

## The sphere of Riemann

### Comments on the book: Bohm, the physics of infinity

Letter written by Leo to Massimo Teodorani, author of the book:

"Dear Massimo,

I am only on page 38 of your book on Bohm and I presume that I have already understood the Bohmian concept of *quantum potential* and the *non-locality* of quantum events. To understand certain concepts one must have thought about them before, to realize what's the problem. For years, I tried to solve the problem of non-locality in my own way, using Euclidean geometry and elementary algebra.

I too believe like Bohm, but for different reasons of religious nature, that there is behind reality an absolute space-time, where time, if nothing is happening, is stopped. Let's call it the substance of God. To make sure that the substance fills the whole of reality, I concluded that it must consist of atoms of zero size. So all the infinite reality is the sum of an infinite number of atoms of zero size. Mathematically it can be shown that the sum of infinite zeros is:  $\infty \times 0 = 1$

That one is the Biblical Unity of God, or for the Pantheists, the Unity of the Being.

This result is achieved with a flight of imagination that has its roots in the equations of Brahmagupta. (See Talmud Scicli)

At the algebraic level we consider the point at infinity of Riemann as the result of:

$$\frac{1}{0} = \infty.$$

And its reciprocal:

$$1 / \infty = 0$$

These are the equations of Brahmagupta, from which derives:  $\infty \times 0 = 1$

To get the infinite zeros that we need to add the substance (or ether of Bohm) to prove the equation:  $\infty \times 0 = 1$  we can use the trick to divide each number of the infinite series of natural numbers by  $\infty$ , since each number divided by infinity gives zero, so we solve the problem of reducing to zero all the infinite natural numbers.

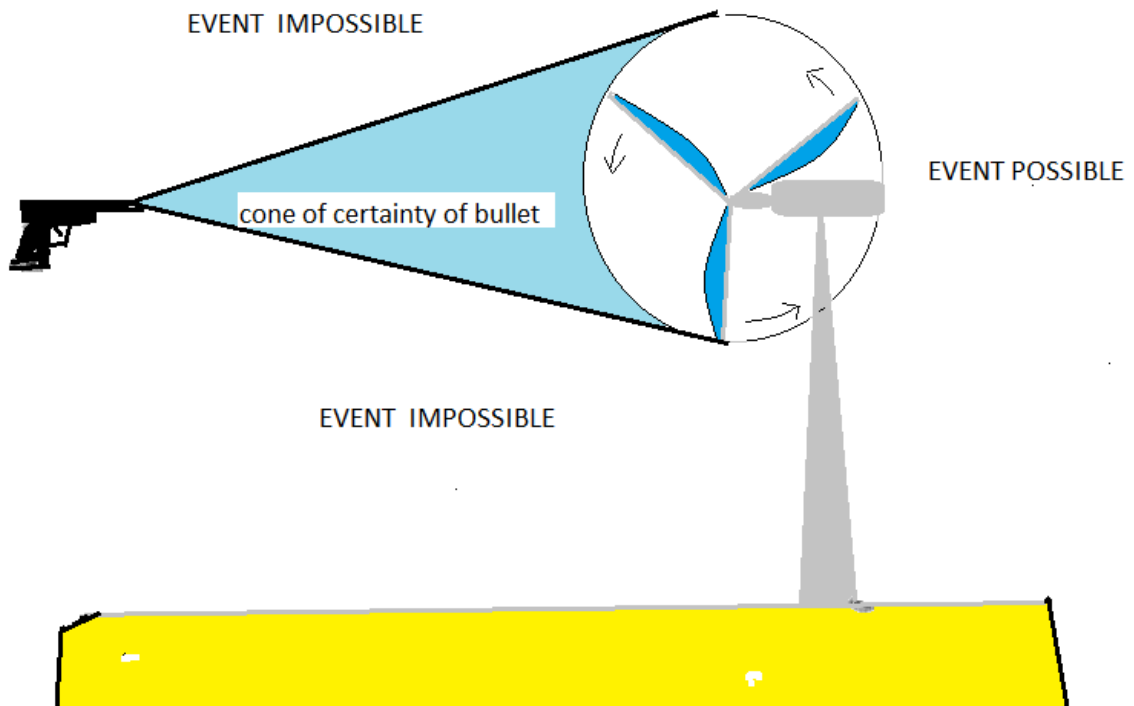
Then we can write:

$$1 / \infty + 2 / \infty + 3 / \infty + 4 / \infty + \dots \dots \infty / \infty = 1$$

Reducing to the lowest common denominator this infinite sum, we have:  $\infty / \infty = 1$  and it doesn't matter if the mathematicians accept the existence of the infinite or not, here it's the simple fact that a mathematical entity divided by itself should always give 1 as a result.

