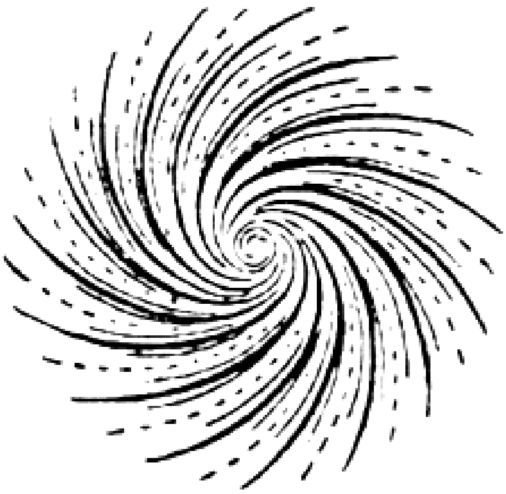

Velimir Abramovic,

Ph D in Philosophy:

HOW ‘MANY INFINITIES’ ARE THERE IN MATHEMATICS?

(From “The Basics of the Science of Time”)

While reading Cantor’s “Diagonalization Argument”, I realized that it contains nothing which can be taken for granted, but that this proof must be analyzed in a classical manner, statement by statement, symbol by symbol, walking through it on foot, using small steps. This manner is necessary, among other reasons, because the essence of every trick, particularly an intellectual one - lies in the illusion of the apparent.

I have accepted the verification of Cantor’s proof (theorem) as something entirely personal because, if it is true that there is more than one infinite in arithmetic, then my effort is pointless, my theory of time incorrect, and mathematics and physics will forever remain two fundamentally unrelated sciences.

For the sake of continuity, Cantor's proof will first be presented here in its entirety, and then analyzed in detail, and finally we will present our own conclusion to the "counting of all decimal numerals" which is in accordance with Mellis' sound minded principle by which "infinities cannot coexist".

"Cantor's Diagonalization Argument

Suppose that the infinity of decimal numbers between zero and one is the same as the infinity of counting numbers. Then all the decimal numbers can be counted in a list.

$$1\ \mathbf{d}_1 = \mathbf{0.d}_{11}\mathbf{d}_{12}\mathbf{d}_{13}\mathbf{d}_{14}\ ....$$

$$2\ \mathbf{d}_2 = \mathbf{0.d}_{21}\mathbf{d}_{22}\mathbf{d}_{23}\mathbf{d}_{24}\ ....$$

$$3\ \mathbf{d}_3 = \mathbf{0.d}_{31}\mathbf{d}_{32}\mathbf{d}_{33}\mathbf{d}_{34}\ ....$$

$$4\ \mathbf{d}_4 = \mathbf{0.d}_{41}\mathbf{d}_{42}\mathbf{d}_{43}\mathbf{d}_{44}\ ....$$

$$. . .$$

$$\mathbf{n}\ \mathbf{d}_n = \mathbf{0.d}_{n1}\mathbf{d}_{n2}\mathbf{d}_{n3}\mathbf{d}_{n4}\ ....$$

$$. . .$$

Consider the decimal number $\mathbf{x = 0.\ x}_1\mathbf{x}_2\mathbf{x}_3\mathbf{x}_4\mathbf{x}_5$ **.......** , where $\mathbf{x}_1$ is any digit other than $\mathbf{d}_{11}$; $\mathbf{x}_2$ is different from $\mathbf{d}_{22}$; $\mathbf{x}_3$ is not equal to $\mathbf{d}_{33}$; $\mathbf{x}_4$ is not $\mathbf{d}_{44}$; and so on. Now, **x** is a decimal number, and **x** is less than one, so it must be in our list. But where? **x** can't be first, since **x**'s first digit differs from $\mathbf{d}_1$'s first digit. **x** can't be second in the list, because **x** and $\mathbf{d}_2$ have different hundredths place digits. In general, **x** is not equal to $\mathbf{d}_n$, since their nth digits are not the same.

x is nowhere to be found in the list. In other words, we have exhibited a decimal number that ought to be in the list but isn't. No matter how we try to list the decimal numbers, at least one will be left out. Therefore, "listing" the decimal numbers is impossible, so **the infinity of decimal numbers is greater than the infinity of counting numbers**."

Now let us review this, concept by concept, statement by statement:

"Infinity of decimal numbers"; what kind of infinity is this if it has zero and one as its outer limits?

"Infinity of counting numbers"; what kind of infinity is this if it has zero and **n** as its outer limits?

Infinity cannot have any outer limits. An unspecified many is not infinity, or rather, an "infinite number" is a contradictory concept in itself unless it refers to zero.

"Suppose that the infinity of decimal numbers between zero and one is the same as the infinity of counting numbers."

For this assumption to be precise, it must be preceded by the definition of a decimal number. Every position of a decimal entry has a value of **10,** that is to say that it immediately covers the entire first decade of natural numbers (**0.n** has an interval of ***0.0, 0.1, 0.2, 0.3… – 0.9***) and it is instantly clear that by using **1,2,3…n** only decimal places, tens, hundreds, thousands, etc. can be mono-symbolically counted but not all the concrete numerical values in those places.

The number of decimal places of every specific decimal number, for example **0.1**, is equal to the number of its decimals, it is **1:1** but, if that number is expressed as ***0.d***, then the number of appropriate ***d*** rises to ten. This compression of **10:1** is the essential characteristic of the decimal expression in whole numbers and, if it is disregarded, listing becomes unachievable.

It will become evident here that the primary flaw of Cantor's list is its poor development, or rather, that the number of decimal numbers in it does not correspond to the number of decimal places and the number of places does not correspond to the number of actual decimals to be listed. For example, the first decimal number $\mathbf{1d_1 = 0.d_{11}}$ … has only one place for ten of its possible first decimals. This shows us that, not only the reinstatement of ontology indispensable in mathematics, but also that the induction of principles of simultaneity is necessary in order to be able to express the essence of the coexistence of mathematical objects in interaction (e.g. in mathematical operations).

"Then all the decimal numbers can be denumerated in a list.

$$\mathbf{1\ d_1 = 0.d_{11}d_{12}d_{13}d_{14}} \ldots\ldots.$$

$$\mathbf{2\ d_2 = 0.d_{21}d_{22}d_{23}d_{24}} \ldots\ldots.$$

$$\mathbf{3}\ \mathbf{d}_3 = \mathbf{0.d}_{31}\mathbf{d}_{32}\mathbf{d}_{33}\mathbf{d}_{34} \ldots\ldots.$$

$$\mathbf{4}\ \mathbf{d}_4 = \mathbf{0.d}_{41}\mathbf{d}_{42}\mathbf{d}_{43}\mathbf{d}_{44} \ldots\ldots.$$

$$\ldots$$

$$\mathbf{n}\ \mathbf{d}_n = \mathbf{0.d}_{n1}\mathbf{d}_{n2}\mathbf{d}_{n3}\mathbf{d}_{n4} \ldots\ldots.$$

. . .”

Let us observe in detail how the list is placed and why by it, as it is, it isn’t possible to inventory all decimal numbers.

By simply analyzing **d** we would find nothing new; **d** has an ontological function and it is there to simply claim the existence of a decimal number in the shape of **d=0,dddd…d…**, less than zero.

Constructed under a right angle with vertical and horizontal components, the list begins from left to right with the natural numbers **1,2,3,4…n**, which are meant to count all the decimal numbers $\mathbf{d_1,d_2,d_3,d_4 \ldots d_n}$. This is all in accordance to the presumption and up to the equality sign all is well. Then Cantor develops a horizontal component of the list, e.g. the first decimal number in $\mathbf{1d_1= 0.d_{11}d_{12}d_{13}d_{14} \ldots}$, the second decimal number in $\mathbf{2\ d_2 = 0.d_{21}d_{22}d_{23}d_{24} \ldots}$ etc.

Already the first index symbol of the decimal has an unbalanced meaning because, to the left, as an index, e.g. $\mathbf{1d}_1$ refers to a decimal number, while on the right, index $\mathbf{0.d}_1$ refers to only fractions of that number ($\mathbf{1d_1= 0.d_{11}d_{12}d_{13} \ldots}$).

The second index numeral $\mathbf{0.d_{11}d_{12}d_{13}\ldots}$, marks the places in the decimal listing, the tenth, hundredth, thousandth, etc.. In each of these decimal places, in lieu of another decimal digit, any number from **0** to **9** may be expressed. Let us focus our attention on the significance of the second index number: it exists to express, in one symbol, a group of ten numbers. This is not specifically stated in Cantor’s table and that makes it lack the solidity to elaborate on the power of decimal numeration (listing).

Horizontally, the second index digit grows by one, yet this does not ensure that the tenth, hundredth, thousandth, etc. decimal of the same decimal number – differ. They may repeat. Vertically, the second decimal number is the same for tenths, hundredths, thousandths, etc. and again there is no specific indication that their decimals in these places are equal. Herein, precisely, lies the problem: between the first and second index numbers, e.g. the principle of equivalency does not apply to the number ***0.d***$_{11}$, or rather, a mutual mono-symbolic replication cannot be applied; the first index number signifies the exact number expressed, while the second index number does not signify with which it is expressed, but is the place number of the decimal place and simultaneously a symbol representing a group of ten numbers, or the symbol for the decade interval of a decimal **(0,0;0,1;0,2;0,3…0,9)**, ***implicitly reduced to one single decimal by 0. d***$_1$. In temporalized mathematics this is a typical example of asynchronous numbers, those which by assumption cannot physically-mathematically coexist.

Let us now analyze the characteristics of Cantor's **x** decimal number and why it is of such weak resolution in this table that it is impossible to find. Cantor defines it as follows: ***"Consider the decimal number*** $x = 0.\ x_1x_2x_3x_4x_5$ ***……. , where*** x_1 ***is any digit other than*** d_{11}***;*** x_2 ***is different from*** d_{22}***;*** x_3 ***is not equal to*** d_{33}***;*** x_4 ***is not*** d_{44}***; and so on."***

Foremost, the expression " $x = 0.\ x_1x_2x_3x_4x_5$ ***…"*** applies only to **x=n=0,** in other words, does not apply to any other concrete value $0.\ x_1x_2x_3x_4x_{5\ldots}$ a number such as this cannot be equal to **x**. The reason for this being that a whole and any portion of it cannot be synchronic. This will be discussed in more detail at a later time while, here, we will elaborate on the analysis of **x** as assigned by Cantor:

The number **x** for every decimal only has one index numeral in the horizontal with a rate of growth of one. Thus, one and the same index numeral of the number $\mathbf{0.x_1x_2x_3x_4x_5}$ …, has a double meaning, with two meanings being obvious: first, it marks the tenth, hundredth, thousandth, etc. place of the number **x**, second, with a growth rate of one it shows that **x** can have an unlimited number of successively different decimals. However, there is also a third, unexpressed, hidden meaning of **x** itself, which is presumed and, as such, in a thesis such as this one, is unforgivable. Namely, it is obvious that **x** in the expression $\mathbf{0.x_1x_2x_3x_4x_5}$…, is there to substitute any of 10 different decimals, which assures that $\mathbf{x_1}$ might never coincide with $\mathbf{d_{11}}$, $\mathbf{x_2}$ with $\mathbf{d_{22}}$**,** $\mathbf{x_3}$ with $\mathbf{d_{33}}$**,** …because **0.d** numbers only cover one decimal value at a time.

