

# The Ontology of Knowledge, logic, arithmetic, sets theory and geometry

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Note: It is recommended to read the article "Introduction to ontology of Knowledge (OK)" (Ref: OdC) before this article.

The general principles of the OK are nevertheless listed below.

- Reality is interdependent, informal, unfounded.
- Reality is a purely logical meta-substance.
- OK shows that such a logical system exhibits an infinity of infinities of ordering modes which necessarily tend towards a one-dimensional asymptote denoted by the term **Individuation** of the logical form  $A \leftrightarrow A \leftrightarrow A$
- The asymptote carries the individuated information A which could be written  $\text{pr}(A|A) \sim 1$  or even "the experience of A knowing A is a necessity"
- The principle which governs these modes of order is the Logos, application of reality towards reality
- Individuation is a necessary solution of the Logos in its principle, although its instantiations are contingent.
- The transcendental subject is a contingent solution of the Logos, an Individuation.
- The Individuation that bears the transcendental subject is its existence, not as a physical or psychic phenomenon, but as the logical principle of a self-determining Individuality: "the experience of I knowing I is a necessity".
- Individuation is a purely logical solution of the Logos, it is not a change but a mode of order. There is no universal time in which Individuation would occur, just as there is no universal time in which logical truths would occur.
- The definition that the OK gives to Knowledge is different from that given by common sense: Knowledge according to the OK is all the formless reality which constitutes the individuation of a transcendental subject. It is contained neither in the material envelope nor in the spirit of the subject. It is a logical bundle that is subject neither to time nor to space. It is relative to the subject who is its Individuation. The Existence of the subject is the ultimate meaning, the highest level mode of ordering, of this bundle of logical interdependencies that bind it to reality (Schopenhauer would say: causal activity). The material world, the body and the spirit of the subject are only categories of the meaning that Knowledge takes on in the subject. Knowledge transcends (logically precedes) the Existence of the subject.

Some elements of vocabulary :

1) Transcendental vs knowing subject:

- The **Transcendental Subject** is a Knowledge, a mode of ordering reality whose asymptote is a one-dimensional "becoming self", an Individuation. As a mode of order, as a necessity, it precedes meaning. It is not subject to time.
- The **Knowing Subject** is the meaning he gives himself, he is both the "I am", "what I am", "the world where I am". He runs through his Knowledge like a wave of meaning. The Existing is the present there, the front of the wave. What exists for the knowing subject, including himself, is the horizon of meaning which advances with the wave.
- The principle of individuation subsumes all that the subject is and becomes for himself.
- It logically precedes the meaning that the subject can give to his existence and therefore to his own individuation. This principle transcends, for example, the separation that appears to the subject between himself and the world, between matter and thought.
- Individuation logically precedes the time of the subject and not the reverse. Time is born, for the knowing subject, from the nature of meaning.

-The following sentence which logically derives from the Cogito: "The proposition 'I am, I exist' is true whenever I conceive in my mind any proposition" states the principle of Individuation from the subject's point of view: "What exists for me is what becomes me" Since individuation logically precedes meaning, "the proposition conceived in my mind" should not be taken as the mere proof or sufficient condition of "my existence". My existence, the fact that I will still exist, is on the contrary the certain truth of my Individuation in which "all propositions conceived in my mind" necessarily participate.

## 2) The evidence

Contrary to the Darwinian interpretation, it is not because my mind effectively describes the world that I exist. It is because my representation is necessarily inscribed in my individuation, which itself is a necessary solution of the Logos, that description is possible and appears effective to me.

It is then necessary, and especially within the framework of this article, to give to the evidence of a Fact a transcendental, logical (and not psychological) definition:

F is **evidence** for Alice if F is a necessary condition of her Individuation.

The evidence of F is written:  $\neg F \rightarrow \neg I$

Since I is necessity *a priori*,  $\neg I$  is impossible, so if F is evidence, F is necessary, certain, Existent, present.

The transcendental evidence of the Fact is equivalent to its present Existence for the knowing subject.

There is also a transcendental Humanity (and beyond that a transcendental living being): what we designate as our common becoming is also a solution of the Logos in which our Individuations are interdependent.

We can therefore define there a shared evidence which would be written  $\neg F \rightarrow \neg We$

## 3) In-act vs Actual vs Existing

At the most general level the OK defines 3 modes of order to reality:

- The **In-act**: Formless, Immanent, Interdependent, Unfounded Reality
- The **Existing**: What has for the subject, a present, certain, necessary meaning.
- The **Actual**: What is made possible, although not existing, by the Existing.

Note that these are modes of order and not different realities: The Existing is nothing other than the Actual, which is nothing else than the In-act.

Example: A system of equations is made of In-act relations between indefinite entities.

Under certain conditions, this system can have several solutions (even an infinity). By the fact that they are possible, these solutions have a certain mode of logical reality, prior and independent of the fact that an agent (Alice) would have calculated them. These solutions are Actually possible (they are Actual although not revealed).

These solutions will come into existence progressively for the agent only through the act of calculating. Note that the Existence of a result for Alice does not change the In-act reality of the system of equations. The existence of a result for Alice does not imply its existence for Bob.

For Alice and for her alone, knowing the progress of her calculation (her representation state CA<sub>i</sub>), the effective probability law on the possible solutions is gradually modified: "Knowing CA<sub>i</sub>", certain solutions (or sequences of calculation ) Actual but not yet calculated, will become more or less probable, even impossible or certain for Alice. When the probability of a solution reaches certitude for Alice, it becomes Existent for Alice.

Actuality is a progressive mode and relates to a state of representation of the subject.

This probability law resulting from CA<sub>i</sub> is the **Meaning** of CA<sub>i</sub>.

*It would be the same with speech: as Alice utters her speech, certain words or syntagms, from possible (according to the context) become probable, certain, then Existent for her and for her listener.*

Let us note that the Meaning of CAi does not depend only on the system of equations but also on conditions of possibilities (calculation rules for example) which are themselves Actual. Note that since the Existence of a result does not change anything in the In-act of the statement, the simple fact that Alice informs Bob of the state of her Existing representation causes Bob's Existent to evolve.

#### 4) Determination vs Necessity

-Is **determined** what the state  $T_1$  is fixed by the (deterministic) laws of the world from its state  $T_0$ . Thus the position and the speed of an object in state  $T_1$  would be determined from a state  $T_0$  by the laws of gravitation. The state qualifies the thing. Laws are laws of the world. In the concept of determination, only one path of existence leads from  $T_0$  to  $T_1$

-Is **necessity** an experiment  $T_1$  whose mathematical expectation "knowing" the representation of the world in  $T_0$ , is infinitely close to one. Thus a knowledge of millions of experiences  $\{T\}_0$  having given the same result X contains the necessity that an experience  $T_1$  give the result X. The knowledge is specific to the subject, so is his experience and does not prejudice a reality. The law that associates mathematical expectation with knowledge is not a law of the world but a law of knowledge. The question of a path of existence between  $\{T\}_0$  and  $T_1$  does not arise.

However subjective (specific to the subject) it may be, necessity does not appeal to the mind of the subject, because a mathematical expectation is a mathematical fact and not an opinion or a belief.

-The determination results from a law of the world applied to objects of the world, the necessity results from a law of knowledge applied to facts of knowledge.

This distinction does not claim semantic or scientific rigor, it is nevertheless fundamental if one wants to think about the future of the world, ie science, for example in the cases of relativity or quantum mechanics.

#### Necessity and Contingency:

I propose to the reader to interrupt the thread of the presentation for a few minutes to meditate on the fact that a logical necessity is realized according to contingent paths, to consider the impact of this on the notion of causality and time.

Let us first note that the point of view of the subject is situated not «overlooking» but «inside» its becoming; knowledge of the subject is the set of contingent paths which realize the necessity of his becoming.

According to the concepts of common sense, the becoming of the subject follows generic, constructive laws. His becoming is contingent, unpredictable, even free. However, a general law imposes itself on this becoming, seen "from the inside", with a force far superior to any mathematical axiom: if the possible becomings are contingent, becoming 'oneself' is a necessity.

Of this necessity the subject does not see the formal cause in his knowledge. By what extraordinary constraint does the "I" subsist through billions upon billions of contingent interactions? At worst, if he can apprehend the persistence of "I am and remain myself", for lack of a generic law to explain it, the persistence of the I will appear to him as the myth of a destiny, reversing the order of time, no longer as a present generically constructing a future but as a future imposing a global law on the present.

In the four-dimensional block-universe of relativity, this teleological aporia is reversed: the time dimension losing its specificity, everything there would be given

*en-bloc* and would therefore be entirely determined. The question then is: What room is left for contingency? We will return to this point in a specific chapter.

The apparent conflict between destiny and freedom is precisely due to the point of view that the subject occupies which does not allow him to perceive that the contingent paths of the time he lives are subsumed by the necessity of his Individuation, in a logical reality indifferent to time. For we can only know what becomes ourselves, our point of view is not above the world but in essence "inside", "involved", in our own individuation.

Can I say then that my actions, my free choices are causes of what I will be?

Can I say that biological or psychic phenomena in me (or through me) are causes of my unity?

If the necessity of my individuation, indifferent to time, subsumes and constrains *a priori* all the contingencies of my existence, how am I in time and by corollary how is my conscious representation in time?

### Butterfly Effect :

Let us analyze the butterfly effect not as a construction from the butterfly to the hurricane, but as a retrospective inquiry from the lived experience of the hurricane.

For the same reasons that, in a chaos, made us understand the sensitivity of the effects to initial conditions, we understand that the flapping of the butterfly's wings is negligible as a logical component of the lived truth of the hurricane, at the very point that it is impossible to deduce the former from the latter.

The incalculability of the wingbeat of the butterfly "knowing" the hurricane, does not call into question its meta-substantial reality but only the form given to the event "wingbeat", its extensional individuated designation (formally sayable ) by means of attributes available in our multiplicity, the only possible formal framework for our inquiry: Is an event that I can formally designate as "a flapping wing" a necessary condition for the hurricane?

This form, this Fact of Knowledge, is all the more contingent as it is unfounded: its truth breaks down logically into a chaos of physico-chemical reactions which are incommensurable to the wingbeat-event.

The hurricane finds its logical truth, its Existence, much more in the general conditions of its possibility than in the supposed "first logical truth" of a "flapping of wings".

The "conditions of possibility" of the hurricane are essentially: temperature, density, energy, speed,... "representable" according to the formal terms constructed in our multiplicity. These terms are probabilistic averages, facts of knowledge with no necessary first truth. These conditions of possibility therefore emerge from truths that are also, incommensurable with the logical chain that connects the butterfly to the hurricane. These Facts of Knowledge are unfounded.

The logical Existence of the hurricane which appears, by experience, as a necessary truth, is a singularity in a tree structure of Facts of Knowledge and not the synthetic consequence of a series of facts of the world.

Beyond the meaning of the Facts of Knowledge, there are no facts of the world whose truth would be calculable.

The Existence of the hurricane, as an experience by the subject, exists as evidence for the subject because it is the logical condition of his own Existence, the truth of which is imposed by the Logos.

Yet in this example, although we cannot know whether a butterfly actually caused the hurricane, let alone whether it was then in South America or Asia, we cannot conceive of the butterfly being "altogether on both continents" according to a probability distribution. In fact, we cannot conceive (in the present) the contradictory experience of past or future events. This example shows that in a context of non-foundation, the non-contradictory unicity of the

past (and also of the future) imposes itself on us because of the laws of Knowledge and not of the laws of the world (this point is detailed by the ref OdC).

From a pure Coincidence to the space of possibilities and appearance of the form.

If with two dice Alice rolls a double six she will think it is a "pure coincidence"

Let us first specify that, just as there is no truth in itself, apart from the experience that one can have of it, there is no probability in itself, beyond its measure by an agent, ie according to the meaning that the agent gives it.

Giving meaning to an experience implies for the agent an extraordinary bundle of interdependencies with reality: if, for example, in Alice's mind six points would make no difference from one point: the experience would not make sense for her, if the history of Alice's world meant that she was not in the presence of the dice: the experience would not have meaning for her. There would be no coincidence. Giving meaning to an experience implies a perspective, a structured multiplicity which determines *a priori* the possible experiences, that is to say those which will have meaning *a priori* for the subject.

Alice's double six and its probability don't make sense in the world *per se*, but in Alice's world. The conditions of possibility of Alice's experience are not fulfilled in the world *per se* but in Alice's world. These conditions of possibility are fulfilled at the cost of other more or less probable coincidences, the effectiveness of which only takes on meaning through the experience or experiences that Alice makes of them.

The coincidence of the two sixes of Alice's throw is therefore far from pure, it is in fact prepared, ie made possible by all the singular coincidences which contribute to the representation by Alice of her world and of herself.

A hypothetical pure coincidence would be one that no other coincidence would have made possible. The probability of  $1/36^{\text{th}}$  of a double six is actually extraordinarily high compared to pure coincidence. A coincidence that nothing prepares, a pure coincidence, borders on the impossible. It can even be argued that it is impossible to experience pure coincidence. It is in this sense that we can state that reality has no form in itself, that it is in itself indescribable.

An actual impossible, an actual pure coincidence is therefore meaningless, a nonsense.

If the double six can exist for Alice, it is precisely because this coincidence is not pure: In the logical structure which binds Alice to everything which, as closely and as far as one wishes, participates in her representation of the world (what the OK calls her Knowledge), there is a set of attractors, of singularities which make the experience of a throw appear to Alice in a finite, countable space of 6 possibilities.

This exponentially proliferating path is structured in singularities according to order modes. This structure of singularities imposes the meaning that Alice gives to her Knowledge. One of the singularities appears to Alice as the necessity for the throw to have a unique result. This unique result is a necessary attractor and the path that links Alice to this attractor is itself structured into 6 individuated contingent paths.

These singularities make possible not the issue of the throw but the experience by Alice of the issue. Without singularities, the logical path from Alice's "I" into reality would be lost in an exponential proliferation of equally probable paths, each of which would have a probability of being traveled on in the order of  $1/e^{\infty}$ . Without singularities, Alice's Knowledge would be nonsense.

*A very simple example illustrates this: A flash of light produced by a 1mW power LED for 0.1 second produces approx.  $10^{-4}$  J. or  $10^{14}$  photons. We can say that the perception of a single photon by Bob is of negligible probability. It is therefore necessary that the proliferation of interdependencies which link his conscious perception to the (supposed) reality of the flash presents the singularities which will individuate this flow of  $10^{14}$  photons and make its perception "possible", ie of significant probability.*

These singularities “affect” the logical structure of Alice's Knowledge as a whole and not simply what common sense would designate as “the launch event”.

Their “logical truth” is neither linked to time nor to the materiality of the “launch event”.

*The perception of the LED flash has the "sense of sight" for a condition of possibility. This one is an extraordinary complex of interdependencies which goes back; over millions of years to the evolution of living things; over years to the learning of vision by Bob; over days to Bob's perception metabolism; over seconds to Bob attention focusing on the LED; over 0.1 second to the process of integrating the effects of photons flux; over milliseconds to the logical combinations that give it meaning in Bob's present world. All these interdependencies are, for their part, a condition of perception and their singularities are made present by the perception of the light flash. To claim that “sense of sight” is already present and certain as such, independently of perception, arises from circular reasoning because it is by perceiving that we create the present and the evidence of perception. It is from all this complex of interdependencies and by its singularities that the meaning of the LED flash emerges for Bob among all its representations.*

Experience and its conditions of possibility are only one reality *a priori*, only meaning distinguishes them *a posteriori*. The logical conditions which determine these singularities are *stricto sensu* the conditions of possibility of an experience by Alice. Because of these singularities, a result of her throw makes sense as a necessity for Alice in a space with 6 possible values, each of probability 1/6.

*If now Alice throws a ball instead of a dice. For the same reasons, a result will necessarily make sense to her in a two-dimensional (x, y) space with continuous values. These are no longer 6 contingent paths that lead to the necessity of the result but a two-dimensional space with continuous values. The probability of a given result {x, y} may seem infinitely small to us, it is nevertheless infinitely greater than the impossibility. We can define a density of probability of  $1/4\pi$  by dividing the certitude ( $P = 1$ ) of a result by  $4\pi$  steradians.*

*If now Alice spins a disk, a result will necessarily make sense to her in the form of an angular position in a continuous-valued one-dimensional space where the density of probability would be  $1/2\pi$ .*

The fact that these examples bring into play events of the physical world could make us doubt the purely logical character of the conditions of possibility, but these logico-material examples could be replaced by purely logical, immaterial "rules": We could for example construct a similar reasoning by having Alice and Bob play “rock-well-leaf-chisel”.

In these examples, the space of possibilities is logically included in an *a priori* necessity, the total of the probabilities cannot exceed the certitude implied by this necessity. Thus, in the example of the disc, although the outcomes are in infinite number, the sum of their probabilities is *a priori* limited to 1. This results in an actual relation between the probability of an outcome “lived” by Alice \* and the share of this outcome in the space of possibilities (\* not by the sensitivity, the understanding or the spirit of Alice but in Alice as a transcendental subject).

So, if Alice draws a sector on the disk and spins it a few thousand times, the probability that the index points to the inside of the sector is also the measure (in Lebesgue's sense) of its angle. An actual probability is the meaning of a measure. Alice's actual experience (ie her Knowledge according to the OK) is taking form.

An evidence then appears to us: When a contingent fact participates (for a subject) in a necessity, the effective probability of its occurrence is a measure, the measure of its importance in the sense of Whitehead (ref OdC) relative to a Whole.

This importance does not qualify a probability in itself but only the experience that an agent can make of it.

**The space of the possible of a necessity is, in itself, provided with a measure.**

The measure is valid only for the contingent Facts contributing to this necessity, it is only valid "inside" the necessity whose space of possibilities is regulated according to general conditions of possibilities in the Whole of the perspective of the subject .

Thus, if the necessity ( $A \leftrightarrow A$ ) is for the subject a simple digit of Existence, its separation into contributing Facts is a priori made possible by the perspective (the multiplicity, the conditions of possibility) of the subject. In this perspective are Actual the possibilities of experiences or "cuts" in the Existence of A, endowed with laws of probability which structure the Existence of A in a space of possible meanings.

These cuts are meaning attractors whose probability "knowing A" is non-zero.

Without cut, i.e. considered from "outside" as One existence, this necessity ( $A \leftrightarrow A$ ) will appear as a contributing Fact of a higher order necessity having its own measure.

Necessity results, not from an intrinsic nature of the contingent facts themselves, but from the conditions of their possibility. These general conditions whose singularities make possible the existence of facts for the subject, constitute, beyond the horizon of meaning, an interdependence between the facts themselves. Although the facts appear disjoint in their extensional parts (in their logical relations as the subject represents them), their intensional parts (beyond the sayable) have common elements. This common intensional part, not subject to form, time and space, is the true cement of a necessity that logically transcends the instantiated facts.

At the highest level, the Knowledge of the subject is logically contained in the necessity of his Individuation. The forms, the meaning that his Knowledge takes for the subject are in deed the labels associated with Actual probabilities in a structure of necessities and contingencies, in the subject.

In summary: any Fact Existing for the subject is a necessity. This necessity is separated into contingent modes of fulfillment whose experience is possible. The law of distribution of probabilities on possible experiences is, for the subject, the meaning of the Fact. This law of probabilities is not in the Fact itself but in the global perspective of the subject, in its multiplicity which is a structure of meaning attractors.

In the generic description of the world by common sense, in the synthesis of reality from primary facts, from atomic logical elements, the meaning of the world is still today an aporia. On the contrary, we see that a description breaking down the necessity of the subject's Individuation into contingent modalities carries with it its own meaning, without the need to refer to other principles, to a hypothetical form in itself or to the mysteries of the Spirit.

