013)ⁱ, I presented a little intellectual experiment: With some simple geometry I was able to achieve a completely widened view of our world. By that, basing upon a simple geometrical growth and propagation progress, starting with the single and simplest finite point of singularity, the smallest unconceivable circle, I resulted in the first new object of perfection in multiplicity, the square, by just using the first four ordinal numbers. With these two geometrical objects, the starting circle and the newly achieved square, I could easily create two geometrical ratios (with the irrational numbers 1.618... and 1.273...), leading to two very important number sequences 6-1-8 and 2-7-3. Finally, with the first four ordinal numbers and these two gained number-sequences out of purely

geometrical ratios, what means that the calculation system used is of no importance, I was able to describe all important natural constants.

Another logical key-point of this intellectual experiment was: Every new introduction should be unequivocally retraceable to already existing information whereby every new invention must simultaneously strive for perfection.

As seen, the whole experiment was *two-dimensional* and resulted to a complete explanation of why the world principally seems to be as it is. The next step of continuing this intellectual experiment is then to stretch out from the two-dimensional plane into space: From a single finite point, the smallest inconceivable circle, as the starting point in my experiment and thus from a finite singularity I generated the square, the first perfect new object in multiplicity which encompassed and surmounted this finite singularity. Up until then the expansion of the first circle to the square was purely laminar, i.e. *two-dimensional*.

After the new perfection is reached in the multiplicity the next step must be a new quality leap. This is found by opening up the space, a further now spatial dimension, i.e. the dimension into three-dimensionality. One possibility how to do this would be to use a fifth circle, erected perpendicular to the working face, so that we then gain a regular pyramid with a square base. Perhaps the ancient Egyptians constructed their pyramids in that way as tombs for their pharaohs (Figure 2):

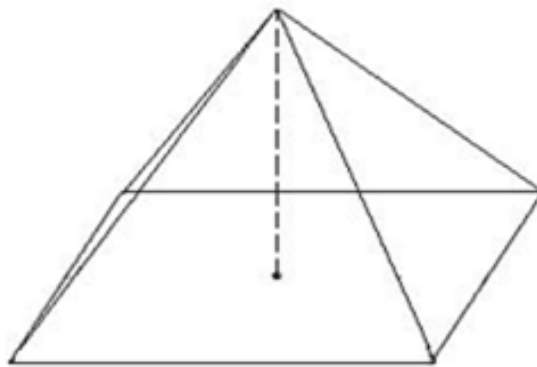


Figure 2: The regular Pyramid with a square base.

To open up space seems here to be fulfilled in a self-evident logical conclusion for us humans since only this method corresponds with our natural conception of space as something *three-dimensional*.

But I believe that this won't be truly logical! So, an alternative perception seems to be better and the only strictly logical one: It will easily be found

up if we consider the important steps of my already mentioned intellectual model. The development of *the two-dimensionality*, i.e. the plane, by an outward expansion was only achieved by means of a third circle, which was generated vertically or perpendicularly, i.e. at a right angle to the starting line of the first two circles (Figures 3 and 4):

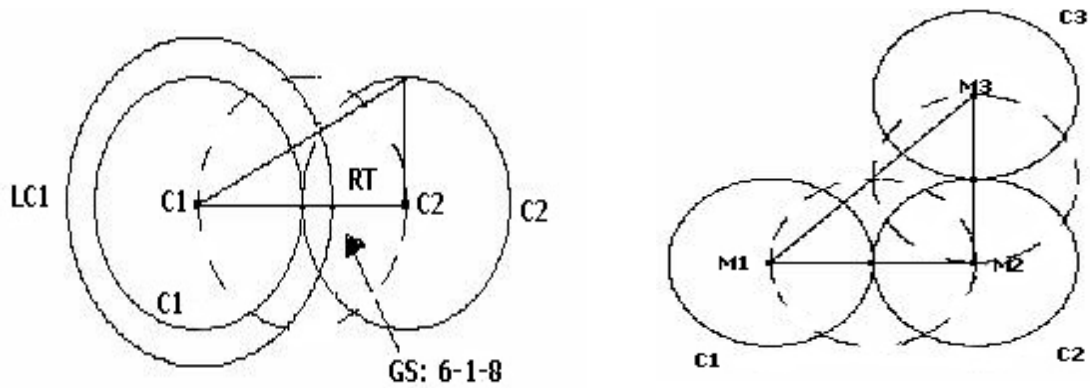


Figure 3 & 4 (right), taken from “Why natural constants are as they are” (Van Laack, 2013).

Starting with the first finite point, the smallest unconceivable circle C1, a second circle (C2) could be created by logical proposals. By-the-way, also a larger circle (LC1) was facilitated and leads us to the “Golden Section” (GS). An outward expansion into the two-dimensionality (plane) was generated vertically (or perpendicularly) by the third circle (C3).

This elevation over the two-dimensionality and thus the development of the three-dimensional space as a new qualitative orientation, must, therefore, also be carried out in a vertical, i.e.

rectangular position to the starting geometry, since *only this* would be unequivocally defined by the preceding process.

However the starting geometry itself is plane and no longer a line. This means the space can logically only be developed by means of a second plane which is perpendicular to the first. The space is thus initially developed by means of a completely different x^2y^2 -geometry, which is not three-dimensional but truly *four-dimensional* as shown in the next illustration below (Figure 5):

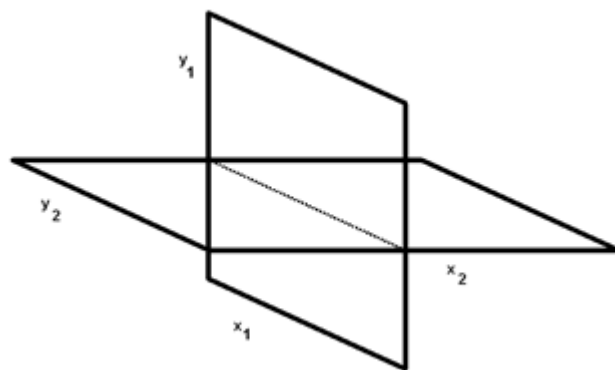


Figure 5: The space is truly four-dimensional with an x^2y^2 -geometry

If the program for our physical world seems to be a two-dimensional one, as proposed in my already mentioned article and described in detail in my book "To Perceive The World With Logic" (2007) – in which and thereby subject to the law of symmetry and polarity, by which then a true four-dimensional infinite space is generated from a plane by the reflection over a right angle – then there *certainly must only be one possible solution for Fermat's equation*: Only the exponent 2 (or those below, i.e. 0 or 1, but this is a triviality) fits into the two-dimensional program on which our world seems obviously to be based.

That means that nothing can exist that extends beyond the *Pythagorean Theorem* since a three-dimensional space as we know it is only *part of the four-dimensionality* (as the result of a double-two-dimensionality) due to the development of all physical things *in this true four-dimensionality*.

Indeed every closed three-dimensional body *logically* demands the existence of this fourth dimension of space.

Although I never read the arithmetical proof of Fermat's Theorem by Wiles – and would probably not even understand it if I did – but here I provide a *logical explanation* which is also pragmatic and plausible and supports my ideas about the most important regions of our world.

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