Within the differences of the decimal places, the vertical component of the list does not allow for the random coincidence of the index decimal **x** and the first index numeral of the number $\mathbf{d_n}$, and the possibility of the equivalence of **x** and $\mathbf{d_n}$ is narrowed down to one exclusive possibility, in the case of $\mathbf{0.\ x_1 = 0.d_{11}}$, in which case **($x = 0.\ x_1x_2x_3x_4x_5 \ldots$) = ($d_1 = 0.d_{11}d_{12}d_{13}d_{14} \ldots$)** also applies. This is the exact possibility that Cantor dismissed by subjective intervention, giving the crown condition under which his proof begins to apply: "where $\mathbf{x}_1$ is any digit other than $\mathbf{d}_{11}$ ". Every sensible person will then inquire "alright, $\mathbf{x_1}$ is not $\mathbf{d_{11}}$, than which digit is it?" This is where the deconstruction of Cantor's "Diagonalization Argument" begins with the simple enlargement of resolution of the list. The philosophical justification for this conscious induction of the principle of coexistence into mathematics with a basis of the simultaneity of numbers, a principle which the medieval theologist and mathematician Duns Scott already noted as having the purpose of physically limiting the concept of true infinity.

But let us bring our attention back to the equivalency of $\mathbf{x_1}$ and $\mathbf{d_{11}}$. As we have already mentioned, the primary flaw of Cantor's list is that the number of decimals which should be simultaneous to the number of decimal places, is not equivalent to it, but **10** times greater, which becomes the deciding factor if the choice of decimals is not executed. For example, the number ***0.3*** has one decimal place (the present) and, in that place, one decimal (also the present), thus – synchronicity, the entire number exists in "the present". However, the generic number ***0,x*** has one decimal place in the "present", which is implicit simultaneously of ten different decimals **0,1,2,3…- 9** from the "future" (because of this it is marked as **x**) until a choice has occurred of the "future present" of ***0,x*** and ***x*** attains its concrete numeric value.

In fact, by expressing the generic values as **a,b,c,x,y**… we represent the "unknown future **0,1,2,3,4,5…**" as the "known present **a,b,c,x,y…**', which is merely one of the many temporal contradictions in the constitution of generic numbers.

In order to test our interpretation of Cantor's index, let us try to, instead of any **d** in his list, insert a generic final decimal, i.e. **0.341**. Here we encounter a problem: **0,3** is not $\mathbf{d}_{11}$, **0,04** is not $\mathbf{d}_{22}$, **0,001** is not $\mathbf{d}_{33}$. It is obvious that the index digits cannot be mono-symbolically interpreted as natural numbers, but only as they are already interpreted. The second index digit also does not mean only what is written, but must be interpreted as the interval between the numbers from **9** to **0**, as has been done.

In Cantor's list, the final array element of the vertical chain **1,2,3,4…*n*** is symbolized as ***n***, $\mathbf{nd}_n = \mathbf{0.d}_{n1}\mathbf{d}_{n2}\mathbf{d}_{n3}\mathbf{d}_{n4} \ldots$, as this is the number of all decimal numbers and this supports his thesis. However, horizontally, he leaves this same chain as **1,2,3,4…** not counting it to ***n***. Why the inconsistency? The reason is very important: had he generalized the second index digit as ***n***, and gotten $\mathbf{nd}_n = \mathbf{0.d}_{n1}\mathbf{d}_{n2}\mathbf{d}_{n3}\mathbf{d}_{n4}\ldots\mathbf{d}_{nn}$, he would have, with this second index ***n***, expressed the number of all decimal places and have opened the question of the possible number of intervals **(0-9)** in those places. He would then have had to rethink his proof, his "argument of diagonalization". Namely, if values **1-9** aren't expressed in the decimal places, then all decimal places may be treated as "parts of zero", e.g. the number of decimal places is also the number of all decimal places in one decimal number, as well as the number of all decimal places of all decimal numbers and the number of all possible decimals in those places which, of course, is the number ***n***:

$$\mathbf{nd}_n = \mathbf{0.d}_n\mathbf{d}_n\mathbf{d}_n\mathbf{d}_n \ \ldots\mathbf{d}_n \ \ldots,$$

This way, horizontally and vertically, the number and meaning of the index digit is balanced with the coefficient **nd**, the list is brought to its proper initial position and thus the problem of listing decimal numbers is defined.

Let us also observe this: let us symbolize the very idea of a decimal using the value **n=0**, that is:

$$\mathbf{0d}_0 = \mathbf{0.d}_0\mathbf{d}_0\mathbf{d}_0\mathbf{d}_0 \ldots\mathbf{d}_0 \ldots$$

Here zero has a triple meaning: a) the decimal number in general, b) any decimal place, the tenth, hundredth, thousandth…, and c) any decimal interval **n=0,1,2,3…9.,** thus, it can mean itself. Temporally, here zero is a symbol for the principle of simultaneity of these possibilities. Now, if we translate the idea of a decimal number into a general idea, e.g. substitute zero with **n=1,2,3…n**, we get the basis for Cantor's list, or rather:

$$\mathbf{1\ d}_1 = \mathbf{0.d}_1\mathbf{d}_1\mathbf{d}_1\mathbf{d}_1 \ldots$$

$$\mathbf{2\ d}_2 = \mathbf{0.d}_2\mathbf{d}_2\mathbf{d}_2\mathbf{d}_2 \ldots$$

$$\mathbf{3\ d}_3 = \mathbf{0.d}_3\mathbf{d}_3\mathbf{d}_3\mathbf{d}_3 \ldots$$

$$\mathbf{4\ d}_4 = \mathbf{0.d}_4\mathbf{d}_4\mathbf{d}_4\mathbf{d}_4 \ldots$$

…

This uncovers the first hidden purpose of this kind of listing, which we cannot easily disregard: while the indexes $\mathbf{d}_1, \mathbf{d}_2, \mathbf{d}_3, \mathbf{d}_4$ **…dn,** cannot take on zero value, but have no upper limit, **(1,2,3…n)**, and indexes $\mathbf{0.d}_1$ **,**$\mathbf{0.d}_2$ **,** $\mathbf{0.d}_3$ **,** $\mathbf{0.d}_4$ … may take on zero value, but are limited up to the number **9**. Thus, in no other case except in $\mathbf{0d}_0 = \mathbf{0.d}_0\mathbf{d}_0\mathbf{d}_0\mathbf{d}_0 \ldots \mathbf{d}_0 \ldots$ can a mutual equivalency of index symbols be attained.

A wonderful example of mathematical asynchronicity and where, in the listing, or specifically where it is forbidden because the complete list must be synchronic with the variability of it's components in order to bring them into the same present, or rather to contain them all in one register. This much for now but we will specifically go into explaining "synchronic causality" in detail, where we will show that synchronicity is the cosmological stipulation for interaction and that it also universally applies to entities in the so called "past" or "future". Incidentally, merely to soften the effect of temporal laws, many logical inventions have been interpolated into mathematics, to name a few: an unclear "principle of equivalency", an imprecise "cardinal number", a paradox "principle of", the "axiom of choice" with no time component, and others.

For the inventory to succeed, all the initial digits must be in equivalent correlation. In Cantor's list ***'one decimal place means one decimal number, but the other way it isn't so, since the one decimal number may have many decimal places'***, thus there is no **1:1** correspondence at all and the listing of all decimals is not even attempted. From a wider stance, Cantor's list is also absurd in a way that "it lacks the numbers" to "count things", that is to say **x** is a "surplus of things". As if all decimal numbers, **x** included, were not made up of units (ones) taken from the natural number sequence **N**, the same **N** sequence that it claims not to be able to count. In this sense, we will demonstrate that there are as many decimal numbers, to the one, as there are natural numbers.

In our synchronic list, the principle of **1:1** is applied to the full interval of decimals by one decimal place and achieves triple univocal correspondence, **1:1:1**, or rather that ***"one decimal place means one decimal which means one decimal number"***.

The breakdown of decimal numbers into elements is the *conditio sine qua non* their "listing", in other words, their two-way corresponding (mono-symbolic) counting in **"ones"** (units) of the natural number sequence **N**, in any case interpreted as the correlation of one decimal number to one natural number **1:1, 1:2, 1:3, 1:4…1:n**. We emphasize that all **n** components of this "new complete list" – "cantorian", **actual** – actually coexist, which consistently and truly, in a mathematically true” manner, implement the principle of synchronicity of numbers.

This kind of analysis is crucial so as to express a complex self-identity of decimal numbers, e.g. to clearly differentiate concepts whose meanings overlap, as are the concepts of the whole decimal number, the decimal place and specific decimals.

Let us now observe why Cantor at the end of the sequence $\mathbf{nd_n= 0.d_{1n}\ d_{2n}\ d_{3n}\ d_{4n}}$ ...does not write $\mathbf{d_{nn}}$ but rather leaves three dots? He does this because it would undermine, or rather disprove his proof; it would show that, in the “listing”, he identifies **10** decimals with each decimal place, which would be the same as claiming that eleven ones is only one. Of course, had he written $\mathbf{d_{nn}}$, he would then have had to reevaluate the entire problem. We are left with the impression that Cantor did not in fact honestly stand to count decimal numbers, but was in a hurry to draw us into his belief by using a numerical trick. Were this any different, he would not be drawing the conclusion from a mistaken assumption that ten variables of decimals can be counted by the use of one (unit) (Cantor’s second index digit $\mathbf{0.d_{11}}$, etc.), thus drawing ***the impossible conclusion of the existence of multiple mathematical infinities***.

Let us focus on the following: a careful observer will notice that with the first index digit Cantor only counts whole decimal numbers and, with the second index digit, only decimal places. ***Decimals are not even taken into account by his list.*** The monopoly of choices of specific decimal values is left to the ethereal and a list of the independent number $\mathbf{x = 0.x_1\ x_2\ x_3\ x_4 ...}$ Where we, of course, cannot find it. However, in fact, no specific decimal number, for example **0.321,** cannot be substituted into this list instead of any **d**. In essence, this entire proof is an extreme example of incomplete deduction. Though it is widely accepted, this proof is simply ridiculous.

We specifically mention that **n** and **n+1** are not simultaneous, which we will elaborate on in detail in another segment, yet, without particular explanation, we can use their imminent timely characteristics, wherever they are in synchronous correlation, e.g. where **n/n=n+1/n+1=1**, which is our case exactly.

Equivalency, simultaneity, comparison:

Through the elements of decimal numbers, the equality of all decimals, all decimal places and all decimal numbers is achieved, thus attaining a triple equivalency. From the self-identity of the decimal **1**, a **1:1** correspondence of a decimal and decimal places decimal has been deduced, followed by the **1:1:1** correspondence with decimal numbers. This brings the list down to what it has been deduced from, simply one general decimal number **d=0.d**.