**The necessity of his Individuation is, for the subject, the first principle of meaning.**

**Corollary: The contingent forms that the world takes for the subject are relative to the necessity of his Existence.**

The concept of "Conditions of possibility" therefore takes on a particular meaning: the conditions of possibility should no longer be considered as "external" to the event. They create for the subject the meaning of the event in the meaning of the world.

In the same Act, the conditions of possibility of an experience cause a Fact and its meaning (its measure) to exist in its space of possibilities.

These conditions of possibility are by definition part of Alice's reality. Alice's reality is all the logical interdependencies linked to her, it is Alice's Knowledge in the sense of the OK, not only the sayable, present part but all that is logically linked to the "I" of 'Alice including the unspeakable and timeless part, beyond the horizon of meaning.

NB: Knowledge of Alice is not "all of reality" but only the subset of reality which individualise in her Existence. Alice's world is not The World but only the meaning of her Knowledge. Only what is interdependent on Alice can be a condition of her experience, of her representation.

To the Knowledge of Alice, for example, it is necessary to include the infinite bundle of interdependencies which will finally make the die, its material, its form and its meaning appear for Alice. The die that Alice throws is not an object of universal reality but an object of Alice's world. This die is not in a universal space-time but in the space-time which associates the facts of the world of Alice.

There is not, on the one hand experience and on the other, conditions of possibility as a "place" and "precondition" of experience, but only one logical path: Knowledge of the subject which, through its singularities, makes possible both a logical Fact with measurable probability and the space of its possibilities.

An attractor as a singularity can be described as the necessity which logically subsumes a set of contingencies. It is also the space which merges the spaces of probability of the contingencies which construct it. We can say that the necessity (... of the result of a throw) is the label (the signifier) of the class of contingencies which construct it  $\{1,2,3,4,5,6\}$  (the signified, the substance) and the space which contains them (the mode of order of the signified, the form). The substance and the form.

For the subject, his own Existence, the persistent experience of his "I", is necessity: it is the necessity of his Individuation, the transcendent principle of his own Existence. This necessity subsumes all the contingencies which participate in it, all the Knowledge of the subject. The need for the "I" clearly delimits the space of possibilities for the subject. "I Exist" is the label (the signifier) of the class of contingent Facts which contribute to fulfill the necessity of my Existence for myself (the signified) but also of the way in which they are organized (space of possibles). In this class, Facts of the world appear to me insofar as experiences reveal that they contribute to the necessity of my Individuation.

"I am, I exist" logically implies the world and the space of possibilities of my representation. There are therefore not the Facts of the world, intelligible to the subject in an *a priori* space-time, but only the Knowledge of the subject whose structural singularities cause Facts to Exist in spaces of possibility. The facts of the world in the Universe.

There is a **reversal of intelligibility**: it is not the world which makes itself intelligible to the subject by the convergence of causalities but the meaning of the Knowledge of the subject which extends according to a law of probability which is its essence. .

The conditions of possibility which impose the 6 attractors of the dice roll, i.e. determine the outcomes of the experience and the space of possibilities, do not appear as such in Alice's representation of the launch-event. Alice represents a roll in progress, as if the probability of 1/6 were an individuated, speakable attribute of each issue. The extraordinary constraint which applies to the representation of Alice and transforms the pure coincidences without meaning into a necessity to which only 6 speakable contingent paths contribute; This constraint which we call: conditions of possibility, does not appear to Alice as part of her experience. Yet we have seen that it is the substantial and formal cause of it.

Unlike the throw as an event that seems to take place in Alice's time, the conditions of possibility of her experience are not located in her time. Alice does not know when the dice was designed or made, she does not know when living beings agreed and when she herself understood that six dots represented something different than one dot etc ...

One could conceive of a variant of the experiment where Alice chooses 2 dice at random from among a billion dice already thrown there on a table. The probability of choosing a double six would be unchanged because the conditions of possibility of the experiment would be essentially unchanged. According to this modality, however, the relation between conditions of possibility and time of experiment would disappear.

When the outcomes of a series of experiments E are distributed over R according to a normal distribution law, the space of values of the outcomes is continuous. The probability of an outcome with exactly a given x value is "infinitely small", yet no value x can be said impossible. This probability (of the order of  $1/\infty$ ) is incomparable to that of an impossibility (which would be of the order of  $1/e^\infty$ ). A probability density function can be defined.

A normal distribution is justified by the assumption that "experiences" have "many and independent" causes. These causes are supposed *a priori* to be possible (of non-negligible probability in spaces of possibility with finite dimensions). It is indeed these *a priori* conditions of possibility, with no relation to the time and place of the E experiments, which allow the outcomes of E to exist according to a law of probability always positive in a one-dimensional probability space. We see here again that the conditions of possibility impose *a priori* the logical space of possibilities of the E series. The experiments of the E series are interdependent in their intensional realities for the very reason that they can co-exist in the subject.

The question then arises of the possibility of meaning, of the actual Existence of infinite outcomes or infinitely close outcomes.

Finally, let us note that for Alice to become aware of the issue of an experiment, the representation of her Knowledge shall extend and include the conditions of necessity of a result. These conditions of necessity determine the space in which the result is represented. One of the issues passes from the status of "contingent" to the status of "Existing", that is to say necessary and present. The others are then nonsense because as soon as one of the contingent issue is revealed as Existing, ie its probability = 1, the Existence of the others is nonsense.

### How Facts do Exist

Without a consciousness there is no object.(Ref: MOND)

The physical world does not Exist without a subject, in other words, in all Existence there is the subject, including the Existence of the solar system a billion years ago.

It is an illusion to believe that the subject can be excluded from the models offered to us by science, including mathematics. The expression  $\langle 1+1=2 \rangle$  implies and therefore expresses the existence of the subject who utters it.

Now we have seen that the presence of the subject is not neutral.

Any scientific theory (including mathematics), any mapping One to One between the facts of a theory and the Facts of our representations must therefore take into account: on the one hand, the non-foundation of the Fact of Knowledge and on the other hand the unsurpassable presence of the subject and its becoming in the very Existence of Facts. (Ref: MOND annex V)

Only Meta-Facts of Knowledge Exist.

Equivalence is a meta-judgment by the subject, unfounded and therefore unprovable.

This affects not only the Unity of the thing but also its Existence as universal truth.

A Fact of Knowledge Exists if it appears to the Knowledge of a subject.

The Fact of Knowledge Exists only for and by the subject.

To designate Facts of Knowledge as Existing is to include them in the class of "Existing-for-the-subject".

The Facts which appear Existing and disjoint to the subject, on the horizon of his representation, have between them, in the depth of their In-act reality, the Interdependence necessary to appear in the class of "Existing-for-the-subject".

The "Existing-for-the-subject" Facts are thus never disjoint. The apparent disjunction of the Facts comes from that the consciousness observing the Fact, ignores the conditions of possibility of the observation, as is shown in appendix II.

The conditions of possibility are however the In-act of the perspective of the subject and it is according to this perspective that he can judge what Exists. Ref WMdP

The Existing in the representation is the level of simple necessities, which contribute in a certain way to the Individuation of the subject.

Starting from the necessity of the Existence of the subject who is an Individuation, the truth of present things, of the predicates which attach to them appears im-mediated to the subject, thus: what **Exists** to him certainly (and presently) exists.

On the other hand, the meaning of what exists is the law of probability on the **Actual** Facts involved in (implied by) this certitude.

Note that meaning as a law of probability is present and certain, but what meaning measures is only probable, Actual.

*When Alice enters the casino saying "I am broke," the meaning of her proposition is present and certain, but what that meaning refers to is an infinite set of Actual, contingent paths to her ruin.*

The meaning of the Existing (necessary) path is the law of probability on the Actual (contingent) paths which realize it. In accordance with the axiom of Existence, the composition of these laws of probability necessarily has as its totality the certitude of the Existence of the subject.

In summary: Individuation of the subject is necessity.

Among the path-attractors that realize this necessity for the subject, what Exists is certain, implied by the individuation of the subject. The meaning of what Exists are the (Actual) possibilities united in this certitude and the reality of what Exists would be the inaccessible detail of all these possibilities.

This is undoubtedly the most important:

Although the Individuation of the subject is a logical necessity, out of time, it forces infinities of contingent Facts to converge towards this necessity, at the rythm of the emergence of the subject's time.

The general necessity which ordains the Facts according to the emergence of the subject's time is not in its future, it is out of time.

Interdependence is unfounded, its "substance" is infinitely tenuous.

A Knowledge is unfounded, without foundation, without first element.

Only singularities of interdependence can Exist for the knowing subject.

The Fact describes a singular order structure, unfounded, without primary Fact, without substance.

If the Facts are unfounded, the link of Interdependence as a relation of one Fact to another is also unfounded, infinitely divisible, without substance. The relationships between Facts are Facts of Knowledge.

If Facts and relations are unfounded, any judgment of consistency or invariance, any law relating to the Facts and their relations is unfounded, without substance.

Laws are classes of Facts, meta-Facts, unfounded and without substance.

If Facts, Relations and Laws are unfounded, the predicates attached to them are also unfounded. Predicates are classes of Facts, meta-Facts, unfounded and without substance.

The meaning of the Fact, the relation or the law, in our representations, is a judgment of necessity.

Facts of knowledge are representation of individuated singularities but whose intensional structure is infinitely contingent.

The necessity of the Fact is a judgment that unites an infinity of contingencies.

A judgment of necessity is the quasi-equivalence between an infinite set of contingencies  $\{F\}$  and a necessity  $F$  that can be expressed with respect to the individuation of the subject "I".

$$\text{if } I \rightarrow \{F\} \text{ then } I \rightarrow F$$

Only the subject knows the Existence and the meaning of the Fact, of the relation and of the law.

The subject is necessary for the Existence of the Fact, the relation and the law.

The judgment of necessity is literally the logical horizon on which meaning emerges.

Below this horizon: the Fact seems certain, beyond this horizon: there is what is Actual.

The Meaning of our Knowledge describes a Reality which is immeasurable to it. The reality of the Fact of Knowledge, located beyond the horizon of Meaning, is limitless.

The Being, the relation, the law are Facts of Knowledge. Their Unity is made necessary only by an effect of structure which itself is only made necessary by the effect of a meta-structure etc...until the Individuation of the subject

**The Unity of Fact is not an essence.**

The "One" to which we attach a name and predicates, the "one-to-one" relation which binds this One to this other One, a singularity of structure in these relations and the law or principle which emerges from them are not things, they have no substance, they are as virtual as the axis of rotation of a vortex. And yet they are One in an infinity of modes of order.

## **Development**

### The axiom of Existence

The reality being formless, its Shannon entropy is infinite.

Now the entropy calculated along the asymptote that is Individuation, that is to say along the existence of the "I", is zero (at least over a finite segment) since the probability of "I" Knowing "I" is infinitely close to 1 ( $\text{pr}(I | I) \rightarrow 1$ ) and then  $\log(\text{pr}(I)) \rightarrow 0$

Thus, Individuations are eigen-solutions to the Logos along which the entropy of the reality tends toward zero, they are information. They give meaning to reality.

*Note: To say that there are necessarily zero-entropy order modes seems to contradict the 2<sup>nd</sup> law of thermodynamics. The answer appeals to the definitions given in the introduction: according to thermodynamics entropy is **determined** to increase over time whereas according to the Logos order modes of zero entropy are **necessities** out of time.*

For the OK the representation of the world in the transcendental subject can be described as a self-contained logical theory by the fact that it is constructed by separation and not by synthesis: Since individuation is necessity, the necessity to keep being imposes itself on the representation by the subject as a **general axiom of Existence**: "I am  $\rightarrow$  I will be".

It can be designated as an axiom of the logical theory that is the transcendental subject in that it is not logically constructed in the theory but appears as an *a priori* necessity.

The general axiom of Existence is indeed a corollary of the Logos.

This general axiom, whose truth transcends the subject, governs both the meaning of our representations and the conditions of possibility of their emergence.

*Note: The « represented thing » is therefore the same as the « thing which represents ». This raises the question of the representativeness or the objectivity of our*

*representations: if the same axiom gives a priori meaning to our experiences and ensures a priori the coherence of the meaning, we have no means to refute our representations and therefore to prove that there is an object-world, having a priori form, vis à vis our representations.*

*Now "I am": is the concrete experience that encompasses all my other experiences. Our representation necessarily satisfies the axiom of Existence. It participates in this necessity to still exist which transcends it.*

*That's why our representation is idoneous : because the representation resulting from the "I am" is by necessity coherent with the experience of what "I will be".*

*Our representation is idoneous before being, in essence, and therefore has no reason to be representative of anything « out there ».*

The question "Why is the world intelligible to us?" » disappears: The forms, the objects, the laws, the categories which appear to us are sub-modes of this general mode of order which is the Individuation « I am → I will be »; they are the contingent paths which realize the necessity of our Individuation.

The world and ourselves, body and spirit, are the meaning we give to our Individuation, by separation according to the laws of knowledge.

*The objects, relations and laws of the physical world have the same nature of Facts of knowledge as the objects, relations and mathematical laws. No surprise, therefore, that the latter allow us to describe the former .*

*The former emerge through judgments (in the OK sense), which are statistical expectations, and are identified with the latter when the expectation tends towards necessity.*

*There is no intensional meaning, only extensional meaning because the intensional is beyond the horizon of meaning and has no meaning. The subject's multiplicity is the meaning of his world (see "non-foundation" paragraph of Ref TRANS)*

The axiom of Existence is generally not taken into account by mathematical science, which on the contrary prohibits for itself subjectivity and anthropocentrism.

Theories which ignore this axiom and propose representations in which the subject and its Individuation are absent cannot be exact. The case of Euclidean geometry necessarily comes to mind as well as certain quantum aporias.

It is the consequences of this **absentism** or **elision** of the subject (ref MOND) that we propose to analyze.

### Idoneity of representation :

First, we will study Ferdinand Gonseth's contribution to these questions. For this we will appeal to the article "From non-certitude in mathematics, The idoneous philosophy of Ferdinand Gonseth" by Marc Sage. (Ref GONS)

Gonseth already wrote:

*Mathematics, it is sometimes said, is the only science whose laws are absolutely true. But the inhuman and almost divine necessity of its conclusions makes it a science in a way foreign to man. The reality, as we have seen, is completely different: In its essence, mathematics is only a set of schematic views and processes of our mind, a conscious replica of the unconscious activity which creates in us an image of the world and a set of standards by which we act and react. Not an edifice anchored somewhere with absolute solidity, but an aerial construction, which holds up as if by a*

*miracle: the most daring and the most improbable adventure of the mind. [Gons1926]  
§56*

To show us that the subject remains present in the most formal mathematics, Gonseth reminds us of their mode of elaboration: He first releases an intuitive, summary knowledge, ensured by practice and unfinished, from which abstraction, whether it is mathematical or of another order, operates by successive schematizations which will first populate the ideal (or abstract) domain with lines, circles and other perfect figures and regularities, then will build the logical or formal domain in which the axiomatic approach deploys all its power.

According to this process, each schematization creates a new horizon of knowledge, at a higher level of generality, but on which the content of our intuitions is indeed represented.

Gonseth writes:

*Mathematical science must free itself from the ideal of absolute rigor if it wants to reconcile the two spirits it carries within it, one of which looks at reality while the other turns away from it.*

Gonseth shows that not only ideas about mathematical objects but also about the rigor of rational reasoning have evolved.

Gonseth analyzes, for example, the place occupied by evidence in establishing an arithmetic judgment:

*[...] If the numbers  $a$  and  $b$  are not very large, our proof of  $[a + b = b + a]$  takes the aspect of a verification on a concrete model, on the basis of certain laws of physics of objects of any kind. Or at least, it boils down to the evocation of an audit of this kind. If both numbers are very large, the character of the proof is quite different. Having observed that we have no difficulty in restarting our verification with larger and larger numbers, we consider as assured the possibility of repeating it with any numbers, even if they are larger than all those we have ever used. . We thus pass from the mental representation of a practically assured act to the intention of a practically impossible act.*

*There is naturally, between the immediately feasible and the unrealizable, no line of demarcation: there is only a rather indeterminate intermediate zone between them. The disappearance of the actual act, explicited here, cuts the cord with the description. The establishment of the normative can therefore only be legitimized by the practical success of a review of acts.*

It is therefore not only the possibility of a "truth" of the predicative propositions that Gonseth calls into question, but also the possibility of a rigorous formal reasoning, autonomous with respect to the intuitive.

Gonseth will prefer the concept of idoneity of mathematics (and the physical sciences which are based on mathematics) to the illusion of their formal rigor.

The appropriate mathematical abstraction then being: "*an abstracting experience from the intuitive sphere, realizing the abstracts as faithful transpositions from lived experience*"

The OK shares the principle of the idoneity of representations, up to the highest levels of abstraction, but on decidedly different bases as already suggested by the introduction of this article.

First of all, Gonseth refers to the autonomy of the rational in relation to intuitive knowledge which deals with sensitive, possibly intelligible phenomena or with intuitively observed regularities.

This vision presupposes a flow of determinations coming from a world opposite towards the subject's intuition and then towards his understanding. This “sequential and directional” vision, already criticized by Maine de Biran (ref NoK), is incorrect.

It is clear, for example, that the intuitive apperception of the same flow of determinations by a today's teenager is not the same as that of a caveman. To this obviously contribute the abstractions and the rational norms at their disposal.

Intuition identifies and ordains knowledge facts according to categories (of facts, laws, rules, principles) already present in the subject.

The available abstractions and norms help to determine which objects and which regularities will appear to the subject and consequently tend to reinforce their idoneity.

In this sense already the sphere of the rational is not autonomous from that of the intuitive.

But this is only the tip of the iceberg because to see the object, the object is not enough: you need eyes and an ability to see, you also need to be "within sight" of what you see, you need light etc ... and above all, you must exist.

The meaning of "what I see" is inseparable from "how I see".

This "how", these **conditions of possibility**, much more than a simple necessary condition, form the perspective according to which the sense of apperception emerges from my overall capacity to know.

Note this: **the conditions of possibility do logically precede meaning**. It would therefore be a serious epistemic error to define the conditions of possibilities as states of affairs or relations with a pre-existing meaning (even if we are capable of observing them in turn and giving them meaning).

The object of meaning and its conditions of possibility are nothing other than the complex and unfounded network of interdependencies which link the subject's Individuation to Reality. Each of the objects of meaning, at different levels of generality, emerges from this “common soup, complex and unfathomable” that we call “conditions of possibility” but that we could just as well call the “intensional” part of knowledge, beyond the horizon of meaning.

#### Idoneity of the aesthetic intuition:

Although it is necessary for all science, including mathematics and geometry in particular, intuition has a bad reputation precisely because, for lack of a sayable cause, it is essentially unjustifiable.

To remedy the uncertainties linked to intuition, science thinks it has the two complementary pillars of experience and reason, the first supposed to explore the horizon to reveal new meaning, the second supposed to eliminate the internal paradoxes of meaning.

The fact is that the evidence of intuition does not always resist being challenged by experience, reason or inter-subjective exchange.

Nevertheless intuition, reason and experience are only categories of knowledge.

What appears to us is on this side of the horizon of meaning: the side of objects in space and time. What founds the possibility of it is on the other side of this horizon.

On this other side, probability is substance, but in the absence of time, nothing is due to chance. Because they are timeless, the conditions of possibility of our existence and a fortiori the conditions of the idoneity of our representations owe nothing to chance.

In the terminology of the OK "To Exist" means "to have meaning over time for the knowing subject" and the subject's own existence means "I will still have meaning for myself".

Existence and the conditions of Existence, the sayable and the unsayable, are part of the same reality.