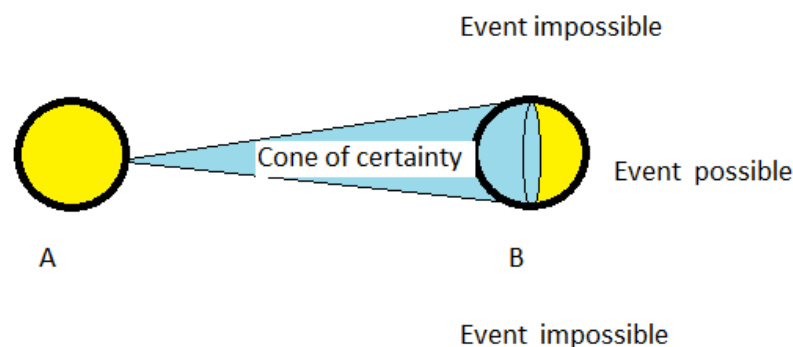
The  $\infty$  cancel out without a trace! The only thing to do is believe strongly that  $\infty$  is a number that represents infinity.

Because the zeros add up leaving no gaps between them, what is worth remembering is that this simple 1, is not only the unit but also the sum of all the great whole that includes everything (i.e. God for believers) .



## The cone of certainty

The letter of Leo continues in an effort to explain to Massimo Teodorani his concept of the *cone of certainty*: "The events that have a probability of occurrence within the space-time describe cones of certainty within the limits of which events can happen. Their total probability is 1, which is the certainty that the event will occur within its cone of certainty. Because the atoms of space-time are dimensionless, also a cone of certainty (like a spherical wave of probability), while being of limited size, contains infinite atoms of space-time and its total probability is also 1. The cone of certainty shown below, which represents the event "collision of two particles" demonstrates this concept. Inside the cone there are infinitely many atoms of space-time in contact among themselves and their sum is 1, so they act as a unit, or as a superfluid and when one moves all of them move together as if the distance between them is annulled ( non-locality).



This quote from Borges summarizes very well the properties of the cone of certainty: it is an Aleph, which contains in itself, despite being small, all the properties of the Infinite, without exception.

*"The diameter dell'Aleph, will have been two or three centimeters, but it contained all the cosmic space, without that its vastness would suffer. Everything ... was infinite, because I saw it clearly from all points of the Universe."* Jorge Luis Borges



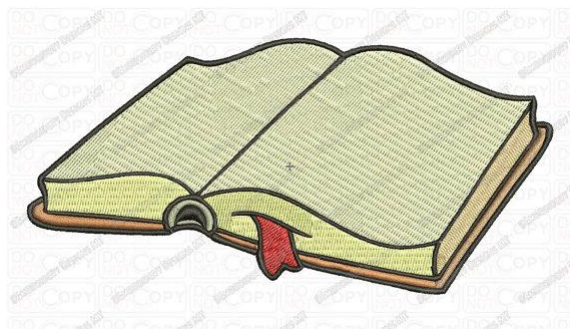
Symbols of Luck

## Probability of the event inside the cone of certainty

The letter of Leo continued: "It is worth to analyze better the concept of probability of the" clash of two particles "illustrated by the cone of certainty. Suppose that the particle B is stationary and that the particle A moves toward B to enter into collision with B. The cone represents the infinite trajectories that A can follow to collide with B, whose sum is 1, that is, the certainty that the event will occur inside the cone. Outside the cone the event will not occur.

Before setting off, the particle A will have before itself the instant representation of the future of the event that it will experience. Since the space is limited to "one" (being the sum of infinite zeros) and the future has not yet occurred, the particle A will have before itself the exact situation of what awaits it and therefore will "know" what will happen in its future within a time equal to:  $1 \times 0 = 0$ . ( At infinite speed ).

This information is what Bohm calls "quantum potential"? It is something like a bit of "good luck" to win the game if luck will assist you and if you have the *horseshoe* and the *horn* foreseen by the Italian tradition, right? "



## The Universal Language

Massimo Teodorani had never answered the questions of Leo and he never commented on his mathematics, but Leo was used to being ignored by the famous scientists and therefore he continued undaunted to read the book.

Arrived at page 81 of the book: Bohm, the physics of the Infinity, Leo realized that between page 38 and page 81, he did not understand a thing of what was written.

