Emmanuel Xagorarakis

THE GROUNDLESSNESS OF INFINITY

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Εκδόσεις Σαΐτα

EMMANUEL XAGORARAKIS

THE GROUNDLESSNESS OF INFINITY

Analytical Theory

Εκδόσεις Σαΐτα

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Dedicated to Kleio,
my (spiritual) mother

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Re: MS # 03-51-SP

Dear Mr. Xagorarakis:

The review of your manuscript, "The Groundlessness of Infinity" has been completed. I regret to inform you that it is not suited to our current editorial needs. This essay does not fit well with the mission and contents of our journal, and it belongs more properly to traditions and discussion in journals that deal with the philosophy of mathematics and analytical theory, and we would strongly encourage you to submit your essay to one of these journals. In addition, you might consider the value of including scholarly references to the relevant scholarly literature in the field if publication in a scholarly journal is desired. Your interest in the Journal of Speculative Philosophy is appreciated.

Thank you for the opportunity to consider your essay. We wish you every success with it elsewhere.

Cordially,

Daniel Toronto
Editorial Assistant
dkt12@psu.edu

PREFACE

The present theory is a purely personal work of mine and it is not based on any kind of existing knowledge – it is a parthenogenesis. This means that the reader is not expected to be acquainted with any scientific field in order to comprehend the present manuscript. Moreover, the present manuscript constitutes the first case in History where we have record of purely scientific and orthologically proving knowledge, which is not based on axioms at all. This for the whole logic and the proofs of the present manuscript are exclusively based on the arithmetical identity, which, as it is known, does not exist and is not apprehended in any axiomatic way. An axiom is a logical/scientific demand, that is an arbitrary acceptance, regardless its being actually correct or mistaken. As to this, the present theory does not run the risk of even the least logical arbitrariness, so the knowledge offered here is literally absolute and perfect.

As by the title of the theory "The Groundlessness of Infinity" one is likely to consider that, if the title is actually valid, everything (time, space, mass, energy, etc) has an ultimate end/barrier. Nevertheless, the proofs that abolish infinity are the same proofs that introduce the wholly new consideration of the notion of counting and of what is called limit. The notion of the "ultimate end" has no place in the present manuscript, and specifically, in this manuscript, we refer to the difference of The Groundlessness of Infinity with "Finitism", which does not prove anything.

This theory –The Groundlessness of Infinity– proves the numeric substance of infinity, thus the infinite in general terms, not to exist. That is nothing can be considered as being of an infinitely large or infinitely small quantity. This is rendered clear and definite by revealing the single quality and nature of the number; the quality which has been unknown since the first time Man has considered numbers and arithmetic. The nature of the number is its being one-part; indivisible. As to this, numbers cannot share anything at all with each other, since, being partially similar (or different), requires their being parted, which is proved impossible by this theory. Therefore, e.g. 3 and 4 cannot be included in one definition, for a common definition of them would require a common element between them. Thus the most common and fundamental definition of infinity "for each number n there is n+1" cannot be valid, for, in order to accomplish it, we need one definition for each number of it. There is no possibility that someone makes infinitely many definitions. And furthermore, the definition of infinity "for each number n there is n+1" constitutes some kind of numeric set. But a set of numbers is not possible. This for, e.g., 3 and 4 as being one-part each, they cannot constitute a set.

The problems like the Goldbach conjecture or the Riemann hypothesis are given the complete solution through the abolition of the numeric set, in a negative way. That is they cannot be proved because they are based on the concept of the numeric set. The P Vs NP problem and is also solved here by applying the numeric nature in the logic of the problem.

In addition, problems like the supposed race between Achilles and the turtle, and the Dichotomy and the Arrow (ancient Zeno's from Elea), as well as the Sorites paradox, which are so far attempted to be solved through the abstract numbering, are solved here through the abolition of the abstract numbering. That's because the abstract numbering (of distances) requires numbers to be inside a set; a continuum. And this we prove in this theory to be groundless. Therefore, Achilles at some discrete point (number of time or space) will have reached or surpassed the turtle.

Based on the abolition of the numeric set and infinity, tremendous changes occur in the Theory of Numbers and Geometry, as well as maters of Physics such as the problem of the race between Achilles and the tortoise. We'll just have to forget whatever knowledge is based on the numeric set and infinity.

As to the Geometry, let's note that the Euclidean Space is proved here. That is the axioms of Euclid are proved, and thus cease to exist as axioms (set acceptances/definitions) and become proofs. It is here proved what a straight line is (i.e. the notion and entity of the straight line), what an angle is and what a square is (and, in extension, a cube), which is the structural unit of the Euclidean Space!!

The circle is proved as a non-Euclidean object, but a physical/cosmic entity, which is apprehended and calculated in the terms of Physics. So the ancient mystery of the calculation of the circle is here solved... This has a mostly technical application to that it is (finally!) answered the question to how a bicycle works and doesn't collapse, as it is based on two circles – its wheels!

THE GROUNDLESSNESS OF INFINITY

1. The arithmetical identity and the total absence of relationship among numbers

Each number is unique and totally different from all the others. This means that, e.g. 3 cannot be related to 5 in any way, so it cannot be apprehended as a part of it either. If we say that 3 is related to 5 as a part of it, then we essentially mean that if we add 2 units to 3, then 5 emerges, or if we subtract 2 units from 5, 3 emerges. So, the correlation we attempt to prove is placed in terms of the identities: i) 3+2=5 and ii) 5–2=3, where 2=1+1, 3=1+1+1 and 5=1+1+1+1+1. The two numbers, 3 and 5, can only be related in terms of identities like the above. But 5 in (i) is related to 3+2 and not to 3. 3+2 is an energy, a number which is identified with 5. So, 5 is only related to (identified with) itself. By this we mean that, since only the whole of 3+2 is related to 5 and not only 3 or 2, and 3+2 cannot but be identified with 5, it is as 5 is only related to itself.

We can say that 5>3, so 5 has been related to 3 itself. Yet, we can't ignore 5=3+2. This identity is the absolute presupposition for 5>3 to be valid. On the other hand, the way we apprehend 5>3 is identified with 5=3+2; 5 being bigger than 3 means that 5 consists of more units that 3, which means that 5=3+x is valid. But x couldn't be other than 2. So, the figure 5>3 is identified with the identity 5=3+2. So, 2, although it isn't apparent in 5>3, yet it substantially exists in it. Therefore we are again led to the identity as the only way of relating. Since the identity is the only way to relate 3 to 5, their relationship, in order to exist, will have to be an identity relationship. And, given something like this can't be, there can't be a relationship between them. In any way, based on the figure 5>3, 5 is given a characteristic which signifies comparison and difference against 3, and not similarity. This is so because, based on 5>3, no common element between 5 and 3 emerges. Whereas 5, in this relationship, is characterized as **plainly** "bigger" (more big), 3 couldn't be named "bigger" (or big), so that it resembles even partially to 5. And, since 5>3 gives 5 nothing but the characteristic "bigger", which constitutes distinction and not similarity, it is obvious that it can't have something in common with 3.

In 5>3, besides the fact that "bigger" attached to 5 cannot be considered for 3 –so it cannot be a common characteristic of them– occurs also this: "Bigger" has a purely quantitative character; it expresses nothing more and nothing less that the substance of quantity, thus the number. 3 is a quantity and only, as being a number [1]. The fact that 5 is bigger than 3 depends exclusively on the addition +2 in 3+2=5. 2 is also only a quantity. And since the characteristic "bigger" depends exclusively on the operation +2, "bigger" is purely a substance of quantity, for in any case, 3 and 2 are quantities. And the increase of 3, that is 3+2, is essentially a quantitative energy, since +2 is a quantity. But the quantitative energy 3+2, which exclusively defines the term "bigger" for 5, is 5 itself: 3+2=5. And since "bigger" characterizing 5 is purely a substance of quantity, it couldn't but be identified with 5, for 5 is only a quantity. Also, attaching "bigger" to 5 creates a quantitative quantity, which is redundant. Therefore, in 5>3 5 isn't just characterized bigger, but "bigger" is the whole of 5. We can say that 5 is "biggerness". This means that the whole of 5 is defined as "biggerness" and that biggerness isn't a characteristic (that is part) of 5, which could maybe connect 5 to 3. So, 5 is the quality of something being bigger. Thus bigger cannot be a common part of 3 and 5 in 5>3.

5 couldn't be related to 3 itself, that is without +2, because, on one hand, Mathematics does not provide such a correlation. On the other hand, our logic in its attempt to relate 3 to 5, uses terms such as "number" or "synthesis of units". But, as it is understood, the term "number" doesn't define 3 or 5; it is just put as an a posteriori etiquette of them. Also, there is: number = n = 3 or 5. Thus what we call a number is identified with 3 or 5, so it cannot constitute a (common) part of 3 and 5. The same goes for the term "synthesis of units" which is identified with the term "number".

In the identity 3+2=5, 3 cannot be considered detached from +2 in terms of its relationship with 5, because then the identity isn't valid. So we comprehend 3+2 as an indivisible energy or entity. 3 has no relation with 5 since there is no way for this to happen. A relationship with 5 has only 3+2, that is 5 itself. Therefore, 3 and 5 as entities that cannot be related in any way, they are totally different to each other, so they are defined in a totally different way. Thus, for the definition of the infinite set of numbers, an infinite number of definitions is required. Consequently we cannot define –apprehend– the substance or notion of the infinite.

In terms of the identity 3+2=5 one could say that 3 constitutes an energy of 5, so in this way it has been related to 5. Nevertheless, it is only right to say that 3+2 is an energy of 5; not 3 by itself. And this is so because 3 itself cannot have any relationship with 5. If we consider the relationship of 3 and 5 we can only say: $3 \neq 5$, so we are talking about an absence of relationship. Again, if we say 3=5−2, we do not relate 3 to 5 but to 5−2, thus we are driven to the same conclusion.

We cannot characterize 3 as an energy of 5 thinking common sense. Arithmetical operations are only the addition and subtraction, and the multiplication and division. They are the elementary ones and any other function that expresses numeric operations in absolute ways, that is through equations offering precision, is exclusively based upon those as it is essentially analyzed into and proven upon them [2]. So, 3, if it is an energy, e.g. of addition, then it will have to be for example the energy 2+1=3 and not in any way the energy 5, which is equal to 3+2 or 4+1 etc.

If we say that 3 is a part of 5 then, as we have said, we are essentially driven to the relationship 3=5–2. In other words, the only relationship between numbers Arithmetic provides is the relationship of identity. And this is of crucial importance, because Arithmetic is the most valid (the only) science of numbers. Any other relationship between numbers, a partial one and not of identity, does not exist in terms of arithmetic and pure numbers. And, anyway, the relationship 5>3 is equivalent to and springs from the relationship 5=3+2.

Although we can't say that a number is a part of another number, we can say that two entities that are not numbers have the characteristic of the one being part of the other; the component of it. E.g. the entity "green colour" can be a part (a component) of the entity "apple", so that we can talk about a "green apple". Given that the green colour and the apple aren't numbers, so they cannot construct an identity such as A·B=C or A+B=C, where A=green color, B=the rest of components and C=apple, the danger of the green colour not being able to be part of the apple is avoided.

Of course, we shouldn't make the mistake to identify the green colour with the number 1 thinking that it constitutes 1 component of the apple, and the apple with number 10 thinking that it possibly consists of 10 elements, of which 1 is the green colour. This would be absurd because in this case we are considering the natural quality of the green colour and not the arithmetical substance of it.

Nevertheless, a reasonable question comes up; when we say that we divide 6 into two parts, how can this consideration be wrong, given that each part (which is 3) appears to be a part of 6? To this we reply that dividing 6 into two parts is identified with the division of 6 by 2. So we have 6/2=3. And it is obvious that 6 and 3 aren't related in any way, in the same way 3 and 5 aren't related in terms of the identity 5=3+2. And, if anything 6/2=3 => 6=3·2 springs from 6=3+3.

If an identity, e.g. A+B=C is to be valid, A+B has to be identified with C and not be approximately equal to it. This means that the relationship between two numbers cannot be valued as a partial identity, but only as an absolute one. And, since it can't be a partial identity, it can't be a partial difference either, because two numbers being partially identified entails their being partially different. If they were to be partially different, they couldn't be absolutely identified at the same time. Therefore the fact that there can only be the absolute and not the partial identity among numbers means that if two numbers are not absolutely identified, they will have to be absolutely different. So, each number has no relationship with the other numbers.

As regards the numerical sequence, as this is expressed with each latter number to constitute a set of the former ones, the answer on the basis of what is proved here is simple. The sequence is: 0=empty set, 1={0}, 2={0, 1}, 3={0, 1, 2}, etc [3]. The sequence, or joint, is said to be on the basis that each number contains all the previous ones. But it is obvious that 3={0, 1, 2} has as absolute basis that 3 is directly sequent of 2. If it weren't, it either wouldn't contain 0, 1 and 2 but more, or it would contain less than these. This is secured and stated as 3=2+1, where +1 is the expression of direct sequence. The 2+1=3 is the only foundation for 3={0, 1, 2} to be valid, for it is the only proof for sequence.

Nevertheless, as in 3+2=5, the same goes for 2+1=3. And, as 3 cannot be apprehended as a part of 5, 2 or 1 cannot be said to be included in 3. As regards the sequential quality or process, it is simply a statement; a figure, such as 0, 1, 2, 3, 4, ... is. And as we explain in unit 3 about 3 being one-part, it is of simple reason to discriminate between the morphological (optical) and the notional characteristics of a figure [4].

It is important to bear in mind that we are based on the arithmetical identity in order to find the nature and the relationship of numbers. This, for, apart from unit 1, the two other main proofs (units 2 and 3 in this manuscript) that reveal the numeric nature and relation among numbers are based exclusively on the arithmetical identity as it is the basis for logical analysis.

And, any other principle, like the above referred –through which the founding of the numerical continuum (which we abolish here) is attempted– is absolutely dependent on and verified by the identity. This means that the identity is prior to any such axioms. Its validity comes first. The identity, as we know, is the absolutely valid "territory" as regards the numbers, as it is not based on any axioms [5]. It is the absolute "tool" through which the numbers are conceived. Therefore, in any way, the numeric continuum cannot be, for the identities secure (through this theory) the total absence of relations among numbers.