Our representations are idoneous before emerging from the unsayable, out of necessity, and the intuition-reason-experience trilogy, despite the corrections it imposes on us, subsumed as it is by this necessity, does not direct us towards a hypothetical knowledge of the true and the real. We could just say that by successive cuts this trilogy allows us to expose a bit further the roots of meaning, knowing that these roots are infinitely extensive and complex.

#### Autonomy of representations:

There is not, as Gonsseth asserts, the world of abstract ideas and the physical world but two categories of experiences by the subject: these experiences correspond to two categories of representation: the physical world and conscious thought, but both are nevertheless of the same logical nature.

The question then arises: "What is the autonomy of our representations, that is to say of the extensional part of our knowledge (structured by its formal categories and its norms), in relation to its intensional part? Why can our mind reason about Facts of knowledge without being compelled to always re-found them (which would be impossible since they are unfounded)?"

“How to understand the persistent idoneity of our representations? »

The answer given by the OK is based on the necessity of individuation and its corollary the general axiom of Existence of which we could give two more mathematical expressions:

- Knowing that "I am", the probability of "I will be" is infinitely close to one.
- In the chaos of logical interdependencies, the present and unified meaning of my representation is the initial condition which necessarily leads to the attractor which is the future unified meaning of my representation.

This necessity is not "simple necessity" but "judgment of necessity" (ref OK) in that, if my Individuation is globally necessary, its fulfillment appears to me to be divided into individuated contingent logical paths (because Individuation is a necessity « at any scale »). These paths are again divided into contingent attractor paths etc ...

One would be tempted to say that the initial condition which is the present meaning of my representation determines the law of probability of such or such attractor paths. But the logical priority of the axiom of existence makes us say on the contrary that *the meaning of my present representation is the law of probability on the contingent paths which lead to my necessary Individuation.*

My Individuation is not generated by an extraordinary multitude of contingent paths which would diverge and converge according to *a priori* laws, but it is first of all a global necessity within which contingent paths separate and merge in a balance always constrained to converge asymptotically towards the "I will be".

Thus, representation has its own dynamic and evolves according to its own law.

These necessities are only logic and probabilities and transcend understanding, reason or spirit. Spirit and matter are only categories of representation.

There is nothing téléological in this : time is not a prerequisite for the realization of the necessities because in their proper, intensional reality, the necessities are timeless.

Time is, for the subject and him alone, like the act by which his own meaning happens, the transaction from the intensional to the extensional.

My Individuation and the contingent paths it takes are not universal truths. They are the meaning of my own existence which is valid only for me, they are me and my representation of the world.

Life is a logical necessity before being a biological build-up. Life is not the state of some-things but a necessary becoming-oneself.

The meaning of an Existing thing is therefore not the state of something but a **judgment of necessity** (see the definition in ref OK) on its becoming itself.

The refs OdC and PLOC show that the identification of meaning with a law of probability on the contingent modes of self-becoming "animates" meaning. The time of the subject is born with meaning.

Though not founded on "things opposite", the autonomy of our representations is based on judgements of necessity of attractors-paths towards our Individuation.

The judgments of necessity are the present premises, probabilities, they have nothing to do with understanding, belief or whatever psychological, they are logical before being thinkable.

The concepts which designate objects, predicates, categories, laws, principles etc ... whether they belong to the intuitive, ideal or axiomatic spheres, are strictly the Transaction which reduces the inexpressible complexity of the intensional into One logical Fact : a mathematical expectation.

The conditions of possibility form a chaos of such extraordinary complexity that the statistical necessities that emerge from this chaos have almost the resilience of immutable laws. And still the axiom of Existence is the general statistical law which is imposed on the conditions of possibility.

The hiatuses that occur are "absorbed" by the subject's perspective without calling into question his Individuation (except the very last time, ...) (ref OdC or MOND).

This explains the persistent idoneity of judgments of necessity.

Thus, the judgment can "hide" its intensional part and thereby make itself thinkable. By hiding its intensional part, the concept takes on an apparent autonomy which allows it to be considered as a thing in itself.

The same process gives an apparent autonomy to the ideal sphere from the intuitive sphere, allowing us, for example, to think of the ideal number "two" rather than "the set of all that is intuitively two" or to think of the ideal concept of "beautiful" rather than "anything that is intuitively beautiful".

Neglecting the intensional part of judgments conceals the fact that they actually emerge from our overall capacity to perceive, from the set of conditions of possibility of our representation. We then designate the object, attach predicates to it and believe to generate a representation of the world by synthesis starting from the object as given, whereas in reality, as we have just seen, our representation emerges, by separation, from the general necessity of our Individuation.

Having designated the objects, we designate "relations" between the objects, when in reality the interdependence of the whole logically precedes the emergence of the meaning of the parts. Relationships are sort of the residual meaning after objects have appeared to us by separation.

This explains the reversion of intelligibility: We believe the world to be intelligible when in reality it is **our becoming that gives itself meaning**.

To come back to Gonsseth, we see of global Interdependence only the speakable part which appears to us as a flow, directed from the object to the subject and conceals from us, under the concept of "conditions of possibility", all what the necessity of the « I » (of the subject) imposes in the direction of the objects of first-order sensibility and logics. The speakable only lets us see what is generic and conceals from us what is general.

The divergences between Gonseth's vision and the OK are therefore important:

- 1) For Gonseth, there is a reality opposite of which the subject gets "effective" intuitions from which the understanding updates its representation. According to the OK, the subject's intuitions are the laws of probability which emerge from a present representation (ie from a mode of order) and determine the contingent logical paths towards the actualization of this representation. The effectiveness of intuitions is imposed by the general axiom of Existence which imposes on the subject his individuation.
- 2) For Gonseth, reality and thought would be "carried along" by a time "prior" to meaning, whereas according to the OK time is specific to the subject and emerges with meaning.
- 3) Gonseth, like many others, leaves it to the mind to formalize logic but abandons the mind to the mysterious shadow of the psychic. The OK states the logical nature of all reality and outlines the general principles of a logical transcendent nature of the mind.

The general axiom of Existence, which we can (thanks to Descartes) conceive as the first axiom of logic and which imposes the absolute truth "I am" on any logical proposition which could appear to my mind, is imposed thus in filigree at the two other levels: to the germination of intuitive knowledge as to their schematization in ideal perspectives.

It is therefore "under jurisdiction of the axiom of Existence" that the exchanges between pragmatic instantiation, intuitive notion, ideal scheme and logical theory take place. It is through and in my becoming that the world appears to me.

A real time confrontation of our immediate sensations with the billions of categorial judgments necessary for their interpretation seems practically impossible, but this impossibility is not only due to the quantity of judgments that must be made present, it is also essential: categories from our perspective such as "all things One" or "all living beings", as well as the ideal concepts that one attaches to them, are not "things", "names" or "file addresses" but Judgments of necessity : probabilities close to 1, and for that are timeless and not carried along with the subject's present.

A probability is neither present nor past nor future, only the agent's experience of it is in the agent's time. This is implied by the notion of ergodicity: a probability resulting from logical (timeless) laws will be verified by a set of (temporal) experiences.

The temporality of the experiences does not affect *a priori* the timeless logical reality object of the probability, however, this probability only comes to Exist as such for the agent through the experience and in the time of the agent.

The experiment prepared and performed by the agent is a sophisticated form of Judgment of necessity.

The relation between the timelessness of the logical meta-substance and the temporality of the representation is also the relation between the transcendental subject and the knowing subject. The first is a logical meta-substance, it is a mode of timeless order, while the second is a wave of meaning that runs through the first.

If the meaning that the knowing subject carries is "animated", it is above all because the timeless meta-substance has not the nature of formless matter but that of a un-founded interdependence. It is not made up of singular interdependent "things" but of interdependence which singularizes itself in the form of attractors. The formal Existence (meaning) of an attractor is in its possibility of attracting the meaning of other attractors. It is not a state but an Act.

By definition, the categories on which our consciousness builds precedes consciousness. It is the categorial judgments which impose which objects, which predicates appear to my intuition in my present.

The present moment and therefore the flow of time are constructed together with the meaning, by the Transaction of the intensional (timeless) towards the extensional (temporal).

*For the psychiatrist the patient's unconscious is thinkable and its representation fits in the practitioner's time. In truth for the practitioner, the unconscious is already a category of representation.*

*For an ontologist, on the contrary, the intensional : what is beyond the horizon of meaning, is in principle unthinkable and out of time. The OK is a modest attempt to overcome this difficulty.*

#### Mathematics idealize the laws of meaning.

Mathematics "are worthy by themselves", insofar as they identify their foundations, and cannot be called into question "for themselves" by an ontology. However, despite the rigor of their construction, they cannot be freed of the laws of representation that transcend their very foundations.

To the question "why do mathematics allow to represent the world so accurately" it would be wise to substitute this one "if the mathematical laws, which are meaning, appear to us so persistent, so universal, so coherent, to the point of reproducing the laws of the world, do we need the reality of the laws of the world? Wouldn't the transcendental laws of meaning be enough? »

At ordinary scales, the representation of the world constructed by common sense or science is idoneous by nature and not because of the epistemic precautions we have taken to construct it. Confronting by experience the laws of the world represented by science with "reality" does not validate more than their idoneity. Indeed: by experimental proof, only the laws of representation are proven persistent/consistent because what science accurately predicts and verifies are the representational facts of the world and not the facts of the world.

Moreover, it is an illusion to believe that the formal rigor of an extensional logic can free us from the uncertainties relating to being. If being is unfounded, the logical relation of one being to another will be unfounded. If the Existence of being (including mathematical being) is a judgment, the logical relation between Existents can only be a judgment.

Mathematical laws, alike the laws of the world, are produced by the laws of meaning.

According to the OK, mathematics is not created by the knowing subject. The knowing subject does not create the One concept, the One thing as idealities. We must think of a mathematics where the principle of Individuation brings out the transcendental subject and all the things One that fulfill the meaning of a knowing subject.

The knowing subject is the Act of emergence of meaning by separation of the transcendental subject. The knowing subject is, in essence, an act, a becoming that takes on meaning by separating a "Becoming-itself" into interdependent singular becomings.

The knowing subject is incommensurable with the transcendental subject and mathematics according to the OK must comprehend the logic which constrains objects and laws to take on a sayable meaning, that is to say to Exist for the knowing subject.

What law of meaning makes the objects of thought sayable and therefore countable to the point that even so-called innumerable "objects" can Exist in us as a sayable and therefore countable concept?

#### The intuition of the One

Arithmetic grew out of the concept of a perfect One. However, the purely One logical Fact would not make sense.

If the One is a Fact of Knowledge, unfounded, then what is arithmetic? What is a

Mathematical Fact?

This question not only relates to the approximate relation between logical objects and objects of the world but to the formal possibility of the construction of an arithmetic: the OK shows that the aesthetic intuition of the One is a singularity in the unfounded logical system that is the transcendental subject.

The properties of the concept of One, as it can have meaning in the subject, then do not support the founding axioms of arithmetic, for example:

- two Existents are never disjoint,
- an infinite number of Existents is in itself unthinkable. Only One concept of it can be thought of.
- the transcendental subject, a necessary condition for the concept of One, cannot be elided from a theory.

"Classical" arithmetic is therefore not only an approximate representation "of the world", but an approximation of any possible meaning.

To say that the One and the laws of arithmetic are a creation of the mind will be of little use until the laws of this creation are brought to light. It is in the transcendental subject, beyond the spirit of the subject and all idealism that the One must be thought, without however returning to a "One form" in itself.

It will therefore not be a question of analyzing the modes of thought of a knowing subject "overhanging" but of understanding how, in the transcendental subject, One attractors are statistically probable.

The One form of the mathematical fact, just like that of the object, emerges by separation from the becoming of the knowing subject. Just as the thought "I Exist" is only the sayable projection of an unspeakable "All what becomes I", the proposition "A exists" is only the sayable projection of an unspeakable "All what becomes A" in the subject. The mathematical fact therefore necessarily has a dimension of Existence: that of its becoming which participates in fulfilling the becoming of the subject.

Since the individuation of the logical fact is in the subject, its dimension is in the subject.

But the logical Fact is not an object, its Existence is a judgment of necessity: the contingent logical paths which would possibly fill the path from one experience of the Fact to another are possibly contradictory. It means that the dimension of Existence of the logical Fact, the "line" which connects the thought experiences of the Fact is not more grounded than the Fact itself. If by experience the subject would separate the Existence of a Fact into its logical ways of fulfillment, this separation would require other dimensions. This proliferation of dimensions is however forced to "merge" into the dimension of individuation they fulfill.

It would then be necessary to understand how logic is structured by separation of one-dimensional facts. Could we bring out the logical, statistical laws that regulate the separation of a necessity, produce meaning and animate the representation; the laws of a multiplicity constrained by its Individuation in the subject?

Could we from these laws build a logic, a mathematics, a representation, separative and no longer constructive?

From what level of complexity, of depth, does the "separative" multiplicity join the usual "constructive" "synthetic" representation that we have formalized through mathematics? Can we determine if the 3+1D multiplicity of our representation of the world is a genuine necessity, an asymptotic necessity, a contingent solution to the creation of meaning?

### The impossible logical or geometrical infinity

Mathematics, arithmetic and geometry think of freeing themselves from the intensional reality of their objects by the application of formal logic: By establishing a list of ideal concepts of objects, logical relations and formal syntactic rules one can in principle construct a formally provable representation.

From the example of the One above we understand that this is illusion: The concepts of objects and relations are not the idealization by the mind of facts other than it. Aesthetic intuition is already Knowledge of the subject. Spirit and aesthetic intuition are only categories of representation of knowledge, their realities as conditions of possibility are indistinct.

There is only one reality. The spirit and the facts of the world are one reality.

The reality underlying the mind is inseparable from the reality underlying the facts it represents.

By idealizing objects and relations, the mind idealizes itself and in particular idealizes its own modes of functioning.

The question then is not the isomorphic relationship between the models of science and an opposite reality, it is not whether space is "in reality" flat or curved as our models suggest.

Nor is the question that of the existence in reality of the mathematical fact.

We are here questioning the conditions of possibility of the formal constructions of our mind "given" its transcendental reality.

*Note: Despite its great utility, modal logic is a failed attempt in this regard. The subject taken into account by modal logic is not the transcendental subject.*

At best we will admit that our mind is limited in its cardinality.

We admit that the number of water molecules in the ocean is limited, we admit that our ability to think of a number of water drops is limited, but we persist in thinking meaning as synthetic. For example, we believe in the concept of recurrent reasoning: in the theoretical possibility of always thinking of a successor to the number or of always extending a straight line, even if only by the mind.

But our Knowledge takes meaning by putting in order, by separation and not by addition.

The Whole of our representation is itself a singularity of null entropy, logically closed on itself, from which only emerges the judgment of necessity of its own united existence.

Since formal logic, its objects, its laws and its syntax are constructions of our mind, which is logically "contained" in our representation, itself subsumed by the necessity of our existence, how the infinite recurrence of laws applied to logical objects would it be possible?

How then to define a line or two parallel lines?

If the fact of knowledge results from a judgment of necessity, if it has a probability infinitely close to 1, the infinite succession of judgments of necessity does not have the properties that we give to recurrence: Since they are united in our Knowledge, the facts of Knowledge are never strictly disjoint and their probabilities do not add perfectly. So much so that if, by schema, we define the Whole of the representation of the subject as the "or" (the addition) of all the Facts existing for him, the conjugation of all the probabilities induced by the meaning of these facts could not exceed the certitude of the existence of the subject.

Let us not be deceived by this statement: « the "I am" is the subsumption of all the Facts of my knowledge », for the individuation of the subject is the primary necessity in which Fact must necessarily be inscribed as contingent singular paths.

### The axiom of Existence and non-contradiction:

Posing the general axiom of Existence as the first axiom of logic obviously calls into question the principle of non-contradiction:

*-The principle of non-contradiction postulates the disjunction between  $F$  and  $\neg F$*

The OK states that:

Individuation is, in its principle, a necessity.

The individuation of any subject is one of the contingent solutions of this necessity.

But for a subject, his own individuation is a necessity. "I will be" is necessary for the subject.

Contrary to what QBism states, this necessity is neither a certitude, nor a belief, nor a bet issued by the subject's conscience on what must happen or what he must experiment. The necessity of the "I will be" transcends (logically precedes) the consciousness of the subject.

This necessity imposes the general axiom of Existence on the emergence of meaning.

What Exists for the subject is what has meaning for the subject.

By definition, what has meaning for the subject is necessary for the I

It follows that if A exists-for-the-subject then  $(I \rightarrow A)$  and  $\neg A$  is nonsense because:

$(I \rightarrow A) \rightarrow (\neg A \rightarrow \neg I)$  which is impossible.

Which is in line with the Kantian principle of "in mundo non datur hiatus":

*Nothing can fall into experience which proves a vacuum, or which only permits it as part of the empirical synthesis. (Kant CRP Postulates of Empirical Thought)*

Neither in the world nor in your mind will you experience present non-existence: a non-horse or a horse that is non-black, but only horses of other colors.

For what Exists, non-contradiction is useless since there can be no non-Existing in our representations.

In a more general philosophy, this leads us to the Spinozist reflection:

*The non-Existence of the subject is nonsense. The idea of my own death is necessarily supplanted by the primary axiom of my Existence. For me, there can only be "another being dead". In this sense, my soul is immortal.*

The thought of F. Gonseth is thus completed since we show that our representations are idoneous by necessity, the absence of unresolved hiatus being ensured by the axiom of Existence.

It is quite otherwise with what is Actual:

Knowing what Exists-for-the-subject, the necessity of the I takes contingent paths which are possible and therefore Actual (NB: not subject to time because time emerges with meaning).

*A contingent being is a being that does not necessarily exist, that may not exist, that is of itself indifferent to existence. — (Roger Verneaux, General Epistemology or Critique of Knowledge, Beauchesne Editions, 1965, p. 167)*

These contingent paths to the necessity of the "I" and their law of probability distribution are the reality of the meaning of what Exists.

Let's take an example :

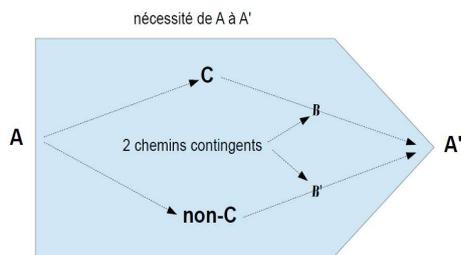


fig 1

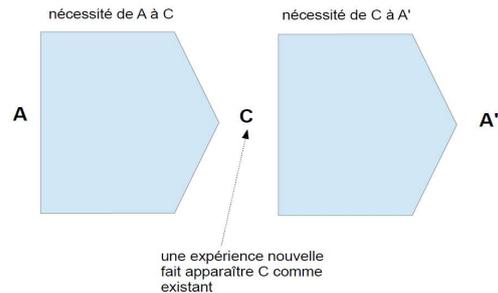


fig 2

Let the Existing A and A 'steps of the same necessary path (fig. 1). Saying that different logical paths (eg B and B') are possible between A and A', means that knowing A, there is at least one possible C such that  $B \rightarrow C$  and  $B' \rightarrow \neg C$ .

Note that C and  $\neg C$  as well as B and B' are Actual but not Existing-for-the-subject.

The Actuality of C and  $\neg C$  therefore does not call into question the Existence of either A or A'.

The Actuality of C and  $\neg C$  is therefore not an incompatible hiatus in the Individuation of the subject.

The principle of non-contradiction therefore does not apply to what is Actual, to what is only possible.

*The photon of Young's experiment can pass through the right slit (event C) as well as the left slit (event  $\neg C$ )*

On the other hand, if a device (fig. 2), Existing in the representations in A or in A', allows, by a cut, to make C emerge as Existing, that is to say necessary, then the perspectives in A as in A' are no longer compatible with  $\neg C$  and therefore with B'.