The only thing that was stuck in his mind was that Bohm vaguely thought that there was an invisible reality (the implicate order) hidden behind the visible physical reality (the explicate order). The implicate order, for some strange and unknown reason, according to Bohm was trying to bring order in the things of the world. It was therefore a coordinating force. Bohm still firmly believed in the unity of everything that exists in one large unitary entity, that he did not dare to call God, but that could have been called: *the Energy* or *the Force* as in the movie Star Wars.

As a good Kabbalist, if he had been Bohm, Leo would call it *the Being* who, however, had a dual nature: *Substance* and *Logos* which together formed the Being.

No wonder therefore that there was a Being, Unique and One, although of dual nature, trying to bring order in all the things of the world that after all were part of himself. Because the Being was the only reality that existed, and the non-being did not exist, the **Existence** was the only thing that there was.

Very well up to now. It was easy to get an idea of what Bohm meant with implicate order. Probably he meant the **Logos** that is the **Divine Mind** that coordinates the reality with its laws.

But then there were many pages where Massimo Teodorani, the author of the book on Bohm, tried to explain Bohm's attempt to get closer to that hidden implied order, through the thought and therefore the language. Bohm in the last years of his life had acquired a Buddhist type philosophy, resembling the effort of Tibetan monks to join the One through meditation and unitary thinking. In fact, for almost thirty years, Bohm had cultivated the friendship of an Indian guru, the great Krishnamurti, who preached meditation to bring order to the confusion, the noise and the chaos that normally clutter our minds. To create order you had to build a pure and very simple language. Not only he had met and exchanged ideas with the Dalai Lama but, following the advice of his friend Krishnamurti, he had also tried to build a very simple language to communicate with the One. Unable to express his concepts in

the language of mathematics, Bohm had therefore started looking for that language and was only partially successful.

The language he had devised was simple and was based on that of the American Redskin Indians, that consisted only of verbs having eliminated the names of things, which probably complicated the dialogue with the Great Spirit of the prairies. It was clear that that great genius of Bohm, towards the end of his days, not being able to formalize his insights with mathematics acceptable by academia, became mired in the search for a surrogate verbal and non-numeric language, enabling him to reach the Nirvana of the implicate order.

This was what Leo was able to figure out by reading the central part of the book, but it was certainly the superficial peel of an onion, since he had not understood its inner layers. There was much more that he needed to understand, to get a clear idea of the thought of the great David Bohm. However it was not lost, on Leo's perception, a deficiency in the mathematical logic of Bohm: although he had approached Buddhism with passion, he had not exploited the concept of **zero**, which was of fundamental importance in Buddhist philosophy.

With a touch of pride Leo had said that Bohm had not had, like him, the mathematical intuition of starting from zero, to write his equations. Starting from zero, and the sum of infinite zeros, in fact Leo had managed to get mathematically One, which includes everything, leaving no gaps in space-time. But now there was a new concept that had suggested the book, that he was reading, and that stimulated the imagination of Leo: the search for a universal language, that instead of mathematics would allow men to get in touch with the Logos. It was an interesting project and worthy of a Kabbalist like him.

Leo took a bottle of Nero d'Avola, he uncorked it, took a robust glass of red wine with a wide base and went to sit in the shade of the stone bench under the big carob tree. He began to think about the languages he knew: Italian, French, English, Spanish, Arabic and Hebrew. None was fit for that purpose, because all, despite being rich in verbs, were complicated by the problem of names, then there were the adjectives and the terrible adverbs, all useless stuff, all ballast if you wanted to communicate directly with the Logos, because communicating directly with the Logos, meant only to express verbal concepts, because the Logos already knew everything. " Right?"



### Zulu Mask

After a few minutes of research during which he would sip his wine, Leo finally realized that there was a simple language consisting of only 100 words, almost all verbs, which he had learned as a young man in Zululand: the **Fanagalò**. The language allowed to communicate with the Zulu workers to give them the necessary orders to operate the rig for oil exploration and could also be used to go to bed with a Zulu waitress, if she agreed.

Leo had forgotten almost everything but he remember some fundamental verbs and a few useful phrases for that purpose. He drank a first glass of wine and after having poured another glass he began to write what he remembered in a notebook.

