Block-universe and indeterminacy
Ontology of Knowledge and relativity

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Problem statement:

According to the Ontology of Knowledge (OK) reality is unspeakable, it is neither subject to form nor to time (see ref. OdC). The OK does not claim to tell an ontological truth (which would be unspeakable) but to propose an ontological model deepened in comparison to the common sense model.

Relativity proposes the model of reality designated as the *block-universe* which is not *in time* but which *contains time*. Relativity is a scientific theory which abstains as much as possible from ontological pretension.

In the absence of a passing time, the same questions of necessity and indeterminacy arise for both theories although in different contexts.

It is by comparing these two theories that we will try to understand the place left to indeterminacy in the block-universe of Relativity.

The block universe:

Let us quote Einstein about the concept of space-time imposed by relativity:

> *-Die Physik wird aus einem Geschehen im dreidimensionalen Raum gewissermaßen ein Sein in der vierdimensionalen "Welt".*
> -Literal translation: *Physics, instead of a "Becoming" in three-dimensional space becomes somehow a "Being" in the four-dimensional world.*
> -Interpreted translation: *[For physics] reality is no longer a three-dimensional spatial world that <u>becomes</u>, i.e. where changes occur, but a four-dimensional world that <u>is</u>. A world without becoming, therefore immutable, where past, present and future are determined as a whole. A world where succession is only an appearance.*

Note 1: The addition of *[For physics]* underlines that on the one hand Einstein deals with the description of reality by physical science and not with the ontological question of reality in itself and that on the other hand the schism made inevitable by relativity is located between physical science and common sense.

Note 2: The words necessarily betray Einstein's thought: the *Being*, in common language, is located in time: *being immutable* is to be identical to oneself according to time. However, in Einstein's block-universe, time does not pass and is not *a priori* distinct from the three other dimensions. Einstein's block-universe is therefore not an "*immutable being*" but one that "*contains time*"

Note 3: What is the possible meaning of what language designates by *determination* or *causal relation*? What place is left to chance, to indeterminacy?

Isn't Einstein's famous expression "God does not play dice" incongruous if everything is forever already played out and if man only discovers facts "always already there" in an order of succession of his own?

Indeterminacy:

According to common sense, indeterminacy is a matter of knowledge but at the ontological level non-contradiction prevails: Indeterminacy means in this case that from a given state of knowledge, either our means are not sufficient to determine what will be the outcome, or this determination is intrinsically impossible but only one of the possible outcomes will actually occur.

The OK reverses this relationship: indeterminacy prevails at the ontological level and non-contradiction imposes itself on knowledge. Indeed, in terms of knowledge, if X exists for the subject, X is necessary for his existence. The experience (the evidence) of X is the Transaction that makes "X exists" a necessary component of "I exists". The experience of X therefore makes the experience of non-X impossible for the subject.

To shed light on this topic, let's imagine a version of the roulette game adapted to the concept of a block-universe. Let's consider all the possible sequences starting from a Fact (A: Alice is at the casino).
This raises a question that science too often fails to answer: "where should we situate the knowing subject?" Is she **overhanging** this Whole, capable of visualizing all its contradictory alternatives, or is she, like Alice, **participating** in the world, but subject by the necessity of her own unity to the Kantian principle of transcendental apperception, to the "in mundo non datur ...", to the non-contradiction that allows her to know only one succession of draws?
Unless the two points of view prove to be compatible.
In the hypothesis of "overhang" the abundance of possible series is extraordinary ($>> 40^N$ in the N^{th} draw) and each possible series counts for one in this sum. The selection of the series that will actually lead to Alice's ruin advent in the external world and Alice will be the witness. The other possible series were only virtual and *a priori* in Alice's knowledge at time t_A.
In the hypothesis of "participation", since the fusion of possibilities can only make sense for the subject under the constraint of transcendental apperception: without a leap, without a void, without contradiction, the composition of their probabilities cannot exceed 1: the non-contradictory necessity of the fact existing for the subject. The selection of the game that led to Alice's ruin happens within Alice's knowledge, under the constraint of her Individuation, by fusion of possibilities into a certainty that excludes contradiction.
The rules of the game are well known and Alice's ruin is inevitable despite the infinite diversity of the games that lead to it and the tiny probability of each one.