If B comes to Exist then B' cannot Exist.

*If the agent knows that the photon has passed through the right slit then the passage through the left slit becomes nonsense.*

Note that the experimental set-up does not notice C but lets it emerge as one of the solutions whose representation in A contained the probability.

C is not a Fact which would or would not occur in absolute physical truth, C is only one of the solutions made possible, Actual, given the perspective of the subject in A. Likewise, C is only one of the solutions made possible given the perspective of the subject in A'.

The experience in C does not change a reality  $A \rightarrow A'$  but changes the subject's perspective, the conditions of possibility of his representation.

It follows that C is not in an absolute time between T(A) and T(A'): only the experience which makes C emerge causes it to emerge in a time T(C) between the represented times T(A) and T(A').

If we can admit with difficulty that the detecting apparatus included in experiment A makes path B' impossible, we would admit with extreme difficulty that the detecting apparatus included in experiment A' makes the existence of path B' impossible.

*Our difficulty in conceiving this form of retroactive causality is due to the fact that we wrongly consider the existence of the physical world and of time as logically prior to our consciousness and therefore to the meaning we give them. We do not understand that Existence is a form and that beyond the horizon of meaning, the (intensional)*

*reality of the Existent is subject neither to time nor to non-contradiction.*

If the non-contradiction applies to the Existing-for-the-subject, it does not apply to what is only Actual.

As Brouwer wrote in 1948: "*there is no truth without an experience of truth*".

Now, meaning appears to the subject through the Transaction from the Actual (possible) to the Existing (necessary).

Beyond the horizon of meaning, in the intensional domain, contradictions are possible.

On this side of the horizon of meaning, in the extensional domain, contradictions do not Exist.

The meaning appears to the subject by resolution of the Actual contradictions.

One should therefore not say "The Existing is non-contradictory" but "The Existing is (for the subject) **the** non-contradictory".

### **The intuition of time**

An analysis of the intuition of time may seem irrelevant in a discourse on logic and geometry. Nevertheless the inclusion of the subject imposes on us a "macroscopic" time aligned with the Existence of the subject which separates into an infinite structure of "microscopic" times, unitary vectors of mathematical expectations carrying meaning.

The structure of the microscopic times is constrained by the necessity of the Individuation to merge into the macroscopic time.

Kant stated (ref CRP p.292):

*We must be able to grasp time as a form of internal meaning by representing it with a line and internal change by tracing this line (movement)(Editor's note: the act), as well as, consequently, [Editor's note: in figuring.]our own successive existence in its different states by an external intuition; the specific reason for which is that every change presupposes something permanent in the intuition, if only to be itself perceived as a change, but that there is absolutely no permanent intuition in the internal sense.*

For OK this declaration is unjustified in that existence is not a succession of states of existence. Existence is not the state of something. To Exist is meaning, including the Existence of the subject for himself. To Exist for the subject is to have meaning for himself. Meaning does not state "what is" externally or internally but what is made possible by what Exists for the subject. Meaning is not a state but a structure of mathematical expectations.

This relationship between the Existing and what it makes possible is transcendental. Certainly the mind of the subject can experience in thought the relation between <snow> (as existing) and <cold> (as possible), but this sayable relation is only a cut, an emergence out of of the unspeakable according to a judgment of necessity (which transcends, ie logically precedes the spirit, according to the definition of the OK).

In a way, the Existing <snow> is the label of a set of vectors (the possibles) fitted with a law of probability. All these possibles are among the attractors of meaning that determine the multiplicity of the subject.

By its nature as a judgment of necessity, by the "existential" relationship between present meaning and meaning to come, meaning ceaselessly escapes the present of the Existent.

Meaning is nothing other than the meta-substance of which it is the meaning. This meta-substance is interdependence and offers, *by itself*, no point of support for meaning. In the words of Gilles Deleuze in "The Logic of Meaning", this meta substance is:

*a pure becoming without measure, a real crazy becoming that never stops...always dodging the present, making the future and the past coincide...*

The essence of time is in the very nature of meaning: the intensional reality from which the meaning of the present moment emerges contains the mathematical expectation of other experiences that will irreversibly augment the Existing and so on.

Meaning is nothing but a promise of meaning.

The <present> is (extensional) meaning but the (intensional) reality of what has present meaning does not belong to the present moment.

The meaning of "I am" is not in a real present state of the I (which would be absurd since I is not One in reality) but in the fact that the experience of the I makes one almost certain (of a probability infinitely close to 1) the experience of the I.

What is "in reality" the meaning of the Existent, its intensional reality, being groundless, is only accessible through mathematical expectations.

One could dare to say that the vectors that carry these expectations (the possible meanings) are properly speaking the imaginary part (in the mathematical sense) of Existence whose vector is time.

At the level of the knowing subject, it means that: if the 'time' vector carries the necessity of the becoming of the subject (of I "knowing" I), the 'meaning' vectors which carry the expectations of all possibilities, all the possible paths from I to I, are the imaginary part of its becoming.

Since the becoming of the subject is nothing other than the subsumption of all the possible paths of its fulfillment.

### **The meaning of the world is the imaginary part of the becoming of the subject.**

This probabilistic relationship between Existence and Meaning (like the relationship between magnetic field and electric field) carried by different vectors is literally the dynamic relationship of a wave of meaning.

Existence is therefore a change of meaning, without reference to an external intuition of time.

Note: The Kantian proposition <that there is in the internal sense absolutely no permanent intuition> is not justified on this basis. On the contrary, what Kant designates as the internal sense has as its first axiom the transcendental permanence of "I become myself".

On a philosophical level, we can say that Existence is the necessity of the One, while meaning is the power of the multiple.

### **For the knowing subject, to give meaning is becoming.**

### **The world, his body and spirit are the meaning of his becoming.**

The article "Philosophy of language and OK" (ref PLOC) shows that the Transaction\* carries the Meaning of a present moment of the Fact of Knowledge towards a Becoming underpinned by its individuation.

*\*The term « transaction » is used here in reference to the concept of « transduction » used by G. Simondon in many of his writings (ref ILFI, IPC). The concepts are indeed very close and associated with concepts of individuation that are themselves close. The transduction is precisely defined by G. Simondon and the concept enjoys a large publicity. I preferred to use another term, on the one hand because the confusion of the concepts would harm a good understanding of the OK and on the other hand because the radical « act » in « transaction » seems to me to be better suited to what goes through the Act. Moreover, the OK shows that the Meaning is revealed by the appearance of quantified Facts. The term « quantum of action » is then perfectly suited to the description of these facts in the context of physics.*

The « wave » that carries the present Meaning is also the horizon of representation.

At the most naive level of description of conscious thought, it is already evident that the set of physical facts which constitute the representation of the "present of the world" cannot be contained "in reality" simultaneously, in the present of the world. Since Einstein, we can say that the simultaneity of these physical facts is a meaningless concept.

The "possibilist" temptation is then great to situate these facts in a "past of the world" so as to give a little time for the representation to unify them.

If it is obvious that such reasoning does not answer the question of the unity of consciousness at the present moment, it is equally obvious that this reasoning is circular since the "past of the world" is what consciousness represents itself as its past.

It is inconsistent to force the transcendental subject \* to reside in the time conceived by the knowing subject.

\* Attention: The transcendent subject is the Knowledge, not the matter of the brain, even extended to the eyes, ears, skin or the whole body. It is not the Freudian unconscious which is only a category conceived by the consciousness of the practitioners. We cannot establish a limit *a priori* between thought and the world. Transcendental subject is the whole network of interdependencies, condition of possibility of my thought/subject. We could compare it to the causal activity of Schopenhauer, provided that we take into account his remarks on causality.

In-act thought or Transcendental subject is neither in the present of consciousness nor in its past. The In-act of Knowledge, which is real beyond the horizon of Meaning, is not in the time of the represented world.

The In-act of consciousness is not in conscious time.

What is understood is not in the time of what understands. (see annex V)

The same demonstration applies to the Facts of Knowledge. The horizon that delimits the Fact bears an Existence vector, subsumption of the vectors carrying the present meaning of the Fact. Meaning is the "imaginary" part of the Existence of the Fact.

However, the intensional reality of the Fact, is neither "in" a present of meaning, nor in a present of the Fact.

If Meaning seems to belong to a present instant of the Fact, it is indeed the revelation of Meaning which is essentially identified with the Act of becoming, according to the principle of Anima (ref OdC and PLOC).

The relevance of the qualifier "imaginary" is above all due to the immeasurable relationship between the In-act of the Fact (its Reality) and the Act by which its Meaning is revealed.

What is revealed as Fact supersedes a limitless, unfounded "reality". Concepts of meaning *a priori* in the N-dimensional present moment of the subject's multiplicity are the "image" of an infinite-dimensional reality.

Note that we are talking here about representation, that is to say about possible experiences and not about a universal reality.

The present meaning (of the Existing) contains the necessity of change and the possible changes of meaning are subsumed in a time vector. Because it is diverse, because it "contains" change of meaning, present meaning also "contains" times.

The intuition of time according to the OK reveals implicitly the Newtonian and relativist intuitions of time. The former considers a strict orthogonality of space (the present meaning of the Universe) with respect to time, meaning and becoming are separated. The latter considers a relation between space and time, defined by a tensor.

This relativistic formalism implicitly takes into account an interdependence between (present) meaning and becoming. Beyond a community of nature, the interdependence between

meaning and becoming reveals that lived time (which is a fact of knowledge) is not an "additional" dimension to the dimensions of meaning (of space) but their subsumption: the vector transaction from "I am" to "I will be" (or from "I was" to "I am") that marks Existence is the (probabilistic) subsumption of the (state) vectors that mark the meaning of "what I am".

The reasoning is indeed very simple: considering the world no longer as "an opposite object" but as a "fact of representation" by the subject, time is no longer the impassive "place" of change but conversely, the "I become myself" imposes itself as a primary necessity and the meaning of the "I am" is, strictly speaking, all the possible imaginary separations of this becoming: the meaning is the con-substantial fulfillment of becoming.

**Meaning is the imaginary substance of becoming.**

**The (present) meaning of my Knowledge represents the possibility of my future.**

**To know is to become what one knows.**

### Intuition of space.

*Before getting to the heart of this matter, a detour through appendix I (separation / homothety) will show the reader how the intuition of space can come into conflict with the logical rigor of recurring reasoning though both are imposed on our reason with the same force.*

The inclusion of the subject as revealed the dimension of Existence of the logical Facts which makes it possible to associate logical structure with multidimensional spatial structure.

It makes it possible to reconcile logic and geometry and more generally to understand the multidimensional structure of meaning.

It makes it possible to understand on the one hand: the unity of nature of the subject's time and of the other dimensions of its representation and on the other hand: the specificity of the macroscopic time of the subject, but it does not simply make it possible to justify the 4 dimensions of the space-time of our representations.

### Spatial intuition is an aesthetic intuition.

The objective is to show that spatial intuition is not different, in its essence, from other aesthetic intuitions.

Spatial intuition is relative to the extent, to the forms, to the figures, to the displacements, it is this which presides over the genesis and development of elementary geometry.

The existence of spatial intuition cannot be doubted: All our gestures testify to it, all our thoughts depend on a natural faculty by which we see and imagine space and all the forms that occupy it.

Spatial intuition participates in aesthetic intuition in the first sense of the aesthetic term: that of the condition of possibility of meaning. It is aesthetic intuition in general which makes possible the logical Transactions by which the unrepresentable reality presents itself to us, not according to an unprovable isomorphism but by morphogenesis.

As a condition of possibility and by its logical essence, intuition transcends meaning.

Aristotle called artistic intuition the "formal cause" of the artwork.

It would be inappropriate to call aesthetic intuition the "formal cause" of sensation because it does not have the properties of a cause. Indeed, if intuition produces meaning, it is itself unspeakable, then there is no "something" that produces "something else".

On the other hand, the meaning of space-time, produced by intuition, is on the speakable side of the horizon of meaning while intuition, as a condition-of-possibility, is on the unsayable side. In this sense, intuition does not precede meaning. The principle of causality cannot be

applied to intuition.

We could just say, seen from this side of meaning, that aesthetic intuition is a principle by which meaning "occurs" and occurs as itself.

To think that aesthetic intuition is differentiated a priori into intuition of space, color, danger, etc., like a set of sensors each presenting their signal to the adequate entrance of the understanding is an illusion. Facts-of-sensation emerge from the global perspective of the subject. The intuition/understanding distinction only has value on this side of the horizon of meaning. We'll come back to this point.

The *a priori* doctrine of a possible intuition-evidence: knowledge of the true and the real without intermediary and without appeal is to be rejected because it is at best unprovable.

Now Euclidean axiomatics is under the regime of intuition-evidence and since its axioms are strictly speaking the foundations of a theory, we can say that geometric theory is based on intuition-evidence.

If Euclidean evidence was able to resist for so long, it was clearly because of the practical impossibility in which we found ourselves to produce a contradictory experience.

Although the famous axiom of parallels was disputed as soon as it was stated by Euclid, many are those who attribute to non-Euclidean geometries the first effective questioning of Euclidean evidence.

However, non-Euclidean geometries are based on a partial replacement of geometric evidence by logical evidence and I doubt that in this they cross the horizon of meaning. (see the article "from logic to existing" (ref Logex))

#### The intuition of the location :

With his well-known: "*the movement is like nothing*", Galileo had already introduced a fatal bug into the Euclidean evidence.

The point is that if "the movement is like nothing", the change of location in itself is like nothing and "the location is like nothing"

What is a location if we cannot say that we are changing location and how we change location?

Certainly I can designate a tiny speck of dust in suspension as a « point » in the space of the cabin of Galileo's ship, or even of a spaceship. But since the cabin is not a place, on what basis could it be made the positional reference of the dust itself?

There is no "absolute" truth of the location.

One could object that the speck of dust remains fixed in its relation to the cabin ....

But no *a priori* relation between cabin and dust makes it possible to define a location in itself.

The relationship between locations (measure or sensation) does not designate locations in themselves.

The location only has an extensional meaning, the location is a logical fact.

Galileo's proposition, by its direct implications compels us to rethink the idea of position: The position of dust is not absolute in all space, nor is it *per se* relative to the cabin.

The position of the dust does not exist, only the (extensional) meaning of the position exists and it exists for the subject.

It is his relationship to the cabin and the dust that gives the subject, for him alone, a legitimate sense of where the dust is.

The position is a form, the only existence of the position is semantic in the knowing subject.

Semantics does not mean illusory: It is indeed logical reality that makes possible the meaning of position, but this reality is beyond the horizon of meaning.

One could object that the position is a reality and that "dust would float just as well without a subject in the cabin!".

To shake this conviction, let's take the simple example of color:

*We will readily agree that this vase there, on the mantelpiece, is red "in reality".*

*And yet it is only red in our representation.*

*Do you think that part of your brain, or the optic nerve, or the back of your eye, or the air between the object and you, or the iron oxide molecules in the enamel, or the photons that bounce are red?*

*Do you think there is something somewhere that is actually "the color red"?*

*No, of course.*

*Color is a Fact of knowledge and it comes to exist in us through its conditions of possibility.*

*By seeing, we create the meaning of "something that we see" but we neglect "that which causes us to see", not out of negligence but out of necessity.*

*If now we consider the conditions of possibility of the meaning of "red", without prejudging the "here" and the "now", the "me" and the "world", only then do we glimpse the extraordinary complexity, the unfathomable depth of the conditions of possibility of meaning.*

*We understand that the meaning of "red" is nothing other than its conditions of possibility, that it is a mode of order and that this mode of order emerges from the way in which the reality globally determines the knowing subject. .*

*This ordering is a purely logical fact and does not change the reality.*

*Let us also note that, contrary to the analysis made by Kant, Maine de Biran and many others after them, the conditions of possibility of meaning are not psychological or cultural, they do not reside "in the mind" of the knowing subject, because the mind is already a category of signification which emerges from its conditions of possibility and not the other way round.*

It is with the position of the dust in the cabin as with the color of the vase: the position of the point is a Fact of knowledge and this one comes to exist in us by its conditions of possibility.

If, moved by a « desire of realism », we think that the laws of the world have proved their robustness while the laws of meaning are some kind of uncertain software, we must reconsider our opinion: the laws of meaning, in the framework outlined above, are just as robust as the laws of the world. (see ref OdC ) The laws of the world operate in a 4-dimensional multiplicity while the laws of meaning extend their logical and probabilistic roots into an unspeakable, groundless, infinitely complex network of interdependencies.

The laws of the world, whether empirical, ideal or formal, represent in the sayable mode, in the multiplicity of the knowing subject, the residual interdependencies, after all "objects" have taken Existence for him.

Understand that the meaning at time T + 1 is far more rigidly linked to the meaning at time T than the physical « realities » it represents.

Einstein and Infeld wrote: *Physical concepts are free creations of the human spirit and are not, as one might think, solely determined by the outside world.* (Albert Einstein and Leopold Infeld: The Evolution of Ideas in Physics).

One can indeed say that the idealization as formal concepts of formal sensations, is "free creation" of the human spirit.

Nevertheless, neither the aesthetic intuition which ordains the logical substance in packets (which we call sensations) which the spirit takes possession of, nor the logical principle which gives the spirit its power, its will and finally the freedom to create, none of this can be called free, or even conscious, or even speakable.

The idea that the conditions of possibility of aesthetic intuition and of the spirit itself are

circumscribed "within" the spirit or "within" the human being in its spatio-temporal extension is paradoxical. However, they participate in the Knowledge of the subject (as per OK's meaning) ie. the set of interdependencies which determine the subject as Individuation. With all due respect to Mr. Russell, there is no evidence that the sensations produced by aesthetic intuition are isomorphic to reality.

The "spirit" Einstein and Infeld tell us about operates on this side of the horizon of meaning, but the subject's spirit is not "a part" of the subject. The spirit of the subject, in so far as he identifies himself as existing, is nothing else than the speakable form of the Knowledge of the subject, which extends far beyond the horizon and the categories of meaning.

Thus, not only are the ideal concepts of point, space and time creations of the human spirit, but the instanciated geometric intuitions that are *this* point, *this* space or *this* instant, also emerge, having form, from the Knowledge of the subject.

Thus, without a knowing subject there is no point, no space, no time.

The knowing subject is a necessary condition for the shape of the world and this truth must be taken into account by all sciences, in particular by the theories of relativity and quantum.

So let's repeat:

The location is a form, the only existence of the position is semantic in the knowing subject.

What is true of the location is true of the relations between locations:

Einstein showed us that without an interaction between two facts, their temporal relationship was meaningless. He also made us understand that without interaction between two facts their spatial relationship did not make more sense.

The OK reinforces this with the proposals:

**The location is not an object of the world but a Fact of knowledge**  
**The spatio-temporal relation is not a fact of the world but a Fact of knowledge.**

Note that these conclusions must also modify the representation of ourselves, both as knowing subjects and as knowing Humanity: We must not say "*the world determines us and we represent it*" but "*we exist as and only as a representation of what determines us*"

The knowing subject is not "an other thing" than a representation, than a certain mode of ordaining reality.

It is in this spirit that we will try to analyze what a point in space is.

We will try to show how a geometry based on "Facts of knowledge" differs from a geometry based on "facts of the world"

The point's existence.

Euclid wrote: "*The point is that which has no part*".

But this definition separates, without justification, space and time because the only point of which Euclid can speak Exists as his thought Exists, ie persists in a (continuous) series of thought experiences. So we have to correct the Euclidean statement:

*"A point is a Fact of Knowledge whose subject does not represent any spatial part"*.

That is to say, the representation can "cut" the point only according to the single dimension of its Existence.