But what is the difference then in the numbers $\mathbf{d_1}$ **,**$\mathbf{d_2}$ **,**$\mathbf{d_3}$ **...**, when one sole concrete decimal number can be expressed as $\mathbf{1d_1}$, and as $\mathbf{1d_2}$ and as $\mathbf{1d_3}$ **...** and also two different decimal numbers can be expressed as, for example , $\mathbf{1d_1}$?

This is analogue to the question – what is the difference between the one that we add to two and the one that we add to a three or four in the sequence **n+1**? The difference is of the most crucial importance – in the ***existential individuality***; in the time-space sense, it is not the same one because there are three and not one. Certainly it is not ontologically the same as in a mathematical, or rather physical reality, when we work with, for example, a **0,37** as with a **n(0.37)**. However, in modern mathematic stripped of ontology, (e.g. the science of existence) this is not even taken under deliberation.

Let us return to the "listing". Hence, as all the elements of the list are known in advance, as are their relations, the induction is complete, without the habitual "jump to deduction" and it is therefore significant to clarify it fully.

The algorithm of my list expresses the timely nature of mathematics, in other words, it is constructed in such a way that it also encompasses the human experience of succession in a timely order of the actualization of decimal numbers. That is the full sense of the constant ($_{\mathbf{n'}}$), which realizes the temporal connection of the possible (all **d** numbers in the eternal present) and the actual (concrete **d** numbers in the same or different presents).

Synchronicity is not only the stipulation for the coexistence of mathematical objects, but also the statute for the propriety of their individual actualization, thus the first specifically chosen decimal number, let us say **0,87496...**, must be $\mathbf{1d_1}$, the second, even if it is, let us suppose, equal to it , **0,87496...**, must be $\mathbf{2d_2}$, the third $\mathbf{3d_3}$ ..., **n**-th must be $\mathbf{nd_n}$. Each first actualized number $\mathbf{nd_n}$ is consisted in $\mathbf{1d_1}$**,** each second $\mathbf{2d_2}$, each third in $\mathbf{3d_3}$**...**, and the vice-versa, $\mathbf{1d_1}$**,** $\mathbf{2d_2}$**,** $\mathbf{3d_3}$ **...,** together are actual in $\mathbf{nd_n}$. For the actual plural $\mathbf{nd_n}$ the field of actualization of the first number is $\mathbf{10d_1}$**,** of the second $\mathbf{10d_2}$**,** of the third $\mathbf{10d_3}$... however, by the actualization of a concrete number, the possibility identifies with reality, narrowing the choice to one each $\mathbf{1d_1}$**,** $\mathbf{1d_2}$**,** $\mathbf{1d_3}$**...** $\mathbf{1d_n}$. If we initially write **0.87325=** $\mathbf{d_4}$, that will temporally define this decimal number as the fourth actual number in the order of coexistent numbers. This way, all actual decimal numbers $\mathbf{d_1, d_2, d_3, d_4}$**...** are synchronized with the cosmos of possible numbers **...** $\mathbf{d_n}$.

Here is where we must answer the question why coexisting numbers are not labeled the same, if they are necessarily simultaneous? This would be similar to asking why people of different ages live in the same present.

Real coexistence is confusing; it is the deepest temporal law in the mutual order of cycles and entities otherwise placed in different times, it is the ***eternity*** that connects the different presents and because of this appears as a chaos that theologists, philosophers and scientists doubt has any law to it. In this study we will demonstrate the manner in which real coexistence creates the impression of the existence of past and future, an impression that time itself is in motion, that it has a flow and direction.

In a mathematical sense, the general notion of coexistence coincides with Archimedes' definition of continuum as – ***"the infinite sum of unequal parts"***, in other words, it coincides with the concept of continuum as ***"the generator of unequal units"***. Under the condition that the reason is uncovered and the manner defined by which the finite becomes independent in the infinite, we shall observe that Archimedes' definition leads us to what we will call ***"the natural continuum of real numbers"***.

The correct and full answers to all of this are of extreme importance and a particular portion is dedicated to the discussion of time as a relation of ostensibly unrelated numbers and the cause of ostensibly unrelated events. For the moment, we will remain on the subject of our mathematical case and more precisely explain the necessity of differently expressing certain numbers that coexist, even when they are equal. The origins of this are the three logical levels of their coexistence the first is $\mathbf{nd_n}$ in which all **d** numbers are actual, the second is $\mathbf{10d_1}$ in which only the first number $\mathbf{d_1}$ is actual, and the third is $\mathbf{1d_{1n'}}$ in which a concrete individual number is actualized, for example **0,74658....** The true purpose for insisting on the specific and, for the modern mathematical mind – too many symbols, is to define the physical characteristics of numbers in their ambiguously purely mathematical interaction. The physics of numbers should first theoretically be solved in mathematics into which we have had insight far more than into physics, where we encounter in experiments, numbers that have already become things, already with objectified, physical numbers whose characteristics and origins we are not acquainted with.

You might also pose this question: "Alright, if for the counting of every **d** I need three units of the natural sequence **N**, doesn't this after all mean that there are three times more decimal numbers than **N**?" Of course this is not what it means, but the answer is not exactly simple. A decimal number is a complex numeral system of three elements and it can in no way be counted by one without losing the characteristics that make it the number that it is. Let us observe the natural number **3**, which needs less interpretation. The number **3** is also a complex system; it can also not be counted with **1**. If we were to do so, we would end its individuality and would not be able to tell the difference between it and a four, a five, a six… it would become the generic number **n**. The number **3** is in itself the symbol for the number of elements it is comprised of and so it is apparent that three ones of a natural sequence are needed to count it in **1:1** correspondence, or rather for **3:3** to be in correlation to **1:1**. Hence, for each decimal number **d** whose elements can be counted with three ones of **N**, as is true for all **d** numbers, the correspondence (**3** elements **d**) to (**3** ones **N**) the ratio is **1:1**, in other words if the number of elements of **d** and **N** have a growth rate of one each, then **d** is equivalent to **N**, **d ~ N**.

The explication of "the synchronization method" list in the numeration of all decimal numbers by the natural number sequence N:

Every group, however complexly arranged, can be counted by the ones of the natural number sequence **N** if it can be deconstructed into elements.

A decimal place constitutes the concept of a decimal number. For a number to be decimal, it must have at least one decimal place and, it that place, one decimal. For **n** one-decimal numbers, there are exactly **n** decimal places. In order to reach synchronicity in the counting of all decimal numbers a firm principle of equivalency must be obeyed which is the mathematically logical expression of synchronicity, e.g. the consistent application of a **1:1** ratio. Considering that a decimal number may have several decimal places and in order to keep a strict equivalency, we will calculate this number as being several decimal numbers, for example with the number **0.975**, we will count it with three units of natural numbers, e.g. **(0.9) -1**, **(0.07) -1** and **(0.005) -1**, also with the number **0.001**, e.g. **(0.0) -1**, **(0.00) -1**, **(0.001) -1**. This way we achieve the equivalency of the number all decimal numbers **nd** to the number of all their decimal places **0.nd,** or rather **nd = 0.nd**. In following with that, the number with **17** decimal places will be counted as the sum of **17** individual decimal places, **17d = 0.17d**. For a decimal number with an unlimited growth of decimal places, this correspondence is also **1:1**, and **(n+1) d = 0. (n+1) d**, because for **n = n, n+1 = n+1.**

However, the power of each individual decimal place is one decimal interval of **10** numbers **(0.1,2,3...9)**. As we are not acquainted which of these **10** numbers is in which of the decimal places of the decimal number and, in order to keep the **1:1** principle, it is imperative that each decimal place additionally be counted with ten ones of natural numbers each. The following constant is most practical for this:

Introduction into the synchronic list:

There can be **(n)** decimal numbers **(d)**, each number can have **(n)** decimal places and in each of these places there can be one decimal interval **n'(9,8,7...0);** for **d=0.d**, that is **n** $(\mathbf{d_{nnn'}} = \mathbf{0.d_{nnn'}})$. How do we know that the number of decimals $(_{\mathbf{n'}})$in one decimal place $(_{\mathbf{n'}})$ is constant – **(10)**, this means that the number of all decimals is equal to the tenth degree of the number of decimal places, in other words equal to the power of ten of all decimal numbers. For this difference to be balanced, all decimal numbers must be calculated as an individual decimal number and counted by a unit of the sequence **N= 1,2,3,4…n**; as we have already stated, for the counting of each decimal number, or its three elements, we need three units of the natural sequence and, thank goodness, there were quite enough of those for this count also.

For the condition of synchronicity, **t=t**, a time must be balanced, $\mathbf{d_{11}}$ ("present") with time $\mathbf{x_1}$ ("future present"), so that T $\mathbf{d_{11}}$ = T$\mathbf{x_1}$. We will accomplish this by synchronically developing the elements $\mathbf{d_{11}}$ to the degree that they include the "future" $\mathbf{x_1}$. Thus, we will develop the potential of Cantor's second index $\mathbf{d}_n = \mathbf{0.d}_{n1}\mathbf{d}_{n2}\mathbf{d}_{n3}\mathbf{d}_{n4\,\ldots}$ into its explicit and full form; (*full* meaning analyzed to the elements in a synchronic relation). We will do this by adding a vertical component to the second index so that we may express the full potency of decimal places which it symbolizes.

For the number **1** $\mathbf{d}_1 = \mathbf{0.d}_{11}\mathbf{d}_{12}\mathbf{d}_{13}\mathbf{d}_{14\,\ldots}$ the fully developed temporal potential of that number is:

$$\begin{array}{ll}
\mathbf{1\,d}_1 = & \mathbf{0.d}_{119}\ \mathbf{d}_{129}\ \mathbf{d}_{139}\ \mathbf{d}_{149}\ \mathbf{d}_{159}\ \mathbf{d}_{169}\ \mathbf{d}_{179}\ \mathbf{d}_{189}\ \mathbf{d}_{199}\ \mathbf{d}_{1109}\ \ldots\mathbf{0.d}_{1n9} \\
 & \mathbf{0.d}_{118}\ \mathbf{d}_{128}\ \mathbf{d}_{138}\ \mathbf{d}_{148}\ \mathbf{d}_{158}\ \mathbf{d}_{168}\ \mathbf{d}_{178}\ \mathbf{d}_{188}\ \mathbf{d}_{198}\ \mathbf{d}_{1108}\ \ldots\mathbf{0.d}_{1n8} \\
 & \mathbf{0.d}_{117}\ \mathbf{d}_{127}\ \mathbf{d}_{137}\ \mathbf{d}_{147}\ \mathbf{d}_{157}\ \mathbf{d}_{167}\ \mathbf{d}_{177}\ \mathbf{d}_{187}\ \mathbf{d}_{197}\ \mathbf{d}_{1107}\ \ldots\mathbf{0.d}_{1n7} \\
 & \mathbf{0.d}_{116}\ \mathbf{d}_{126}\ \mathbf{d}_{136}\ \mathbf{d}_{146}\ \mathbf{d}_{156}\ \mathbf{d}_{166}\ \mathbf{d}_{176}\ \mathbf{d}_{186}\ \mathbf{d}_{196}\ \mathbf{d}_{1106}\ \ldots\mathbf{0.d}_{1n6} \\
 & \mathbf{0.d}_{115}\ \mathbf{d}_{125}\ \mathbf{d}_{135}\ \mathbf{d}_{145}\ \mathbf{d}_{155}\ \mathbf{d}_{165}\ \mathbf{d}_{175}\ \mathbf{d}_{185}\ \mathbf{d}_{195}\ \mathbf{d}_{1105}\ \ldots\mathbf{0.d}_{1n5} \\
 & \mathbf{0.d}_{114}\ \mathbf{d}_{124}\ \mathbf{d}_{134}\ \mathbf{d}_{144}\ \mathbf{d}_{154}\ \mathbf{d}_{164}\ \mathbf{d}_{174}\ \mathbf{d}_{184}\ \mathbf{d}_{194}\ \mathbf{d}_{1104}\ \ldots\mathbf{0.d}_{1n4} \\
 & \mathbf{0.d}_{113}\ \mathbf{d}_{123}\ \mathbf{d}_{133}\ \mathbf{d}_{143}\ \mathbf{d}_{153}\ \mathbf{d}_{163}\ \mathbf{d}_{173}\ \mathbf{d}_{183}\ \mathbf{d}_{193}\ \mathbf{d}_{1103}\ \ldots\mathbf{0.d}_{1n3} \\
 & \mathbf{0.d}_{112}\ \mathbf{d}_{122}\ \mathbf{d}_{132}\ \mathbf{d}_{142}\ \mathbf{d}_{152}\ \mathbf{d}_{162}\ \mathbf{d}_{172}\ \mathbf{d}_{182}\ \mathbf{d}_{192}\ \mathbf{d}_{1102}\ \ldots\mathbf{0.d}_{1n2} \\
 & \mathbf{0.d}_{111}\ \mathbf{d}_{121}\ \mathbf{d}_{131}\ \mathbf{d}_{141}\ \mathbf{d}_{151}\ \mathbf{d}_{161}\ \mathbf{d}_{171}\ \mathbf{d}_{181}\ \mathbf{d}_{191}\ \mathbf{d}_{1101}\ \ldots\mathbf{0.d}_{1n1} \\
 & \mathbf{0.d}_{110}\ \mathbf{d}_{120}\ \mathbf{d}_{130}\ \mathbf{d}_{140}\ \mathbf{d}_{150}\ \mathbf{d}_{160}\ \mathbf{d}_{170}\ \mathbf{d}_{180}\ \mathbf{d}_{190}\ \mathbf{d}_{1100}\ \ldots\mathbf{0.d}_{1n0} \\
 & \ldots\ldots\ldots \\
 & \mathbf{0.d}_{11'}\ \mathbf{d}_{12'}\ \mathbf{d}_{13'}\ \mathbf{d}_{14'}\ \mathbf{d}_{15'}\ \mathbf{d}_{16'}\ \mathbf{d}_{17'}\ \mathbf{d}_{18'}\ \mathbf{d}_{19'}\ \mathbf{d}_{110'}\ \ldots\mathbf{0.d}_{1n'}
\end{array}$$

Discussion:

The first index of the decimal number $\mathbf{1d_1}$ marks that entire number. The second index marks the number of decimal places, or $\mathbf{1d_1 = 0.d_{11}d_{12}d_{13}d_{14} \ldots d_{1n}}$. The sub-index of the second index, the one that has been added to Cantor's list for optimization, (to achieve unification in the interpretation of each individual element), has a limited interval of possible values **(0-9).** In this purely "arithmetic square", the number of arithmetic portions of sides is always equal to the number of arithmetic portions of diagonals. This derives from the fact that a decimal number which has at least one decimal place, otherwise it cannot be a decimal number. Thus, the ***n*** sum of all decimal places of one single number ($\mathbf{1d = 0.d}_1\mathbf{d}_2\mathbf{d}_3\mathbf{d}_4 \ldots \mathbf{d_n}$) is equal to the ***n*** sum of all possible decimal numbers in general ($\mathbf{nd =d}_1\mathbf{d}_2\mathbf{d}_3\mathbf{d}_4 \ldots \mathbf{d_n}$). Are we now able to, in Cantor's style, without any ontological discussion, to conclude that this is also a case of the equality of a portion with its whole? Of course we cannot, because the ***place of a number is not the number itself***. In the system of decimal expression, all places are zero until proven otherwise (**0,000…0…).** Where the decimal place is zero, no number exists **(1,2,3…9)**, but its place does exist **(0,1,2,3,…10,11,12,…n)**. This characteristic of zero to absolutely replace every number in any position is of the deepest philosophically mathematic significance, which is closely expressed in the very structure of a decimal number.

.

Interpretation of the components of the synchronic list:

a) **1, 2, 3, ...n –** decimal numbers;

b) $\mathbf{1d_1, 1d_2, 1d_3} \ldots \mathbf{1d_n}$ – individual decimal numbers;

c) $\mathbf{(_n)}$ – the second index digit; represents the number of decimal places; for every number **d** , it develops *horizontally* into a sequence $\mathbf{(_{n=1,2,3,4\ldots n})}$**,** while *vertically* for all **d** numbers it is equal because they all have the same number of decimal places - $\mathbf{(_n)}$;

d) $\mathbf{(_{n'})}$ – the third index number; the constant of synchronicity of all decimal numbers; represents the entire interval of numeric values of each decimal place: $_{\mathbf{i}}[_{\mathbf{n'(9,8,7,\ldots0)}}]$; *horizontally* it is monotonously repeats because these are cases in which certain decimal numbers in their decimal places have equal decimals; *vertically*, for the numbers $\mathbf{1d_1, 2d_2, 3d_3} \ldots \mathbf{nd_n}$, it has a periodicity of **10**, because each tenth, hundredth, thousandth… etc. decimal place of any and every d can have any value within the interval, except in the case of a specific decimal number whose decimals are in an actual coexistence, in which case these values must be individually and specifically numerically defined;

e) **(=)** – relation of synchronicity for numbers;

f) **(0.d) –** the number between one and zero.

Thus:

1 $\quad \mathbf{1\ d_{1n}}_9 = \mathbf{0.d_1}_{19}\, \mathbf{d_1}_{29}\, \mathbf{d_1}_{39}\, \mathbf{d_1}_{49}\, \mathbf{d_1}_{59.}\, \mathbf{d_1}_{69}\, \mathbf{d_1}_{79}\, \mathbf{d_1}_{89}\, \mathbf{d_1}_{99}\ldots\ldots\mathbf{d_1}_{n9}$

2 $\quad \mathbf{1\ d_{1n}}_8 = \mathbf{0.d_1}_{18}\, \mathbf{d_1}_{28}\, \mathbf{d_1}_{38}\, \mathbf{d_1}_{48}\, \mathbf{d_1}_{58}\, \mathbf{d_1}_{68}\, \mathbf{d_1}_{78}\, \mathbf{d_1}_{88}\, \mathbf{d_1}_{98}\ldots\ldots\mathbf{d_1}_{n8}$

3 $\quad \mathbf{1\ d_{1n}}_7 = \mathbf{0.d_1}_{17}\, \mathbf{d_1}_{27}\, \mathbf{d_1}_{37}\, \mathbf{d_1}_{47}\, \mathbf{d_1}_{57}\, \mathbf{d_1}_{67}\, \mathbf{d_1}_{77}\, \mathbf{d_1}_{87}\, \mathbf{d_1}_{97}\ldots\ldots\mathbf{d_1}_{n7}$

4 $1\ d_{1n6} = 0.d_{116}\ d_{126}\ d_{136}\ d_{146}\ d_{156}\ d_{166}\ d_{176}\ d_{186}\ d_{196}.......d_{1n6}$

5 $1\ d_{1n5} = 0.d_{115}\ d_{125}\ d_{135}\ d_{145}\ d_{155}\ d_{165}\ d_{175}\ d_{185}\ d_{195}.......d_{1n5}$

6 $1\ d_{1n4} = 0.d_{114}\ d_{124}\ d_{134}\ d_{144}\ d_{154}\ d_{164}\ d_{174}\ d_{184}\ d_{194}.......d_{1n4}$

7 $1\ d_{1n3} = 0.d_{113}\ d_{123}\ d_{133}\ d_{143}\ d_{153}\ d_{163}\ d_{173}\ d_{183}\ d_{193}.......d_{1n3}$

8 $1\ d_{1n2} = 0.d_{112}\ d_{122}\ d_{132}\ d_{142}\ d_{152}\ d_{162}\ d_{172}\ d_{182}\ d_{192}.......d_{1n2}$

9 $1\ d_{1n1} = 0.d_{111}\ d_{121}\ d_{131}\ d_{141}\ d_{151}\ d_{161}\ d_{171}\ d_{181}\ d_{191}.......d_{1n1}$

10 $1\ d_{1n0} = 0.d_{110}\ d_{120}\ d_{130}\ d_{140}\ d_{150}\ d_{160}\ d_{170}\ d_{180.}\ d_{190}......d_{1n0}$

....

1 $d_{1nn'} = 0.d_{11n'}d_{12n'}\ d_{13n'}d_{14n'}\ d_{15n'}\ d_{16n'}d_{17n'}\ d_{18n'}\ d_{19n'}.......d_{1nn'}$

....

11 $1\ d_{2n9} = 0.d_{219}\ d_{229}\ d_{239}\ d_{249}\ d_{259.}\ d_{269}\ d_{279}\ d_{289}\ d_{299}.......d_{2n9}$

12 $1\ d_{2n8} = 0.d_{218}\ d_{228}\ d_{238}\ d_{248}\ d_{258}\ d_{268}\ d_{278}\ d_{288}\ d_{298}.......d_{2n8}$

13 $1\ d_{2n7} = 0.d_{217}\ d_{227}\ d_{237}\ d_{247}\ d_{257}\ d_{267}\ d_{277}\ d_{287}\ d_{297}.......d_{2n7}$

14 $1\ d_{2n6} = 0.d_{216}\ d_{226}\ d_{236}\ d_{246}\ d_{256}\ d_{266}\ d_{276}\ d_{286}\ d_{296}.......d_{2n6}$

15 $1\ d_{2n5} = 0.d_{215}\ d_{225}\ d_{235}\ d_{245}\ d_{255}\ d_{265}\ d_{275}\ d_{285}\ d_{295}.......d_{2n5}$

16 $1\ d_{2n4} = 0.d_{214}\ d_{224}\ d_{234}\ d_{244}\ d_{254}\ d_{264}\ d_{274}\ d_{284}\ d_{294}.......d_{2n4}$

17 $1\ d_{2n3} = 0.d_{213}\ d_{223}\ d_{233}\ d_{243}\ d_{253}\ d_{263}\ d_{273}\ d_{283}\ d_{293}.......d_{2n3}$

18 $1\ d_{2n2} = 0.d_{212}\ d_{222}\ d_{232}\ d_{242}\ d_{252}\ d_{262}\ d_{272}\ d_{282}\ d_{292}.......d_{2n2}$

19 $1\ d_{2n1} = 0.d_{211}\ d_{221}\ d_{231}\ d_{241}\ d_{251}\ d_{261}\ d_{271}\ d_{281}\ d_{291}.......d_{2n1}$

20 $1\ d_{2n0} = 0.d_{210}\ d_{220}\ d_{230}\ d_{240}\ d_{250}\ d_{260}\ d_{270}\ d_{280.}\ d_{290}......d_{2n0}$

....

