A natural concept of time

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Here is in a few lines the concept of time according to the Ontology of Knowledge

The meaning:

Reality is interdependence.

Without an ordained space *a priori*, there is no chaos but an infinity of infinities of infinities of possible orders.

An order is not an ordained state but an ordained logical bundle.

A knowledge is a partial bundle stamming from a "point of view."

Knowing a partial beam, its possible extensions are not equiprobable.

The meaning is the law of probability that binds a knowledge to its extensions in its logical neighbourhood.

Meaning is not the attribute of a state but the action that extends and directs a knowledge.

Neither knowledge nor meaning changes reality.

The Individuation:

If an infinite bundle of interdependencies has $1+\varepsilon$ degree of freedom, it has an infinite degree of freedom.

--> The meaning of a knowledge tends towards complexity (its entropy grows infinitely).

If an Infinite bundle of Interdependencies presents N degrees of freedom, there are possible cuts presenting $M<N$ degrees of freedom.

--> The complexity is metastable, it collapses by successive cuts towards an asymptotic path with a single degree of freedom (entropy tends towards zero).

There are infinite numbers of possible solutions to this collapse.

The existence of cuts that reduce complexity is the very condition of world representation.

The existence of a knowledgeable subject is one of the possible solutions.

The existence of the subject is individuation of meaning.

Neither existence, nor individuation, nor meaning change reality.

The "I":

The subject is not a knowing being, he is a knowledge.

It does not happen to the knowledge of the subject to make sense, to exist is to make sense.

It does not occur to the meaning to individuate in the subject, the subject is individuation of meaning.

The "I" is the aymptote of the individuation of meaning.

The "I" is an ideal one-dimensional course with entropy zero .

The meaning of the "I" is $Pr(«I» \mid «I») = 1$ with « I » ≠ « I ».

"I" is not a being but a bond of interdependence, a vector, an act, a becoming.

The subject's time is carried by this vector.

Time is changing the meaning.

Yet nothing changes reality.

The facts of the world:

Because we are individualization of knowledge, because it is the very nature of our being-in-the world, only the facts that contribute to his existence can make sense for the subject.

The facts of the world exist for the subject only according to their participation in his individuation.

The meaning of a fact F is identified with $Pr(«I» \mid F)$

For the subject, the fusion of the meaning of all facts ($\cup$ Fi) is subsumed by his individuation: $Pr(«I» \mid (\cup Fi)) = Pr(«I» \mid «I») = 1$

The facts of the knowledge of the subject form a whole made globally interdependent by the constraint of individuation.

A fact of knowledge makes sense for the subject only on the basis of a perspective, a context created by the individuation of all his knowledge.

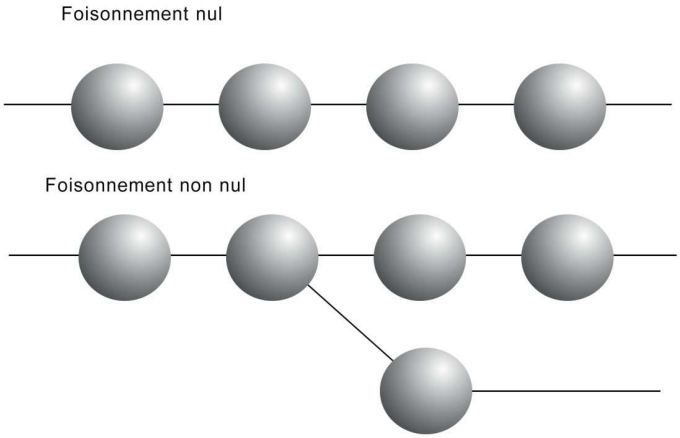
Our representation of reality tends to grain towards the specific low entropy states (i.e. with a minimum number of degrees of freedom) that are the objects of the world.
This perspective projects on the timeline of the subject his representation of the world and of himself.
The representation of the world by the subject is orthogonal to the time of the subject.
Individualization is an asymptote never reached.
Since zero entropy cannot be achieved, the graining of our representation leaves a residue, of which one aspect is space, offering three additional degrees of freedom to the objects of the world to exist.