## Einstein's block universe, Determinism or Necessity:

Brief definition of the determined block universe according to Einstein:

-« *From a formal point of view Einstein pointed out that, for the theory of relativity, the (modified) time coordinate loses its specificity: it enters into the laws of nature in the same way as the space coordinates.*

*Einstein also seems to assert that for physical science, reality is no longer a three-dimensional spatial world that becomes, i.e. where changes occur, but a four-dimensional world without becoming. An immutable world therefore, where past, present and future are given as a whole. A world where succession is only an appearance. »*

*\* Note that Einstein speaks of physical science (die Physik) and not of physical reality. Joël Dolbeault: Einstein and the block-universe (Armand Colin "Revue d'histoire des sciences") 2018/1 Volume 71 | page 85*

- « *Motion is now represented as something that is, that exists in a two-dimensional space-time continuum, and not as something that changes in the one-dimensional space continuum. »*

*Albert Einstein and Leopold Infeld: The Evolution of Ideas in Physics (Flammarion, 1983)*

Thus, for lack of becoming, Einstein's block-universe is determined.

If the scientific formalisms of Einstein's block-universe are thinkable, the block-universe is unthinkable as an ontological reality because it is incompatible with the very modalities of consciousness: The being of conscious thought is present and becoming, but the being of the block-universe could neither be present nor in becoming. The block-universe exceeds our ability to conceptualize it.

As Einstein wrote, the time and space forms are free\* creations of the (human) mind, the block-universe form is therefore a free\* creation of the mind and this formal creation, constrained by the modalities of thought, cannot be isomorphic to the reality it claims to describe.

*\* Free in the sense that the experience is a confrontation between our lived experience of the world and our concepts. The practical idoneity of our representation in no way imposes the isomorphism of concepts with a "reality". Our representation is morphogenesis.*

In the "always-there" block universe, the existence of being (both particle and living being) is represented as an "always-there" line.

Thought, our thought, which imposes itself on us as a becoming, and therefore with it the representation of the universe, should be conceived as the "always already there" trace of a course in the block-universe.

It is to this seemingly irreducible hiatus that the OK proposes to provide a solution.

Einstein expressed his realistic beliefs which caused him to write:

*Physical reality is there like a four-dimensional carpet, where there is only "being" and no "becoming". What we call causality is nothing but the structural regularities of this rug.*

In Einstein's words the regularities would be those of a "4D substrate". They would have a reality, a form "in itself". And these forms in themselves would determine "from the outside" the outline of the existence of the subject and its representation.

The OK states that the possible paths are infinitely divergent and convergent, infinitely complex. The bifurcations and therefore the possible futures and pasts are infinite and indistinct. Even to the point that the block-universe has no form in itself, it is unspeakable,

each path having a probability close to impossible.

Nevertheless, as shown by the theory of dynamic systems, certain path modalities present singularities (attractors) whose probability is not negligible. Depending on the initial conditions, certain singular modalities may even appear as necessities.

These singularities, the attractors of a path, do not depend on the "substance" traversed but on the conditions which "rule" the path.

These singularities are necessities of the journey and not determinations of the world.

The subject is a mode of order in this chaos. The regularities experienced by him are singular modes of the motionless journey along the "threads" of interdependence.

It is therefore necessary to replace the notion of determinism (property of the universe-block) by that of necessity (specific to a modality of course).

The Subject is an instance of motionless journey, a mode of order, a necessity.

The singularities of his journey are proper to the subject, according to the logical laws that direct his journey and not according to the laws of the world. These are the Facts (objects) of his representation.

Contrary to determinism which makes the succession of states of the universe depend on a state  $t_0$ , according to modes of change determined by the universe, the principle of necessity makes the possible Facts for the Subject at his instant  $t_1$ , depend of a representation at his instant  $t_0$ , without prejudging intermediate truths.

The law of probability on possible Facts "knowing  $F_0$ " is the "transcendental" meaning of the Fact  $F_0$ , even before the meaning appears to the consciousness of the subject.

The principle of Relativity can then be expressed: "The laws of meaning are the same for every Subject. »

Unlike causal determination, the relation of necessity is not synthetic: the necessity (probability) of a Fact  $F_1$  "knowing"  $F_0$  logically precedes the succession of intermediate states which are, therefore, actually contingent.

*Note: In the block-universe, the precedence of necessity over its modes of fulfillment is obviously by no means a finalism.*

The paths that fulfill a necessity are contingent, which is why, although for the Subject to become "himself" is a necessity, he can define himself as free in his choices.

The persistent unity of the world is not a causally constructed property of the world. The unity of his representation by the subject is a necessity corollary of the unity of his Existence.

We still have to "imagine" under thinkable formalisms what reality transcends the subject, his thought and the block-universe of his representation.

### The point:

In the block-universe of relativity, the existence of the point is a line

Since the point is a Fact of Knowledge, the dimension of Existence of the fixed point for the subject is the dimension of Existence of the subject, ie his time.

The extreme simplicity of the representation of the point does not denote its simplicity "in reality" but judgments (in the OK sense), this simplicity owes to the fact that from a complex reality emerges a less complex mathematical expectation which is its meaning, until the meaning of a simple one-dimensional existence takes on.

*With the same logic, one could say that the extreme simplicity of the meaning of a traffic light owes to a structure of judgements, each of them replacing an extremely complex, unspeakable reality with a less complex one until it takes, for the subject, the speakable meaning of « one in a space of 3 possibles ».*

The instantiated fixed point P is not simple in reality but in representation.

In the multiplicity (as per Husserl's meaning (see Ref MOND)) of representation, the meaning of the existence of P lies in the relation:

$\Pr(P | P) = 1$  and  $\Pr(\{x,y,z\}_P | \{x,y,z\}_P) = 1$  over the time of the subject.

The implication of P by P appears to the representation as a necessity.

This relation of equality to oneself is only the image made speakable by judgments of an infinitely complex, unfounded reality, for which equality would be unprovable.

It is the laws of meaning that give reality its rigidity.

*To figure this out, imagine a point made up of a millionth of a gram of carbon deposited by the tip of a pencil on a sheet of paper. This point contains about one billion billion ( $10^{18}$ ) carbon atoms, which at each moment return, by a chance each time renewed, comparable quantities of photons. These facts affect, in ways where contingency plays a large part, equally fantastic amounts of neural connections, each of which is just the name of a no less fantastic amount of electrochemical interactions. In this enumeration, let us not forget the much more extraordinary set, in terms of its cardinality and the role played by chance, of the logical conditions which brought us to this sheet and directed our intentionality towards this rectangle of white paper. We could go on enumerating indefinitely. And yet it is by combining all this that our aesthetic intuition brings out, by judgments, the point P, One, present, necessary and whose existence appears continuous and necessary as long as our experiences are separated by more than 0.04 sec. of our time.*

*The point on the sheet is built in the indicible.*

*It is these instances of judgment that our "mind" idealizes in the speakable as "a point that has no part".*

The equality of P to P is a judgment: 'knowing' P the experience of P is a necessity. This equality is valid only between instances of representation of P and according to the attributes *a priori* available for the subject.

The existence of the point appears to the representation as a one-dimensional continuum: the dimension of time. Yet the set of logical conditions of possibility for the representation of P has none of these attributes: the transition from {all that makes P} to {all that makes P} is an inextricable bundle of contingencies and the continuity of existence of P does not even have a meaning\*.

\* The proposition: "*the continuity of existence of P does not even have a meaning*" could be translated as "*between two representations of P, P does not exist in the form P*" or "*between two Existing points P, linked by a necessity, infinities of infinities of contingent paths are possible even though they do not Exist*".

The continuity of existence of Facts of Knowledge in space and time, as it appears to our representations, does not have its formal equivalent in reality.

Not that we can say that reality is discontinuous, but rather that these notions of continuous and discontinuous cannot be defined beyond the horizon of meaning.

Even a definition of continuum adapted to this side of the horizon, such as: "between the experience of P and the experience of P, I can experience P" is an unprovable judgment.

One could think of other relations from P to P to deduce the intuitions of the mobile point and the line, then of the surface, then of the plane then other figures of geometry.

On the one hand I do not have the technical skills to make a rigorous demonstration of it and on the other hand I would like to focus our attention on more ontological aspects.

According to OK the line of Existence of the subject represents the asymptote of his Individuation which itself separates into innumerable contributing Existences (the becoming of all the logical existents of its representation).

The existence of the subject is not a synthesis, it is the primary, transcendental necessity from

which emerge the "contributing" existences.

The principle of individuation (or Logos) imposes both the separation of the subject into contributing individuations (the Power of expansion of meaning) and their convergence in the subject (the Necessity of becoming-himself).

Thus, to analyze the Existence of a logical Fact as A phenomenon would be an error since this Existence emerges, by separation, from the global phenomenon which is the individuation of the subject, like a participation in its own becoming. The law which determines the Existence of the Fact is in the Whole of the subject and not in the Fact itself. Starting of course with the law that directs the intention.

Experience is defined as the Act through which the Existing emerges for the subject.

The conditions of possibility of the Experience, that is to say of the formal Existence of the object, are in the Whole of the subject. It is in and by the Whole that the experience of the One object is individuated.

Returning to our dust speck : even on a "realistic" approach, it is through the mediation of billions of "photons" that the dot comes to Exist for the subject although those photons themselves will not Exist for him.

Only the point appears to his aesthetic intuition as Existing in space-time, because the conditions for the possibility of an aesthetic experience of the photon are not present. It lacks the logical "cuts" that would individuate the photon.

However, in the absence of an aesthetic experience of the photon by the subject, the photon and its journey are meaningless. Nothing certain can be said about the "self-existence" of the photon between the dust-point and the subject. According to special relativity, the existing photon "in itself", considered in the only possible frame, i.e. the frame attached to it, travels neither distance nor time.

The "particle" photon can only be located in the space-time where it Exists for the subject.

The same "realistic" approach would show that the aesthetic intuition of the point is mediated by a set of electro-chemical reactions of extreme cardinality and complexity but which the subject will not aesthetically experience, which will not Exist as such and to which their probabilistic chaotic character prohibits a detailed objectification.

One might think that an agent (physicist or neurologist) could "by experience" objectify the optical path or the neuronal activity, but on the one hand the agent is not the subject and on the other hand, to objectify photon or neuronal activity, the agent must first make them Exist in his space-time which is isomorphic to that of the subject, not because they would be the same reality (space-time is a creation of the mind) but because of the idoneity of intersubjective exchanges. The experience of the agent therefore takes on meaning a priori in the same multiplicity where the subject Exists, which prohibits the sought-after objectification.

The aesthetic intuition of the individuated point emerges from the multiplicity of the subject: that is to say from the set of logical Facts which, in the subject, impose as a necessity the persistent experience of the point according to the relation:  $\Pr(P \text{ knowing } P)=1$ .

Now the multiplicity of the subject is attached neither to the point nor to the photons, but it emerges from the global becoming-itself of the subject, it becomes with him.

The conditions of possibility of the experience of the point are in the subject and not in the point as object. The point has no formal reality "in itself", no intensional meaning and its extensional meaning expresses the possibilities of all new experiences by the subject "knowing" the point.

The point that Exists for the subject, its line of Existence, results in fact from a separation of

the Existence of the subject. The Existence of the point is like a separable thread from the cord that would be the Existence of the subject.

The proposition "the existence of the point and that of the subject are interdependent" must therefore be replaced by "the individuated image of the point Exists in the subject".

We shall emphasize:

*OK is not idealistic: It does not involve "Mind of the subject" or "ideal realities" or "ideal substance".*

*OK is not realistic: For OK "There is no being in reality" and "Representation is not isomorphism but morphogenesis"*

*For the OK there is a reality which is Interdependence (which can be described as logical or probabilistic).*

*In itself this reality has no form.*

*Nevertheless this reality necessarily presents one-dimensional singular modes of order, of zero Shannon entropy, i.e. carriers of their own necessity: Logical Individuations.*

*The transcendental subject is an Individuation.*

*The asymptote of this Individuation is the Existence of the subject.*

*The knowing subject is the emergence of meaning, by separation, out of the transcendental subject.*

*Meaning is a vector of mathematical expectations.*

The space-time in which the subject represents the trajectory of the point is attached to the becoming of the subject.

The possible trajectories of the point in the space-time of the subject are in fact projections, conjectures on the possible experiences « knowing » its present representation.

The conjectures can only designate possible experiences, which will bring this point to Exist for the subject, that is to say in a way compatible with his own becoming.

A point having Existence for a subject cannot have, for the subject, other trajectories of Existence than those which are compatible with his becoming. Not as a condition stated by the proposition: "if these trajectories are not compatible they do not exist, or the existence of the subject would cease", but by the proposition: "Individuation transcends meaning".

The simple question: "Are there other trajectories that would not be compatible with the becoming of the subject?" is absurd because it has no answers that make sense.

The subject is not the solution but the resolution of a calculation, it is not something but an act, not a state but a becoming (see G. Simondon on this subject).

The point that Exists for the subject is not a being-object opposite, nor a being-idea but an individuation  $\text{Pr}(P \text{ knowing } P) \rightarrow 1$  in the individuation of the subject  $\text{Pr}(I \text{ knowing } I) \rightarrow 1$ .

The principle which individuates the meaning of the point does not find its reality "in" the meaning of the point but emerges by separation from the Individuation of the subject.

Space-time is, for the subject, the set of possible locations (weighted by probabilities) of all the (lived) becomings of what Exists.

Space has no reality:

The intuition of space is not an a priori condition of all experience.

Spatial sensation arises from the global faculty of representing. It is consubstantial with meaning. It is determined by knowledge and its laws, subsumed by the principle of individuation, and not by an external cause.

Space is not the sum of places. On the contrary, the space of my representation is a Whole. Facts and their modes of order, locations appear to me by separation from the Whole.

The position of the point is not an attribute of the point in itself ; on the contrary, it is the product of the separation of the whole. More precisely, it gives meaning to the residual interdependencies after separation.

The position of the point is relative to the Whole of the representation.

There is no point except in the representation of the world by the subject.

The point is fixed or mobile only in relation to the universe represented by the subject.

Whatever the frame he uses to represent, the subject is fixed in his representation.

Existence and position of the object are not two different phenomena.

The Existence of the object is, for the subject, the individuation that has become necessary of the predicates associated with the object under the primary law of his own individuation.

The knowing subject locates the object by the same Act which makes him Exist and makes all objects Exist.

There is no place in space where the object would be, no geometry in reality. (Ref MOND)

The geometry that locates objects in space is already a very high level of conceptualization by thought, this geometry has no equivalent in reality.

There is no point, line, angle, surface etc. in reality.

Just as it is inconsistent to represent the time of the transcendental subject in the time of the knowing subject, it would be inconsistent to assign to the transcendental subject forms and places described by means of the concepts of form and of place elaborated by the knowing subject.

The intensional reality of the Fact of Knowledge is not in a place describable by meaning.

Can we say that the reality of a pressure is in the place of the experimental device which reveals it or that a pressure has in Reality the form of the phenomena which reveal it?

The Unity of Fact of Knowledge is structural and logical. The common place of the Fact does not result from a spatial community of its attributes. What unites the attributes of a Fact is the meaning, the association of the attributes into a common law of probability, a common expectation, a common necessity.

These common probabilities define, among other things, the spatial meaning of the Fact, as it appears to the subject.

Let's recall the OK postulate "reality is formless"

If there is no *a priori* spatial sensation, there is no more *a priori* spatial order, things are not "nearer" or "farther" in reality but only as a representation by the subject and in a perspective that is not limited to space.

The laws of the Logos are *a priori*. They are a necessary condition for the Existence of the subject. These laws impose themselves, among other things, on the emergence of formal concepts and sensations of space and time, which are Facts of Knowledge.

The formal intuitions of space and time are not immanent but only consequences of the laws of the Logos and first and foremost of the axiom of Existence.

The laws of the Logos are universal insofar as that term has any meaning. Although statistical, they are of an extreme consistency because they apply to gigantic numbers of Interdependencies.

Nevertheless, for the Knowing subject, this results in instances of individuated and non-universal (relative) representation of the world in space and time.

The eigen solutions of the Logos are the forms of the world:

The asymptote of Individuation is a becoming, one-dimensional insofar as it is possible to define "singular states"  $A_t$  and  $A_{t'}$  without dimensions such that the judgment of necessity  $A_t \leftrightarrow A_{t'}$  can only be stated as a probability close to 1

This necessity of individuation could separate into the convergence of individuated, countable paths, themselves one-dimensional  $A_i$ , such that the judgment of necessity  $A_i \leftrightarrow A_{i'}$  can only be stated as a probability close to 1.

Is this mode of separation/convergence the only formal possibility?

Can't we consider a mode by which  $A_t$  (resp  $A_{t'}$ ) would be represented by a one-dimensional continuum  $A_t(x)$  such that the judgment of necessity  $A_t \leftrightarrow A_{t'}$  can only be stated as a probability law of dimension 1 ?

Or a mode by which  $A_t$  (resp  $A_{t'}$ ) would be represented by a 2-dimensional continuum  $A_t(x,y)$  such that the judgment of necessity  $A_t \leftrightarrow A_{t'}$  can only be stated as a probability law of dimension 2.

Or finally a mode by which  $A_t$  (resp  $A_{t'}$ ) would be represented by a 3-dimensional continuum  $A_t(x,y,z)$  such that the judgment of necessity  $A_t \leftrightarrow A_{t'}$  can only be stated as a probability law of dimension 3.

Can't we consider a combination of these modes where would converge "extensive individualities", four-dimensional, cuttable only by three-dimensional "states" etc...

We should keep in mind, however, that the solutions evoked are modes of order, possible modes of description, relative to a subject, resulting from judgments of necessity and not from objective and universal formal realities.

### **Impact on logical theories (logic, arithmetic, set theory)**

The meaning and therefore the Existence of the Fact of Knowledge, of the relation between Facts, of the law that generalize relations between Facts are **judgements of necessity**.

It means that although unity of the Fact and its meaning have necessary reasons to appear to the subject, they are not provable because it would take a complex and unfounded set of logical inferences to establish that proof.

This is neither a deficiency nor a limit inherent to our human condition but an essential truth: reality is indelible simply because it is unfounded, complex and "logically prior" to the Meaning.

Fact of Knowledge, its Unity and its Meaning are not real as per common sense but they rightfully Exist for the subject.

Meaning is therefore not a mere "name", it is not the "name of nothing" it is not a name "invented from scratch". But the Meaning is not the name of "something" that has form in reality and it's no more build-up from atoms of Meaning.

Meaning is "creation of form" and form is not "an other thing" than the Fact of what it is the form. Form is what appears extensionally from an intensional reality.

Let's take the words of A. Badiou:

*The name is what can be said extensionally of the unrepresentable (OK's note: the intensional reality of the fact), form that presents itself in the frame of multiplicity shall not be considered as "an other thing" than the unrepresentable [Ref: Badiou p.80]*

Note the double meaning of "an other thing": not only the meaning is not else than what it gives meaning to, but also it is not "a thing".

Having stated that there are no things in reality, it would be inconsistent for OK to designate

the Meaning as “a thing”

Meaning of Facts is not a thing. At best could we say that a predicate is a meta-Fact, the complexity of which is lesser than the complexity of the Fact it qualifies.

Color for example is a meta-Fact, a class of Facts that offers a lesser complexity, allows to present under fewer dimensions the Fact it qualifies.

Conditions and modes of Existence of Meaning are, for the subject, the same as those of the Fact. Predicate is a singularity, a set of interdependant Facts, a class of Facts the Unity of which appears to the subject.

One could say for example that in the multiplicity of the subject, the Meaning of the “Socrates” Fact is interdependant of the meaning of the “ugliness” Fact.