2 $d_{2nn'} = 0.d_{21n'}d_{22n'}\ d_{23n'}d_{24n'}\ d_{25n'}\ d_{26n'}d_{27n'}\ d_{28n'}\ d_{29n'}.......d_{2nn'}$

....

21 $1\ d_{3n9} = 0.d_{319}\ d_{329}\ d_{339}\ d_{349}\ d_{359.}\ d_{369}\ d_{379}\ d_{389}\ d_{399}.......d_{3n9}$

22 $1\ d_{3n8} = 0.d_{318}\ d_{328}\ d_{338}\ d_{348}\ d_{358}\ d_{368}\ d_{378}\ d_{388}\ d_{398}......d_{3n8}$

23 1 d_{3n7} = $0.d_{317}\,d_{327}\,d_{337}\,d_{347}\,d_{357}\,d_{367}\,d_{377}\,d_{387}\,d_{397}.......d_{3n7}$

24 1 d_{3n6} = $0.d_{316}\,d_{326}\,d_{336}\,d_{346}\,d_{356}\,d_{366}\,d_{376}\,d_{386}\,d_{396}.......d_{3n6}$

25 1 d_{3n5} = $0.d_{315}\,d_{325}\,d_{335}\,d_{345}\,d_{355}\,d_{365}\,d_{375}\,d_{385}\,d_{395}.......d_{3n5}$

26 1 d_{3n4} = $0.d_{314}\,d_{324}\,d_{334}\,d_{344}\,d_{354}\,d_{364}\,d_{374}\,d_{384}\,d_{394}.......d_{3n4}$

27 1 d_{3n3} = $0.d_{313}\,d_{323}\,d_{333}\,d_{343}\,d_{353}\,d_{363}\,d_{373}\,d_{383}\,d_{393}.......d_{3n3}$

28 1 d_{3n2} = $0.d_{312}\,d_{322}\,d_{332}\,d_{342}\,d_{352}\,d_{362}\,d_{372}\,d_{382}\,d_{392}.......d_{3n2}$

29 1 d_{3n1} = $0.d_{311}\,d_{321}\,d_{331}\,d_{341}\,d_{351}\,d_{361}\,d_{371}\,d_{381}\,d_{391}.......d_{3n1}$

30 1 d_{3n0} = $0.d_{310}\,d_{320}\,d_{330}\,d_{340}\,d_{350}\,d_{360}\,d_{370}\,d_{380.}\,d_{390}......d_{3n0}$

....

3 $d_{3nn'}$ = $0.d_{31n'}d_{32n'}\,d_{33n'}d_{34n'}\,d_{35n'}\,d_{36n'}d_{37n'}\,d_{38n'}\,d_{39n'}........d_{3nn'}$

....

This derives:

1 $d_{1nn'} = 0.d_{11n'}\;d_{12n'}\;d_{13n'}\;d_{14n'}\;....d_{1nn'}$

2 $d_{2nn'} = 0.d_{21n'}\;d_{22n'}\;d_{23n'}\;d_{24n'}\;....d_{2nn'}$

3 $d_{3nn'} = 0.d_{31n'}\;d_{32n'}\;d_{33n'}\;d_{34n'}\;....d_{3nn'}$

4 $d_{4nn'} = 0.d_{41n'}\;d_{42n'}\;d_{43n'}\;d_{44n'}\;....d_{4nn'}$

....

n $d_{nnn'}= 0.d_{n1n'}\;d_{n2n'}\;d_{n3n'}\;d_{n4n'}\;....d_{nnn'}$, and as , by assumption, $\mathbf{n\,(d_{nnn'}) = n\,(0.d_{nnn'})}$, finally $\Rightarrow$ **d = 0.d**.

Each individual decimal number and all of them together, taken from the principle ***one decimal – one decimal place – one decimal number***, e.g. from the correspondence **1:1:1**, in the individual symmetric counting of all possibilities **d=0.d**. Through this complete induction to the widest possible concept of a decimal number, we have shown a two-way deductive-inductive passage of the listing by ***method of synchronization.***

This is how we have arrived at the most compact form of the listing of decimal numbers by the ***“one decimal – one decimal place – one decimal number”.*** By the rigid application of the triple univocal correspondence **1:1:1**, the synchronic list is vastly simplified, so that the first index digit is also the number of all decimal places and the entire number, while the second index digit is constant ($n' = 9,8,7 \ldots 0$):

1 $\quad \mathbf{d_{1n'} = 0.d_{1n'}}$

2 $\quad \mathbf{d_{2n'} = 0.d_{1n'}\, d_{2n'}}$

3 $\quad \mathbf{d_{3n'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}}$

4 $\quad \mathbf{d_{4n'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}\, d_{4n'}}$

....

n $\quad \mathbf{d_{nn'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}\, d_{4n'} \ldots\, d_{nn'}}$, and assuming that $\mathbf{n(d_{nn'}) = n(0.d_{nn'})}$, this derives **d=0.d**.

It is now possible to correctly count all the decimal numbers.

There are exactly **10** different decimal numbers with one decimal, exactly **10x10** with two, exactly **10x10x10** with three, thus:

$\mathbf{d_{1n'} = 0.d_{1n'}} \qquad = \mathbf{10}$

$\mathbf{d_{2n'} = 0.d_{1n'}\, d_{2n'}} \qquad = \mathbf{10x10}$

$\mathbf{d_{3n'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}} \qquad = \mathbf{10x10x10}$

$\mathbf{d_{4n'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}\, d_{4n'}} \qquad = \mathbf{10x10x10x10}$

....

$\mathbf{d_{nn'} = 0.d_{1n'}\, d_{2n'}\, d_{3n'}\, d_{4n'} \ldots\, d_{nn'}}$, e.g., all decimal numbers, there is exactly

$$\mathbf{\frac{10^{n+1} - 10}{9}}.$$

Conclusion:

For the number of digits **n=1,2,3,4...n** there are **10, 110, 1110, 11110**.... $\mathbf{\frac{10^{n+1}-10}{9}}$ **N** natural numbers, thus α is **decimal = α decimal places =α**

decimal numbers = α natural numbers = $\mathbf{\frac{10^{n+1}-10}{9}}$**,** in correspondence with **1:1:1:1,** which means there are exactly as many decimal numbers as there are natural numbers and that Cantor's "diagonalization argument" at least in this case, does not apply.

Finally, if we were to disassemble each decimal into elements, in the sense **(d=0.3=0.1+0.1+0.1)** and were to compare it to **N=3=1+1+1**, we would find that **0.0 ~ 0,** the sum of the ones of the first ten decimal numbers is equal to the sum of ones of the first ten natural numberssuma, **∑ d (0.1) = ∑ N (1),** according to the formula for the summation of ones in a sequence of natural numbers **N,** e.g. that $\mathbf{n\frac{(n+1)}{2}}$**,** which again confirms that there are as many decimal numbers **d**, as there are natural numbers **N,** as shown in the table:

(0.0) $\Rightarrow$ **(0)**

(0.1) $\Rightarrow$ **(1)**

(0.1), (0.1) $\Rightarrow$ **(1, (1)**

(0.1), (0.1), (0.1) $\Rightarrow$ **(1), (1), (1)**

…….

(0.1) x 9 $\Rightarrow$ **(1) x 9,** which is also true for the potency of all other decimal places.

For the sake of Cantor's followers, let us attempt to count natural numbers using Cantor's correct correspondence, once one - one natural number; for example:

1, 1, 1, 1, 1, ... sum is 5

1, 2, 3, 4, 5, ... sum is 15

Is this the ***cantorian*** proof that the "***infinity of natural numbers is greater than the infinity of ones"***? Of course not, because a correspondence in the following form is imminent for natural numbers:

1, 11, 111, 1111…sum is 10.

1, 2, 3, 4…sum is 10.

We must count a zero as a zero and not as **1** because **n x 1 = n**, and **n x 1 x 0 = 0**, from which we can deduct that zero has a stronger power than **1** and than **n**. Why? Zero is the arithmetic infinity, with physical characteristics, and as such is the absolute limit for what is arithmetically correct as well as what is physically finite.

Characteristics of $x = 0, x_1\, x_2\, x_3\, x_4 \dots x_n$**:**

Cantor's list is only actual for the choice of one decimal for **x** per each decimal place, e.g. it predicts only one possible decimal for the tenth decimal place - $\mathbf{d_{11}}$, hundredth - $\mathbf{d_{22}}$, thousandth - $\mathbf{d_{33}}$...etc., while the number $\mathbf{0.x_1}$ allows for the actual choice of ten decimals **(9,8,7...0)** in the tenth decimal place, as many in the hundredth $\mathbf{x_2}$, the thousandth $\mathbf{x_{3\dots}}$ that is to say that the number $\mathbf{x = 0, x_1\, x_2\, x_3\, x_4 \dots x_n}$ and is actual for a choice of **10** decimals for each decimal place, the tenth, the hundredth, the thousandth… It is clear that any concrete value of $\mathbf{d_{11}, d_{22}, d_{33} \dots}$ **x** can have some other value. The list and **x** play the following game: the list says, **"**$\mathbf{d_{11} = 0{,}2}$**",** and **x** says **"**$\mathbf{0, x_1 = 0{,}7}$**"**, the list says **"**$\mathbf{d_{22} = 0{,}03}$**",** and **x** says **"**$\mathbf{0, 0x_2 = 0{,}05}$**"**, the list again says **"**$\mathbf{d_{33} = 0{,}003}$**"**, but **x** says to that **"**$\mathbf{0, 00x_3 = 0{,}009}$**"** and so on, as the Russian mathematician Esenin-Volpin said, "to exhaustion". If **x** only had the choice of two decimals, the list would lose its listing game with it, if the first decides the value.

Cantor's number **x** has a greater resolution than his list and, thus, if we enlarge the resolution of the list, **x** must appear.

Foremost, the very symbol **x** in $\mathbf{0,x_1}$, signifies that **x *immediately corresponds*** to the full interval of decimals $\mathbf{(_{n' = 9,8,7\dots0})}$, and the index digit $\mathbf{x_1}$ with the second index digit $\mathbf{0.d_{11}}$, e.g. symbol of the first decimal place and does not have to coincide with the symbol of the entire number.

We are left with only one task – to build a house for Cantor's homeless number **x**, under the principle of simultaneity, so that it may dwell in it.