2. The relationship of two numbers as a relationship of "compose" to "decompose"

A number isn't the object of composing, but the energy, the act of it. Three oranges is a composition of oranges. Three apples is a composition of apples. The statement "composition of apples" and the statement "composition of oranges" are different as regards the words "apples" and "oranges". What they have in common is the word "composition". Similarly, the statements "three apples" and "three oranges" differ in the parts "apples" and "oranges" and share the number. Therefore, the number is the energy and not the object of composing, which, although it can vary, we don't cease to talk about a composition, for there is always the element of number present. The substance of composing is the substance of multitude, the lot, therefore the number of objects and not the objects themselves. This is so, because what we call an orange is not necessarily a composition of oranges for there can be only one orange or none. Since a number does not constitute the object (target) of composing, that is something which is being composed by something else (like the oranges that are rendered a composite entity because of the number 3), but the energy (or quality) of composing, it is then only right to consider it in the verbal form. So, number 6 is a "compose". Indeed, $6=2\cdot3$, where $2\cdot3$ is an energy and involves an action.

6 is a "compose". The operation $2\cdot3$ is identified with this "compose". If we consider the operation $(2\cdot3)/3=2$, then we have an energy opposite to the "compose"; a "decompose". "Decompose" on one hand belongs to the same category with "compose", which means that it's an energy. On the other hand it is a totally opposite energy to "compose". This for, this "decompose" (as an autonomous, pure notion) is the total abolition of "compose". Therefore, the "decompose" which is defined as $(2\cdot3)/3=2$ cannot be regarded as a part of "compose", which is called $2\cdot3=6$, because it doesn't contribute to the construction and existence of 6, but it totally abolishes it.

So, if 6 has the substance "compose", 2 is the absence of 6, as a "decompose". Thus 2 cannot be related to 6.

Of course, as it is well known, no term can describe (and therefore set in common) what we conventionally call numbers, since the term number and the relative ones cannot be defined. The most common definition that we know of the number is: (a number is) "the property possessed by a sum or total or indefinite quantity of units or individuals" [6]. But the structure of the definition already contains the notion of the number inside it in different words, and therefore we have circular argumentation: "...a sum..." is nothing else but a number of things. Obviously, the same goes for the terms "total" and "quantity". And also, in any attempted definition of the number, we have terms, such as quantity. We always have circular attempts when trying to define the indefinable. For example: (Number is) a concept of quantity involving zero and units. [6]

And, if anything, here we apprehend 2 and 6 as sole entities; detached from any supposed set they are said to belong to, and which might give them the quality "even" (numbers), etc. (And, furthermore, in unit 12 we even explain why the sets of "odd" and "even" numbers cannot be sets. Therefore, the numeric qualities "odd" and "even", or any other numeric quality, cannot be). So, we are only interested in the characteristic 2 has to work as an energy of opposing to the energy 6 has; that is, 2 (as a "decompose"), is apprehended as refuting the substance of 6 (as a "compose"). And the term "compose" is conventional in our attempt to describe 6, and we merely refer to it for our facilitation. 6 can actually be defined as a numerical energy, that is 2·3 or 1+1+1+1+1+1. In this way the seeming paradox, of 2 being itself a compose (that is 2=1+1), although it substantially is opposite to 6 (which is also called "compose"), is avoided.

Now, to make our syllogistic clear and point why a "compose" is abolished by a "decompose" and isn't rendered just different, that is it isn't rendered a composition less composite or simpler, we note these:

It is totally different to "decompose" a "compose" than to "decompose" a "composition", which is the object of a "compose". If a "compose" is 6, then a "composition" is 6 cars. If we decompose the composition of 6 cars, which means we are making it simpler, we can have: 6 cars/3 = 2 cars. In other words, we analyzed (decomposed) the 6 cars into three couples. This synthesis didn't loose its quality (that is the substance which is called "car"), it just became less composite – simper. And, the quality, which hasn't been lost is the one we combined the number 6 (the "compose") with –the car– and not any other supposed quality 6 has. The 2 cars are considered a part of the 6 cars because they retain their quality. This means that the part has the same quality as the whole – it just differs in terms of quantity. Therefore, two quantities (numbers) not being combined with a quality (e.g. the quality "car"), where the one is supposed to be a "part" of the other, are a totally different case. Because no substance is preserved in the "part" which is called quantity, then this quantity cannot be considered a part of the larger one. In 6/3=2 no common element is preserved from 6 to 2, for 6 is only quantity (it isn't escorted by some quality, e.g. "car"). And this quantity is obviously **all divided** in 6/3. So, no common element is preserved from division 6/3 to 2. The entity "2 cars" being part of the entity "6 cars" means that it is partly identified with it. This means that it is identical as regards the substance "cars" and different as regards the number (2, 6).

In a few words, it is totally different to decompose a composite entity than to decompose a "compose". The term "decompose" and the term "composition" (composite entity) do not express homologous substances, since a "decompose" includes only a number (e.g. 6/3=2), while a composition includes a number in combination with some quality (e.g. 6 cars). So, these two terms, as non-homologous, do not perform antagonistically between them.

The "decompose" as the negation of the "compose" declares the total absence of the "compose" inside it. So, the substance of "compose" is absent from the "decompose". Thus the substance of 6 is totally absent from 2. 6 and 2 are not considered in a similar way at all.

We can also approach this matter as follows: Since 6 is *itself* the very energy of composing –2·3– then 2 by itself doesn't constitute a synthetic energy of 6 at all. To constitute such an energy, it has to be considered as multiplied by (put together with) 3. Thus, since 2 by itself (solitarily) doesn't take part in the energy of composing which is called 6, it doesn't constitute a part of 6, because the energy of composing "6" is the very substance of 6. In fact, this non-participation of 2 in the "compose" which is called 6 renders it something from which 6 –the "compose"– is absent. In this way it is explained why the "decompose" (2) is apprehended as the absence of the "compose" (that is 6). The only substance 6 has is the multiplicity, or else, the "compose", which springs exclusively from number 6. Therefore, since 2 doesn't take part in this multiplicity by itself, which means it doesn't contain this multiplicity, and given that this multiplicity is all that 6 is, then 2 has nothing in common with 6.

To this point one could say that 6 isn't a "compose" but a composition; a composition of units. Nevertheless, as we indicate in another part of our work, the meaning of "compose" and this of "unit" cannot be considered separately – as having separate meanings. They cannot be substantially segregated. This is because the action of composing has always the units as its object, since whatever we may compose is a unit – can be considered a unit. As to this, it is rendered superfluous to say that we compose (numeric) units. We can merely say that we compose. Therefore, the unit or the units are not apprehended as the object of composing and the number is a "compose" and not a composition (an object of composing).

In conclusion, the fact that a number is the action of composing and not its product –that is something composite– leads us to say that a number cannot be divided. Saying that a number is divisible means that division (or else, multiplicity) is a trait of it and therefore a part/side of its entity. Yet, the very essence of the number is multiplicity –multitude– (or division). This is the whole of its existence. So, we cannot act on the number and divide it. This means that the expression "divide 4 into, e.g., four parts" isn't consistent, because the very 4 is the energy of division into four parts, that is the quality of the fourfold. In other words, dividing an entity A into 4 parts means attributing to it the characteristic of being fourfold.

But, if this entity is 4, we surely can’t attribute the characteristic of fourfold to the fourfold, that is to 4, because redundancy will emerge. And it is certain that we have to do with redundancy because we are stating: “4 is fourfold”, so we are referring to the substance of the fourfold twice, since 4=fourfold and fourfold=fourfold. In other words, saying that 4 is fourfold is equal to saying that 4 is a fourfold “fourfoldity”, which constitutes a redundancy case. And this is so, because if we say $4=A$, then giving 4 the characteristic “fourfold” is equal to regarding the characteristic A inside A [7]. This is irrational, because in this way we consider $A>A$. But there can only be $A=A$. So, the only thing we can say is this: A is A ($A=A$). Therefore in the case of four we are only allowed to say that 4 is 4 (which means we identified 4 with itself) and not that 4 is (has the characteristic of being) fourfold.

What’s more, neither are we allowed to consider any other multiplicity characteristic of 4, such as “bipartite” (2), because, if 4 is considered as “fourfoldity”, due to its being constructed by four units, we can consider 4 as “bipartition” if we state $4=2+2$ and $2=x \Rightarrow 4=2\cdot x$. The x obviously constitutes a part, for, if 4 is defined as “fourfoldity” because $4=4\cdot 1$, then 4 is also defined as “bipartition” because there is $4=2\cdot 2$. That is if $1=y$ and $2=x$, then $4=4y=2x$. The x and y are of the same nature – the nature of the number, so if y is considered a “part”, then so is x. For this, no quality of multiplicity can be attributed to a number except for that of being one-part (simplicity).

The fact that an entity is being parted, means that a partition energy is applied on it. But if the whole entity is the partition, there can’t be considered an act of dividing it, because this would demand the whole existence of it. This means that such an action would transform the whole substance of its entity, therefore there couldn’t be a firm reference point on the basis of which the partition is to be performed [8]. If before the partition we have a partible (divisible) substance x, then, after the partition, we must have a parted (divided) substance x. If, after partition the x substance ceases being x and becomes, e.g. $x/2=y$, then the x substance ceases existing. So, we cannot be talking about the partition of a substance that is the partition on the basis of a substance and the partition as a characteristic of a substance, because partition cannot be a quality of x, since the parted substance is y and not x. What’s more, the term “number” or “quantity” couldn’t be regarded as an unchangeable reference point during the decomposition of the “compose” (number). This means that we can’t say that the “compose” –6– has in common with “decompose” –2– the substance of the quantity or the number, because these terms are only conventional and their content is identified with 6 or 2, and doesn’t constitute a partial characteristic of them. For this, there is no reference point during the “decomposing” of “compose”.

So, “compose” is identified with what we call quantity or number. What’s more, the verb which comes out of the noun “number” –numerate– is of the same meaning with “compose”, for the composition (or composing), that is synthesis, is a number, a quantity of entities. Or, to say better, it is the quantity that accompanies entities [9].

Therefore, 6, as a “compose”, is totally absent from 2 – “decompose”. And this is certain, because “decompose” is by definition opposite to “compose”. So, 2 can’t be a part of 6.

We can only view this matter as this: In the phrase “six cars” the term “cars” has the quality of “composite”, because it is put together with number 6. If we were to talk about one car then the total of cars wouldn’t have the quality “composite”. So 6 is itself the quality “composite”. So 6 cannot be regarded composite, i.e. receive this quality, for this would be redundancy and a groundless consideration. This means that we would be talking about a “composite composition”, which is absurd, just as a “benevolent benevolence” or a “speedy speed” is.

There could be said that, if 2 is a “decompose” of the “compose” called 6, then 1 is a larger “decompose” because it emerges by the further decomposition of the decomposition 6/3=2, that is the 2/2=1. Therefore, 1 is a stronger “decompose” against the “compose” –6– in comparison with “decompose” – 2. Thus, the difference of 6 from 2 is a partial difference, since there is a stronger one that is the difference of 6 from 1.

To this argument we reply that we aren’t interested in if 1 is distant from 6 more units that 2 is. We are interested in the relationship of the meaning 2 involves against this of 6, and the relationship of the meaning of 1 against the meaning of 6. 2 and 1, if they have a characteristic of meaning, this is –conventionally– the meaning of quantity. So, we can’t support that 1, as a meaning of quantity is more distant from the meaning of quantity 6 than the meaning 2 is from that of 6. So, 1 and 2, as meanings against 6 are equal. In any way, as we’ve said, the meaning of composing is the meaning of quantity. Of course, 1 and 2 are called “decompose” in relation with 6, but “decompose” and “compose” are homologous meanings; they both stand for positive or negative performance of composing.

Therefore, we are interested in the quality 2 has; to decompose the “compose” – 6 – that is to refute its meaning, and we aren’t interested in the grade of decomposing, which doesn’t affect the meaning “decompose”, the refuting of compose. The necessity of being interested only in the relationship between the meanings of those numbers and not their quantitative difference is obvious if we think as follows:

2 is the “decompose” of the “compose” –6– because there is 2=6/3. 1 is a larger “decompose” of 6 for it emerges by the decomposing of 2 which is itself a

"decompose" of 6, that is 1=2/2. So we can say that if 2 is a decomposition of 6, then 1 is a double decomposition of 6. But the characteristic of "decompose" –1– the "double" "decompose", is nothing different than this very substance of "decompose", since the "double" comes from (and is identified with) the division of 2 by 2, that is the decomposing of 2. So, if 2 in relation with 6 is a "decompose" or a decomposition, then 1 in relation with 6 is a "decomposite decomposition", that is the meaning of decomposing reported twice. Therefore, the larger quantitative difference 1 has from 6 than this 2 has from 6 doesn't offer any meaningful differentiation between the relationships 1 and 6, and 2 and 6. This means that in both relationships the only element existing is the relationship of "compose" with "decompose". In the relationship of 1 and 6, even though this is characterized a double decomposition, the element "double" offers nothing more to it than what "decompose" offers. It is easily understood that also in the phrase "larger decomposition" the term "larger" is of no importance, since the term "larger" and the term "double" in this case stand for the same meaning.

On the other hand, as we've said, a "composite composition" is redundant and it's only right to talk about a simple composition. Therefore, a decomposition cannot be named double, and for this, neither larger, but only a decomposition. This is so, because decomposition and composition are homologous substances, since they are both identified with the number, so whatever goes for the one of them goes for the other too.

A "decomposite decomposition" of 6, that is 2/2=1, doesn't only fail to differentiate the relationship of 6 with 1 from the relationship of 6 with 6/3=2, that is the (plain) "decomposition" only in terms of function (quality), but also in terms of quantity (for, in any way, quality and quantity of the number are the same thing: a number is only a quantitative entity): If we say that 1 has a greater difference from 6, than 2 has from 6, the greater difference is only a difference of quantity. Therefore, we are comparing two quantitative differences and the comparison (the difference of the differences) is a quantitative difference – a quantity. So, the quantitative difference of 1 from 6 differs only in terms of quantity from this of 2 from 6. Consequently, since the difference of the quantities is quantity, the only characteristic we can give to the comparison of relationships between numbers is their self: the quantity. Consequently, 6 has the same difference (or relationship) from 1 as it has from 2.