> *Let us note that the rules and devices of the game that impose Alice's ruin as a necessity are neither in the time nor in the space of the game. They are always and everywhere "already there" as conditions of possibility not represented in the phenomenon "game" itself.*

Thus, although in the "participation" hypothesis each of the parts has a tiny probability of making sense for the subject (of appearing to him as existing), the experience R (ruin of Alice) will make sense with certainty (a "*certainty infinitely contingent*" according to the Leibnizian term) to such an extent that R could be attached to A like the predicate {Alice is ruined} <A is R> at the very moment of the experience A.
The ruin of Alice is a necessity although the paths that fulfill it are contingent, incalculable, random. <A is R> is a "judgment of necessity" according to the terminology of the OK.
In this reality, however, and unlike the universe of common sense, the paths leading from A to Alice's ruin R are not subject *a priori* to non-contradiction, they are all there, outside of time, Actual as possible modes of order, but whose probability of appearing (of existing for the subject) of each one borders on impossibility.
Only a singularity combining these modes of order and merging their probability into a necessity will appear to the subject as R does. This singularity is induced by general conditions of possibility (the rules of the game).
In the block universe, the necessity of R "knowing" A is no longer determined by a succession of causal relations but induced by general conditions of possibility, not subject to the time of the phenomenon.
The same reality can therefore be considered from two points of view: from the ontological point of view R is attached to A by an infinity of possible paths, possibly contradictory, whereas in terms of objectified knowledge only the singularity which merges all these possibilities to make them the non-contradictory necessity takes on the meaning of existing {Alice is ruined}.

Generalization:
We must therefore distinguish two points of view on the same reality of the Block Universe:
On the one hand, the block universe of objectified knowledge and therefore of science, it is relative to the knowing subject(s). This block universe is the place that Relativity speaks of. The place of

everything that has existed and will exist. But this existence is not an universal truth, it is only true for the subject(s).
On the other hand, the ontological block-universe. This is the one OK speaks of. It is the “place” of all possibilities, unspeakable, not subject to time.
Science is a rigorous way of saying what we know and of accessing what we can know from what we know.
To move from the OK point of view to the science point of view one has to consider, on the one hand the individuation of the subject(s) "I can only know what I become" and on the other hand the process of emergence of meaning which "objectifies" its objects "I only know as existing what is necessary for my becoming".

> *Note: The term possible, like all concepts of language (and science), has no absolute truth, facts can only be possible “from a given knowledge”... because in an unfounded reality, without identified singularities, any "possibility" would border on zero, that is to say, on impossibility.*

The law of distribution of possibilities is the meaning of present knowledge.
The block universe used by relativistic physics therefore leaves room for indeterminacy although the complexity that indeterminacy induces beyond the horizon of objectified meaning is not represented there because of the two constraints above.
Necessity, in its principle, must be considered as a singular mode of order of reality in general. This singularity constitutes the stitch by which a complex universe projects itself into a logical fact that can be said in a space of limited complexity, ensuring the progressive transition between the unfathomable, unfounded, unthinkable, interdependent reality "in general" and its representation that can be thought of by a subject and by science.
The necessity of the fact R "knowing A" is not determined by the succession of causal relations specific to the phenomenon in the world of its representation, but induced by the general conditions of possibility diffuse in reality in general. In other words, the predicate <A is R> is not intensional but only extensional.
The objectified meaning is not produced by the aesthetic intuition of the subject or by her understanding but must be considered as a mode of probabilistic order in a reality not subject to time.

The collapse of indeterminacy:
In the block universe, all possible paths to R “knowing A” are Actual as probabilistic expectations but will not necessarily come to exist for the subject.
If an experience makes a fact R' Exist for the subject on one of these possible paths, R' is no longer contingent but necessary, certain, and subject to non-contradiction.
It follows that any fact R" such that R"→ ¬R' is impossible, its probabilistic expectation is zero.
The experience R' therefore eliminates all paths to R that would be contradictory to it.

The "place" of the general conditions of possibility is not the space-time of the block universe. This place is reality in general, incommensurable to the space-time in which phenomena appear to the knowing subject.
The *real in general* (unthinkable) should not be confused with the extensional meaning of the *Whole of the existent* which, as we have seen above, is the law of probability on all possibilities attached to the present experience.
OK shows that the extensional meaning of the Whole of the Existent is subsumed by the necessity imposed on the subject to become him.her.self and therefore that the law of probability on all possibilities "knowing" the Whole of the Existent merges into the certainty of becoming oneself $Pr(\text{I knowing I}) \approx 1$.

We can say that "*the extensional meaning of the Whole of the Existent fixes the conditions of possibility of the individuated fact just as much as the individuated fact participates in the meaning*

of the Whole of the Existent". This proposition takes up the hologrammatic principle thought by Edgar Morin on the subject of knowledge: a fact of knowledge only takes on meaning in its relation to the Whole of knowledge and the individuated meaning thus revealed contributes in turn to the meaning of the Whole. This principle also applies to complex physical systems (for example, to the consistent development of the living being from a genome).