Let us develop the first decimal place **1d**$_1$ according to the constant $\mathbf{d_{11n'}}$ **,** and look for $\mathbf{0.x_1}$ there**,** which in the synchronic list must be in correlation with the first decimal of the number $\mathbf{1\ d_{1nn'} = 0.d_{11n'}}$, $\mathbf{x_2}$ the second decimal number**,** $\mathbf{x_3}$ the third, etc., up until $\mathbf{0.x_n} = \mathbf{0.d_{1nn'}}$. And here is how, in the list synchronized with the characteristics of **x**, **x** appears:

$\mathbf{x \quad = 0{,}x_1}$

$\mathbf{1\ d_{1nn'} = 0.d_{119}}$

$\mathbf{d_{118}}$

$\mathbf{d_{117}}$

$\mathbf{d_{116}}$

$\mathbf{d_{115}}$

$\mathbf{d_{114}}$

$\mathbf{d_{113}}$

$\mathbf{d_{112}}$

$\mathbf{d_{111} \quad x_2 \quad x_3 \quad x_4 \quad ...\ x_n}$

$\mathbf{d_{110} \quad d_{12n'} \quad d_{13n'} \quad d_{14n'}\ ...\ d_{1nn'}}$

Conclusion:

If x does not have a value in interval $\mathbf{d_{11n'}}$ **,** e.g. if $\mathbf{0.x_1}$ doesn't have any of the first decimals of $0.x_1$ = 0.9, 0.8, 0.7....do 0.0, and if for $\mathbf{x = 0.x_1x_2x_3x_4\ldots x_n}$ the following does not apply $\mathbf{x = d_{1nn'}}$, **then x is not and cannot be a decimal number.** By further comparison, we repeat what we already know.

Discussion:

In the example of listing decimals, we demonstrated the functioning of the

Scott-Leibniz concept of compossibility, according to which, of all possible instances, only those are realized which can coexist, in other words, those that are compatible in time. We have demonstrated that the entire mathematical cosmos **d1** results in only one actual instance, with only one physical number **d1**. If I were to write the decimal number **d1= 0. 27451401**, then every other number that I write, actualize, must be **d2**, which especially is true in the case of equal numbers, for example **d1= 0. 27451401** and **d2= 0. 27451401**. Why? Because the mathematical reproduction does not mean that the numbers physically coincide, but only that they are of equal value, which in mathematics is spontaneously respected in practical problems, where for example, we cannot treat two twos in a given expression as one, while in theoretical mathematic this ontological aspect of numbers is not taken seriously. Contrary to the very practice of mathematics, there is a casual attitude that "equal numbers exist ***whenever*** we want them to", and if it is clear that this cannot be true for actual numbers because their number is always a determined amount and they appear in sequence.

If we write **1=1=1=1**, that principle (=) defines the simultaneity of four ones, which is why we cannot write **2=3**, because these numbers are not simultaneous, but we can write **2/2=3/3/=4/4...=1**, because through the ones the synchronization of actual numbers is achieved, while the ***number 0, in the world of natural numbers, represents only the actual infinity itself.***

One need not be too intelligent or educated, but merely sensible and ready for the truth, to see that zero is the only number which, due to the nature of the necessity, fulfills Cantor's minimum requirement for an infinite sum – "to contain at least one component as great as itself", or rather to contain a "portion that is equal to the whole". However, zero fulfills much more than that basic requirement: zero cannot be altered in mathematical operations because ***the parts of zero are mutually equal and every part of zero is equal to the whole zero***; **(0+0+0+0+…0 x n…+ 0 x 0 = 0)**. This is all on this subject for now as we will elaborate on operations with zero in the later section, ***"Of the physical interpretation of mathematical operations".***

Enthralled by the constant division of one, Cantor forgot about zero, which has exactly all the characteristics of an infinite that he looks for; not just the one, but ***"every element of the sum of zero, as well as the sub-sum of its parts, is equal to the whole zero"***. However, obviously, in the concept groups, it is impossible to conceive an absolutely empty group because it must be "an array element of itself" B. Russell and this is where we are faced with an ***aporia*** that is unsolvable on the level of understanding actual infinity as a time-material group. In short, on a purely mathematical level, Cantor encountered its physical, or rather time constrictions and, all in all, found that he did not think abstractly enough. Real physical time is much more abstract than the mathematical symbol $\mathbf{T_0}$, or **0** itself written on a piece of paper; this ***zero in time*** that is beyond the senses, this mysterious constant present, cannot appear in any other form but that of a diverse real plenty, or group, as an vast space and almighty matter. It is the ***"existing nothingness"*** that we lack the sense of, but that allows for all of our senses as it allows for all that our senses receive. This is why the understanding of time is the same as understanding of the way in which infinity produces parts, the same as the understanding of the way zero produces ones, or rather, the understanding of the way by which the present essentially generates space and matter. "The essence of the mind is emptiness"- so say the Upanisads, so say the Tibetan monks. Where would they know this from, were it not so? After decades of thought, I vouch that this is the deepest truth. This is why I am convinced that infinity, the zero, the decimal point, the present – it is possible to completely comprehend them all, because they are all one and the same and, speaking topologically, all within us. More than this, it is everywhere and always. The present – theoretically, and the seeming differences among vast numbers of objects and beings – experimentally, they are the real subject of all human sciences.

The solving of the most common equation, for example like $\mathbf{2 + x = y}$ is basically an operation of the synchronization of numbers, the bringing of those numbers into a common present, e.g. the actualization. Here is a complementary example from physics: why is Heisenberg's "principle of non-determinacy" – a non-equation and not an equation? Obviously because the impulse and position of electrons cannot be determined ***simultaneously***, and that lack of power is again due to the fact that we don't know what time is. Even philosophy has notion that when we write **1=1** it means to have two ones that are temporally, e.g. physically connected and it does not mean merely having some imaginary one in two places. Eternity and the unchanged course of Plato's concepts are in fact characteristics of the present.

Finally, this should make sense to everyone, except Cantor's followers, that **n** and **n+1** are not simultaneous because, while we have an ***actual n***, we do not have a real physical correspondence for the **actual *n+1*,** so we should not imagine it in mathematics either because as a final instance of the process of deep thought, it is this that supports the hypothesis by which spirit and matter do not have the same basis. The imminent consequence of this shallow stance is the fundamental lack of connection between mathematics and physics, although they both do study the same real world to which they also both belong. As both of these sciences are exact, they are both in essence exclusively occupied by time and only a real hypothesis of time can, to a satisfactory degree, uncover the natural fundaments that they share.

In the example of **x** we have been convinced that the prediction of the actualization of every concrete decimal number in a synchronic list is crucial, and as such- is correct; the essence of what is crucial is the truth, (from the truth falsity can not follow), and the essence of the truth is existence (all that exists is in some way true).

If we apply mathematics to groups with an unknown number of elements, (the cardinal number of the hairs on someone's head), or to groups whose individual complex systems we count as elements, e.g. **1:1**, (for example, the number of atoms in a molecule), we need only be aware that this is practical and not theoretic mathematics and that the power of the tool of the human mind is far greater. In this sense, the differential calculi, as well as the entire non standard analysis, are clearly practical mathematics, only.

A blatant example of mathematical pragmatism in physics is unquestionably the formula for the calculation of the speed of motion **s/t = v**, e.g. velocity = distance divided by time, where we multiply and divide numbers that have been given different variables because this is mostly in agreement with experience. Physics and mathematics require an ontologically deeper conception of motion than the constant movement of a body through empty space and the jumping of electrons on quantum levels. Experience is not an alibi for misconception; the Sun revolving around the Earth also coincides with our experience. In the General Theory of Relativity, Einstein called this fact, in which the observer very much decides his own experience, very appropriately "the epistemological defect". In that same sense, the phantom **x** demonstrates the ***defectiveness*** of one-sided listing, and not the ***lack*** of natural numbers.

We also notice that the synchronic list works as nature itself does. Why is that?

The principle of synchronicity in mathematics is the induction of physical characteristics to numbers. **n** is mathematics, however **1,2,3,4** is physics, these are numbers with the characteristic of originality, because we have a unique one, a two, a three…; just by receiving a value, a number crosses from the infinite world into the finite, from the unspecified to the specific, it is characterized by temporal meaning and is actualized by this. Certainly we may operate with actually conceived numbers without being aware of their temporal purpose, but this is possible only because numbers have their temporal purpose in any case, whether we are aware of it or not. Mathematicians always essentially observe numbers in synchronicity, because the key symbol is **(=)**, and are not even aware of it, but rather they naively believe that mathematics is timeless. This attitude degrades mathematics to a technical level and, often, merely to a banal intellectual game. In general, the most important flaw of mathematics is its very poorly developed ontology.

AN ANCOUNTABLE SET

Cantor's original proof considers an infinite sequence of the form (x_1, x_2, x_3, ...) where each element x_i is either 0 or 1.

Consider any infinite listing of some of these sequences. We might have for instance **(figure 1):**

$s_1 = (0, 0, 0, 0, 0, 0, 0, ...)$

$s_2 = (1, 1, 1, 1, 1, 1, 1, ...)$

$s_3 = (0, 1, 0, 1, 0, 1, 0, ...)$

$s_4 = (1, 0, 1, 0, 1, 0, 1, ...)$

$s_5 = (1, 1, 0, 1, 0, 1, 1, ...)$

$s_6 = (0, 0, 1, 1, 0, 1, 1, ...)$

$s_7 = (1, 0, 0, 0, 1, 0, 0, ...)$

...

And in general we shall write

$s_n = (s_{n,1}, s_{n,2}, s_{n,3}, s_{n,4}, ...)$

that is to say, $s_{n,m}$ is the m^{th} element of the n^{th} sequence on the list.

It is possible to build a sequence of elements s_0 in such a way that its first element is different from the first element of the first sequence in the list, its second element is different from the second element of the second sequence in the list, and, in general, its n^{th} element is different from the n^{th} element of the n^{th} sequence in the list. That is to say, $s_{0,m}$ will be 0 if $s_{m,m}$ is 1, and $s_{0,m}$ will be 1 if $s_{m,m}$ is 0. For instance:

$s_1 = (\underline{\mathbf{0}}, 0, 0, 0, 0, 0, 0, ...)$

$s_2 = (1, \underline{\mathbf{1}}, 1, 1, 1, 1, 1, ...)$

$s_3 = (0, 1, \underline{\mathbf{0}}, 1, 0, 1, 0, ...)$

$s_4 = (1, 0, 1, \underline{\mathbf{0}}, 1, 0, 1, ...)$

$s_5 = (1, 1, 0, 1, \underline{\mathbf{0}}, 1, 1, ...)$

$s_6 = (0, 0, 1, 1, 0, \underline{\mathbf{1}}, 1, ...)$

$s_7 = (1, 0, 0, 0, 1, 0, \underline{\mathbf{0}}, ...)$

...

$s_0 = (\underline{\mathbf{1}}, \underline{\mathbf{0}}, \underline{\mathbf{1}}, \underline{\mathbf{1}}, \underline{\mathbf{1}}, \underline{\mathbf{0}}, \underline{\mathbf{1}}, ...)$

(The elements $s_{1,1}$, $s_{2,2}$, $s_{3,3}$, and so on, are here highlighted, showing the origin of the name "diagonal argument". Note that the highlighted elements in s_0 are in every case different from the highlighted elements in the table above it.)

Therefore it may be seen that this new sequence s_0 is distinct from all the sequences in the list. This follows from the fact that if it were identical to, say, the 10th sequence in the list, then we would have $s_{0,10} = s_{10,10}$. In general, if it appeared as the n^{th} sequence on the list, we would have $s_{0,n} = s_{n,n}$, which, due to the construction of s_0, is impossible.