The fact that, as we've said, composing and decomposing are homologous, in combination with the fact that the one is opposite to the other, renders them completely unlike to each other, the one being the total absence of the other. To understand this, let's take two other homologous substances: 2 and 1/2. These substances are homologous as to being double the unit. But the one is double in an adverse way than the other; 2 is double is the sense that we multiply 1 by 2, while

1/2 is double in the sense that 1 is divided by 2. 2 being the total absence (or negation) of 1/2 is apparent if we put them together. They are then neutralized; (2·1)/2=1, that is they lost their double character and got neutralized; became single (1 has been produced).
Similarly, the numbers +1 and −1, which are homologous from the aspect of being one unit distant from zero, given that the one is a negative and the other a positive quantity (which means that the one is the negation of the other), the one is totally absent from the other since, being put together, they are totally abolished: +1 −1 = 0. This means that their quality of being one unit distant from zero has been lost.
So, also the substance of composing, given that it is homologous to decomposing, it is totally absent from it. This means that two homologous substances, when being opposite, their quality which is characterized as homologous, is totally absent from the one in relation to the other. This is so because they are completely adverse to each other, since a total neutralization and loss occurs when put together (related) [10]. So, the one is totally opposite to the other, which means that decomposing (2) is totally opposite to composing (6) and doesn't constitute a partial negation (absence) of it. And, 2, related to 6, couldn't have any other common element since the whole substance of 6 is the composing and the whole substance of 2 is the (de)composing. Here we note that the characterization of 1 and 2 and consequently 6 as quantities doesn't render 1, 2 and 6 identified substances, for this characterization is used simply to help us indicate the characteristic 1, 2 and 6 have: having no characteristics besides their selves, which cannot be parted into other characteristics. As to this, 1, 2 and 6 are considered similar. It is indeed this similarity which urges us, even conventionally, to consider them by the common term "quantity".

3. The definition of e.g. 3 as 1+1+1 confesses its being one-part

A number is a synthesis of units; nothing more, nothing less [9]. This is obvious. The two substances of the term “synthesis of units”, “synthesis” and “units” are depended on each other in an absolute way, so as to be apprehended as one substance, one indivisible entity. The substance of synthesis, on one hand cannot be parted from the substance of units, and on the other hand, synthesis is only connected to units. That is, whatever we may compose, e.g. material objects, ideas, etc, is considered to function as what we call units. This is so self-evident that the phrase “synthesis of units” is redundancy, for synthesis couldn’t have any other object but units. On the other hand, the contemplation of some units could only be characterized as being synthesized since, if we consider three units, +1, +1 and +1, there can only be +1+1+1=3, where 3 is the synthesis of the units. Either way, we already called them units when supposing their existence (“if we consider three units, +1, +1 and +1...”).

So, we are led to the conclusion that it is enough to state the word “units” in order to describe a number, without needing to mention “synthesis” as defined by units [7]. Similarly, when referring to synthesis, it is redundant to mention the word “units” after it. Therefore, a number is an indivisible substance. That is, if the term “synthesis” is not to be used (but only the notion of the unit), the number cannot be characterized synthetic or composite.

Nevertheless, since number 3 doesn’t consist of only one unit but three, there is the question how it can be a one-part (indivisible) substance.

If we say that 3 (+1+1+1) is divided into the unit (+1) and the unit (+1) and the unit (+1), we then attribute the characteristic “triple” to it. Yet this characteristic is threefoldity, thus the meaning of the existence of three parts, therefore three units. So, the substance “threefold” is the substance “3”; number 3. Thus, we attach the characteristic 3 to 3. This means we identified 3 with itself. As to this, 3 cannot be composite (triple) because, as we’ve said, 3 is itself the composition. The composition (threefoldity) not being a partial trait of 3 (but 3 itself) means that we cannot consider 3, and at the same time consider the characteristic “triple” in it. If we consider the synthesis (co-existence) of substances “3” and “triple”, which means we attached the characteristic “triple” to 3, then we realize that 3 is lost. This happens because, since threefoldity is 3 itself, then a threefold 3 is a triple 3, that’s 3·3. So, there is 3·3=9, therefore a triple 3 is 9 and not 3. Triple, related to 3, actually characterizes 9 and not 3. So, 3, as the very meaning of composing (threefoldity), cannot be composite, and therefore it is simple; one-part. According to what we’ve stated above, if we attach “triple” to 3, its substance is lost and we face redundancy (because 3·3=9). But if we attach to it the characteristic “one-part”, then there is, accordingly, 1·3=3. So, being one-part, as a quality of 3, is absolutely correct, for one-part be attached to 3, means it is actually attached to it (for 1·3=3) and it does not conclude to be attached to another number (such as 3·3=9).

This phenomenon, which comes from our attempt to attribute the quality "composite" to the number, doesn't happen with the other substances. The substance "apple" or "apples" can be triple that is we can have 3 apples without 3 being in any way identified with "apples" and without a "triple apple" constructing a substance different than "apple" – unlike 3, which in this way is describing something other than 3, that is 9.

Therefore, two numbers, e.g. 3 and 4, are simple and indivisible substances and, as apparently different from each other, they are absolutely different, and not partially. This means that each of them is apprehended (and defined) in a totally different way. So, for each number, a totally different and unique definition is required. Therefore, in order to apprehend an A quantity of numbers, we need an A quantity of definitions. In order to apprehend (i.e. define, state, suppose, etc) an infinite quantity of numbers, we need an infinite quantity of definitions, and not only one definition, such as: for every number n there is n+1. Therefore, the notion of the infinite cannot possibly be defined, so it is completely groundless.

Besides that, the fact that in order to comprehend the infinite quantity of numbers –therefore the very substance of the infinite– an infinite number of definitions is required, means that in order to apprehend the infinite, we must apprehend the infinite. This is a circular argument which also renders the infinite groundless.

Also, in terms of infinity, we apprehend numbers as a set; a set of infinitely many numbers, or an infinitely large series of numbers, which is a set. And, numbers being totally different from each other, they cannot constitute a set. So, infinity cannot be defined.

As we've said, the substance of units is absolutely joined together with the substance of synthesis, so that these two substances are essentially one substance –a one-part substance– for each one is identified with the other, so that they don't constitute two (separate) parts. Therefore, if we consider the substances: "unit", "unit" and "unit", that is a quantity of units, these substances can only be apprehended as composed with each other instantly. For +1, +1 and +1 there is no possibility that there can't be +1+1+1=3. And this because the units are purely abstract entities and their composing has no need for proximity in terms of space and time unlike, e.g., 3 objects that are far from each other and cannot constitute a set in time and space.

Therefore, it's only enough to mention or merely think of the substances: "unit", "unit" and "unit" [11] in order to clearly apprehend number 3. The term "synthesis" (of units), as we've said is redundant.

But the substances “unit”, “unit” and “unit” are identified. So, in order to apprehend 3, only one substance is used: the unit. The fact that the unit is reported 3 times does not constitute an additional characteristic of 3, because the meaning of the phrase “three times”, that is number 3, is itself the report of the unit: the figure “unit”, “unit” and “unit” is equal to 1+1+1=3. So, the figure 1+1+1 is all that 3 is. But in this figure there is only the substance “unit” (+1). Besides that, the repeated report of the unit (here, three times) is the synthesis of the units and, as we’ve said, the substances “synthesis” and “units” that is “unit”, “unit”, “unit” are identified. On the other hand, the unit is one-part by nature. This, because the very definition of one-part (singularity) is the unit [12]. One-part is this which consists of one element; this whose components are as many as 1.

From these we are led to the conclusion that 3 or 4 or 5, etc are one-part substances. As to this, 3 against 4, because obviously different (3≠4), it is completely different from it. This means that 3 is a substance which is defined in a completely different way than 4. 3 cannot be partially different from 4 because it cannot be parted, as it is one-part.

The fact that the substance “unit, unit, unit” has only the element “unit” as a component and nothing else can be stated as a characteristic of this substance (3), means that 3 has the only characteristic “unit” provides it with: one-ness, singularity. This doesn’t mean that 3 is identified with the unit (that is 3=1). What it means is that 3 is constructed by the unit, it receives its characteristics or, to say better, its only characteristic: being one-part. The unit, as the state of being one-part, cannot have any characteristic other than this of one-part because, if it weren’t so, “one-part” couldn’t characterize it (since it would then be composed of more than one elements).

In the figure “unit”, “unit”, “unit” we can attribute to the one unit the characteristic “first”, to the other “second” and to the last “third” [13]. So, we can claim that we’ve found some more characteristics for number 3. Yet, these characteristics do not add something new to the figure of units since e.g. the characteristic of the last unit –third– is the substance of number 3. The third unit is the last of the three-unit sum, thus it signals number 3. And as we’ve said, number 3 is the whole meaning of the figure “unit”, “unit”, “unit”, so this figure maintains the characteristic “unit” as its only one and doesn’t have “three” as an additional characteristic, since this is identified with it.

If we say that 3 consists of three parts, we are not speaking precise, for the three parts are no other than its units. So, it’s like saying that 3 consists of three units. But the statement “three units” is identified with 3. Therefore, instead of saying that 3 consists of three parts (units), we have to say that 3 consists of 3 – is identified with 3. So, the 3 consisting of three parts cannot be its characteristic: the three parts are

identified with three. If they were a characteristic, it would be like saying "3 is a characteristic of 3". So, 3 cannot be divisible or composite.
Thinking similarly, we can express ourselves as this: If we assume that number 3 is the substance in terms of which the unit is referred some times (3 times) we have expressed a redundancy. This is so because the term "times" has the same meaning with "units".
If we say that some event took place some times, e.g. 3 times, we mean that the events that took place have a quantity, which is 3, so the 3 times is literally the 3 units. Each event is defined by the number 1 (the unit) so that the quantity of events can be apprehended.
Nevertheless, for number 3 detached from any entity, such as the entity "event" which we referred, that is in the case we are describing 3 and not some events that are simply defined by 3 which merely defines their quantity, things are different: Assuming that 3 is the unit reported some times, because the times are in any case the quantity of the units reported, which means that the 3 times are the very 3 units –for they couldn't be anything else– our assumption is redundant. Therefore, in the definition "3 is the unit reported some (or 3) times", in order not to be absurd, we'll have to remove from it the phrase "some times" or "three times", since the word "three" is also referred twice. And, if anything, the word three is the substance-to-define. So, what emerges is the definition: "3 is the unit reported". Therefore the only element defining 3 is the report of the unit. Thinking similarly, we also prove wrong the supposed characteristic of our figure, that is the unit be "repeated". And this, because the (meaning of the) repetition of the unit is identified with its being reported some times. This confirms the figure we have mentioned, and which defines 3, which is the "unit, unit, unit".
Indeed, this figure is nothing less and nothing more than the report of the unit. No other substance is referred (or recorded) in it, such as what we call "some (or three) times". Therefore, 3 couldn't possibly be defined by anything else, other than what we call "the report of the unit". So, 3 is one-part and indivisible, being constructed only by the unit; it only and strictly consists of the unit.
So, we say that 3 is the report of the unit because "the unit 3 times" or "3 units" is redundant, as 3 is used in order to define 3. And if we define 3 as "the unit some times", or "some units", this is no different than "the unit 3 times" or "3 units", because "some" couldn't but be 3; it apparently couldn't be 4 or 6, etc. This is an important clarification because the definition of 3 as "some units" couldn't be redundant; here we don't have a redundancy: "some" is different than "three". So, 3 as "some units" would be composite, because "some units" is a multitude of units. But one could assert that we can say 3 is some units without "some" (units) be necessarily identified with "3" (units) so that we don't have to identify 3 is some

units with 3 is 3 units. That is, it is not necessary that "some" couldn't but be 3 merely because (in defining 3) it couldn't possibly be 4 or 5, etc. We can say that "some" in this case is a notion which is used to define 3, and in this way, it is wrong to replace "some" with "three". But it is true that **the defining components of what is defined are more fundamental than (prior to) the object (target) of the definition**. And, in order to conceive "some" number, we first have to state 1, 2, 3, 4, 5, etc. This means that some is a **choice** out 1, 2, 3, 4, 5, etc, which we have already stated so that we can choose one of them. We cannot have "some" without 1, 2, 3, 4, etc, because "some" (number) is defined as a choice among numbers. And, if we don't have the numbers, how can we choose one of them? What's more, given we haven't stated (set) any number at all, that is if we haven't stated 1+1+1..., how can we talk about some number? Numbers in any way are conceived as "1+1+1...". So, bearing in mind the aforesaid, that is the defining components of what is defined should be more fundamental than (prior to) the object of the definition, we cannot have "some" constructing 3 in "3 is some units" because 3 –or 4 or 5, etc– is prior to "some". So, some is referred to 3, and not the other way round; not 3 to some. And, as to this, we cannot state "3 is some units". Or, if we are to state that, it is obligatory that "some" is referred specifically to 3 or 4 or 5, etc (and the true reference in our example is, of course, only 3) just because "some" is not prior to those; it cannot be autonomized and considered separately from them.
We said that "3" is prior to "some". That is, counted (specific) numbers (3, 4) are prior to abstract ones ("some"). Yet, this doesn't mean that if we haven't specified the magnitude of a number, then this number cannot be defined or even be non-existent. It is only that here we engage ourselves in the definition process of e.g. 3. Therefore, we can suppose an abstract (non-counted) number "na" for which we say it is defined as "some" units. Yet, "na" is itself "some" number (and not 3, which is more "3" than "some"). So, "some" number is defined as "some" units, which is again redundancy and the only thing we can say is that na (or some n) is "the report of the unit". In this definition we also concluded for 3 or 4, etc. Furthermore, in the definition of na, it would be more correct to distinguish between "na" units and "some" units. In defining 3, "some" units isn't correct in the sense that "some" isn't a specific choice (or number) of units. We have to choose a specific number out of many and so say 3 is 3 units, for "some" isn't a specific number; it isn't a choice out of numbers, but rather any possible number. So, "some" in defining na, because it –more scholastically– means any n and not the na we take, should be replaced with "na". That is "na is na units" (which in return is redundant, as in "3 is 3 units", so "na is the report of the unit"). As "3" is prior to "some", so is "na" prior to "some". It is of no difference the fact that na is of unknown magnitude. It is not necessary that the choice of the number is out of some counted numbers, such as 1, 2, 3, 4, 5, that

we mentioned in the above paragraph. This for, as we say in previous paragraph: *This means that "some" is a* ***choice*** *out 1, 2, 3, 4, 5, etc, which we have already stated so that we can choose one of them. We cannot have "some" without 1, 2, 3, 4, etc, because "some" (number) is defined as a choice among numbers. And, if we don't have the numbers, how can we choose one of them?* So, "some" is a choice out of 1, 2, 3, 4, 5, etc. But what makes it necessary that the choice be out of 1 or 2 or 3, etc? Couldn't it be as well a choice out of nx, ny and nz? The fact that these numbers aren't counted is not a problem because what we are proving has nothing to do with whether the numbers are counted or not. And this is the reasoning that *we cannot have "some" without having stated specific (counted or uncounted) numbers, because "some" is a choice among numbers, and if we don't have the numbers, how can we choose one of them?*

Above we wrote: *So, "some" in defining na, because it –more scholastically– means any n and not the na we take, should be replaced with "na".* Nevertheless, there seems to be no problem saying "any n", that is we can define any n and not only one n (such as na) as n units. This is simply by saying "any n is any units". It is the same as saying "na is na units". The word "any" here, as by the statement, doesn't define the units, but rather the n, that is more than one ns, or to say better, more than one definitions of ns. And, of course, it is also attached to the "n units", as "n"="n units". But, also here "n is n units" or "any n is any n units" are redundant, so we can only say "n is the report of the unit" and "any n is any report of the unit". But, as it is the conclusion of this part of our theory from the definition of the number as "the report of the unit", we cannot talk about "any number". That is numbers cannot constitute a set or a continuum or be considered together, in an abstract manner. This, for a number, as it consists only of the unit (singleness or simplicity), can only be one-part (single, simple). And, one-part entities, as they cannot be parted, cannot have any part in common with each other. They, therefore, cannot be apprehended together (as a set, a continuum, etc).