“ That's what I remember: not much, really !”He wrote:

#### **Fanagalò Vocabulary:**

Principal verbs :

To go : *amba*

To bring: *buya*

To want: *funa*

To kill: *bolala*

Pricipal sentencies:

- 1) Upi lo kaya ka mina ? *Where is my room?*
- 2) Upi lo lwandle ? *Where is the beach?*
- 3) Upi lo bar ? *Where is the bar ?*

- 4) Ayikona pata mina lapa ! *Don't touch me there ( if the Zulu waitress had not understood where to touch )!*
- 5) Mina funa lo gnigni ka wena ! *I want your gnigni ( pussy )!*
- 6) Mina funa amba lapa ! *I want to go there !*
- 7) Buya lapa lo sack ! *Bring the sack there !*
- 8) Buya lo manzi lapa ka lo dam! *Bring the water to the pool !*
- 9) Bolala lo omunto ! *Kill the man !*

That was all that Leo remembered from the period spent in Zululand. It was a language that was used to fill a swimming pool, go to the bar or to the beach, designed to try to go to bed with a Zulu waitress (if she agreed) or to get advice on the location of your room in the guest house. It could also be used to assassinate a man, which Leo never did, because the opportunity never presented itself. Evidently there were many verbs and a few names, which were necessary to make it clear to the Zulu what he wanted, when it was not enough to use the index to point it out.

But was it enough to make himself understood by the Logos?

Evidently not. The third glass of Nero d'Avola Leo found the solution: instead of a mathematical language or a literary language, he had to communicate with the geometry, preferably Euclidean, that was easier to understand.

But the communication was unidirectional, because it was just enough to ask intelligent questions, as the Logos, who knew everything, was not interested in the theories of Leo.

With a pencil Leo drew a single point, on a sheet of white paper. That represented the size zero, consisting of the sum of an infinite zeros. That point was all right to describe the reality when nothing happened and the zeros were all asleep.

But if the infinite zeros woke up and were put in motion, what happened?

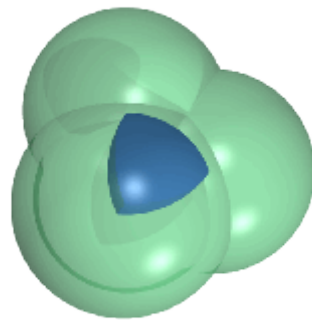
It is clear that every zero would become an active individual who would be diversified by the infinite zeros that formed the One, arranging themselves geometrically to form a more or less orderly arrangement, that would try to fill the infinite space-time without leaving any gaps. In other words they would have formed a compact structure of tetrahedrons, formed by particles of size zero. Leo drew on a new sheet of paper the pyramidal structure that was the pile of oranges



in the grocery shop. But the oranges, so stacked, were leaving voids, to be precise 15% of the space occupied by the oranges was empty. Here is Leo's design, which represented the atoms of space-time as a stack of oranges that left empty space between them:



So as not to leave empty space, the oranges would have to be of size zero and divide among them their spheres of action, intertwined as in the tetrahedron of Reuleaux. Leo drew a tetrahedron of Reuleaux in another sheet of notebook. See the drawing:



Those were the usual concepts of Leo, the same that he always expressed in all his essays. Concepts difficult to understand and even more to try, but the fact that oranges were of size zero, helped to understand how they could be stacked without gaps between them. The language that you could use was therefore the geometry, because it explained almost everything and the tetrahedrons could fill the entire space-time that was the substance of the *Logos*.

The great Bohm, like Leo, had also finally come to the conclusion that it was worth using the geometry, and he had attempted to use a type of abstract geometry which is called "*topology*". Even in that attempt he had failed, but arrived however at the conclusion that *matter* and *consciousness*, on a higher plane, were the same thing.

The last 20 pages of the book were devoted to describing the findings of Bohm in the field of understanding of psychic phenomena. Even there, Leo had understood very little, but he trusted that Massimo Teodorani had understood something. The human brain was considered by Bohm a hologram and reality was considered an

explicit holography, where the part was nothing but the representation of the whole, reflecting the implicit order. That was a concept to which Leo had arrived some time with his concept of Aleph, explained by the mathematician Amir Aczel. Each element of the closed space, such as the distance between point 0 and point 1, contained infinite dimensionless points, which mimicked the infinite space, the great **One** that contained everything. So that infinite One was the sum of many infinite Ones that paradoxically were of the same cardinality of the infinite that contained them. For years Leo had read the articles on David Bohm, but now he had finally discovered, thanks to the book that he had finished reading, that Bohm had gone through a process similar to his intellectual process and had come to his same conclusions. More than a teacher he had become a big brother, who had opened new horizons of knowledge towards the **Truth**.

After the fourth glass Leo thought he knew almost everything and then closed the book and fell asleep with his head resting on carob and after reciting :

***Credo in unum Deum,***

***Patrem omnipotentem,***

***Factorem Caeli et terrae,***

***visibilium omnium et invisibilium.***