For the OK, the boundaries between the physical world and knowledge dissolve: The general conditions of possibility include in a single reality the laws of the world and the laws of knowledge*, the latter as well as the former not being considered for their apparently irreconcilable meanings but for their inseparable reality.

> **not the laws of knowledge considered as the good use of consciousness but the probabilistic laws according to which the consciousness of the subject evolves*

The continuous and the discrete

The blockuniverse of Relativity also poses the double question of the knowing subject:

1) how is the knowing subject, as a being, compatible with the block-universe model?
2) and how, since he is himself reality, can he think and therefore create such a model?

This question is addressed in chap. 3 of the article ref NMA

For the OdC, matter and mind, the known and the knowing, the physical world and the subject's knowledge of it, merge into the same reality.

This option is, in our opinion, the only one that allows the subject to be integrated into the block universe of Relativity. The concept of "world-line" evoked by Einstein to represent the subject within the block universe does not stand up to reflection: in the 4-dimensional universe as in the timeless reality of the OK, the subject cannot be separated from (everything) that determines him, that is to say from the singularity in reality that OK calls his Individuation. Schopenhauer already makes this observation in the " world as power and representation". He reveals the infinite complexity of the "causal past" of the subject and shows that each fact of this causal past is *de jure* cause of the present state représentation of the subject

> *An example from relativity allows us to illustrate this: I contemplate the star alpha-centauri (which cosmology places 4.3 light years from us). Let T be the instant when a given photon impacts my retina. 10^{-12} seconds later (fact T+) I can say with certainty that it is "in me and has become me". From this I can deduce as very probable the proposition "10^{-12} seconds before (fact T-) it is "in me and will be me". But in a reality without mind*, the path of this photon (supposed to be a particle) has no other reference than itself. Now in the reference system linked to the photon, Relativity tells us that no time and (by definition no distance) separate the emission of the photon (fact Te) from any point of its path. So in this system of reference (which is no less valid than mine) Te and T- are in one and the same instant (in fact one and the same point). How then not to consider the fact Te, in the same way as T-, as the cause of my present state (according to Schopenhauer) or as participating in my Individuation (according to the OdC).*
>
> **How indeed could we define a subject's mind in the block universe?*

This is why OdC proposes to consider the subject under two aspects: the **singularity-subject** which integrates all the facts which participate (<u>out of time</u>) in his individuation and the **knowing-subject**. The knowing subject is then a wave of meaning running through the reality of an individuation out of time (let us note that *individuation out of time* is very different from *the causal past*).

The general conditions of possibility of meaning include in a single reality laws of the world and laws of knowledge**, the latter as well as the former not being considered for their apparently irreconcilable meanings but for their inseparable reality.

> **not the laws of knowledge considered as the proper use of consciousness but the probabilistic laws according to which the consciousness of the subject evolves.

The knowing subject imagines a world populated by objects, but these disjointed beings are only

objectified meaning that emerges from extensional relations that merge into the unity of "I exist". This system of relations is so complex that it is not cuttable. This is why these objects appear to us to be connected by a continuus space-time.
On the other hand, the continuity of the trajectory of the object according to its time appears to us as a necessity* but it is only objectified meaning that hides from us the reality of the infinity of possible paths that fulfill this necessity.

> ** The necessity thus described is neither an opinion, nor a belief, nor a bet of the knowing subject but a fact of probability: for the subject, the necessity of R is induced by the knowledge of A with his becoming as a condition of possibility.*

Final note:
The reader familiar with the philosophy of science will understand that this ontologic vision makes the relativistic universe and the quantum universe compatible.

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Références :

Publications by the author : available in pdf on **www.academia.edu**

Ref ODC Introduction to Ontology of Knowledge

Ref RLPS Logico-phylosophical summary of Ontology of Knowledge

Ref AiSUM Summary by an AI of the Introduction to OK

Ref PLOC The philosophy of language and the OK

Ref BOIR Beyond the Opposition Idealim vs Realism

Ref TRANS The OK and the Kantian transcendantal

Ref SOLI The OK is it a solipsism ? 20200429

Ref LOGEX From Logical to Existing

Ref LAMG The OK logic arithmetics set theory and geometry iss.20220523

Ref BQOC Beyond Qbism with the OK

Ref FQAQ Four questions about QBism and their answers by OK

Ref MOND The OK and the form of the world

Ref TSWK Time space and world as a Knowledge iss 20240118

Ref CNT A_natural_concept_of_time_20210210

Ref BLOC Bloc-Universe and indeterminacy

Ref CQOK Continuous , Quantified, Quantity, as Knowledge ? issue 20240204

Ref ToM Transcendence of meaning iss.20240718

Published Book:
Ref UPF : *L'Univers n'a pas la forme*
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