The “Socrates” Fact reveals its Meaning through a Transaction that carries the possibility, according to a given probability, of the appearance of the “ugliness” Fact.

This possibility is not “presented” to understanding, nor even “deduced by the understanding”. It is in itself a logical Fact constituent of the representation. Understanding is itself only a meta-category of representation.

Under these conditions how it is possible to state a formal equivalence between a Fact of Knowledge and its meaning i.e. the Fact of logic, the proposition that is used as its label? Any Fact of logic, any proposition associated to a Fact of Knowledge is a judgement: the mathematical expectation that replaces, in a necessarily approximative way, a complex and unfounded reality by a set of relations extensionnaly exprimable within the multiplicity of the subject.

Back to Socrates: the representation of Socrates ugliness by the subject expresses (in a way) the probabilistic relation:  $\Pr(\text{Ugly}|\text{Socrates}) \approx 1$  knowing that  $\Pr(\ll I \gg|\text{Socrates}) \neq 0$  and  $\Pr(\ll I \gg|\text{Ugly}) \neq 0$  (ie that the Facts Socrates and ugly are Actual ie possible for the subject)

The concept of **equivalence** (from a physical fact to its meaning) that founds the concept of isomorphism shall be replaced by **idoneity** (from meaning to subject's becoming).

The concept of **isomorphism** (between physical world and its representation) shall be replaced by the concept of **morphogenesis** (from formless reality to formal representation). Morphogenesis, attribution of form, is idoneous as soon as the extensionnal relationships it introduces into the multiplicity of the subject do not jeopardize his Existence, i.e. the continuity of his Individuation. We see here themes developed by E. Kant (Ref: CRP)

Proposition A is not logically certain, as soon as it is claimed that A designates a Fact of Knowledge.

It follows that the relation  $A = A$  is not provable. Its reflexivity is not provable

The same will be true of any logical relation between logical facts.

So the relation  $A \rightarrow B$  does not have a precise truth.

In a recurrence, the first judgment of equivalence which states A, the uniqueness of the « successor», its recurring otherness ... are uncertain truths.

This questions the very possibility of a recursive reasoning and therefore the possibility to logically build a infinity of Facts.

Should we then imagine «natural » logical theories without recursivity ?

Are such theories only possible ?

Could a non-recursive arithmetic be an analytical basis for non-Euclidean geometries ?

Further on :

The Existence of the Fact is not universal but relative to the subject.

The Fact of Knowledge only Exists for and by the subject.

The truth of propositions «there exists A» or « for all A» is relative to the subject.

If the predicate of Existence of A is relative to the subject, so is its belonging to a set according to a law, because the law itself is a class of Facts, that is to say a meta-Fact, which has Existence only relatively to the subject.

In appendix V we show, from Whitehead's ideas, that the world of the subject is not the juxtaposition of disjoint Facts with absolute Existence.

The Existence of a Fact contributes to assert the existence of the subject (see appendix II).

That participation to the subject's Existence is its only mode of Existence.

For the representation by the subject, the Existing is therefore distributed according to a law of probabilities of Existence whose sum can not exceed the certitude of his own Existence.

The Universe is my representation, it is all of the Existing. The universe can therefore not Exist to me more than I exist. I am necessarily the All of the Existing.

This principle can be expressed very concretely: For the subject to be able to make A and B Exist in the same representation, the In-act of A and that of B can not be totally disjointed, the meanings of A and B, expressed in terms of the probability of "I" do not add up then exactly.

The "I" subsumes necessarily the totality of what makes sense (ref : MOND).

Reminder : « *The world is my representation, my representation is the world* » (Ref : QRPR) .

There is not on one side the proposition <A>, that could be qualified of propositionnal Act and on the other side the Fact <designated by the proposition A>.

It follows that logical propositions that state the meaning are also subject to this subsumption by the "I" of the subject.

*Although the meaning of each Existent Fact opens up an unfathomable infinity of possible experiences, although these possibilities are Actual, the fusion of all possibilities opened up by the meaning of all Existents is subsumed by the necessity of the Existence One of the subject.*

This statement is not about cosmology, neither about psychology nor about mathematics. It is, one might say, about a topological property of meaning : locally open to the alterity of possibles but globally closed by the Unity of the Existing.

To repeat: let us not seek by what extraordinary the local otherness merges in the unity of the Existing. The unity of the subject is the timeless necessity, the first singularity encompassing every possible meaning. We will show in the article «The OK and the shape of the world» (ref MOND) that the concept of multiverse and Everett's interpretation of the collapse of the wave function are therefore rendered obsolete.

Mathematician can therefore not absolve himself of this constraint on the grounds that mathematical facts are pure facts, ideal, detached from any contingency other than the formal rules have a *priory* set: " *if I declare  $A=A$  as an axiom, it shall be true inside my theory !*"

This is delusion, the false belief that axioms edited by the knowing subject have authority on the transcendental subject. The extensionnal thought has not the power to abstract itself from its intensionnal reality (unspeakable and unfounded).

Extensionnal thought is a meta-Fact.

There are no multiplicities, no mathematical varieties without subject, no more than there are objects.

There is a freedom that I have not: the freedom not to become «myself». If the subject can influence (consciously or not) the path that his representation of the world follows, he has not the power to abstract himself of this represented world. Not as center but as nexus of it. What he represents is himself and he is what he represents. His own Existence is the condition of appearance of any Fact of his knowledge, including (and probably in the very first place) mathematical Facts.

Note: Existence being so defined, mathematical Facts Exist in the same way as Facts of the world.

Note also that putting in common, sharing and comparing the mathematical Facts and reasoning do not change the fact that the subject is in there.

OK is not a solipsism. (Ref: SOLI)

An arithmetic of numbers Existing-for-the-subject should respect this constraint: namely that the integral sum of the Existences of the numbers, extended to the totality of the field of this arithmetic, is limited to 1.

Should we imagine logic and arithmetic non-universal, relativistic, limited by a horizon \* focused on the subject , bounded by the certitude of existence of the subject ?

\* Note that this question relates to the possibility or not of building by recurrence an infinite of Existing. The question of an real infinity is non-sense for infinity is a form and Reality has no form. 'Real infinity' is beyond the horizon of meaning.

The rejection of a truth in reference, the new definition of Meaning allow logicians to merge intentionality (the United meaning of propositions) and extensionality (their logical interdependence) into a concept of Transaction by which the In-act of the proposition (of the fact of logic) takes meaning (reveals its intensionality) in the form of a law of probability on the eigen-solutions of its extension towards its logical neighborhood.

From the notion of Transaction emerge two new notions (already mentioned in the ref OdC):

- that of **importance** (to use Whitehead's term), notion of quantity, of « more or less », the relative contribution of proposition A to the Existence of the subject, the probability of « I » knowing A: ( P («I» | A ) ). The term 'importance' comes from that the meaning of A is only expressed by its contribution to the Existence of the subject and this Existence is only expressed by his individuated becoming.

- that of **Necessity** which qualifies the way in which the In-act, by its structure of probability, directs the expansion of the Fact towards its neighborhood. What may happen next ? Which direction will take the expansion of the theory compatible with the “me” to come ?

We can now state that : In a logic of Facts Existing-for-the-subject, the integral sum of the Powers of the Facts, extended to the totality of the field of this logic, is limited to 1.

As shown by OK for the representation of the world, a logical series in which a term may have more than one successor would necessarily lead to complexity and complexity leads to the appearance of individuated singularities that could have to each other, asymptotically, ordained relations similar to those of classical arithmetic.

A logic, an arithmetic must result from the separation of the general rather than from the composition of the generic. The first axiom of a logic or an arithmetic is the **axiom of Existence** of the subject.

Shouldn't "classical" arithmetic be seen as a limit, asymptotic case of separation and order pushing back to infinity the necessity of the subject's individuation?

## Impact on geometry

### The geometry closed by the subject

The article "The OK and the form of the World" (ref: MOND) illustrates how reality appears to the subject in the form of objects in the becoming, in a four-dimensional space (variety) whose time of the subject (its becoming) would be a privileged dimension

It details the birth of Poincaré's theses about geometric space: namely, that it is a convention created by the understanding.

The OK adds that geometric space is not an isomorphism of reality but a morphogenesis, that idoneity of the forms created by the Logos is neither providential nor contingent but essential, since representation by the subject is a eigen-solution of the Logos, a transcendent principle. We see in it that geometry is necessarily relative to the subject and that the properties of its objects emerge from the global process of representation.

The discussion of appendix V shows that in a geometry of points Existing-for-the-subject, the integral sum of the powers of the Facts (points and their relations, i.e. figures), extended to the whole field of this geometry, must be limited to 1, i.e. to the certitude of the Existence of the subject.

In that sense, geometry is not distinguished from arithmetic.

Would non-Euclidean geometries be based on a "non-Euclidean" logic and even more fundamentally on the non-foundation of meaning resulting from the properties of the Logos? Non-foundation renders obsolete any reasoning that crosses and even approaches the horizon of meaning.

What could be more obvious than the proposition:

*"A topology of meaning (and therefore of representation) cannot have meaning"*

It is much less obvious to apply this proposition to one's own thought.

### The empty space:

The question of empty space remains open.

This question does not relate on the nature of empty space since space in general is a Fact of representation.

In the paragraph on the intuition of the One, we have shown that what seems to separate the Existing-for-the-subject Facts and which nevertheless unites them is a Fact of representation. This logical vacuum is not spatial: there is no empty space between the elements of a set.

Since there is no being in itself, there is no non-being in itself that would separate beings. There is no void, no empty space in itself.

We can say, however, that the mind creates emptiness where there is certainly not: whether it is subjected to a virtual 2 or 3D image or to a virtual stereophonic sound, the mind has no difficulty in inventing emptiness where there never was, based on pure convention: The subject will point to a (very real) place in the 2D image, between two depicted objects, and state "this place is empty". The reverse is equally true: what Exists for us is essentially empty.

Emptiness is born with meaning and its law is in the multiplicity of the subject.

The void question concerns the logical process that leads to representing a void between Existing facts (objects).

Could the void be the logically necessary consequence of the replacement of an unspeakable (complex) reality by a sayable (non-complex) representation, of a space of infinite dimension

by a space of finite dimension?

Could it be the consequence of the passage from the three-dimensional cut on which the present moment of our universe is represented to the dimensionless cut on which the "I" and all Individuation are represented as a becoming?

Is the void due to the fact that a representation by separation and aggregation of the complex towards an asymptote made of one-dimensional becomings cannot be infinitely dense?

Does moving from complex to sayable necessitate emptiness, by simple logic?

Individuation by becoming "bodies" is the only form representable by our minds, the only quantum of Meaning that can Exist. Would the forms "wave" and "space" be only a putting into perspective, an overall ordering of these quanta, requiring non-Existing?

The Existing is certain (necessary condition of the Existence of the subject), it appears by experience whereas the meaning of the Existing is a law on possible experiences. However, a set of possibilities is by principle more "vast" than the certainties that may emerge from it: experience replaces a distribution of possibilities by One Existing. Does the emergence of the Existing create emptiness?

Is empty space the place of all possible experiences? of all possible Existences? Isn't the blank sheet the place of all possible points?

Is emptiness the logical answer to the paradox of the Cogito: The necessity of the "I" cannot by itself denote all the contingent thoughts that fill it?

To paraphrase Gödel: Are there actual truths in my Knowledge which cannot Exist, which necessarily remain non-Existent?

### **Impact on mathematical thought.**

#### 100 If 'logic' is a formal means of thinking the real, the 'logical' is the very nature of the real.

100-1 Logical interdependence is the meta-substance of the real

100-2 An unfounded logical system necessarily presents singular order modes, minima of complexity, asymptotically one-dimensional, Individuations.

100-3 A logical theory takes shape in the transcendental subject, not because he is the mind that thinks logic but because he is an Individuation in logical reality.

#### 101 The Individuation of the transcendental subject is also the necessity of a Becoming-self.

101-1 The knowing subject is the meaning that emerges from the transcendental subject.

101-2 The knowing subject has "I become myself" as its semantic nexus.

Nexus definition: the semantically distinct elements of a logical construction relate to each other such that the construction states a predicative phrase.

#### 102 There is reversal of intelligibility.

102-1 These are not causal relations of the world which converge towards the subject and make themselves intelligible, but the Becoming-self of the knowing subject which separates infinitely into contingent modes of fulfillment and gives meaning to his world.

102-2 Meaning runs through formless logical reality like a wave of experiences whose law of probability "resides" in the Whole of the subject.

102-3 A logical theory is born by separation and not by synthesis.

102-4 The representation of the world arises by separation from "I become myself".

#### 103 There is only extensional meaning.

103-1 Logical Fact is not a "thing" but meaning, meaning is not a "state" but a relation.

103-2 The Existence of the logical Fact is not in the logical Fact itself but in its relation to the whole meaning and ultimately to the subject.

103-3 The attribute of the logical Fact does not qualify the logical Fact itself but its relation to the whole meaning and ultimately to the subject.

103-4 All meaning subsumes into the primary meaning "I become myself"

#### 104 What is necessary for a necessity is a necessity.

104-1 The Existence of the knowing subject is necessary to all that Exists for him.

104-2 The Fact Exists if its experience is necessary.

104-3 Existence does not qualify the Fact but its necessity to appear to an experience.

104-4 Meaning does not emerge from the object but from the multiplicity of the subject.

104-5 The multiplicity of the subject is the global logical structure of the becoming-self of the subject

104-6 The meaning of the world is included in the becoming-self of the subject

104-7 The representation of the world is done by separation and not by synthesis.

104-8 No logical construction can elude the construction of the knowing subject.

104-9 Neither logic, nor arithmetic, nor geometry, nor any mathematical theory can elude the construction of the knowing subject.

104-10 There is no infinite meaning. An infinity of "facts" and a thought of infinity is impossible because the fusion of all possible logical facts is the subject.

### 105 Meaning is unfounded:

- 105-1 The intensional (reality beyond the horizon of meaning) is meaningless, it does not Exist.
- 105-2 The intensional is immeasurable with the extensional (meaning below the horizon of meaning).
- 105-3 The Logical Fact is unfounded.
- 105-4 The intensional takes on meaning through statistical expectations on possible experiences, *a priori* sayable (ie with meaning) in the extensional.
- 105-5 Meaning is probabilistic in nature.

### 106 There is neither «thing One» nor «thought One» in reality

- 106-1 Individualized "Facts" are attractors of meaning .
  - 106-1-1 as a concept the fact is possible, out of time, contingent, possibly contradictory.
  - 106-1-2 Existing Facts are certain, present, necessary, non-contradictory
- 106-2 Unity of facts is not essence: it is meaning.
- 106-3 Disjunction of facts is not essence: it is meaning
- 106-4 Without disjunction of the facts, an infinite recurrence cannot be proven.

### 107 Meaning is animated by its own nature.

- 107-1 A fact F Exists for the subject when a representation "knowing F" makes the experience of F certain.
  - 107-1-1 A fact F Exists for the subject when the a priori necessity of "I become myself" implies the necessity of F: "I become myself"  $\rightarrow$  F.
  - 107-1-2 The contrapositive clause  $\neg F \rightarrow \neg$  "I become myself" is meaningless because  $\neg$  "I become myself" is paradoxical.
- 107-2 A fact F Exists when it becomes itself in the experience that the knowing subject makes of his own becoming-self.
- 107-3 By its nature the Existence of a logical fact has the dimension of a becoming.
- 107-4 The meaning of a fact F is the law of probability distribution over the facts whose representation "knowing F" makes possible to experience.
- 107-5 The meaning of the logical fact is not a state which happens to change but a law of probability on the separations of its becoming whose experience is possible.
- 107-6 A logical, arithmetic, geometric, mathematical truth in general is not a state of truth but a judgment of its necessity in the becoming of the subject.
- 107-7 The meaning of what Exists is the law of probability on what can Exist
- 107-8 The Existing is a wave of mathematical expectations, of necessities of which the semantic Whole (the nexus) is the knowing subject.
- 107-9 The dynamics of this wave is in the meaning, ie the relation between the present experiment and the possible experiments.

### 108 There is no meaning in itself, only the experience that the knowing subject has of it.

- 108-1 The only possible experiences are those that bring out an a priori sayable meaning according to the multiplicity of the subject.
- 108-2 The continuity of meaning is meaning.
- 108-3 Since the meaning is unfounded, the continuity of the meaning is unfounded.
- 108-4 The continuity of meaning must be understood as the impossibility of a falsifying experience according to the multiplicity of the subject.

## **Philosophy of mathematics**

To the unresolved double question: "Are there any mathematical facts and, if so, are they independent of Human? The OK provides the following answer:

Infinities of infinities of infinities of logical facts are actual in Reality but do not Exist a priori.

Logical Facts come to Exist in the representation of any knowing subject.

The mathematical Facts Exist in the very fact that they are represented.

The mathematical facts are facts of representation, they do Exist of the same Existence as facts-of-the-world do.

Note: Representation is not the exclusivity of Human.

This also answers the question: «why mathematics are so well adapted to describe the real?»

The forms of the world, which come into Existence in our representations, are combinations of eigen solutions of the Logos, they are meta-Facts of Knowledge. Formal concepts (logical, arithmetic, geometric...) are meta-Facts of Knowledge.

The formal concepts that Exist in our Knowledge are the seeds from which our perspective of the world is structured and ordered.

Formal concepts are like words: words structure thought and thought makes words exist, formal concepts structure thought and thought makes forms exist.

Beyond the structural property of unity of the attractor, whose contingency we have postulated (Ref: OdC), how to identify other structural properties of attractors and how to trace the interdependence between their intensional and extensional properties?

For example, how to define a symmetry of structure and how to associate this symmetry with the laws of probability on the modes of expansion which it makes possible (structuring by synthesis), or conversely with the possible cuts of the structure (structuring by separation)?

This question is also that of the genesis of a differentiated meaning in an unspeakable and unfounded reality.

The identity of nature, the co-existence between the mathematical Facts and the Facts of the world raises another question: Does the principle of the Logos precede the Fact, does it transcend its object?

The answer to this question is already in the article "introduction to the OK": In an unfounded reality there is no difference in nature between the law, the principle and its object.

Only the knowing subject needs to make this difference.

As for Einstein's question: "Why is nature intelligible to us?"

The answer seems obvious: "Because all things in nature Exist by our representation and because our representation is us"

## **Conclusion :**

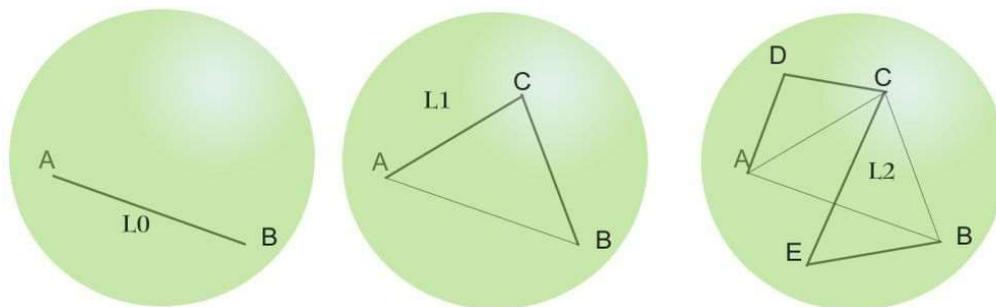
- Because the One is not founded there is no provable equivalence, no provable recurrence, no provable infinity to be built.
- Space, time and Facts appear by the same Act of Knowledge
- Because the representation of the world is the subject, no representation of the world can exceed the subject's Existence
- It is delusion to believe that mathematics and science can escape anthropocentrism.

appendix I  
**The paradox of the sphere**

Modest exercise of geometric thinking :

Let assume the usual geometric space, with its 3 dimensions and its notion of distance  $d(AB)$  between two points A and B.