Appendix I

A simple heuristic model

Imagine a purely logical Reality (logic is not subject to time, let's say it is In-act).
To model this Reality let's create two heuristic concepts: the element and the interdependence.
If two elements of Reality A and B are interdependent, the reality of A depends on the reality of B and vice versa. $A \leftrightarrow B$
This interdependence is In-act.
This link applies only to the instanciated relationship between the individual elements A and B.
The sign does not introduce a condition "if A then B" but the Interdependence "A because B and vice versa" that one could also write $Pr(A|B) \neq 0$ and $Pr(B|A) \neq 0$
Let's also consider other interdependencies $B \leftrightarrow C$, $C \leftrightarrow D$, $C \leftrightarrow E$, etc....
We will then be able to build a network from A (which then plays the role of **Point of View**) by adding, from near to near, the interdependent elements. At the n^{th} addition, this network will naturally constitute a part of Reality.
We will name Knowledge such a network from A.
Knowledge is a network of Interdependencies stamming from a Viewpoint

Abundance: This new heuristic concept means that one element is statistically interdependent with $2+\varepsilon$ other elements. It can also be said that the beam has $1+\varepsilon$ degrees of freedom.



If the abundance is not zero, as soon as the number of interdependencies is high, not only the power of the network stamming from A but also its complexity become infinite: the network of elements and interdependencies stamming from A exceeds any possibility of cut because at the n^{th} divergence the neighbourhood (the interface) of the Knowledge contains $(1+\varepsilon)^n$ elements.
To "cut" the Knowledge issued from A from the rest of Reality it would then take a cut of infinite dimension because: $\forall N>1$, when $n \rightarrow +\infty$, $(1+\varepsilon)^n / n^N \rightarrow \infty$.
The E entropy of the network grows as the logarithm of the number of its branches.

$$E \rightarrow +\infty$$

Should we think that Reality would be unsplitable in parts, not cuttable?
In fact, no, a principle of aggregation tends to reduce the complexity of the Knowledge.

The loop:
In the simple case of zero abundance, if the chain $A \leftrightarrow B \leftrightarrow C \leftrightarrow D \leftrightarrow$ ... closes on A in such a way that $A \leftrightarrow B \leftrightarrow C \leftrightarrow D \leftrightarrow \ldots\ldots \leftrightarrow A$, this chain forms a loop.
In the general case of a non-zero abundance, the network of interdependence links closes globally on itself (in a woolball could be said).
In absolute terms, the loop would be totally cut off from Reality, constituting a part in itself, independent of Reality, a self-created element.
In the general case we will say that the generalized loop of Interdependencies is a statistically singular configuration, with a minimum neighbourhood, a number of links with Reality lower than

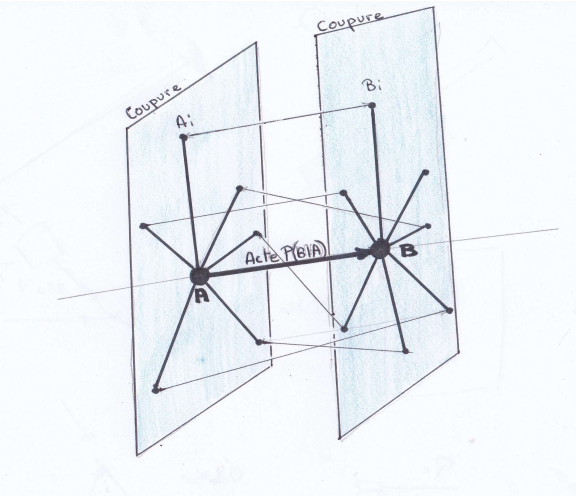
the N mentioned above, i.e. constituting a part of Reality by a cut to N dimensions or, using the definitions of Poincaré, representable in a space with N+1 dimensions.

Let us now assume that the probability of loops in a Knowledge increases and tends towards 1 when complexity increases.
In a Knowledge stamming from A, a non-zero abundance leads to complexity and therefore necessarily to the existence of loops, constituting "new elements", presenting a minimum neighbourhood.
This aggregation of Knowledge applies ad libitum, as long as the complexity is not "exhausted", i.e. until the abundance tends to zero, without ever being able to reach it since the complexity then exhausts, the probability of loops tends to diseaper.
This asymptot with a zero abundance, with a single branch would correspond to a zero entropy.
This principle results in an asymptotic balance between the expansion and aggregation of Knowledge derived from A, such as the abundance tends aymptotically towards zero.
As it absorbs its logical neighbourhood, the Knowledge issued from A is aggregated into elements.
It has possible cut surfaces of finite dimension.
At the aymptote ($\varepsilon=0$) the aggregation is the Individuation of Knowledge.
Such as $A \leftrightarrow A \leftrightarrow A \leftrightarrow A$
It should be noted that this aymptotic balance is inherently contingent.
It does not require any prior law or ad-hoc constant.
The principle described above is a sufficient cause.
We will name this principle the Logos

Note that the viewPoint A, is not necessarily the true origin of Knowledge, in the sense that it can itself be a loop, a part composed, its components being themselves composed and so on. The decomposition of A can be repeated infinitely.
-A Knowledge is unfounded, unfounded, without a primary element.