Now, about the figure "unit, unit, unit" we can't say that, because the word "unit" is recorded 3 times, the figure contains the substance of 3 (as a part of it), because this remark regards the type and not the meaning of the figure. And this, because also the phrase, "run fast", as to its type, has the substance (number) 2, for it consists of two words. But, what's right to evaluate is the meaning and not the type of the figure (the phrase), which has nothing to do with what is being described, that is the fast run. Besides, if we consider the figure "unit, unit, unit" typologically, we can assume that it contains number 14, for it consists of 12 letters and 2 commas, which is absurd.

In the figure of units the only substance reported is the unit, and 3 is identified with the whole figure and doesn't constitute a part of it, but is defined by it. Therefore, the substance 3 stems from the meaning –the function– of the figure "unit, unit,

unit", and not from its type; its code. This means that 3 is the outcome of the figure's function and not a morphological characteristic [4]. It is important not to stumble on the morphological characteristics of the figure, because then we will realize that each word in the figure "unit, unit, unit" isn't identified with the substance of the unit, but it merely stands for it. This means that we could have, instead of a figure, 3 apples in front of us, each of them symbolizing one unit of number 3. An apple and the word "unit" are of the same nature; they are both natural entities, since we conceive them through our vision. So, in the way each apple isn't identified with the meaning of the unit but it just symbolizes it, in the same way the word "unit" just symbolizes the unit and isn't identified with it. In any way, the figure of units is 3 words. And, as the three apples can't be identified with number 3, the 3 words can't be identified with number 3, in the same way.

If we say that 3 is 3 units we are stating redundancy, for 3 is made of units. Thus, combining 3 with the word units is equal to combining units with units – the second ones constructing the meaning of the first ones. So, either we'll say 3 is 3 –therefore 3 being one-part is secured– since this definition doesn't constitute an analysis –division– of 3, or we'll say that 3 is the report of the unit, so 3 is again one-part as being defined and constituted only by the unit.

The fact that 3 and 4 aren't correspondingly "three units" and "four units", but are either "three" and "four", or "units" and "units", sets boundaries to our thinking and helps us understand that 3 and 4 don't have in common the characteristic "units", because this would require "units" to be a part of 3 and 4, and not their whole existence: if we are to relate 3 to 4, they will have to be partly and not totally equal (for there can't be 4=3). But such a partial relation, or difference, cannot be.

On the contrary, two other entities, e.g. "3 apples" and "4 apples" can actually be partially different from each other – the one being part of the other, not because 3 is a part of 4 but because they have in common the part "apples". We just name 3 "part of 4" because it is difficult to discern between the substances "4" and "apples" or "3" and "apples", given that they are always presented and exist as inseparably joined together. So, instead of saying that the common part is the "apples", we wrongly say that 3 is a part of 4.

Defining 3 as "three units", is redundant. But, if so, then how is the identity 3·1=3 described? Isn't 1·3 the unit (1) three times (·3)?

To this we answer that, in the expression "three units", which is symbolized as 1·3, the term "units" describes a neutral and meaningless characteristic, since 1·3=3, thus "·1" doesn't add anything. Whereas, by saying that 3 is merely "units" (or to be more specific, "the report of the unit"), we don't mean "·1" but "1+1+1", for, in any case, 3 cannot be identified with 1. In this case, 1+1+1 is the whole of 3 and not something meaningless. And, in this case, it is indeed redundant to define 3 as “three units”, for there would be 3(1+1+1)=9. On the contrary, 3 as “three units” (3=3·1) is not being parted into “three” and “units”, since “units” is of no value. Therefore, it is the same to say “three is three”, so –in this plainly stating way– we don’t have to do with an analysis of three.

Based on the nature of numbers as one-part entities, we can answer how the most common definition (but not proof) of the numeric continuum is proved wrong. So, we have: 0=empty set, 1={0}, 2={0, 1}, 3={0, 1, 2}, etc. So, each number is the set that contains all its former ones. Yet here we abolish by proof the composite nature of the number, as well as the so-called numeric set. So, e.g. 3 cannot contain the numbers 0, 1 and 2.

4. The decimal numbers

As far as the decimals are concerned, we can prove them to be one-part as follows: Number 4, which is an integer (thus we are certain it is one-part), is identified with, e.g., 20/5 (4=20/5). So 4 is identified with the fraction that has as its numerator an one-part entity (number 20) and as its denominator an also one-part entity (5). The decimal 0.4 is identified with 2/5. If we try to find any difference between the characteristics (or elements) of the fraction 20/5 and these of 2/5, we will find none. Firstly, both 20/5 and 2/5 express division. As to this they are identical. Beyond the function of division which is the general characteristic of fractions, a specific fraction as 20/5 or 2/5 couldn't have a characteristic other than the numbers that constitute its numerator and denominator, as well as the relationship between those. The parts of 20/5 and 2/5, 20, 5 and 2, have all exactly the same characteristic: their being one-part entities. If they were to have a second characteristic, they wouldn't be one-part, for that would be a second part of them. In 20/5, 20 against 5 has one and only relationship; the total absence of relationship. In 2/5, 2 and 5 also have the total absence of relationship.

Therefore, the relationship of 20 and 5 couldn't but be exactly the same as the relationship of 2 and 5, since both relationships are characterized only as absent, and absent to exactly the same grade: totally absent.

Consequently, since all the qualities of 20/5 are exactly the same as these of 2/5, then if we are to characterize 20/5 somehow, 2/5 is to be given exactly the same characteristic. So, since 20/5 is an one-part entity, 2/5 is also one-part. Obviously, the same goes for 0.2, 0.35, etc.

5. The order and the sequence of numbers

Numbers, as non-related to each other in any way, thus not being parts of a set, they cannot be said to be subject to or form an order or scale. We will realize it is natural the numbers not being subject to a scale, even if this scale is a symbolic and purely intellectual "line", if we think as follows:

If we suppose three objects ordered in a line, we say that one of them is the first, another is the second and what remains is the third one. As we understand, the order of these objects is defined exclusively by the serial number of each one. The second object is called second only because, in order to trace it, we count two objects from the start of the order. Therefore, quantity 2, number 2, is the order; the essence of what we call order. As to this, numbers, as defining order, or, to say better, as the very quality of order, cannot be subject to order. So, it is redundant to say that 1 is the first (the first number), 2 is the second (the second number), etc, for the meanings of "first", "second", etc, are identified with 1, 2, etc. The numbers cannot be defined by, that is be placed to, order (see unit 3).

The fact that there can't be numeric orders or numeric sets means that numbers cannot be categorized as odd and even – first and second. This is proved on the basis of the proof that numbers cannot be subject to order. 1 being called "first" and 2 "second", is exclusively due to the specific order that we give them. 3 being called "first" (odd) and 4 "second" (even) is also due to their (so called) order position: to 3 being "third", that is being first after the last "second" number (2) and 4 being second after the last "second" number (2). In the same way the "following" numbers are characterized "first" or "second". And since the evenness and oddness of the numbers springs exclusively from their order and –literally– is identified with it, for the terms "first" and "second" are terms of order, then this categorization of them is as groundless as their arrangement in order. Thus, since e.g. the "fifth" order of 5 is literally identified with its "first" (odd) quality, then if, as we have proved, 5 is the very quality "fifth" (or "fifthness) and it isn't characterized fifth, 5 will also be the very oddness, and not odd. As we've also explained, while 5 isn't fifth, yet it characterizes e.g. a chair as fifth, if in an order of chairs it has number 5. Similarly, while 5 isn't odd, yet 5 chairs are an odd set, for if they be divided by 2, one chair loses its integrity, since a set of 2.5 chairs comes about.

As we write above, 5, as the quality of fifthness (multitude 5), is in the same way characterized "oddness". Yet we gave 5 –fifthness– a different name, other than itself: "oddness". Therefore, is it that 5 can have two substances; the one called fifthness and the other one called oddness? The answer is no, for, as we write above, 3 is called odd, or first, because it is first after the first second number – 2. This only means that 3 is one unit bigger than 2. So, if 3 is thirdness and also oddness, then:

thirdness is 2+1 as 3=2+1, and oddness –3– as one unit bigger than 2, is only expressed as oddness=2+1. And, oddness=2+1=thirdness. So, thirdness is identified with oddness and it doesn't constitute an extra characteristic of 3. In extension, the same goes for 5 and for another number that we may call odd, as well as for even numbers. And since oddness and thirdness are identified, as 3 is indescribable (one-part), then oddness is indescribable, so that there is nothing we can say to characterize it. And, as 6 and 7 are defined by the common definition "the report of the unit" (see unit 3), but do not share the same nature, although they are named the same, so 4 and 6 can be in common named "even" and be not apprehended in common. This, for, as we said, *evenness, oddness* and *multitude*, or *number*, are identified as substances; they are one-part and indescribable.

So, while (as we mention above) 5 isn't odd, 5 chairs is an odd set, for if we divide them by 2 then in the 2.5 chairs we meet a chair which has lost its integrity. Therefore, four chairs is an even set of chairs and 5 chairs is an odd set of them. And since the oddness and the evenness stem exclusively from the number of the chairs, and "chairs" remains unchangeable between 4 and 5 chairs, the only thing changing be the number, then isn't the difference between oddness and evenness attributed to the numbers? And since the difference between oddness and evenness is exclusively due to the numbers, then how come the numbers don't bear the characteristic odd or even? The answer to this is that we are wrong to say the factor "chairs" is unchanged. In 2.5 chairs one chair lost integrity, which means that this chair, as a unit, ceases to exist. And this is not a quantitative (numeric) energy that is 1 chair divided by 2; 1/2 chair. What we are saying is that the whole chair isn't just different than the half chair only in its quantity. The chair as a unit, a whole object, has some physical or morphological characteristics; it has a back-side, four legs that are almost surely not similar to each other, it has a left and a right side, etc. Now, by dividing this chair into two parts, these parts cannot possibly be identical with each other. Instead of a chair we can have any other object as a unit, physical or theoretical: an apple, or a geometrical object, etc. The division of them in half changes them in terms of quality. As to this the even and the odd quality of a set is a physical and a morphological characteristic, and not a characteristic of numbers.

But do all objects that constitute units change morphologically? Don't some of them change only in terms of quantity? If we take a fraction of a straight line with its edges being A and B, then how does AB/2 differ morphologically from AB? We can say they are only different in the quantity of their lengths. Yet, what is it that makes AB a unit? How is it a whole object? And what makes AB/2 a non-whole object, which means that it is not integral? If we are to give AB a certain amount of length which we refer to in a specific way, we can define this as e.g. one meter.

Nevertheless, what we measure as one meter is only empirically and physically conceived and defined. 1 meter is the distance that 1 kg of mass covers in 1 second of clock time, the mass being as high as the sea level and making free fall. This is a descriptive way to set a unit (piece) of a straight line. It contains various aspects of morphology (physicality). So, if we consider half the meter, this would be, for example, further or closer to the sea than the other half, etc. Also, considering that we keep the standard of 1 meter in a museum, we realize it is inevitably related to natural and social standards/conventions. As it is understood, the same goes for all magnitudes: time, weight, speed, etc.

Even if we try to consider the above referred fraction AB/2 of a straight line as a unit in a purely abstract manner in terms of geometry, which would mean we separate the magnitude from the morphological and physical characteristics that define the AB, we still cannot avoid morphology and empiricism. This is so because in taking AB as a natural and/or real existence, the specific characteristics will always be there, at some grade or another.

In the way that numbers aren't characterized by order, oddness or evenness, but, as we wrote, these belong to the various entities that the numbers accompany, we can prove the same for any other supposed characteristic or categorization of numbers. So, the quality of a number having its decimal digits periodically repeated, such as 10/3 = 3.33333... falls under this case. Saying that 3.333... has 3 as a periodically repeated decimal digit is equivalent to saying that the relationship of each such decimal digit with its former one is 1/10. This means that the second digit, 0.03, together with the first, 0.3, form the fraction 0.03/0.3 = 1/10. Similarly, the third "3" against the second is 0.003/0.03 = 1/10. Therefore, all that the periodical quality of 3.333... is lies on the fact that the decimal part of this number consists of numerals each of them being 1/10 of its former one.

Consequently, the sequence 10-100-1000-10000..., in which each number is tenfold its former one, is the same case. The fact that in 3.333... each number is succeeded by a ten times "smaller" one, while in 10-100-1000..., that is in 10^n, where n = natural integer, each number is succeeded by a ten times "larger" one, doesn't mean a difference between the two cases. The "ten times larger" and "ten times smaller" essentially introduce the distinction between integers and decimals: e.g. 5 is five times "bigger" than 1, while 1/5=0.2 is five times "smaller" than 1. Yet, we have proved that decimals and integers are of exactly the same nature; they are one-part. As to this, the relationships among decimals are the same as these among integers.