From this it follows that the set *T*, consisting of all infinite sequences of zeros and ones, cannot be put into a list s_1, s_2, s_3, ... Otherwise, it would be possible by the above process **to construct a sequence s_0 which would both be in *T*** (because it is a sequence of 0s and 1s which is by the definition of *T* in *T*) **and at the same time not in *T*** (because we can deliberately construct it not to be in the list). *T*, containing all such sequences, must contain s_0, which is just such a sequence. **But since s_0 does not appear anywhere on the list, *T* cannot contain s_0.**

Therefore *T* cannot be placed in one-to-one correspondence with the natural numbers. In other words, it is uncountable.

... the diagonal argument establishes that, although both sets are infinite, **there are actually *more* infinite sequences of ones and zeros than there are natural numbers.**

===

It claims that: if an unlimited sequence of objects **($x_1, x_2, x_3, \ldots x_n$)** , where every element of the sequence is x_n or **0** or **1 –** is developed into a list, that lsit will not contain certain parts of that sequence. In other words, it proves that the sequence **($x_{1(0;1)}, x_{2(0;1)}, x_{3(0;1)}, \ldots x_{n(0;1)}$)** does not contain all of it's variations, which is not only contrary to the assumption, but also absurd. If Cantor's condition defines the sequence, then that sequence must entirely fulfill the given condition, or the condition for the sequence has not been formulated well. We will show that Cantor's condition for the development of the sequence is not explicit because it contains a hidden time component.

Therefore, Cantor, in the same sense as in the list of decimal numbers, claims that there is a sequence $x_1, x_2, x_3, \ldots x_n \ldots$, which ***cannot be counted.***

Let us apply the method of synchronicity here as well.

In order to prove the above statement, Cantor sets a condition by which in one place **S** = x_1 we may write either **0** or **1**. In this condition the time and space of x_1 are not equivalent in number, or rather are not equal in value, because for one place $1S_1x_1$ (space) has two times $2Tx_1 = (Tx_{1(0)} + Tx_{1(1)})$. Geometrically developed, this is the condition for which ***"one same space has two different time coordinates".***

$T_1x_{1(1)}$; $T_2x_{2(1)}$; $T_3x_{3(0)}$ ... $T_nx_{n(1)}$

$T_1x_{1(0)}$; $T_2x_{2(0)}$; $T_3x_{3(0)}$ ... $T_nx_{n(0)}$

$T_0=S_0$ ----x_1--------x_2----------x_3----------x_n------------- **Cantor's set**

S_1x_1 ; S_2x_2 ; S_3x_3 ... S_nx_n

The question in this instance is how to reach numerical equivalency, in other words correspondence of **1:1**, which is necessary for the counting of sequences by listing.

By setting the condition that Sx_1 in $\mathbf{T}x_1$ can be either **0** or **1**, Cantor apparently inserts the temporality of numbers, or unconsciously, by necessity, or betting on the possibility that we won't think that the problem has to do with time.

If in the present $\mathbf{T_0}$ has two values for **x,** e.g. **0** and **1**, this means we have **2** synchronic possibilities for the actualization of each array element of the sequence, that is to say that for every $\mathbf{x_n}$ two "presents" must simultaneously be **- 0** i **1**. According to this, the time coordinates of ***diagonal synchronicity of Tx*** which contains all the possible sequences of the alternative **(0;1)** which are $\mathbf{Tx_{1(0;1)}}$, $\mathbf{Tx_{2(0;1)}}$, $\mathbf{Tx_{3(0;1)}}$, $\mathbf{Tx_{4(0;1)}}$, $\mathbf{Tx_{n(0;1)}}$. For argument sake, let us construct a temporal coordinate system for the "alternative present" **Tx,** with coordinates developed through $\mathbf{Tx_{n(0;1)}}$:

$\mathbf{Tx_{n(1)}}$ $\mathbf{Tx_{n(0;1)}}$

… **…**

$\mathbf{Tx_{4(1)}}$ $\mathbf{Tx_{4(0;1)}}$

$\mathbf{Tx_{3(1)}}$ $\mathbf{Tx_{3(0;1)}}$

$\mathbf{Tx_{2(1)}}$ $\mathbf{Tx_{2(0;1)}}$

$\mathbf{Tx_{1(1)}}$ $\mathbf{Tx_{1(0;1)}}$

Tx --

$\mathbf{Tx_{1(0)}}$ $\mathbf{Tx_{2(0)}}$ $\mathbf{Tx_{3(0)}}$ $\mathbf{Tx_{4(0)}}$**…** $\mathbf{Tx_{n(0)}}$

(figure 2)_

It is obvious that every sequence in the form **0110111001...01...** must fall on the diagonal **Tx** $[Tx_{1(0;1)}Tx_{2(0;1)}Tx_{3(0;1)}Tx_{4(0;1)}\ldots Tx_{n(0;1)}]$. This consequently derives synchronicity tables, developed according to the synchronic elements of **0** and **1,** which Cantor's sequences are comprised of.

Note: in the first case of **0;1,** in the present T_0 in terms of space there are only two possibilities for the sequence to, **0** and **1**, but because of the given requirement for one to coexist with the second, third, fourth…etc. member of the sequence, temporality allows for two more such possibilities, e.g. in the case of T_0 the sequence can begin, or it can continue with $Tx_{0\ldots1}$, $Tx_{1\ldots0}$, $Tx_{0\ldots0}$ and $Tx_{1\ldots1}$. Thus, the full synchronicity of elements, for both time and space, in this first case of $Tx_{1(0;1)}$, is not two but four, e.g. 2×2^1, (two special possibilities each for two presents) . However, as the second array member follows the first and, it gives the first a fixed temporality, which reduces the number of possibilities now from four to two. The other two possibilities can be realized eternally, in other words, in the total sum of "future" synchronic sequences $(n+1)Tx_{n+1(0;1)} = 2^{n+1}$ we must count them, as 2×2^1.

Tables of synchronicity for an unlimited number of objects (x_1, x_2, x_3, ... x_n) where every element of the sequence is x_n or 0 or 1:

1 $Tx_{1(0;1)} = 2^1$

----

1 $= x_{1=0}$

2 $= x_{1=1}$

----

2 $Tx_{2(0;1)} = 2^2$

----

1 $= x_{2=0,0}$

2 $= x_{2=1,1}$

3 $= x_{2=0,1}$

4 $= x_{2=1,0}$

----

3 **$Tx_{3(0;1)}$** $= 2^3$

----

1 $= x_{3=0,0,0}$

2 $= x_{3=1,1,1}$

3 $= x_{3=0,1,1}$

4 $= x_{3=1,1,0}$

5 $= x_{3=0,0,1}$

6 $= x_{3=1,0,1}$

7 $= x_{3=0,1,0}$

8 $= x_{3=1,0,0}$

----

4 **$Tx_{4(0;1)}$** $= 2^4$

----

1 $= x_{4=0,0,0,0}$

2 $= x_{4=1,1,1,1}$

3 $= x_{4=0,1,1,1}$

4 $= x_{4=0,0,1,1}$

5 $= x_{4=0,0,0,1}$

6 $= x_{4=1,0,0,0}$

7 = $x_{4=1,1,0,0}$

8 = $x_{4=1,1,1,0}$

9 = $x_{4=0,1,0,1}$

10 = $x_{4=1,0,1,0}$

11 = $x_{4=1,0,1,1}$

12 = $x_{4=1,1,0,1}$

13 = $x_{4=1,0,0,1}$

14 = $x_{4=0,1,1,0}$

15 = $x_{4=0,1,0,0}$

16 = $x_{4=0,0,1,0}$

----

5 $Tx_{5(0;1)}$ $= 2^5$

----

1 = $x_{5=0,0,0,0,0}$

2 = $x_{5=1,1,1,1,1}$

3 = $x_{5=0,1,1,1,1}$

4 = $x_{5=0,0,1,1,1}$

5 = $x_{5=0,0,0,1,1}$

6 = $x_{5=0,0,0,0,1}$

7 = $x_{5=1,0,0,0,0}$

8 = $x_{5=1,1,0,0,0}$

9 = $x_{5=1,1,1,0,0}$

10 = $x_{5=1,1,1,1,0}$

11 = $x_{5=0,1,1,1,0}$

12 = $x_{5=0,0,1,0,0}$

13 = $x_{5=0,1,0,0,0}$

14 = $x_{5=0,1,1,0,0}$

15 = $x_{5=0,0,1,1,0}$

16 = $x_{5=0,1,1,1,0}$

17 = $x_{5=0,1,0,0,0}$

18 = $x_{5=0,0,0,1,0}$

19 = $x_{5=1,0,0,0,1}$

20 = $x_{5=1,1,0,0,1}$

21 = $x_{5=1,1,1,0,1}$

21 = $x_{5=0,1,0,1,0}$

22 = $x_{5=1,0,1,0,0}$

23 = $x_{5=1,0,1,0,1}$

24 = $x_{5=1,0,0,1,0}$

25 = $x_{5=0,1,1,0,1}$

26 = $x_{5=0,1,0,1,1}$

27 = $x_{5=1,0,0,1,1}$

28 = $x_{5=1,1,0,1,1}$

29 = $x_{5=0,0,1,0,1}$

30 = $x_{5=1,1,0,1,0}$

31 = $x_{5=1,0,1,1,1}$

32 = $x_{5=1,0,1,1,0}$

----

6 $Tx_{6(0;1)}$ = 2^6

----

1 = $x_{6} = 0,0,0,0,0,0$

2 = $x_{6} = 1,1,1,1,1,1$

3 = $x_{6} = 0,0,0,0,1,1$

4 = $x_{6} = 0,0,0,1,1,1$

....

64 = $x_{6=0,0,1,1,0,0}$

----

7 $Tx_{7(0;1)}$ = 2^{7}

----

1 = $x_{7} = 0,0,0,0,0,0,0$

2 = $x_{7} = 1,1,1,1,1,1,1$

3 = $x_{7} = 0,0,0,0,0,0,1$

4 = $x_{7} = 0,0,0,0,0,1,1$

....

128 = $x_{7=1,0,1,1,1,0,1}$

Note: the first seven elements of Cantor's **"uncountable set"** ***s_0* = (1, 0, 1, 1, 1, 0, 1, ...)"** from the example above, can be found in the synchronic table **$7Tx_{7(0;1)} = 2^{7}$**, e.g. the one that contains **2^{7}** ***variation with the repetition of 0 and 1,*** synchronic in **Tx_7**. The other components of this sequence, e.g. the eighth, ninth, tenth… **n-ti** are listed in the synchronic table **$nTx_{n(0;1)} = 2^{n}$.**

----

8 $Tx_{8(0;1)}$ = 2^{8}

----

1 $= x_{8=0,0,0,0,0,0,0,0}$

2 $= x_{8=1,1,1,1,1,1,1,1}$

3 $= x_{8=1,1,1,1,1,1,1,1}$

4 $= x_{8=1,1,1,1,1,1,1,1}$

....

256 $= x_{8=0,1,1,0,1,1,0,0}$

$nTx_{n(0;1)} = 2^n$

------------------------------ ,

Or, all individual sequences, added: $\Sigma\ 2^{n+1} - 2$. With the member **(– 2)** only two of four possibilities are actualized 2×2^1 of the first synchronic table, which has already been discussed.