It follows that, in our heuristic model, the notion of element can be abandoned, replaced by a singular (cuttable) configuration of Interdependencies.
If elements A and B are unfounded, the $A \leftrightarrow B$ link loses its foundation at the same time. It must be replaced with the Interdependence between "The Multiplicity of A" and the "Multiplicity of B."
- The Interdependence link is unfounded.

Switching to probabilities:
We can then use Kolmogorov's philosophy of probabilities and generalize it.
The reality in this case would consist of a set of events that have occured (events are themselves interdependent and unfounded sets of events that have occured) which the subject would gradually become aware of.
The logical link $A \leftrightarrow B$ can be replaced by a probabilistic link $Pr(A|B) \neq 0$ and $Pr(B|A) \neq 0$
The complex reality of this link runs through the unfounded realities of A and B.
The subject's knowledge of A's constitution makes it likely that B's constitution will be experienced (keeping in mind that A and B are states of knowledge of the subject).
For B, the unfounded complexity of A is ultimately replaced by Pr(B|A).
This is in fact the result of a succession of judgments that each time replace an aspect of complexity with a probability.
By generalizing it can be said, in quantum terms, that the unfounded reality of A presents itself to B as a state vector representable in a state space (of finite dimension N+1)
NB: The state space depends on the overall structure of Knowledge B.We will not develop this point here.
The N-dimensional cut that delimits Element A (for B) is the place of an Act, a judgment by which the unfounded complexity of A collapses into a countable set of probabilities Pr (Bj|Ai), $1<i<N$.
This Act, this projection, carries an additional dimension "orthogonal" to the cut, which completes the representation space according to B (size N+1).
This is what the figure below is trying to show.



The Act by which the complexity of A is replaced by a state vector can be characterized as a judgment, in the sense that A being unfounded the state vector cannot be calculated exactly. However, this judgment is not psychological, it is a contingent result of the reality of A.
A simple example of such a judgment would be: "If I am at the casino in front of a roulette game with a sum of money (1), then I entered it with money (2) and I will end up without money (3)". Only the proposal (1) being established by its statement, the proposals (2) and (3) are contingent truths, although unprovable, they are judgments.
It should also be noted that Pr (B|A) is not a bet, neither on the possibility of B knowing A nor on A as a possible cause of B.
Since all events have occurred, probabilities result from Actual interdependencies that themselves result from deeper and more complex Actual interdependencies, etc.
Ignorance by the subject of these interdependencies does not affect their reality.
Everything that makes B is real long before it makes sense, long before it exists for the subject.

Appendix II

The present moment

Common sense distinguishes two sorts of facts of knowledge:
The experience of a fact of the physical world which the subject would become aware of through sensations.
The thought experience by which Facts of Knowledge come to appear and make sense for consciousness.
For common sense, the facts of the physical world (classical physics) occur according to the time of the physical world, regardless of the moment when the consciousness of the subject becomes aware of it.
The Facts of Knowledge are, however, logical facts and are not subject to the same time:
-a theorem that has not yet been demonstrated is already true,
-the result of a calculation that we have not yet made is already in the operation laid,
-a memory that is not present in mind is already a reality,
-to which time are subjected the facts of our dreams ?
Knowledge brings to the consciousness the Facts of Knowledge according to its own tempo.
Some want to consider the facts of thought as electrochemical phenomena and consequently report the tempo of Facts of Knowledge to the tempo of the facts of the world.
This is illusion: There is nothing to link the representation to a material state of the subject, because the material state is itself a representation.
It is easy to show that the present moment of the world as Alice's thought gives it meaning, cannot in any way be included in a present physical reality of Alice's thought, associated with a present state of Alice's brain.
It would be futile to reject this evidence on the pretext that we do not know how thought works. We already know that it is impossible to make sense in the present world of the present state of a few billion physical elements.
When I represent a "world without me or before me," I nevertheless remain the sine qua non condition and the focal point of this representation of the "world without me or before me".
If there is a past and a future represented, representation does not actually have a past and a future, the reality of representation is not in time.
A present moment of knowledge is not the present state of something physical.
The present moment of knowledge, even if it is limited to its conscious part, is not "something", nor is it "the state of something."
The meaning of a Fact of Knowledge is not "the present state of something."