Therefore, as long as a stereotyped system of relationships is formed, which is: "from 10 to 100, from 100 to 1000, etc", which is equal to "multiplying 10 by 10 and each number which results, by 10", is the sequence of same digits stereotyped in terms of periodical decimals. And this stereotyped sequence is essentially the periodical quality. This means that in as much as 10 is related to 100 in a specific way (x10), 100 to 1000 in the same way (x10), etc, is the systematic sequence of the decimal digits of 3.333... justified.

Even more, the code "1000" is purely a product of social/scientific convention, for if we numerated in terms of e.g. the senary (heximal) numerical system, "1000" would stand for the quantity that 216 stands for in the decimal numerical system. Consequently, in terms of the senary system, the sequence 10-100-1000... corresponds to sequence 6-36-216... for the senary system, through which we observe that there is no regular or stable sequence of digits. Therefore, the repeated zeroes after the unit do not express the magnitude of each number in an absolute manner and, furthermore, an absolute succession of the numbers of each numerical system.

In addition, thinking simpler, some regularization is also this: We take 1, add the unit (1) to it and add the same (the unit) to what each time results. Can it be that this regularization, or norm, isn't at least equally considered such, as this of "multiplying 10 by the decade (10) and multiply by 10 what each time results"? Yet, the regularization 1, 1+1, 2+1, 3+1, 4+1... cannot be considered a regularization, for it includes all numbers, in the elementary way. In any way, the present theory proves that the definition "for each n there is n+1" is not valid and therefore the referred regularization is by this absolute logic abolished.

Nevertheless, while in 3.33333... each decimal "3" is not related to the others and in general there can't be said that this number is "periodic", the "periodicality", which is supposed to be a quality of this (or some other) number, is met in terms of 3.333... defining any entity which isn't a number. So, for the first decimal "3", 0.3, we can say it defines and functions in terms of the natural entity which is called "meter". Therefore: 0.3m=30cm. The next "3", 0.03, creates 0.03m=3cm, the third "3", 0.003, makes 0.003m=3mm, etc. If we put these lengths to parallel positions, one edge of each one placed on a single straight line, and the distances between every two of them being equal, and initiating with the larger one, moving successively to the smaller ones, then the regularization appears: the free edges of these lengths form a straight line. Therefore we have regular sequence of lengths; a periodicality.

Consequently, although 3.33333... cannot be characterized periodical, it itself gives the periodical quality to the natural entities, such as the meter we've been referred to. 3.333... is the very quality of being periodical –"periodicality"– exactly as 4 is "evenness" or 5 is "fifthness", according to what we've written in the previous pages. And in the way "fifthness" or "evenness" are, as we've said, identified with "multiplicity", that is the meaning of the number (multitude), thus be one-part, so is "periodicality" (3.333...) a multiplicity (number).

We should note here that the distinction-categorization of numbers to integers and decimals, as exactly the other categorizations, is not valid in terms of numbers themselves, and yet it is met in terms of non-numeric entities as their being defined by numbers.

First of all, we've proved that decimals are also one-part entities, therefore they are related to each other and to integers exactly as integers are related to each other. This, only, is enough to result in that the referred categorization cannot be. But, even if we consider their so-called distinction, we come to this: 0.5 compared to 2, is characterized as a decimal, while 2 is an integer, for only one reason: 2 being bigger than 1, while 0.5 is smaller than 1. Nevertheless, we've proved (in unit 1 above) that the figure 2>1 or 1>0.5 doesn't entail a relationship between 1 and 2, or 1 and 0.5. As to this, 1 cannot be considered as the "criterion" of a distinction between integers and decimals.

On the contrary, e.g. 2 cars, involve the integral meaning of the "car", which means we can locate at least one articulate car within this set, while 0.5 cars –half a car– cannot be articulate, thus neither integral.

6. The in approximation statement of numbers. The solution to the P Vs NP problem. The proof of that the shortest path between two points is a straight line.

As regards the philosophy of numbers and number theory, where certain ways are used for the correlation among numbers and the finding of number sets, we have to say the following:

The proofs and correlations hide the elements of the empirical and chance. That is, when e.g. we use the fractions in order to find relationships among numbers through the similarities between their numerators or their denominators, we are essentially based on entities (the fractions) that contain empiricism and chance. So, we can assert that, for example, taking 3/8 and 5/8 together, we can say that they have in common the denominator (8). Also, 4/5 and 4/7 appear to have some relationship because the numerator (4) is the same in both fractions.

But these combinations cannot be valid. And this is so because for the definition of e.g. the price of 6/2 we use the method of "trial and error" until we find how many times 2 fits into 6. So, we have 2 and, by means of addition, we say: 2+2=4, and then we say 4+2 (that is 2+2+2) equals 6. But this effort of ours is essentially the operation of addition. So addition has taken the place of multiplication in order to verify that 2 fits 3 times into 6. We couldn't find a solid outcome by means of division or multiplication.

Therefore, the statement of the fraction does not lead in a numerical price in a way which is absolute and a priori. This means that the correlations among fractions have no base, for the statements of the fractions do not offer precision [14].

Of course we use the fractions in the various equations and we have solid outcomes. Yet this does not contain the study of the nature of the fractions. In the equations we simply count in order to find a final price. And, certainly, the equations are empirical processes. They aren't a philosophical (strictly theoretical) study of the nature of numbers. And, certainly, we may have already found that 6/2 equals 3 in an empirical way. Yet, this doesn't mean that we granted 6/2 as a numerical price, thus as also an absolute entity. It is just the memory of an empirical process that informs us about the price of 6/2. And the very memory (or some kind of record) isn't indisputable enough so that we can speak about the foundation of 6/2, based on memory.

The essence of what we are saying and proving here is that the fact that e.g. 3/8 and 5/8 have as a common part the denominator, 8, sets the two numbers as composite –as having a common element– and this does not agree with the absolute proof, in this theory, that a number cannot have parts and be composite. **If anything, it is *the very essence* of multiplication that dictates the number be multiplied; but the number is proved to be non-multiple, i.e. simple, in this theory. By the same logic, division dictates that the number be divided; yet the number is indivisible, i.e.**

simple; one-part entity (see unit 3). And, as to this, the factorial statement of numbers (multiplication and division, and whatever derives from these functions) does not state the number in accordance with its nature, which is the number be one-part, simple, indivisible and non-constructible. Nevertheless, **even if we take for granted the statement of a number as a fraction**, this doesn't lead to the conclusion that there is any relation between fractions. In unit 2 we refer to the relation of two numbers as *"compose" to "decompose"* in the case of division. So, between two fractions, e.g. 4/2 and 8/2, the first of them (4/2) is a simpler "decompose" than the second "decompose" (8/2). Their relation is (4:2)=(8:2):2. So, the two fractions are related as *"compose" to "decompose"*, and this forbids any relation between them (see unit 2). Unlike in units 1 and 3 of our theory, in terms of the proof of unit 2 we do not try to see and prove that a number has no common part with another number. The way we prove the total absence of relation between two numbers, in unit 2, has to do with the relationship of *"compose" to "decompose"*, and not with the fact that a number is not parted.

So, since 6/2 doesn't express in an absolute way a numerical price (a number), thus, as a number, it isn't absolutely valid, but it is only valid in an empirical way, therefore in a way not enough valid. And this simply means that the statement of a certain numerator (6) and a certain denominator (2) are being held somehow by chance, since their statement as a fraction equals 3 by chance.

Now, maybe one would say that we are not interested in the price of 6/2, but in 6/2 itself. Yet, this way of thinking has no base, for 6/2 as by its statement, bears and entails the operation of division; the 6:2.

And division, as by its nature, goes for a numerical outcome. If the outcome is not given, then the fractional statement is also not given or valid.

In other words, the choice of the numerator and the denominator is a matter of luck, since these two define the outcome of the division, which is found on the basis of those two in a way of luck.

The "arbitrary" character of fractions helps us avoid the paradox of e.g. 20/6 which cannot be stated as a fully counted number (20/6=3.333…), although the statement as a fraction represents the total magnitude of 3.333… During the counting of 20/6, the each time appearance of a decimal "3" is a matter of empirical process. And we cannot rely on empiricism in order to claim the absolute price of a number. That is, the statement of 20/6 does not correspond to 3.333… in a manner of precision. The only objection to these would be that, unlike 20/5=4, the dividing of 20/6 never stops. Yet, this involves the abstract numbering and infinity. Therefore, the sequence of the "3s" simply cannot be a sequence. So we resign from the attempt of counting 3.333… for ever. And, since the empirical (not valid) character of the fraction 20/6, as such, doesn't push us to find the outcome (3.333...) in an absolute manner, then there is no problem.

Equations and identities in general are based on division and multiplication, as well as on methods like the crosswise method (e.g. 2/3=4/6 => 2·6=3·4). If we didn't have these divisions and multiplications (2/3, 4/6, 2·6 and 3·4), the crosswise method wouldn't be. Thus, the solution of equations is made somehow at random. Therefore, the statements of the equations are also not absolutely valid. Therefore, in general, we cannot be talking about qualities of numbers (properties, behaviors, etc) on the basis of the equations. So, numbers lack characteristics. And this we prove in this theory as saying that the number is one-part and simple, and there cannot be relations among numbers. Of course, we can rely on the equations and the methods used inside them in order to find solutions. But all these are as valid as the plain statement of multiplication is: 6/2=x. And, as we've said, multiplication is the basis of the equations. So, the equations are as valid as the multiplications inside them are.

Unlike the division and the multiplication, the fundamental definition of 3 as 1+1+1 may be empirical as a counting process, but it doesn't allow the possibility of a mistake as it offers the absolutely detailed statement: this of the units in a row. This means that the analysis of the units is detailed and is made in an absolute way with no possibility of mistakes or deviations. Let us remind here that, as we have proved in the present theory, the numeric nature is proved and defined as "the report of the unit", that is e.g. for n=4, the figure 4=1+1+1+1, which means: unit, unit, unit, unit – and that is "the report of the unit" (see unit 3 above).

The fact that, as we've here said, the numerical functions –that are composite and involve some kind of description in order to be defined and conducted (fractions, etc)– are apprehended in a non-precise way and are made at random, this fact is essentially the solution to the P Vs NP Problem [15]: When the calculation held by the computer follows the pattern "unit, unit, unit, unit, unit", that is unit=1 and then unit, unit=2 and then unit, unit, unit=3 and then unit, unit, unit, unit=4 and then unit, unit, unit, unit, init=5, this means that the computer functions as 1 2 3 4 5. So, in terms of the computational function, this is precise and not made at random. But when instead of 1 2 3 4 5, we have 12,345, since this is a fraction (as we write above), it is held at random. And this disagrees with the proofs of the numeric nature (see units 1, 2 and 3 of the present) and the (as here proved) abolition of the abstract reference to numbers, together with the abolition of the numeric continuum (unit 10). As to these, the computer cannot solve (conduct) the above the above referred function in any direct way, because the exact counting (which complies with the numeric nature) is not the one which is conducted at random, and therefore, as we write above, it is not valid but can only be referred to the simple counting (1+1+1+1+1) in order to gain its value (and be checked by the computer). As to this, the solution to the P Vs NP problem is given here: P ≠ NP. See also unit 12 in this manuscript.

The logic that solves the above mentioned problems is essentially the proof that factorization (multiplication and division), as being composite, it cannot be apprehended as precise or be conducted in a precise way. This is so because it does not agree with the simple nature of the number, which is proved simple through the process of addition, and as to this, the addition, as proving the numeric nature, is considered to be precise and non-composite: 1+1+1+1 is a figure which stands for a non-composite notion. And indeed 1+1+1+1 identifies 4, which is non-composite. The proof that the shortest path between two points is a straight line lies in this logic. The straight line is a one-dimensional geometrical object, whereas a line with angles or curves is more than one-dimensional (two-dimensional or more). In the case of the one dimensional object we have to do with **dimensional singularity**, where the addition of sizes (components) is used for measuring, whereas in **dimensional plurality** (more that one dimensions), we use factorization processes (multiplication, division) for measuring the components and the size. Therefore, the proof to the problem (Euclid’s postulate) is obvious: Plurality has by nature more elements and components than singularity has. In fact, singularity is the state of being **one component** whereas plurality is the state of **more than one** components existing.

7. The case of the negative numbers

As we have proved, a number cannot be related to another number in any way. But considering a negative number, e.g. –3, it seems to have a correspondent positive number, i.e. 3. That is, for –3 we say that the absolute magnitude of it is 3. Therefore, can this be a way of relating two numbers? The answer to this is simple regarding what we have already proved. The magnitude of 3 is defined as the distance 3 has from zero. And this distance is defined as the continuum $0 \rightarrow 1 \rightarrow 2 \rightarrow 3$. But as we prove, this cannot be a continuum or any kind of set (see unit 5). Therefore, based on the proof about the numeric nature, the notion of what is called "magnitude" cannot be of any use in order to suppose a resemblance between two numbers. The other way we can use in order relate –3 to 3 is multiplication: $(-3)\cdot(-1)=3$. This is interpreted as the negation of the negative number which results in the positivication of the same number. Nevertheless, in unit 6 we prove that the function of multiplication does not agree with the numeric nature, as this is proved in this theory, but multiplication must be interpreted as addition in order to gain its value. And this leads us to interpret $(-3)\cdot(-1)=3$ as $-3+6=3$. Nevertheless, considering the proof of unit 1 of the present manuscript, it is clear that in the above stated identity, –3 cannot be related to 3 in any way. As a conclusion, we are able to say that a number cannot have any kind of relationship with any other number.