Synchronic table with formula $(n+1)Tx_{n+1(0;1)} = 2^{n+1}$:

This formula 2^{n+1}, for example, for **n=7** defines the number of synchronic combinations 2^8 e.g. for every **n** it defines a **n-th,** but also the next table **n+1** of synchronic combinations **0** and **1**, so that it is impossible to ***write or conceive*** the sequence **010101100...0...1...** $x_{n(0;1)}$, which is not contained and individually counted ***in advance*** here. Also, $\Sigma\ 2^{n+1}$ sums up all the sequences of the previous tables, while also counting two unused possibilities of the first synchronized table. In relation to this we observe something of great importance: for Cantor's requirement "one place – two times" in the first synchronic table 2^1 only the first **2** of a total of **4** given possibilities are realized, while the other two possibilities are only realized in 2^{n+1} as a condition for unlimited growth.

$(n+1)Tx_{n+1(0;1)}$ = 2^{n+1} counts all the sequences one by one, as **n+1**, in the same way that the natural sequence **N** does with its members.

It can be said that the synchronic table with formula **$(n+1)Tx_{n+1(0;1)}$ = 2^{n+1}** "predicts the future of Cantor's sequences" because it contains them all and counts them, encompassing also every "future" sequence of **n+1** members, which can be tested infinitely.

Conclusion:

All the actual sequences **n** are summed up in **$\Sigma\ 2^{n+1} - 2$** and all the possible **n+1** sequences are included in the synchronic table of ***$(n+1)Tx_{n+1(0;1)}$ = 2^{n+1},*** which represents the sum of all possible synchronic tables and includes any of Cantor's sequences, in the shape of **0,1,1,0,...0,...1,....(n +1)*$_{(0;1)}$*.**

Explication of the method of synchronization of the elements of Cantor's sequences:

0

1................ = **2^1**

0,0

1,1............. = **2^2**

0,0,0

1,1,1............ = **2^3**

0,0,0,0

1,1,1,1.......... $= 2^4 \ldots 2^n \ldots \Sigma\ 2^{n+1} - 2$

0,0,0,0,0,...0,...n+1

1,1,1,1,1,...1,...n+1 $= 2^{n+1}$

Conclusion: All sequences in the form **(0,1,0,1,1,0,0...0...1...n+1)** with **n+1** members, contain in the synchronic table $\mathbf{2^{n+1}}$ and this sum is not greater than the natural sequence **N**.

"Consider any infinite listing of some of these sequences. We might have for instance:

$s_1 = (0, 0, 0, 0, 0, 0, 0, \ldots)$

$s_2 = (1, 1, 1, 1, 1, 1, 1, \ldots)$

$s_3 = (0, 1, 0, 1, 0, 1, 0, \ldots)$

$s_4 = (1, 0, 1, 0, 1, 0, 1, \ldots)$

$s_5 = (1, 1, 0, 1, 0, 1, 1, \ldots)$

$s_6 = (0, 0, 1, 1, 0, 1, 1, \ldots)$

$s_7 = (1, 0, 0, 0, 1, 0, 0, \ldots)$

...

And in general we shall write

$s_n = (s_{n,1}, s_{n,2}, s_{n,3}, s_{n,4}, \ldots)$

that is to say, $s_{n,m}$ is the m^{th} element of the n^{th} sequence on the list."

Objection: This is a blatant example of a purposely mistaken correspondence of the left and right sides of equivalency. The list is set in such a manner that the number of sequences is independent of the number of its members, e.g. the sequences on the left side of equivalency number **n**, while there are $\mathbf{n^2}$ of their members on the right, which means that the list realizes only the correspondence of one sequence only with its first member, because $\mathbf{n=n^2=1}$.

“It is possible to build a sequence of elements s_0 in such a way that its first element is different from the first element of the first sequence in the list, its second element is different from the second element of the second sequence in the list, and, in general, its n^{th} element is different from the n^{th} element of the n^{th} sequence in the list. That is to say, $s_{0,m}$ will be 0 if $s_{m,m}$ is 1, and $s_{0,m}$ will be 1 if $s_{m,m}$ is 0. For instance:

$s_1 = (\underline{\mathbf{0}}, 0, 0, 0, 0, 0, 0, ...)$

$s_2 = (1, \underline{\mathbf{1}}, 1, 1, 1, 1, 1, ...)$

$s_3 = (0, 1, \underline{\mathbf{0}}, 1, 0, 1, 0, ...)$

$s_4 = (1, 0, 1, \underline{\mathbf{0}}, 1, 0, 1, ...)$

$s_5 = (1, 1, 0, 1, \underline{\mathbf{0}}, 1, 1, ...)$

$s_6 = (0, 0, 1, 1, 0, \underline{\mathbf{1}}, 1, ...)$

$s_7 = (1, 0, 0, 0, 1, 0, \underline{\mathbf{0}}, ...)$

...

$s_0 = (\underline{\mathbf{1}}, \underline{\mathbf{0}}, \underline{\mathbf{1}}, \underline{\mathbf{1}}, \underline{\mathbf{1}}, \underline{\mathbf{0}}, \underline{\mathbf{1}}, ...)$

(The elements $s_{1,1}$, $s_{2,2}$, $s_{3,3}$, and so on, are here highlighted, showing the origin of the name "diagonal argument". Note that the highlighted elements in s_0 are in every case different from the highlighted elements in the table above it.)”

This is resolved by the following characteristics of synchronic tables:

1) Every first array member of every sequence is found in the synchronic table $\mathbf{2^1}$.

2) Every second array member of every sequence is found in the synchronic table $\mathbf{2^2}$.
3) Every third array member of every sequence is found in the synchronic table $\mathbf{2^3}$.
4) Every n array member of every sequence is found in the synchronic table $\mathbf{2^n}$.

Also:

1) Every sequence of one member can be found in the synchronic table $\mathbf{2^1}$.
2) Every sequence of two members can be found in the synchronic table $\mathbf{2^2}$.
3) Every sequence of three members can be found in the synchronic table $\mathbf{2^3}$.
4) Every sequence of n members can be found in the synchronic table $\mathbf{2^n}$.

Sequences are listed in a synchronic table in such a way so that, for example, the third member of the fifth sequence is in exactly the third place in $\mathbf{3Tx_{3(0;1)}= 2^3}$, the fifth member of the seventh sequence is in the fifth place $\mathbf{5Tx_{5\,(0;1)}= 2^5}$, the eighth member of the ninth sequence in the eighth place in $\mathbf{8Tx_{8(0;1)}=2^8}$, that is, as we have already stated, an entire sequence of seven members, for example , s_0 = (**1**, **0**, **1**, **1**, **1**, **0**, **1**), can be found in the synchronic table $\mathbf{7Tx_{7(0;1)} = 2^7}$, and any whole sequence of any number of members will be found in $\mathbf{Tx_{n(0;1)} = 2^n}$.

Therefore, if we induce the temporality criterion of **t=t** into the above table of Cantor's rearranged sequences **(picture no.2)** this will essentially constitute an order of the sequences in space, e.g. ***the n-th member of the n-th sequence will be in precisely the n-th place of the synchronic table 2*** $\boldsymbol{2^n}$**.**

Discussion: On the diagonal of synchronicity **(picture 2)**: for example, for the value $\mathbf{Tx_{1(0)}}$ we have a synchronic value $\mathbf{Tx_{1(1)}}$ and vice-versa. Every $\mathbf{Tx_{n(0;1)}}$ develops its own synchronic table, which covers all possibilities.

Every vertical sequence coincides with one horizontal sequence of an appropriate number of digits, for example, the vertical sequence $\mathbf{Tx_2}$ **= 0110** is equal to one of the horizontal sequences on the synchronic table

$\mathbf{Tx_{4(0;1)}}$, the vertical sequence $\mathbf{Tx_{3(0;1)}}$ **=01101100** is equal to one of the horizontal sequences on the synchronic table in $\mathbf{Tx_{8(0;1)}}$, etc. All vertical sequences are the same as some horizontal sequences, in other words, vertical sequences are “the subtotal of the horizontal sequences”, and thus, if we count the horizontal, we count all of the sequences. To get the **1:1** correspondence, all the sequences are broken down into elements that have a growth rate of **1**, e.g. **(0,1; 00,11; 000,111; 000,111;** $\mathbf{n_{(0;1)}}$**)**. Synchronically arranged, all sequences in the shape of **0101...1...0...** can also be counted as **n+1**. At last, every sequence in the form **0101...1...0...** can be counted individually as **n+1**.

Finally, every sequence in the form **0101...1...0...** is included in the table $\mathbf{nTx_{n(0;1)}}$, which further excludes the possibility of the existence of Cantor’s uncountable set of **n** elements.

The elements of the synchronic table cannot further be ordered successively because they all exist simultaneously in $\mathbf{T_0}$, that is to say, they coexist in the present. It is clear that the synchronic relation of elements excludes the temporal hierarchy and their eventual order is only on paper.

Synchronicity is the main temporal characteristic of natural numbers in general. For example, if we write the number **4** as **1;1;1;1**, it is obvious that all four ones coexist in $\mathbf{T_{0(4)}}$, in other words they cannot be temporally arranged without bringing us into conflict with the assumption of the existence of the number **4** as a unique system in itself, coexistent with itself.

Synchronicity is the highest natural form of order of equal physical elements, as well as mathematical. It will be demonstrated that the synchronic table is the most powerful mathematical tool in physics because it is the ***eternal present***, or the only real physical infinity, an ***absolute inertial system***. The continuity of synchronicity excludes succession, thus excluding motion itself, or in other words, change.

The basic formal complaint toward Cantor’s “method of diagonalization” is the incorrect correspondence, e.g. the induction of equivalency among elements that are unequal in number. For example, in the case of decimal numbers, $\mathbf{d_1 = 0.\ d_{11}\ d_{12}\ d_{13} ...}$, in the case of sequences $\boldsymbol{x_1}$ **= 01001101...,** $\mathbf{x_2}$ **= 1001010...,** and also in the case of sets where "an empty set contains itself", **(**the paradox **0=1)**.

By avoiding two-way equivalency, Cantor succeeds in that exploration by his method by definition have negative results. For example, decimal numbers and sets cannot be counted using Cantor's method of diagonalization, yet based on this he positively concludes that ***"the infinity of decimal numbers is greater than the infinity of natural numbers"***, and that there is ***"an uncountable set"***. However, from certain negative examples and the inability to apply a method successfully, we cannot follow a ***certain*** positive conclusion, so generalized that it cannot be understood and so this method is entirely unreliable and foreign to ***the physically exact spirit of mathematics***. The best judgment on the subject was given by Cantor himself in 1877, in a letter to Dedekind (on the subject of the revelation that for every positive whole number **n** there exists a **1** to **1** correspondence of points along the line of all points in **n** dimensional space): "I see, but I do not believe". In mathematics quite the reverse is true: "I don't see, but I believe", for example I cannot see numbers, I cannot see a length without a width, I cannot see a point that has no elements, yet I believe that all this exists.

Cantor's greatest accomplishment for science is certainly that, with extreme examples of incomplete induction and the ontologically unelaborated introduction of an actual infinity into mathematic thought, he inadvertently brought attention to the fact that the main problems in mathematics cannot be solved without physics and that the temporality of mathematics is absolutely necessary.

----end----