Suppose in this space a hollow sphere of diameter  $D = 1$ .



Suppose now two points A and B on the surface of this sphere. We will call  $L_0$  the path from A to B.

$$L_0 = d(AB) \leq D$$

Choose  $d(AB) = 0.9$

One proves (demonstration without interest) that, whatever A and B, there is always at least one point C, taken from the surface of the sphere, such that:

$$d(AC) + d(CB) > d(AB) \cdot k_1 \text{ provided that } k_1 < \sqrt{2}$$

Choose  $k_1 = 1.4$

We can therefore replace the initial course  $L_0$  by a path  $L_1 = ACB$  whose length  $L_1 = d(AC) + d(CB) > L_0 \cdot k_1$ .

We will call this operation the "separation" of AB

Since C is on the surface of the sphere, it is possible to subject the same separation to the AC segments (we add a point D on the sphere) and CB (we add a point E on the sphere) and thus replace  $L_1$  by a path  $L_2 = A, D, C, E, B$  whose length  $L_2 > k_1 \cdot L_1 > k_1^2 \cdot L_0$

Repeating n times the operation one can thus create a sequence of courses  $L_n$  of length  $L_n > k_1^n \cdot L_0$ ; in our case  $L_n > 1.4^n \cdot 0.9$

Since  $1.4 > 1$ , the length of the path  $L_n$  tends to infinity when n tends to infinity.

First surprise: There exists between A and B, distant from 0.9, a course of potentially infinite length which remains confined within the sphere of diameter 1. Since at each separation, one can choose between several additional points, the number of the possible paths growth "dizzily" with n.

There is therefore between A and B, a "dizzying" infinity of potentially infinite length paths, confined within the sphere of diameter 1.

But that's not all !

Suppose now that after each separation

$$L_n \rightarrow L_{n+1}$$

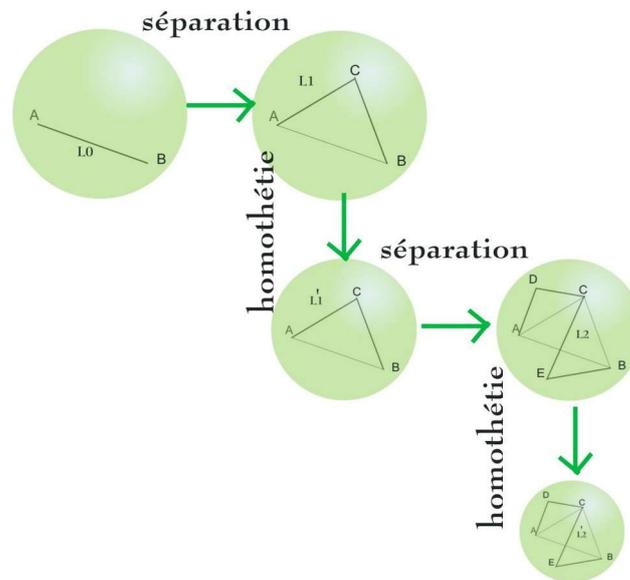
we apply a homothety

$$L_{n+1} \rightarrow L'_{n+1}$$

having for fixed point the center of the sphere and for ratio  $1/k_2$  with the condition  $1 < k_2 < k_1$

Let us choose  $k_2 = 1,2$

During a homothety, all the lengths: the diameter of the sphere, the distance  $d(AB)$  of the original segment and the length of all the paths are reduced in the same proportion of  $1/k_2$



So if  $L_1 > L_0 \cdot k_1$  (separation)

$$L'_1 = L_1 / k_2 > L_0 \cdot k_1 / k_2 \text{ (homothety)}$$

$$L_2 > L'_1 \cdot k_1 > L_0 \cdot k_1^2 / k_2 \text{ (separation)}$$

$$L'_2 = L_2 / k_2 > L_0 \cdot (k_1 / k_2)^2 \text{ (homothety)}$$

we therefore have  $L'_n > L_0 \cdot (k_1 / k_2)^n$

since  $k_1 > k_2$ ,  $k_1 / k_2 > 1$  and therefore  $(k_1/k_2)^n$  tends to infinity when  $n$  tends to infinity

since  $k_2 > 1$ ,  $1/k_2 < 1$  and therefore  $(1/k_2)^n$  tends to zero when  $n$  tends to infinity.

Numerical application:

With  $D = 1\text{m}$ ,  $k_1 = 1.4$  and  $k_2 = 1.2$

At the 440<sup>th</sup> iteration,  $d(AB)$  would be reduced to  $0.9 (1/1.2)^{440} = 1.3 \cdot 10^{-35}\text{m}$ , dimension slightly less than the length of Planck.

The length  $L'_{440}$  will be greater than  $0.9 \cdot (1.4/1.2)^{440} = 2.57 \times 10^{29}\text{m}$ , which is about 1000 times larger than the supposed size of the universe.

Thus, in a purely geometric space, it is possible to create an infinity of paths of length greater than the size of the universe, all confined in a sphere of diameter less than the length of Planck, without any of these paths ever do intersect.

One would be tempted to put this calculation on the shelf of mathematical curiosities and forget it soon, as the results exceed the understanding.

This exercise does not prove anything. It does not really present a paradox, but it shows how the intuition of space and the logical rigor of recurring reasoning can come into conflict, which both are binding on our reason with the same force.

Although this exercise remains within the frame of mathematical theory, we can not avoid questioning its ontological implications.

Einstein refers to the coincidence ( $dx = 0, dt = 0$ ) as an invariant, but what happens to a path such as L'440 observed in two referentials with a relative velocity close to  $c$  ?

If the suture between Reality and its representation must be only the experience or the phenomenon. If we only have the experiments/phenomena A and B to ensure this suture. If A and B are so closely related that no experience can distinguish them (the Planck length is the lower limit of observability). We see that between these two points the possibilities of divergence between a representative model (geometrical) and Reality are extraordinary.

## appendix II

### **The meaning of a logical proposition is to assert the Existence of the Subject**

#### Abstract:

The proposition "this is true" appears to us as applying to the real, to the extent that it would be a consequence of immediate sensations.

It makes sense, in fact, only insofar as it is co-founded to the truth of the «I become myself» of the knowing subject.

#### Development:

In the expression "Snow is white", although "snow" is grammatically the subject of the verb to be, it is logically the object of the proposition. The true subject of the proposition is what observes and declares.

This ambiguity reveals much more than a simple grammatical problem because, thinking about it, the real subject of the proposition is the proposition itself, in its reality which comprehends and by which converge all the conditions that are necessary and finally sufficient for it to exist; all that is true in the proposition and yet is not expressed, the "I am" that expresses the proposition and which nevertheless does not Exist, does not formally appear in its meaning.

This is a necessary constitutive property of our representation of the world that could be stated: **"The sense ignores the substance of Knowledge to name only affections, singularities, cuts"**

The conjecture of the observed object overlooks the certain reality of the observing subject. The conjecture of the seen object ignores the view as an organ and more generally all the conditions of possibility of the vision, starting with those which placed the object in sight of the subject and gave to the subject sight, speech and language.

The individuation of the "What-I-see" ignores the diffuse generality of the "How-I-see"

The common nature of all the aperceptions is yet an essential character of the representation, a prerequisite to the intelligibility of our perceptions.

This is indeed a necessary condition for the combination of logical facts. How, for example, could I form a binocular vision if the stimuli coming from each of my eyes were not brought to the same semantic denominator? How to combine the senses of sight and hearing, how to combine a present sensation with previous images etc...

This common nature is the Fact-of-Knowledge, as a logical structure stripped of any substance. The basic principle of this structure is the loop of logical relations, the co-founded set of interdependencies.

Thus, our sensations are Facts, that is to say, logical entities, irreversibly constituted in the transcendental subject.

This course can not be travelled back, any meta-proposition trying to prove the existence of perceived forms is meaningless. As Bossuet wrote, *"the object of the concept is never the existence of what the term means... Whether the object exists or not, we understand nevertheless the concept"*.

When the scholastics affirmed *"knowledge does not come out of being because there is nothing outside of it"*, they simply confused the being-object and the being-subject of knowledge, the perceived being and the perceiving one.

The Knowledge is the transcendental subject and the knowing subject emerges off Knowledge.

The proposition "this is true" is a part of the representation of reality. This representation is

"myself" as a present Point of view.

Our thought is a "Point of view", about us and the real.

The term "Fact-of-Knowledge" does not describe a cultural or mathematical concept such as set theory, nor a psychic phenomenon such as an opinion. It describes a structure of actual logical relationships, and this by not appealing to any physical or psychological reality.

"I Exist" is not a simple postulate but the asymptotic sense of a Fact of knowledge, of a co-founded, interdependent whole.

To play with words one could say that "I" is the "eye" of the vortex

*NB: In a co-founded, interdependent set, the Whole comes logically first. Parts are separated by cuts. A cut is not a disjunction nor a void, but a set representable in a finite dimensional space.*

By separating the "I Exist", like zooming in the In-act logical links, emerges from "I Exist" a more complex set of Facts: the "Representation of the present reality" from which emerge in turn the "sensations".

The sensation emerges from the "I Exist" by cuts without ever being disjointed. The sensation and the sign which names it imply the actual probability of the Existence of the subject, as he represents himself, here and now.

A sensation that would not imply the actual necessity of the Point of View would not be represented, it would have no meaning, it would not Exist in the Point of View.

The proposition "the being is this" only makes sense if it involves the "I am".

It is the instantiated assertion of the "I am"

This conclusion, written with the thinking being as the subject, is quite general: An attribute of the real, whatever the Point of view, makes sense only as a necessary and sufficient condition to this Point of view, only as a premise to the complete and coherent theory that is the Point of View.

The premise of a theory is not a condition, it is consubstantial to the theory.

Well beyond a principle of relativity, these lines state the co-foundation of the Point of View and the represented Reality, the subject and the object.

The real in the form in which it appears to us, the object of science, is co-founded in the observer's Point of view, they are part of each other. They are indisjoint.

Every experience of the real is in advance co-founded with the observer and the result will be as well co-founded.

Among the predicates, that of position is no exception. The proposition "this is in this place" expresses as well as "this is" the co-foundation of the Fact to my "representation of the real" and to the "I who thinks" and therefore to the "I am".

The position predicate is just as essential to the object as to my representation of the world, as to my Existence. Inseparably.

The predicate of position emerges by cuts in Knowledge, that is to say in the reality of the subject. The position of the object is not a predicate attached to the object, it is necessary to the existence of the world and to my existence as subject.

The position of the object is co-founded with the object and the subject.

- If one could distinguish the stating by the subject of the proposition 'this is in this place' from the predicate <this is in this place> it means; the logical conditions (in the subject) for the statement of the proposition would be infinitely wider, more complex and persistent than physical conditions (in the world) to the truth of the position predicate.

- Since there is co-foundation between the sensation and the subject, the position predicate can not be separated from the subject by disjunction but only by cut. They are indisjoint.

- It would be foolish to believe that the sensation of position, in the form of an individuated sensible phenomenon, then of an individuated intelligible phenomenon, then of an individuated immediate concept ... would eventually be associated with other sensations and stated, by a subject-proposition which, for its part would have accumulated all the necessary conditions for its own existence.

No, the position predicate, like the others, emerges from the subject, at the ever-present moment when the subject and the world come to Exist for the subject.

A more general conclusion:

**Every representation " is worth itself " .**

Every representation, ruled by the laws of the Logos, includes its conditions of truth.

The question of the truth or of the equivalence between the object and its representation is without interest since the Reality has no form and therefore objects are only representation.

A knowledge creates its own meaning. It gives itself Meaning.

A Knowledge comprehends its own condition, its own probability of Existence.

It follows that all science "is worth itself".

For all that, a representation (and science) is not a calm sea because the revelation of meaning implies incessant steps towards an unknown neighborhood, not yet revealed.

The relation of reality to Knowledge is unknowable.

The expansion of Knowledge towards its unknown neighborhood is made of jumps, of quantified emergent truths, hitherto only probable and which therefore did not yet Exist, of breaks and changes of course between contradictory possibles.

### appendix III

## From Maine de Biran to the geometry of Poincaré

### Abstract:

The Fact of sensation emerges from the faculty of feeling and not from a fact opposite.

### Development:

Common sense is that the sensation comes from a fact opposite and enters the mind in the form of a sensible phenomenon, transformed by the understanding into an intelligible phenomenon recognized by reason as a fact-of-sensation. The fact-of-sensation, once revealed to reason, is combined with others to ultimately synthesize a representation of the world.

For Maine de Biran (Ref NoK and DAI), this vision is erroneous, it is to apply to the transcendental subject the modes of reasoning which describe material or logical systems elaborated by the consciousness (the knowing subject) and whose relevance is not established to describe the transcendental subject.

It is only after having generally affected the subject, in a diffuse form, that the sensible phenomenon emerges as a fact-of-sensation.

The sensation is possible (although informal), as a singularity of the transcendental and it is the global faculty of knowing which gives it form.

Sensations are not combined by reason at the level of revealed meaning, as would be logical propositions but merge in their diffuse form like chaos. .

Reflex acts demonstrate this.

Only then formal concepts can be revealed to the subject in the form of Facts of Conscience. In fact, we can say that there is between the informal and formal levels a diffuse front where the classes of Facts of the thought/subject are the germs of crystallization of the meaning of transcendental. In other words, the faculty of combining sensations operates in the subject, already before meaning.

We are both subjects and objects of our sensations, at the same time spectator of sensation/object and actor/subject of sensation.

This diffuse front obliges us to abolish the difference of nature between the logical/mental/intangible and the physiological (or whatever physical nature) of thought.

### Knowledge operates by separation and not by synthesis.

The fact can not be seen without the filigree presence of the knowing subject.

This fact can only appear to the "knowing me".

Without a subject there can be no objects.

At the moment when the fact of sensation is revealed, it is already part of the whole of knowledge of the subject.

To the idea that reason synthesizes the universe of knowledge by disposing, at each moment, one-to-one, the facts of sensation, revealed for themselves, we must oppose that it is the global faculty of knowing who lets emerge the fact, as part of a whole unified and organized globally in the self-object.

Not that we must choose between one or other of the hypotheses, but rather understand how they cooperate to increase and formalize the meaning of Knowledge.

We see then that the fact of sensation in its form and also its position in the universe of our representation is just as much and certainly more determined by knowledge and its laws than by the possible a priori form of an external cause of the sensation or its position relative to other objects.

### Space according to Poincaré :

The concept of space to which this conclusion leads us is close to that of Poincaré: a universe whose form is created as a whole by the transcendental subject and appears to the knowing subject. An universe where nothing has "by itself" a position.

According to Poincaré (Ref S&H, THP), space has no external reality, nor is it the product of a kind of a specific sensitivity. The properties of space derive from our motor and tactile experiences. However, sensations have no geometric and spatial character. Spatiality appears to us from associations and orderings of sensations.

Poincaré supposes an innate capacity, a category of the understanding which he names "sensible space" or "representative space" whose function is to classify sensations and to allow the qualitative comparison of sensations of the same kind.

*NB: The way sensations are ordained by the faculty of knowing is illustrated in appendix V from the ideas of Whitehead.*

The axioms of geometry are conventions, the question of truth in geometry does not make sense, Euclidean geometry is the one that corresponds best to our experience and in particular to the sensations associated with the movement of natural solid bodies.

For Poincaré, the genesis of space is physio-psychological and cultural.

It is at this point that the OK diverges from Poincaré.

It is surprising that the father of dynamic systems theory was content with this typically Darwinian explanation, implying a psychological component under the mysterious label of a "category of the understanding" he leaves unexplained, as did before Kant and Schopenhauer (ref CRP, QRPR, MVR).

How, could a "category of understanding" identify and compare "sensations of the same kind" ? This is a typical example of the epistemological error of describing the transcendental subject with the terms of the knowing subject.

Poincaré, who had seen the constructive character of probabilistic laws and chaos, did not ask the question "what are the laws of the understanding?" from the point of view of logic and very large numbers. It must be said that at the time the field was occupied by the rise of the physiological and psychological sciences of thought.

It is also surprising that Poincaré did not note the circular aspect of a Darwinian explanation underpinned by the notion of a priori time and by an a priori materialistic view of the world. These remarks made, it remains nonetheless that according to the conception of Poincaré, in a space created by the understanding from various "sensations" and having in themselves no spatial character, the objects of the world do not have "by themselves" position and therefore no speed, acceleration, inertia, mass etc ...

These properties of the object emerge from the global Knowledge of the subject and it is this essential link of the individuated object with the whole of the represented universe, which gives meaning to the ideas of mass, inertia, gravitation, relativity.

For example: The inertia of an object is a mode of its relation to my perspective of the universe: "*If I move an object in my representation of the universe, the whole representation is affected*" "*To move an object, I shall change all my representation* »

## appendix IV

### Linear system and unfounded reality

Here is an exercise of thought that requires only a general culture in algebra.

This text does not claim any mathematical discovery and its rigor in this respect is certainly criticizable.

We simply wish to use formalisms and mathematical methods for illustration.

A linear system is a set of equations that is expressed as  $n$  lines of linear relationships between  $p$  unknowns. Typically :

$$a_{11}x_1 + a_{12}x_2 + \dots + a_{1p}x_p = b_1$$

$$a_{21}x_1 + a_{22}x_2 + \dots + a_{2p}x_p = b_2$$

..... ..

$$a_{n1}x_1 + a_{n2}x_2 + \dots + a_{np}x_p = b_n$$

The  $a_{ij}$  and  $b_i$  are usually given numbers.

The  $a_{ij}$  and  $b_i$ , which we will symbolically denote by  $[A, B]$ , express, under a certain convention of writing, a relational system.

Note that  $[A, B]$  is the representation of relations and not the relations themselves, so much so that many formal manipulations of  $[A, B]$  are possible (eg linear combinations) without altering the reality of the system of relationships.

The  $x_j$  are neutral conventional signs for unknowns which we only know to have the  $n$  interdependencies defined by the system  $[A, B]$ .

Under certain conditions, there exists a unique solution, that is to say a unique set of  $p$  values  $x_j$  that we will designate by  $\{X\}$

We can then write  $[A, B] \rightarrow \{X\}$

The fact that the solution is unique means that there is logical equivalence or interdependence between the relational system and the solution.

What we can write  $[A, B] \leftrightarrow \{X\}$

There is equivalence between the expression  $\{X\}$  of solutions and the relational system expressed by  $[A, B]$

$\{X\}$  is the representation of  $[A, B]$ , in a reduced form since  $\{X\}$  is a point in the space  $\{x_j\}$  (at  $p$  dimensions).

We could generalize the meaning of the  $x_j$  no longer as the coordinates of a point in a geometric space but as predicates describing an object in a space of values.

We can then say that the predicate  $\{X\}$  is the expression in the ordered space  $\{x_j\}$  of a relational system itself expressed by means of the convention  $[A, B]$ .

The formal representation of the predicate  $\{X\}$  describes the same reality as the formal representation of a relational system.

It is interesting to note that  $\{X\}$  can be defined formally as an individuated object located in the space  $\{x_j\}$  whereas  $[A, B]$  is a relational system that can not be represented as an object in this same space.

We find again one of the themes of the OK according to which the Fact  $\{X\}$  would be only the representation, by a cut representable in an ordered space, of a coherent system of interdependencies  $[A, B]$ .

Then the question arises: Is not every point of space  $\{x_j\}$ , that is to say each of the possible  $p$ -tuples, the representation of a relational system of which it would be a solution?

System that can take a form similar to  $[A, B]$ .