8. The prime numbers

And, since we refer to the so-called qualities of numbers, let's see a special category of numbers: the Prime Numbers.
The prime numbers have the "quality" of being divided only by themselves and the unit, so far as only integers come out from the division. The key to this case, and the condition, is the presence of integers as the result of division. Nevertheless, why should we set as a necessary condition the presence of integers as the result of the referred-to operation?
We have proved that all numbers, including the decimals, are one-part entities and, as to this, each and every number is totally unrelated to another one. Therefore we can't have two distinct groups; the one of the integers and the other of the decimals. And the relationship of a prime number with an integer is exactly the same as the relationship of a prime with a decimal one; the total absence of relationship. Therefore, why should we presuppose the presence of integers as the outcome of the divisions? And, for certain, all numbers are indefinable. No words can describe their nature, as that is simple. So, distinguishing between the two so-called categories of numbers, the integers from one hand, and the decimals from the other hand, is groundless.
To be clearer in now the integers as the result of the divisions are not different from the decimal numbers, let's think as this: In contemplating, e.g. 4, we subconsciously and naturally think of, let's say, 4 boxes. This is the only way to describe 4, simply because 4 itself cannot be described; it is one-part, having no characteristics, thus indescribable. Now, 0.3 boxes cannot be considered as an integral quantity, simply because there is not one or more whole boxes indicated. There is only a fraction (piece) of a box (0.3 boxes). But, 4 cannot even be considered as four units. It is a one-part entity. The same goes for 0.3. Therefore we cannot distinguish between integers and decimals, when, of course, referring to them as pure numbers. See also: unit 2, paragraphs 5, 6 and 7. So, if we can accept a distinction between integers and decimals only in the case these accompany physical or geometrical sizes, the same must go for the prime numbers when they are to be divided and give or not give integers as the outcome of the division. This means that in order to have 0.5 cars or 1 car, we have to take (the prime-numbered) 5 cars and divide them by 10 or 5 correspondingly. On the contrary, if we have 5 alone and divide it, we cannot be talking about number of cars, but pure numbers. And, since the quality called "cars" decides the decimal or integral character of the outcome of the division, we have to have this quality combined also with 5. As to this, if 0.5 cars is called a decimal amount of cars (and not an integral one) because the number is decimal, the same goes for 5 cars; 5 cars is a prime number of cars. 5 alone cannot be characterized –as

a prime number– of a different numeric category from, e.g. 4. Remember that, as we explained above, 5 cannot be characterized prime on the basis that it can only be divided by 5 and 1 so as to give an integer and not a decimal number. We can only be talking about an integral or a decimal amount of, e.g. cars. So, as we have already written, for 1 car to come about, we have to divide 5 cars and not 5 lone. As to this, if 1 car is an integral amount of cars (and not a decimal one, which would be if we attach number 0.5 to the car) and the integrity is due to number 1, the same goes for 5 against 4; 5 makes the cars able to be divided only by 5 and 1 in order to have an integral amount of cars. But, in this case, we are obliged to consider 5 together with cars. The prime quality belongs to the cars and not to number 5; just as 0.5 cars is not an integral amount of cars, simply because we don't see a whole car. Therefore, 5 alone cannot be considered prime, for it has to be combined with cars in order to give an integral amount of cars (1 car) when divided by itself (5). And it is of crucial importance that five alone cannot be named prime, for 5 alone is 5 as a number. To be clearer on this, please see unit 5 ("The order and the sequence of numbers"), paragraph 3 and, furthermore the whole of unit 5. On the basis of the above we can say that e.g. 5, as a sole number, is the very substance of "primality" (or fifthness), and as primality itself, it cannot be characterized prime due to that this would be redundant. 5 just gives the quality of primality to the objects it may accompany.

And the naming of, e.g. 5 as primality, fails to be a characteristic of it (and, furthermore, we can't have a category of the "primalities" – 2, 3, 5, 7, etc) because 5 is found to be primality only in the case that it accompanies physical objects. If there was a way, theoretically, that we never had the chance to match 5 with any objects, then there would be no way that we could realize 5 functions as primality. Therefore, 5 as a pure number needn't be characterized a "primality".

An objection to these would be the following: Ok, 5 as a pure number cannot be characterized a prime. But why should we consider it detached from physical objects (such as cars)? We can easily say that from the very combination of 5 with cars (here we name cars as "c") is granted the prime quality of 5; that is we can define a prime number as follows: any number combined with c is prime when, in dividing it by a number other than itself and the unit, gives a non-integral quantity of c. And it is the very combination of a number with c that reveals the possible prime quality of the number.

The answer to this is as follows: Combining, e.g. prime 5, with c and dividing it by e.g. 10, is stated as follows: 5c/10=0.5c. And we also have 5c/5=1c. As it is obvious, the object c has a completely neutral contribution inside the equations. Its role is, may we say, colorless. It doesn't contribute to any change. The change is completely in terms of the numbers of the equations. So, there goes what we've written previously. It is right that we consider prime numbers and the outcomes of their divisions detached from physical objects and, therefore, as detached, these numbers cannot be said prime. To be clearer, in 5c/10=0.5c and 5c/5=1c, if we are to consider a contribution of c to the equations, this cannot be. The only change of c is found out of the equation. That is, we can only spot the changes of 0.5 cars in relation to 1 car through a physical description that surely isn't in accordance with the numeric operations of the equations 5c/10=0.5c and 5c/5=1c. Therefore, we can find the difference of a whole car from one half of a car by saying that half a car has a quality difference from a whole car; it has only two wheels and cannot be driven. This has to do with morphological differences and not quantitative ones, that is, not the quantitative –numeric– ones of the equations. And, since these differences create the so called prime qualities and cannot be related to the numbers, it is then certain that numbers, such as 5 or 7, are free from being named prime.

After all, isn't the criterion of "c" the same as regards the distinction between odd and even numbers and between integers and decimals, as it is regarding the distinction between the prime and non prime numbers? The criterion is: having or not having a whole "c". And this goes for all kinds of numeric distinctions. Isn't that suspicious? The wholeness of c is as we said a matter of physical quality; it is the notion of being individual, atomic. An atom is a system with all its parts put together and joined inseparably so that we can have atomicity. But this "joint" appeals to the sciences of Physics or Biology or Anthropology, etc, and not to number theory. An atom is an entity located in physical space. Numbers, on the other hand, we have proved to be one-part; indescribable, thus of no physical qualities. Absolutely no physical qualities can be attributed to numbers (such as atomicity or wholeness – and primality is an expression of wholeness). And since we've proved this, we cannot be based on the whole c, that is the physical world in order to "prove back" that there are qualities of numbers. Simply, because here we detached numbers from the physical world, we cannot use physics to support and give qualities to numbers, for this would be the reattachment of physics to numbers.

Therefore, it is obvious that only one of the two is valid: either the inclusion of numbers in physics (case B) or the separation of those two sides (case A). The separation is proved by unit 3 – the number be one-part. The inclusion doesn't have to do with a proof, but it's simply a need that comes from the observation of the *whole c*. And, in any way, the definition of 3 as 3=1+1+1 (see proof, unit 3) is absolute and is surely prior to the observation of that we can only divide 5 by 5 and 1 in order to have an integer. Simply enough: we have to state 5=1+1+1+1+1 (proof of unit 3) in order to have 5; so this is prior to the observation of the primality of 5. So, case A is stronger than case B, and since it's either case A or case B, only case A is valid.

As to this, the criterion of "c" about the distinction between the prime and non prime numbers, cannot be. So, there are no prime numbers.

9. The unknown (not counted) one-part entities (numbers)

The unknown (not counted) one-part entities (numbers) are founded and proved by our central proofs (units 1, 2 and 3) just like the counted one-part entities (e.g. 3 and 4). We have to do with exactly the same logical processes as regards the central proofs. Simply enough, where we state 3 and 4, we state na and nb instead. If anything, 3 and 4 do not differ from the uncounted entities when defined as e.g. the report of the unit (third proof). That is 3 is defined as the report of the unit, without a distinctive element in the definition which would show it's about 3 and not about any other number. So, an uncounted number does not lack anything against the counted 3. It is defined as the report of the unit in exactly the same way as 3. Also, the units of an uncounted number n stated as n=1+1+1+1... do not lack of any characteristic against 3=1+1+1. In the referred proof we explain that there can't be a first, second or third unit inside the identity. In the opposite case there would be a problem for we would have to name each and every unit. And this would be impossible in the case of an uncounted number. So all we have to do is simply replace the 3=1+1+1 with n=1+1+1+... Therefore, an unknown number is not at disadvantaged position against 3, as to the elements the proof consists of.
In terms of the second proof (the relationship of two numbers as "*compose*" *to* "*decompose*"), we deal with uncounted numbers as follows: Instead of stating 3=6/2 we state n1=n2/n3 and we follow exactly the same way of reasoning as in 3=6/2. The same goes for the first proof. We state n1=n2+n3 and follow exactly the same logic as in 5=3+2 in order to prove that n2 or n3 do not stand as parts of n1.
Although we have to do with unknown numbers, yet the sure thing is that they do not form sets with each other. That is, in the way we have two unknown numbers, x and y, we have two known ones, 3 and 4. In the way we conventionally put 3 and 4 together in our talking, we can put together (conventionally) x and y. What we must be careful of is that the abstract (general) numbering is something different than referring to unknown numbers. During the numbering (more specifically, during the continuous transition from one number to another) we construct a continuum; a continuity among numbers. And it is different to refer to solitary numbers.
The abstract continuity among numbers essentially constitutes a numeric set. The "for every n there is n+1" puts all ns together (i.e. "for every number"). So, we have to do with an abstract set of numbers. And it is different to refer to unknown but solitary numbers than do not form sets with each other.
Let's note here that stating that numbers are one-part entities (see unit 3), it cannot be that through this statement we conclude to that numbers have the common characteristic of being one-part. Firstly, the number *being one-part* does not constitute a characteristic of it, since all that the number is, is the state of being

simple – one-part; a number is the absolutely simple entity. So, the "one-part" cannot be a characteristic of a number, but its whole entity. So, if e.g. 5 and 9 are to have the being one-part in common, they then have to be identified, since their characteristic-in-common is their whole entity. Apparently, this cannot be. Furthermore, when saying 5 and 9 are one-part, we deliver a conventional ant not accurate statement; since, as we have proved, there cannot be one reference (statement) which includes more than one numbers, but only one number can be included in a reference, i.e. definition, then, when we refer to e.g. 3 numbers, we essentially conduct 3 references. So, for e.g. 5, 9 and 16, instead of stating the existence of a set of three numbers, we state separately "5" and then "9" and then "16". These are three statements (stating three numbers) that are made only separately, i.e. the statements cannot be included in a set and they are absolutely discrete. In other words, the statement of 5 is held alone and the statement of 9 is held alone and the statement of 16 is held alone. Of course we can say that we conducted three statements in total (and therefore we took three numbers as a set), yet this is not accurate. The three definitions that are set in common, lead to the function of multiplication: the definition of some number (dn) which is multiplied by 3; dn·3. Yet we have already explained that the function of multiplication is not expressing the numeric nature (in unit 6). When conducting multiplication we cannot be certain we have to do with numbers unless we interpret the multiplication as addition (see unit 6). Therefore, because the definition of e.g. 5 is absolutely in accordance with 5 itself, for it is an absolute definition (which means that the –absolute– identity 5=1+1+1+1+1 –unit-by-unit addition– constitutes all that the *definition* of 5 is – see units 1 and 3), the dn·3 corresponds to "number·3" that is 3 numbers. To say this practically, it is like saying "number 5" and "number 9" and "number 16" are 3 numbers or, equivalently, "number·3". In stating these "three numbers" by means of multiplication, we have: the 3 numbers 5, 9 and 16 are a sum (or collection) of factor 3 as (5)+(5+4)+(5+11) = (3·5)+4+11. (We are led to the statement of this equation in an absolute way because the reference of "three numbers" is absolutely the reference of three numbers that are *summed together*. The fact that these numbers are summed cannot be overseen at all – it cannot be denied in any case.) In the first part of the equation, the presence of the same number (5) 3 times is the only way to introduce the factor 3 into the supposed relationship of the three numbers 5, 9 and 16. And, as to this, we result in the multiplication (3·5). So, the multiplication existing here is of no value according to how the number really exists. And there couldn't be a more valid way to combine these three numbers, than the above one, because any possible relation that may exist among numbers, must spring from the basic, elementary numeric functions: addition and multiplication. If the elements of the numerical behavior (function) do not offer a numeric relation, then the numbers are unrelated in the elementary (i.e. absolute) level. Since the nature of the number cannot be expressed by means of multiplication, or factorization in general, the above referred paradox –the numbers having in common their being one-part or their being numbers– is avoided. This means that the very three definitions of the three numbers cannot constitute a set; the figure (3·5)+4+11 is the interpretation which stands for the three supposedly common definitions of the three supposedly related numbers 5, 9 and 16. But as it is apparent, only 5 is present as triple.3 doesn't multiply the other numbers in any way. But the relation of 3 with only one of the numbers means that 3 does not address to more than one numbers. We don't have a common address, but only a solitary one. And this is interpreted as that the three numeric addresses (numeric references) cannot be considered commonly, but only separately.

To see the matter with a different logic, we can say these: A number is proved to be an absolutely simple entity. This means that it has no characteristics and qualities at all. How can we find a common characteristic or a common point or a common notion, and so on, between two entities for which we cannot state even the least of a description? As to this, even referring to "two" or "three" such entities, i.e. setting them as a group of two or three, cannot but be wrong and, in the best case, conventional in terms of our ability to refer to what is called number. Of course the term number is wrong or conventional, and the right thing to say is what results from the proof of the numeric nature: the number is completely indescribable and does not form any kind of set with another number.

10. The relationship of The Groundlessness of Infinity with Geometry and Physics. The difference with Finitism [16]. The proof of the Euclidean space [17]. The fact the circle is not Euclidean and, on the basis of this, how the circle is actually measured. The answer to how a bicycle works.

As regards the seeming paradox which comes from the abolition of infinity, in the field of physical entities –the physical world, which is defined as a four-dimensional continuum; the space-time– we answer to it as follows:

The introduction of the dimensions –we will here deal only with the dimension of length in favor of simplicity– appears to support the unlimited continuity, thus infinity, in this simple way: if we suppose a specific length a, no matter how much we may divide it, there always comes some length from it and length is by nature divisible. Therefore, the dividing never stops, and given that division is purely an arithmetic energy, which is defined as 1/n, where n>0 and real, then even infinity in its pure form –this of the pure numeric continuum– is secured.

To this we answer that it's exactly this pure numeric character of the division of length that must make us, and will eventually lead us, to the conclusion that the foundation of the unlimited (infinite) divisibility of a is groundless.

If we regard a sequence of divisions of a, we have e.g. a→a/2→a/4→a/8. If we have a as a1, a/2 as a2, a/4 as a3 and a/8 as a4, then there is: i) a1=a2·2, ii) a2=a3·2, iii) a3=a4·2. In extension we have a4=a5·2, thus an=an+1·2. But a2=a1/2 => an+1=an/2. As to this, so much the *transition* from an an to an an+1 as much the *relationship* of an an with an an+1 is purely quantitative, thus arithmetic.