Yet common sense too often overlooks this evidence:
If Alice becomes aware of a physical fact F at the time Ta by the Fact of Knowledge Fa and Bob at the time Tb > Ta by the Fact Fb, common sense will simply say that F occurred in a time T0<Ta<Tb and no one will care about the impact of the Fa experiences of Alice and Fb experience of Bob on their own time.
Yet, in the absence of absolute simultaneity, the only possibility for Alice or Bob to refer the time of an individuated fact to the time of the world that he or she represents is to locate the experience, to locate the Fact of sensation in relation to the whole of her/his representation of the world.
However, the only stitches that can reference the time of the world that Alice represents to the time of the world that Bob represents are the experiences identified as common by their knowledges.
Would Fa and Fb be their only common experiences, Fa and Fb should impose Ta=Tb.
Here is a circular reasoning: Times Ta for Alice's experience Fa and Tb for Bob's experience Fb although identified as a common experience, are considered different moments according to a time reference that appears common to Alice and Bob only by virtue of their experiences identified as common.
An explanation for this paradox is provided by M.Bitbol (ref MQIP p112 113) who, referring to Goodman and Wittgenstein writes: ". . . *a probabilistic estimate at first glance offers great resistance to its possible experimental rebuttal. It would even be fair to say that it is irrefutable*

law by the only finished experience.... If the probabilistic assessment is based on solid reasons, if the renunciation of these reasons leads with it the fall of a pan of too broad and too well validated knowledge, the finding of a frequency that deviates from the projected value will not be enough to refute the latter. Many more experiments will have to be done, many more discrepancies will have to arise before the possibility of replacing the projection system from which probabilities derive is simply considered. »

It is understandable from this quotation that the apparent rigidity of the time reference common to Alice and Bob is indeed the result of the extraordinary number of common experiences that synchronize their personal times and that the unique experience of the fact F at times Ta ≠Tb does not enough to challenge it.

On the opposite, it is the inequality of Ta and Tb that imposes Fa ≠ Fb.

This example also highlights that the moment Ta of the Fa Fact of Sensation experienced by Alice is not fixed by the present moment T of fact F in the world, but by the way Fa is merged with all the other Facts of Alice's Knowledge to finally lead to the semantic (and necessarily present) unity of the knowing subject.

Annexe III
Carlo Rovelli (ref FTCR)
The thermal time hypothesis.

extrait de l'essai de Carlo Rovelli :
In nature, there is no preferred physical time variable t. There are no equilibrium states ρ0 preferred a priori. Rather, all variables are equivalent; we can find the system in an arbitrary state ρ; if the system is in a state ρ, then a preferred variable is singled out by the state of the system. This variable is what we call time.
In other words, it is the statistical state that determines which variable is physical time, and not any a priori hypothetical "flow" that drives the system to a preferred statistical state. When we say that a certain variable is "the time", we are not making a statement concerning the fundamental mechanical structure of reality. Rather, we are making a statement about the statistical distribution we use to describe the macroscopic properties of the system that we describe macroscopically. The "thermal time hypothesis" is the idea that what we call "time" is the thermal time of the statistical state in which the world happens to be, when described in terms of the macroscopic parameters we have chosen.
...
Time is, that is to say, the expression of our ignorance of the full microstate.

One should note that this text from Carlo Rovelli doesn't tell us about the world as a system since nothing can be said about the world,but it tlls us about the representation of the world by a subject. This remark is enough to lead us to the concept of time as per Ontology of Knowledges.
Then the end quote becomes :
The "OK time hypothesis" is the idea that what we call "time" is the thermal time of the interdependant system which builds up the representation of the world by an individuated subject.
...
Time is, that is to say, the axis of our existence as individuated knowledge.

On could eventually add :
The time of a subject is an asymptotic 'zero entropy' line in the interdependant system that 'Reality' is.

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Références :

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