### The non-foundation

Analyzing the relational system  $[A, B]$  we see that it is formally composed of the predicates  $A_{ij}$  and  $B_i$  arranged according to a conventional structure.

One would be tempted to express the predicates  $A_{ij}$  and  $B_i$  in the same sense space as  $\{X\}$ , but that would probably be a mistake and certainly a way to lose the ontological meaning of our example. Under certain conditions, however, each predicate  $A_{ij}$  and  $B_i$  can in turn be considered as the expression, in a certain space of values, of a relational system.

This relational system can in turn be analyzed as the conventional disposition of predicates and so on into an endless decomposition.

Thus, the Logical Fact described by  $\{X\}$  in our familiar space of values, would be the representation of an unfounded relational system, a set of predicates contingent to infinity, a signifier without substance.

The reality represented by  $\{X\}$  would then be a structure of interdependencies, pure, that is to say without objects, unfounded.

### The In-Act

In the relation:  $[A, B] \leftrightarrow \{X\}$  The “relational system”  $[A, B]$  and the “solution”  $\{X\}$  conventionally play a different role.

$[A, B]$  plays the role of the equation and  $\{X\}$  that of the unknown solution.

The equation is a set of relations In-act, true of all times and everywhere, without order a priori, independent of any observation.

The solution appears to each of those who perform the calculation, in a time and according to their own modalities and depends on the starting point chosen for the calculation.

Thus, the Reality ( $[A, B]$ ) is In-act, out of time and from all place, while logical Facts ( $\{X\}$ ) appear to the knowing subject as eigensolutions of the Logos, individuated, localized in the time and the space of the subject.

It would no doubt be possible to extend the example to a more general case of infinite system, without a unique solution, and thus to reinterpret the principles of the OK by the formalisms of algebra.

Some very great writers have already written about this kind of exercise (G. Deleuze "algebra and pure thought", A. Badiou "the being and the event"), showing how "mathematically" it is dangerous for the author and difficult for the reader to follow.

Putting its steps in the footsteps of science has all too often deprived metaphysical thought of its necessary freedom and relevance. We will stay there then.

On the other hand, it is possible to draw a parallel between this exercise and the propositions of F. de Saussure (FdS) in philosophy of language (ref PLOC).

FdS explains the concept of sign: association of the signifier (the acoustic sensation) with the signified (the concept), he also shows what is arbitrary in the choice of the signifier, not only in the choice of the term associated with the concept (which is made evident by the diversity of languages), but also by the fact that there is no contingent, see no traceable relationship between the structure of the signified and that of the signifiers.

In fact, the relation of the space of signifiers to the space of signified has structural characters similar to the relation of the space of the variables to that of the equations of the algebraical linear system.

The system of equations is a system of relations, possibly unfounded, infinite, which, if it is not complex in the sense of the OK, is at least of dimension superior to that of the solutions.

This is why they are called "solutions"

None of the figures (numbers) constituting the solution can be associated with an individuated "thing" constituting the relational system but only with the entire system.

We also note that if the solutions are individuated, quantized, the equations represent a continuous relationship between the variables, i.e. the variables are not determined as countable by the equation.

These differences make the solution vector irreducible to the possibly complex logical object that is the system of equations.

It is the same with the language: the signifier is a cut in the signified relational complexity.

The signifier is not in the same space as the signified.

A difference still:

While the system of equations draws its forms in a universe of a priori ordered numbers, the concept (in the sign) is rooted in an infinite, unfounded set of relationships between concepts.

The concept is not "something" but only a more or less vague perspective on a bundle of associations that, in reality, is impossible to pin down. The association of the signifier with the concept therefore requires a judgment of individuation of the concept.

We then understand the difficulty of recognizing the logical structures in a language, as well for the words as for the syntactic rules, because the interdependencies, the relations, which appear to us necessarily between individuated signifiers, are actually between signified, and will present the same structural complexity.

Interdependencies between signifiers will always fail to reproduce the structure of the complex fields of interdependences between the signifieds.

The miracle of language is there, in the Act which, by a series of judgments, makes it possible to individuate concepts in the unfounded space of the signified, of the thought/object, of the Knowledge, to associate to them words, in the countable space of the signifiers, of the thought/subject, of the consciousness.

This miracle is twofold: indeed the signified/signifying interaction is reciprocal: each signifier gives Existence to a germ of agglomeration in the relational complexity of the signified.

Each signifier contributes to structuring the perspective of the subject on his Knowledge.

Language is the structure of consciousness, of the representation of the world, and since, for the OK, the world is representation, language is the form of the world.

Language is not a copy of the forms of the world, the world has no forms.

Language makes Exist in our Knowledge the structures by which we give shape to the world.

The parallelization of language and the representation of the world, the fusion of the two principles, shows us to what extent the laws of Knowledge, the self-created, self-organizing structures of the In-Act build our representation of the world. according to their own law and make the "laws of the world" unnecessary.

The refusal by F. de Saussure, but also by Kant and Schopenhauer of a formal reality in reference to the sign as to the formal representation of the world, has opened the way for us. The idea of a physical world in reference, although it establishes common sense, is a circular reasoning and therefore without proof, since it would justify the truth of the signifier (the word, the form) by the significant sensation.

The idea that the physical world would be "hardware" with rigid laws while consciousness is flexible "software" is itself wrong. It is not supported by experience or reflection. Poincaré has shown us that, as long as there are large numbers of interactions, the laws of the physical world, would they be elementary and deterministic, are no more rigid than laws of probability, while the cognitive processes perpetuate the individuated subject with an extraordinary

persistence, through billions of billions of random interactions.

The signifier is attached to a cut in the signified, the word is stricto sensu a quantum of action of the concept. The meaning of the word is the quantified probability which, associated with the concept, makes it possible to conjecture the identifiable facts that one can experience next.

This is as much for the immediate concept (the horse I see now) as for the general concept (the concept of horse).

The laws which rule our representation of the world, which seem to us to rule the relations between signifiers, are but the images of the extraordinary complexity of the interdependencies in the In-act.

In the proposition <Plato was the disciple of Socrates> the signifier "disciple", which appears to us a relation of one to one, is only the representable image of the extraordinary complexity of the Interdependencies between {what was Socrates} and {what was Plato};

Interdependencies that it would be impossible to circumscribe to the only signified Socrates and Plato.

In the space of representations, the "disciple" relation is not attached to the concepts of Socrates and Plato in their unfounded reality, but to the focal points of the individuation of these concepts, virtual points to which countable sets of conjectures are attached, the laws of probability on the new signifiers that the evocation of these concepts can make exist.

The materialist and monistic view that the "laws" of thought are consequences of the laws of the material world is an assessment error, and so far an affirmation without proof.

Quantum theory shows us that the world that we believe to be deterministic when it comes to describing it by the signifiers of Facts and Relationships, is in deed probabilistic.

The countable and dicible laws of the world of our representations emerge from the laws of the individuation of meaning governed by the principle of the Logos.

The acoustic image of language, the formal sensation as well as the law, are in their turn the germs of the individuation of the concept, in a reciprocal action, not of the sensation (or of the word) to the concept, but of the whole formal sensations (see note) to the indistinct and metastable mass of concepts, ie to interdependence.

The laws of this "crystallization" of concepts from germs are probabilistic, transcendent and universal, thus explaining the similarity of structure of languages and representations of the world and the place left nevertheless to divergences, to choices.

The example of physical crystallizations (which we owe to G. Simondon) is quite suitable: the principles are universal and the structures are similar, depending nevertheless on parameters of substance; however, each crystallization is unique and no contingent logical relationship can be established between the resulting image and that of the original substance.

What "makes law" is the mode, the principle of germination and not the "class of germs". It is in virtue of the principle of germination that forms appear to be classifiable, that there are invariances, figures of crystallization.

Crystallizations from the same substance with the same parameters, although each is unique, are immediately identified as similar.

The relation between signifier and signified is necessary. We have shown that it is reciprocal but that it links two incommensurable universes: the countable universe of signifiers and the unfounded universe of the signified, the equivalence of the signifier to the signified can therefore only be a judgment, an extended form of contingent predicate to infinity.

This relation does not require at all the existence in reality, of a formal referent to the word or the sensation.

(note) About the interdependence of sensations: The set of signifiers ultimately expresses the existence of the "I", as an asymptote to the aggregation of meaning.

There can therefore be no void of meaning, except to question the certitude of the "I", which is impossible.

Every individuation of meaning, in that it replaces the complex (the excess of meaning) with the countable (the meaning Unit), occurs in opposition to the emptiness it creates. If individuation punctually releases the tension of an excess of meaning, it creates a new tension because it can not create a void-of-meaning.

Under the general constraint of the 100% certitude of individuated Facts and finally of the "I", these logical tensions are resolved according to the same principles:

Transaction is a projection from a space to another space of lesser dimension. Transaction takes the 100% certitude (for itself) of the Fact  $F_n$ , taken in the complex space of its In-act, to pass it as a conditional probability of a Fact  $F_{n+1}$ , "knowing"  $F_n : P(F_{n+1} | F_n)$  in a space of lesser complexity (see appendix V for more details).

At all scales and always with the "I" as the ultimate focal point, Individuation gives to the representation of the world a sort of fractal structure.

## The fact and its importance

A.N. Whitehead (Wh), philosopher and mathematician, is with B. Russel co-author, in 1910-1913 of "Principia mathematica", a founding work of modern logic and arithmetic.

In 1938 Wh gave 9 lectures presenting his metaphysics, whose texts have been grouped into a collection entitled « Modes of Thought » (ref WMdP)

In the following lines, we will start from the notions of "Importance of the Fact", theme of the first of these lectures and "Perspective", theme of the Fourth, which we will reinterpret according to the terms of the OK and then try to go beyond them to draw conclusions applicable to arithmetic and geometry.

Let's start by solving two vocabulary details:

(1) The term matter-of-fact: We will rather use the term "Fact" as defined by the OK, as it may be involved in the terms "Fact of Knowledge" or "Fact of Sensation"

(2) The terms "being connected" or "connectedness". We will prefer "Interdependence" which is well defined by the OK.

### Development

Wh first states that "*There are two contrasted ideas which seem inevitably to underlie all width of experience, one of them is the notion of importance...The other is the notion of matter-of-fact*". We will see that in this quote, the expression "*all width of experience*" is not incidental.

For Wh, the importance of a Fact is not a mere judgment (would it be unconscious) of the subject, applied as an attribute to the Fact existing by itself. Importance is a condition associated with the appearance of the Fact in the perception of the subject, its Existence as the OK defines the term.

"... *characteristic modes of thought as we first recall ourselves to civilised experience .... are "this is important", "that is difficult", "this is lovely" etc.*"

For Wh, there is no surprise that one can qualify as "important" a Fact even though it is only vaguely characterized by the terms "this" or "that", for importance is not a mere qualifier of the Fact.

Not that importance is a prerequisite for the Existence of the Fact.

As the OK shows, since the Fact has no substance, it is the association of meta-Facts, of judgments of belonging to classes of Facts. Thus, judgments such as unity, importance ... co-exist in the Fact, like all the meta-Facts that constitute it. Importance co-Exist in the Fact.

As an illustration, a movement rapidly converging towards our axis of vision triggers in us a physical state of alertness, even before it has been individuated as a Fact of perception and acknowledged as "a danger" by our spirit.

Having shown co-existence in the Facts of the importance judgment, Wh then exposes the nature of importance, beyond its usual psychological meaning.

For Wh: "*the notion of a mere Fact is the triumph of the abstractive power of the intellect*" "*A single fact in isolation is the primary myth required for finite thought, that is to say, a thought unable to embrace totality (3)*"

(3) This term of totality would have deserved more precision. We propose " ... *the totality of its Knowledge* " or " ... *a thought/subject unable to give meaning to the totality of his thought/object* ". Knowledge and thought/object designate here the same notion.

Wh: "*This mythological character arises because there is no such fact. Connectedness is of*

*the essence of all things "*

We will move from Interdependence inside the Fact to come to the Interdependence between the Facts of Knowledge and its role in the constitution of a perspective that will make possible a judgment on their respective importance.

For Wh, the judgment of importance is that aspect of our feelings of the world by which a "*perspective of the world of things felt*" imposes itself on the subject. It is according to this perspective that our consciousness neglects such unimportant Facts and gives Existence to such important facts.

*"The two notions of importance and perspective are closely intertwined."*

The importance of the fact lies not "in" the fact but in the global relational structures that determine the modes of judgment of importance and is called perspective.

One could consider that importance qualifies the individuated Fact while the perspective describes the scheme of a structure in the Knowledge of the subject. This simplistic vision should not make us forget that on the one hand the importance is a relationship of "more or less", relative in essence, order relationship between Facts, necessary to an orderly structure; and that, on the other hand, the perspective is in the proper sense according to a point of view: that of the subject.

At this point, the reader of Wh's lectures feels the same discomfort as when reading Kant or Schopenhauer. As long as the terms: importance, perspective, judgment keep a psychological connotation, nothing is clear.

The OK proposes to the reader, by explaining this notion of "point of view of the perspective", to deepen the intuition of Wh to highlight by which objective process the Facts of our Knowledge seem to emerge in a space ordered by the importance and more generally by order relationships.

For this, let us quote a somewhat obscure passage from Wh: "*We may well ask whether the doctrine of perspective is not an endeavour to reduce the concept of importance to mere matter-of-fact devoid of intrinsic interest.... It is true to say that perspective is the dead abstraction of mere fact from the living importance of things felt. The concrete truth is the variation of the interest, the abstraction is the universe in perspective, the consequent science is the scheme of physical laws which, with unexpressed presuppositions, expresses the patterns of perspective as observed by the average of human beings*".

According to Wh, perspective results from systematization, in the form of laws, of invariances of structure (patterns) in the importance of Facts of Knowledge, as felt by the subject.

For the OK, Wh's analysis lacks the following premise: "*The subject is individuation of his Knowledge*"

Let us recall some principles enunciated in ref. OdC: The Logos tends to aggregate the Knowledge of the subject into individuated singularities that are the Facts of Knowledge which, themselves, being interdependent, will be aggregated in turn and so on into a global process of individuation that converges to an asymptote : the "I", the knowing subject, the Point of view. The meaning of each Fact is expressed by a law of probability on the Facts to appear.

From a global view we can say that the agglomeration of the Facts of a Knowledge, by its convergence, gives Existence to the subject. It is the individuation of the subject.

G. Simondon has clearly stated (ref ILFI, IPC): The subject is not the result of individuation, it is the principle, the Act of individuation. Individuation does not end with the appearance of the subject. The convergence is perpetuated indefinitely towards the always repulsed focal point that is the "I". Thus, the flow of appearance of the Facts and their agglomeration "towards" the "I" is endless.

This convergent agglomeration is not regular.

The contributions to the individuation of the "I" are not equal.

The conditional probability of Existence of the subject, knowing the Existence of a Fact is not the same for all Facts.

Existence of certain Facts is objectively more important than others for the Existence of the subject. The importance is therefore not a psychological or physiological phenomenon but a distribution of objective probabilities in a system of interdependencies.

It is the probability of Existence of the subject knowing the Existence of the Fact.

According to the same principle by which the Facts are individuated, singularities in the importance of the Facts appear and subsist. They individuate in meta-facts of importance.

The dynamics individuate and persist, as the convection in the atmosphere is individuated in cyclones and anticyclones.

Importance is not an exclusive attribute of the Fact, according to an absolute scale, but a characteristic that judges the Fact as one of the Facts, from a perspective of which we now know that the point of view is the "I".

Now, by virtue of the Cogito, the Existence of the subject is certain for the subject, in essence.

It follows that the sum of the importance, integrated over the whole extent of his Knowledge is equal to one for the thought/subject.

Importance is only one of the modes of Existence, one of the formal elements that coexist in the Fact and carry the meaning.

Importance is only one way of qualifying the remarkable singularities resulting from the Logos.

It is here that the remarkable consequence emerges.

In a reality according to the OK, which would not be ruled by physical laws a priori but by the laws of Knowledge, by the principle of the Logos:

The world of the subject is not the juxtaposition of Facts disjoint, with an absolute Existence, possibly ordered according to a priori scales.

The meaning of the world is not a possibly infinite addition of independently existing, or loosely interdependent, meanings of Fact.

Since the Meaning of a Logical Fact is the assertion of the Existence of the subject, the world is a set of Facts whose cumulative Existence results in the certitude of the Existence of the subject.

For the representation of the subject, the world is distributed according to a distribution of probabilities of Existence whose integral on the totality of the extension of his Knowledge is 100%.

This distribution is not equal, it is even metastable according to the principle of individuation. There are singularities.

From the global interdependence between the singularities, the Logos' laws define, according to a perspective centered on the subject, the rules and the parameters that order the representation of the world.

Thus, the limitations to the extent of the world as it appears to us, our inability to qualify the infinite to large and small scales, result neither from insufficient means of observation, nor from an intrinsic limit to the world, but from the fact that the Existence of the world is included in the Existence of the subject, the totality of which can not exceed a mere certitude. This principle can be expressed very concretely: In order for the subject to be able to make A

and B exist in the same representation, the In-act of A and that of B can not be disjoint, then the Senses of A and B, expressed in terms of conditional probability of "I" do not add up completely.

Such a conclusion is not without consequences on the validity conditions of arithmetic and geometry.

Arithmetic: If we consider the number (integer) as the Fact of arithmetic, then only pure numbers, numbers which would be nothing for the subject, numbers with a zero Existence can constitute an infinite according to the classical principle of recurrence. Of such numbers nothing could be said. In particular their importance would be nil ( $1/\infty$ ) and therefore uniform, as moreover it would be impossible to attach to them the sense of the logical operations which define them, these numbers could not be ordered.

An arithmetic of numbers with non-zero existence should respect the above stated constraint: that the integral sum of the existences of numbers, extended to the whole field of this arithmetic, is limited to 1.

Let us say that if the conditions necessary for that each number  $n$  can be represented by the subject, occupy a fraction  $F_n$  of its existence, the series will be limited by  $\sum F_n \ll 1$

One can probably conceive several classes of solutions respecting this constraint, that they limit the extension of the domain or the density of probability of Existence. I even suppose that they have already been elaborated for the solution of relativistic and quantum problems.

Geometry: If we consider the point as Fact of geometry, then only points with zero Existence can populate a continuous and/or infinite space. This space could not be ordered.

The constraints that would impose to points with non-zero existence, to "physical" points, would be of the same types as for the numbers of arithmetic.

I will not venture on this terrain.

It can be argued, however, that the solutions to this constraint:

- Will be centered on the subject
- The Facts will necessarily be without substance, unfounded. In other words, in these facts, there will be judgments of structure, singularity, and importance. They will possibly be defined only by intersections of classes.

- The Facts will be interdependent so that:

$$\sum_i P(\text{subject} \mid \text{Fact}_i) \ll P(\text{subject}) = 1$$

In conclusion :

It is remarkable that this Mode of Thoughts was written (in 1938) by the co-author of Principia mathematica (written with B Russell in 1910-1913).

In purely ontological terms, it will be noted that it is not the "totality" or "cardinality" of a world being which is limited in reality, but the Existence of the world which is limited to the Existence of the subject by the laws of the Logos .

Only the representation of a world is limited by an horizon.

Any question of form related to what is beyond this horizon is useless.

Should we deduce a new cosmology?

This text has brought us an objective answer to two questions concerning the OK:

- How, among the infinity of infinites of actual orders, a particular order is brought to Exist for the subject ?
- What is the principle of the relations of "more or less" that will order and qualify the individuated Facts?

In philosophical terms, this throws light on Kant's "*in mundo non datur hiatus*" in his

"Critique" ref CRP:

A hole in the representation of the world would be for the subject a quantum of uncertainty about his own existence. But such uncertainty is impossible under the Cogito.

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