Therefore, we essentially have to do with the continuum 1/1, 1/2, 1/4, 1/8, ... since the factor a in a/1, a/2, a/4, a/8 is neutral and the presence or absence of it does not secure and does not cancel anything, for, in any way, the relationship a→ a/2 is equally valid with a/a→ (a/2)/a => 1→ 1/2.

Therefore comes the question how we can regard a1 - a2 - a3 - a4 ... as a continuum, since this is identified with 1 - 1/2 - 1/4 - 1/8 ...., which by the present theory has been proved as a non-continuum. But let's not make the mistake to say, on the basis of this, that the length a itself doesn't entail continuity. This for we are here engaging our thinking with the *very transition* from a to a2 and not with a *itself* or a2 *itself*. What worries us is if there can be such a transition, for it is the transition which makes way for infinity. And, in any way, a cannot be possibly identified with the transition, because the transition is a number (remember 1 – 1/2, where 1/2 comes from 1 by dividing it by 2, thus 1/2 is the very transition).

So, since the transition from a to a/2 is a transition from one number to another (from 1 to 1/2) and only as such can it be considered, then the division of a, a/2, cannot have a as a reference point, that is it doesn't receive its substance as division from a. And what concerns us is how a is divided –and infinitely divided– and not a itself. That is we do not consider the relationship of a and a/2, but the division, that is the transition from a to a/2; the relationship of 1 with 1/2. The relationship of a with a/2, exists in the common element of a and a/2, that is a. Yet this has nothing to do with the quality a has of being divided. This, for the relationship of a with a, in terms of its different sizes, which is defined by the fraction (a/2)/a = a/(2a) = 1/2 or a/(a/2) = (2a)/a = 2, is a number, therefore not some length entity. As to these, since in the relationship between lengths (and, in extension, between any similar physical entities), the substance of length is not of use, then we don't have the substance (or notion) of length as a reference point on the basis of which we could consider the divisibility (or the multiplicity) as a continuum, which as such, could be unlimited, and therefore infinite.

Indeed, since the transition through dividing from a to a/2 is essentially apprehended as the transition from 1 to 1/2, then what goes for it is what goes for the transition, that is the relationship between two numbers, which we have revealed in the present theory. This means that, as the abstract and general meaning or term "number" cannot be, but we must have defined (or be uniquely referred to) 3 (as 1+1+1) so as to be talking about it and then to 4 (as 1+1+1+1) in order to be talking about the entity which is called "four", so in the same way, in order to consider a/2, while we have previously considered a, we must consider number 1/2, that is 1/(1+1), which is all that the transition from a to a/2 is. That is we cannot be talking about a general and abstract transition from length to length. And, of course, we can also be talking about an unknown (uncounted) number, but in a way that this number has no relationship with other numbers, as we have written in previous pages (about the not counted numbers).

According to these, it is rendered clear that The Groundlessness of Infinity does not use at all the notion of "finite" in the same way that the supporters and thinkers of "finitism" do.

The finitists, based possibly on the principle of intuitionism, may support that what exists (or what we have to consider in specific cases) is only what we are capable of conceiving through our senses or counting in our minds; our minds being of finite capacity, measure only finite sizes [18]. Yet, for any finite size, if this is f, can't it be that there isn't f+f2, since, having defined f as set inside finite boundaries, we inevitably consider what is out of the boundaries? The boundary is by nature what separates two sides [19]; the one which is inside it and this which is out of it; or else we cannot be talking about a boundary. Therefore, there will always be the out-of-boundary case, thus always a larger quantity, a "+1". As to these, infinity in terms of the Finitism cannot be avoided.

And, in the case of calculating and seeing what number each time comes about, by the logic that we a priori deny the infinite series of numbers, we still cannot avoid infinity [20]. This for we only axiomatically denied the infinite; without any kind of proof. But calculating in this manner does not exclude infinity, because we cannot avoid the abstract continuity of numbers; the abstract numeric reference. We still regard numbers as a series. Therefore, we are obliged to always make way for the next number. And, this number may be a finite-sized one, but, given the series of numbers, we essentially accept that this is an infinite series of finitely sized numbers. What we are saying here is that unless we deny in some way the numeric continuum and, of course, the numeric set, there will always be "space" for the abstract (thus also infinite) continuity of numbers.

And the voices against infinity couldn't have supported a way of reasoning with substantial similarity to our theory, for our way of thinking stems from the absolute truth of the Groundlessness of Infinity. This is that there isn't any kind of relationship between e.g. 3 and 4. That is between these that we (conventionally) name "numbers". 3 and 4 cannot be apprehended as a set.

Of course, considering one number at a time, in calculating, and not taking the whole series of the numbers (which is said to be infinitely large), is healthy. And this has a substantial similarity to our theory. But, as we've said, we need to go further than this in our attempt to abolish infinity.

Now, considering the logic by which we solve the P Vs NP problem, as well as the proof to that the shortest path between two points is a straight line, by the same logic we are able to prove Euclid's parallel postulate, as well as the converse to Euclid's parallel postulate [21].

So, let's begin with the latter. *If a straight line falling on two straight lines makes the alternate angles equal to one another, the straight lines will be parallel to one another.* This of course means that the two straight lines will not meet at any point of their length.

We take two points, A and B, and a third point x. For the shortest path between A and B, if x is not included in the shortest line A – B, then any line which includes points A, B, x is not straight. Since the proof that "the shortest path between two points is a straight line", is based on the non-factorization –according to the proof written in this manuscript, unit 6– then the points A, B constitute only one dimension, while the points A, B, x constitute more than one dimensions. This for, according to the aforesaid, any line including all three points A, B, x presupposes the factorization. And, since the factorization in the specific case is introduced by only one element –which is a point, therefore dimensionless, therefore inside it there is no multiplicity (multitude of factors, see unit 6) but singularity (absence of multitude of factors)– then the specific factorization presupposes no more than one factor (dimension) in the field defined by the A, B, x. As to these, the A, B define one factor (dimension) and the A, B, x define one plus one factor that is two factors

(dimensions). So, we can say that we have the simple dimension of length (defined by the points A, B) and the double dimension of the area that is the two dimensions –factors– lengthXwidth (defined by the points A, B, x).
Since, in order to define the one dimension (length), A and B are demanded in common, we can't separate them as concerns the perception of the one (i.e. single) dimension. A line l2 which goes through point x, if it is not to constitute the factorization we've been referred to (lengthXwidth), it has either to not go through A, or not go through B, or not go through any of those points. And since the A, B define a dimension and don't just constitute a straight line section, therefore they constitute any line l1 which includes A, B and another point C from which the shortest path to A is a line including B or the shortest path to B is a line including A. Therefore, if l2 is not factorized in relation to l1 this means that the l1 and l2 do not share any point in common. This means that the non-factorization, on one hand, and the absence of a common point, on the other hand, are unbreakably and indisputably connected and related to each other. We take for granted that l1 and l2 are straight lines. If l1 and l2 have no common point, this means that they are parallel (for this is the definition of the parallel straight lines). If, as we supposed, the l1 and l2 aren't factorized (which means that they are straight), this means that they have no point in common. The non-factorization guarantees the absence of a common point (i). The absence of a common point defines the parallel state between straight lines, and the converse; the straight lines are parallel when they don't share a point (ii). As we previously wrote, according to our proof (unit 6), the non-factorization leads to the straightness of the line: the non-factorization (singular dimension) and the straightness are essentially the same thing. Therefore, the (i) constitutes so much the non-factorization as much as it constitutes the straightness. As to this, when two straight lines aren't factorized with each other, they have no point in common (i). If the straight lines do not have a common point, they are parallel, and equivalently, if the straight lines are parallel, they have no common point (ii).
The non-factorization in Euclidean Geometry comes from the definition of the area: lengthXwidth. So we have the square figure of which the one pair of parallel lines can be lines where the one of them is part of l1 (l1sq) and the other is a part of l2 (l2sq). The other pair of lines is two parallel lines that are of equal length and vertical to l1sq and l2sq. The l1sq and l2sq are included in the one dimension of the square i.e. they constitute its width. Therefore, the l1sq and l2sq of the square are not factorized and they constitute straight lines (iii) since the non-factorization proves the straightness (iv) (proof in unit 6 of this manuscript). So, in the Euclidean square the parallel lines l1sq and l2sq are straight (v). And the l1 and l2 are, as we wrote, straight. The combination of (i) with (iii) produces the absence of a common

point between parallel lines in the Euclidean space. That is, the combination of (i) with (iii) grants the non-coincidence on the Euclidean square. Since the l1sq and l2sq are included in l1 and l2 correspondingly, we expand the non-coincidence in the relationship of l1 and l2 by combining (iv) with (v) and so prove (ii) that is we have absence of common point between two parallel straight lines. And this is the proof to the Converse of Euclid's parallel postulate [21].

Now, about the initial postulate, the parallel postulate [21], that is about the converse case of what we proved, where two straight lines are intersected by a line forming two interior angles on the same side that sum to less than two right angles, and so we have a triangle (or at least a triangle of which we see only the two above referred lines), we think as follows: Since the two straight lines are not parallel (i.e. the angles sum to less than two right angles) and therefore we don't nave absence of factorization, but factorization instead, this means that the two lines because behaving as factors, they will produce dimension. That is in this case we don't only have the dimension of length, but also the dimension of width, thus the appearance of area as the dimension which is produced. As to this, the lines, in order to constitute the area, they have to meet with each other, thus form a closed figure, so that there is the possibility that they be combined, i.e. interpreted as lengthXwidth.

In unit 6 we prove that the shortest way between two points is a straight line, which constitutes the singular dimension. This means that this is the proof of the definition of the first dimension in Euclidean space. Having proved the parallel postulate (above), we essentially set the proof of the two dimensions in Euclidean space: since the two parallel straight lines never meet, the interior space between them will always be dissected by vertical line segments of equal length, thus the Euclidean surface consists of (perfect) squares in all of its magnitude. This is crucial, for the square constitutes the structural unit in the Euclidean surface. And the introduction of the third dimension (height) follows the same logic as this of the introduction of the second dimension (width), i.e. by means of factorization. This means that the introduction of the third dimension follows exactly the same logic as this of the introduction of the second dimension in order to be proved. **As to these, the Euclidean space [17] is proved here.**

As regards the case of the geometrical object which is the circle, it comes as a direct consequence by the above written that **the circle is not a Euclidean object**. The Euclidean space is composed by the factorization of the *dimensional singularity*, which we've proved to be **the straight line and only the straight line**. And **we have proved the notion of the straight line** (see (iv) above, and unit 6). The circle is not constructed or conceived as straight at all. Therefore, as a non-Euclidean object, the circle cannot be defined and measured in terms of the Euclidean geometry. Apparently, the same goes for the sphere, and also for all objects that do not consist of only straight lines. The explanation of why the periphery of the circle is not a straight line, as a whole and in any segment of it, is simple on the basis of what we've proved. The circular periphery is defined, constructed and apprehended as the line which is constructed by only one straight line, the radius. In the case of the circle the radius is not factorized, that is it is not combined with any straight line dissecting it. The way the radius produces the circle is through rotation. This means that there can't be a certain angle which is set for two different positions of the radius. This means that the surface is not specifically set by the radius. So we don't have a set (i.e. given) factorization. Therefore we cannot consider the Euclidean two-dimensional space for the circle. This means that the circle cannot be measured as a Euclidean two-dimensional object, although it is drawn and placed on the surface; this surface, when it comes to the circle, is not a Euclidean surface – apparently!

In terms of the Euclidean logic, it is enough to consider or mark two different points, and at the same time a straight line comes to existence. And then we consider a point outside that line, so that the notion and the existence of the angle appears, thus having the shape and the magnitude of a (Euclidean) surface. As to these and after having proved the Euclidean logic and space, we essentially have proved that the notion of the straight line and the angle exist not only as objects, but also as theoretical and abstract-logical objects. In the case of the circle the line is not set in any abstract and theoretically firm way, as we write above about the rotation of the radius. And we are eligible to say this for, having proved the Euclidean logic, it is rendered certain that the circle does not follow this logic, which is the logic of an object which doesn't only exist physically, i.e. as a shape, but also through the theoretical and abstract logic which, of course, derives from proof.

Therefore, the circle, as not being an abstract theoretical object, but only a physical and empirically apprehended object, it can only be constructed and measured in the physical-empirical way. And this way cannot but be the very natural process of our holding the compasses and rotating it in the known way. So here we have to do with Physics; we consider the notions of distance, time and speed. As we've already said, it derives from the proof of the Euclidean space, the knowledge that the circle is only a natural/empirical object and not a theoretical/abstract one. As to this, we are talking only about the physical/natural formulation of the circle. Therefore, in terms of this formulation, we consider the speed and the time of the process and so we measure the length of the circular periphery. Now, about the magnitude of the circular surface, since this is also –and apparently– not abstract/theoretical, but only a natural/physical shape and magnitude, then it surely cannot be apprehended as a clearly two-dimensional surface with zero thickness. Therefore, we consider the physical notions of volume, mass and density, and in this way the measurement is conducted.

A surprisingly and curiously so far unanswered question is how a bicycle works. That is how it remains standing and doesn't collapse when driving it. Yet it is of no wonder that this question has been impossible to answer if we consider the radical change of our perception of the circle as we have here proved it: no abstract geometrical solution can be given about the circle (i.e. the wheels of the bike), simply because, as here proved, the circle is not an abstract (Euclidean) object. And, since working with the laws of Physics means we interpret and understand them through the geometry, Physics cannot give the answer.

So, the answer is very simple. The circle is always physical/natural, so the bicycle wheels are genuinely considered as circles. The bike remains stable through being unstable. A straight (Euclidean) line is by no means a route for the bike. The radiuses of the wheels (circles) are vertical to the ground at any moment or point of being in touch with it. So the vertical position is constant (i). And since the circles (wheels) are natural, this means they are actually/literally adjusted (ii) to the horizontal (straight) ground, which is horizontal in the sense that the radiuses of the wheels are always vertical to it, as we mentioned (i.e. in the dynamic way of motion). So, when in the motion, the constant position (i) is actually adjusted (ii) to the progress (riding) because the wheels are by no means considered in a theoretical or abstract way as circles, so they share the same nature with the ground (natural and not Euclidean nature), so their (circular) spinning is literally adjusted/applied to the horizontality (straightness) of the ground. This adjustment, as we mentioned, would have never been able to be apprehended through the geometrical thought. And the spinning wheels (circles) constantly recycle (re-circle) the as above referred adjustment to the horizontal (momentarily straight) ground, so the (unstable) stability of the bike is explained. The bike is stable in the unstable way because the straightness of its course is not Euclidean (see [ii] above), thus the stability is not Euclidean, i.e. not abstract, but imperfect, i.e. physical/natural. The adjustment (ii) be constant (i) is in terms of Physics fluently explained by the Newtonian action-and-reaction Law, but only and absolutely because the adjustment is real and by no means Euclidean. So when the bike tends to fall, the opposite turn (i.e. reaction) by the front wheel (as a reaction) constitutes the instable stability of the bike riding.

The fact that the circularity of the wheels is literally adjusted/applied to the straightness of the ground, we can understand and see in a practically if we imagine and simulate the wheels as straight surfaces. The referred practical way of thought is by replacing the two bike wheels with trails, like the tank wheels, of triangular shape, in which the width of the surface touching the ground is the same as this of the (circular) wheels. The one (obviously) straight side of the triangular trail is in contact with the (obviously straight) ground. Given that the front wheel of the bike is turn in order to be stable as instable (i.e. stable instability), then, if, in the case of the trails, with the front wheel turning, the bike moving on the trails, it is the same as moving on sandals of ski. This paradigm with the trails practically depicts nothing more and nothing less than the real adjustment of the circular wheels to the straight ground, in the practical way.

11. The solution to the paradoxes of ancient Zeno: the race between Achilles and the tortoise, the Dichotomy and the Arrow. The solution to the Sorites Paradox.

The abolition of the abstract continuum (see unit 10 above), together with the abolition of infinity, completes the solution of up to now unsolved paradoxes, such as the most important ones of Zeno of Elea, of ancient Greece. As it is known, in Zeno's paradox of the race between Achilles and the tortoise [22], Achilles will never reach the turtle, for the distance between them will always be divided e.g. in half. According to our theory, distance cannot be divided infinitely, thus the paradox is solved. But one can here say that when we've reached the minimum quantity of this length, since this cannot be something other than length, it can only be regarded divisible as by nature. And if it is divided in half, what comes from it is also divided in half, and so on forever. The abolition of the abstract continuum gives the answer to this objection, since the "so on" and "forever" constitute the very notion of the abstract continuum. We also cannot assume that there will be "some" minimum length, as stated above, for "some" is introducing abstract quantity, thus the abstract continuum. The progress of Achilles' run in order to reach the turtle, if the original distance between them is 10 meters, it is expressed as 10 meters $\cdot$ $1/2^n$. The each time dividing of the distance in half is the each time increase on the "n" (natural integer) by one unit. So, we have to do with the classic case of the numeric continuum, which, in this theory is abolished.
Hence, as obliged to speak only about specific and discrete distances and moments of time, we will surely find specific and discrete times at which Achilles lacks specific and discrete distances from the turtle. Also, a specific time at which the two runners meet can obviously be stated, as well as a specific time when Achilles has surpassed the turtle a specific distance.
This reasoning also applies to both versions of the paradox of the Dichotomy. In the Dichotomy, the abstract counting is also what makes us incapable of reaching a solution [23].
About the paradox of the Arrow [23], the abolition of the abstract continuum is what saves the concept of the continuum itself. The arrow being still at **any moment** of its course (because the moment has no magnitude) is a wrong statement: referring to *any* moment means the abstract reference to the time (the moments) of the movement of the arrow. The abolition of the abstract continuum directs to specific and discrete time references. So, in the moment A of the arrow's course the distance covered will be a specific distance Ad. For a different moment B, the distance is different; Bd. This secures that the arrow actually covers distance and thus it is moving.

The abolition of the abstract counting –in subjects and problems where **continuous counting** of natural sizes is the case– also sets the solution to the Sorites Paradox; simply because the problem arises from vague (i.e. abstract) predicates [24].

12. Why certain generalizations and laws in numbers are valid, though attempts for others (e.g the Goldbach Conjecture, the Birch and Swinnerton-Dyer Conjecture and the Riemann Hypothesis) fail.

Firstly, any axiom in the field of Mathematics (in arithmetic), which is undisputedly valid, is like the theorem of the even numbers, which is of the mostly basic ones:

An even number is the outcome of multiplying any integer by 2.This means that if integer x, and even y, then (i) y=2x.

Similarly, absolute presupposition for the apprehension of an even number is, divided by two, to produce an integer. That is (ii) y/2=x.

It is obvious that both (i) and (ii) are of equal proving validity. And since there is no other definition for even numbers, we are then content with (i) and (ii), which have the particularity each of them being the outcome of the other. That is we founded y as 2x. Yet, x=y/2 => y=2y/2 => y=y. The y=y is simply declarative and, consequently, of no proving value. As to this, the axiom we are talking about is not an axiom as a proof, but a statement of zero logical analysis and structure.

If we consider each and every axiom of Arithmetic which is indisputably valid, we will see it is referred to the identity y=y or A=A. This is the reason of our inability to analyze them and prove them either right or wrong, and simply accepting them as they are. This comes naturally, as A=A is simply declarative. All these axioms do not constitute proofs with any logical value [25].

From the theory and the philosophy of Arithmetic, the descriptive studies, that is the ones that do not have only a declarative character (which by the above is proved groundless), but an analytic one, are only the set theories and in general any theory in which the notion of the numeric set is used. But, can it not be supported that the notion of the numeric set isn't unbreakably connected to logical and mathematical paradoxes and contradictions which are dominant in the field for millenniums now?

Let us note that paradoxes such as Zeno's, which are present in logic and mathematics for three thousand years now, and their solution has been impossible even by the greatest of minds throughout the centuries, are solved in the most natural and logically clear way on the basis of the abolition of the abstract continuum, which is based on the abolition of the numeric set.

Now, maybe one would like to ask how come the Goldbach Conjecture [26] be always proved true empirically and not be possible that it is generalized in the theoretical field, that is be proved theoretically. First of all, let's say that, as it is well assumed, the speaking-about conjecture cannot result in A=A. And this for there cannot specific numeric (quantitative) correlation between parts of the conjecture, unlike (i) and (ii) above, so that we conclude to an identity. As concerns the each-time-attempt proved true conjecture, let's give a parallel case, which also constitutes the basis of number theory; “If in any number the unit is added, or any other number, the outcome is a number” [27]. This is surely true, or, if anything, has up to now been proved true in the empirical way...

It is, though, The Groundlessness of Infinity, that sets the new, sane logical bases, so much in the (number)theoretical field, as much in the empirical one, for it is very true that the true theory does not contradict practice!

According to the revelation of the numeric nature by the present theory and, as a direct consequence from this, the abolition of the numeric set and the abstract numeric reference (or numeration), we cannot be referring to “some” numbers, but to absolutely separate numeric entities that don’t form sets with each other. Now, maintaining that, from an empirical aspect, by adding the unit to any number, a number comes about, this is absolutely in accordance with the above proved apprehension of the number, in terms of The Groundlessness of Infinity. This for, since the unit will have already been added, there will essentially have been a specific numeric operation. That is, if e.g. we have 3 (where 3=1+1+1) and we add the unit, we have the specific (and not in an abstract way empirical) number 4, where 4=3+1 => 4=1+1+1+1. **Therefore, if for 3 we do not make the “+1” hypothesis, we literally have not even supposed that 3 is followed by a number!** If anything, the abstract and in sets numbering is not the empirically proved, for it introduces the abstract and the infinite.

13. The infinite continuation of decimal numbers

If we accept infinity, then e.g. 10/3=3.333... has an infinite continuation of decimal digits. While, if we reject infinity, 3.333... has a finite lot of decimal digits. Yet, this doesn't mean that, as long as we don't give infinite continuation to the digits, we face a paradox from the aspect that, in this way, the price of the fractal statement (10/3) is not exhausted. And this for, given infinity, the statement 10/3 is not exhausted either. And this because, no matter how many decimal digits we may write, the statement 10/3 is never stated accurately and fully.

Therefore, the possible acceptance of infinity, does not give any asset. This is so because 10/3 is not stated accurately neither by taking infinity for granted nor by abolishing it. The only difference that we have by the groundlessness of infinity is that we can be referring only to one or more decimal digits that, nevertheless, are of finite lot.

Yet, how can the numbering and the continuation of the decimal 3s stop somewhere, given this (the numbering) if finite? That is, as long as the price of 10/3 will have never been stated accurately, by means of a decimal number, then we are obliged to accept infinity. To this we answer according to what we have written in the previous unit (unit 12): **"Therefore, if for 3 we do not make the "+1" hypothesis, we literally have not even supposed that 3 is followed by a number!"** So, each time we count one decimal "3" or more. And, in this way, we realize that the increased 3.3333... has a new price. If we don't add that sole 3, we are not able to talk about one more 3. This, for we haven't even made the hypothesis that e.g. 3.333... has one more 3. Let's not forget that numbers can only be conceived as of specific numeric price and as completely detached from each other; they cannot form sets. Therefore, when we add the 3s to 3.333..., this addition is made with a specific lot of digits each time. If we don't increase with a specific lot the 3s each time, then we have an abstract increase of 3.33333..., which in this theory we have abolished. The abstract number (and, consequently, infinity) doesn't exist. Therefore, if we don't increase 3.333... by a specific lot of 3s, each time, then we introduce the abstract 3.333..., which is absurd.

Nevertheless, only if each time we proceed in specific increase, then by counting the each time increased 3.333..., can we be talking about an existing and true number. And, if someone asserts that, for every specific 3.333... goes the by one "3" increased number, since we are talking about each time specific increases, then each specific increase is apprehended as a new specific number. So, the fact that by each increase (specific one) comes a new number, it does not contradict the rejection of the abstract number. This for, by each increase of the number, specific new numbers come about.

Yet, the point is whether we make the increase specifically or in an abstract manner. By the specific increase we have discrete numbers, which are not included in sets. In a few words, we can increase 3.333... by the (specific) lot of, let's say, three or a thousand 3s. And, afterwards, having conceived that there can be a further increase, we add more 3s. But we make this each time specifically and in a discrete way. And so, we needn't say that the 3s are infinitely many.

Here we remind that, on the basis of infinity, in any way, the price of 10/3 is not exhausted when the number is stated as a decimal. Simply enough, without infinity, the process of the 3s is made through an each time discrete counting.

All these also go for the irrational numbers. The fact that their decimal numerals are not periodically repeated obviously does not introduce something which calls for further study.

And let's remember here what we've proved about the nature of the multiplication and the division (in unit 6). **The statement 10/3 has the empirical character and the state of randomness.** Therefore, for 3.333... the each time location of one more digit does not disagree with the nature that 10/3 carries. The state of 10/3 is the state of randomness, as a numeric statement, although stating 10/3 seems to be something absolutely precise. This absolutely agrees with the each (discrete) time location of one more decimal digit of 3, as an empirical process.

EPILOGUE

The Foundations of Arithmetic and of the Euclidean Geometry
The knowledge of freedom that the proof of P≠NP provides

The general idea of this theory is the fact that each number is totally different from the others, so it is defined and apprehended in a totally different and unique way. Thus, in order to consider an infinite quantity of numbers (which means consider the very infinity) we need an infinite quantity of definitions. Therefore, there is no possibility that we ever have the chance to define the infinite.

Each number being totally different from all the others renders –apart from the substance of the infinite– also the notion of what we call a set of numbers, groundless. This is because, in order to consider two or more numbers as a set of any kind, these numbers must have something in common, and this cannot be.

This means that any mathematical theory which deals with number sets is wrong at least to the grade to which it is based on these sets. So, for example, it is irrational to wonder if the decimals from zero to ten are more plenty than the integers from zero to ten. This is so because the "quantity" of ten cannot be composite. Thus, there cannot be considered e.g. ten integers constituting it. The revelation of the numeric nature and the abolition of the numeric set in this theory constitute absolute truths, since, if anything, the fact that the absence of relationship among numbers is absolute, and the nature of the number is absolutely simple (one-part entity). As to this, it comes naturally that fundamental unsolved problems, regarding the numbers and their supposed qualities, are given the complete solution here: the **Riemann Hypothesis** is one example in this case. And the application of the numeric nature in the logic of problems like **the P Vs NP problem**, is proved to be absolutely effective in solving these problems – for the application of the (absolute) numeric nature, is made in an absolute way. Also, applying the numeric nature to Physics, unsolved **fundamental problems in Mathematical Physics**, like the paradoxes of Zeno where calculation is present, are solved through the wholly new way of regarding calculus in this theory.

On the basis of these, it is obvious that the **new Foundations of Arithmetic** do not bear any contradictions, and problems in general, for all of problems stem from what we call a numeric set!

Now, as regards the Euclidean Geometry, the numeric nature as proved in this theory plays the fundamental part when applied to the axioms of the Euclidean Space and proves them, thus **proving the Euclidean Space**.

In this theory we give the solution to the fundamental problem, stated as P Vs NP, by proving P≠NP. This secures that we now know the bank accounts, the classified documents of state governments and services, etc, are safe. Furthermore, the fact that the NP class problems cannot be P class problems means that there cannot be a way of reading and controlling fields of life such as social movements and human behavior and thought, with the use of catholically automatic ways. **We now know that Humanity will never really be threatened by automaticity.**

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In this theory, The Groundlessness of Infinity, I introduce by three separate proofs a totally innovative concept regarding the nature and relations among (pure) numbers. The applications of this wholly new knowledge conclude to proving and solving major up-to-now unresolved problems, e.g. the Riemann Hypothesis, Zeno's Paradoxes, the P Vs NP Problem, and other major open issues. The core knowledge, as by the three above mentioned proofs is that a number cannot be composite, it cannot bear any properties at all, and there cannot be any kind of relationship among numbers. This leads to the abolition of the numeric set of any kind, and subsequently to the abolition of the numeric continuum and infinity. Nevertheless, it is the same logic that abolishes infinity, which abolishes the notion of a supposed "ultimate end", by introducing a new way of regarding the "limit" in counting. The only logical basis I use about the proofs is the arithmetical identity. Therefore in this theory, the new Foundations of Arithmetic are established. Also, the Euclidean space has been proved here: the notion and the entity of the straight line, the angle and the square have been proved. In extension, the circle is proved to be a non-Euclidean object, and the proof of the genuine calculation of the circle is given. This leads to answering the, surprisingly, so far unanswered question of how a bicycle works.

Εκδόσεις Σαΐτα

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