Theory of Consciousness

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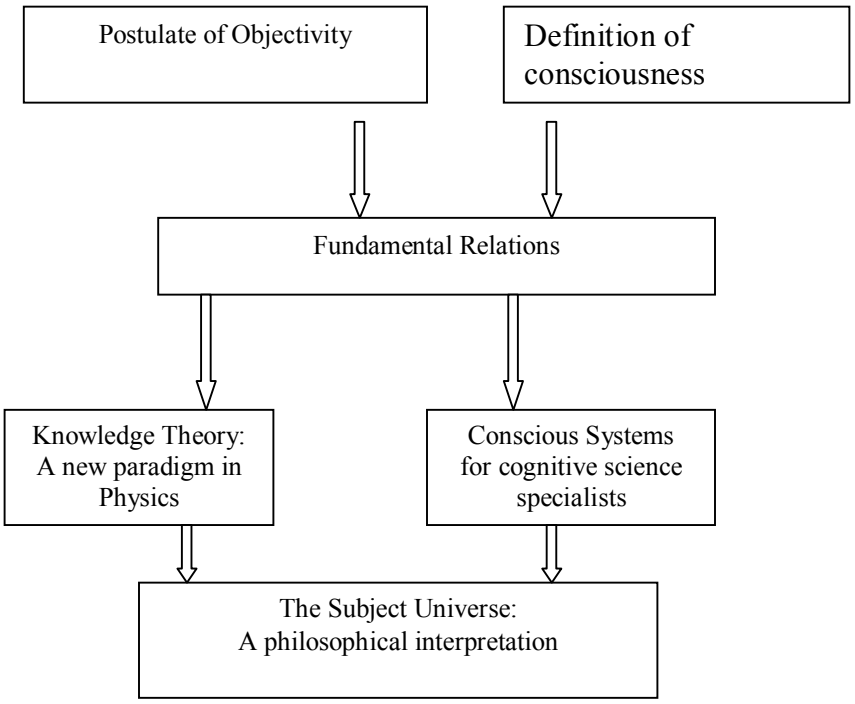
Abstract: The Theory of Consciousness has been published and presented in several conferences. Its originality is to call into question the Postulate of Objectivity on which today-science relies, to define consciousness as knowledge of knowledge and to formulate knowledge (or awareness) as a mathematical function. The purpose of this document is to present the following first steps of the Theory: (1) Definition of the feeling of consciousness. (2) Formulation of the Postulate of objectivity. (3) Introduction to the knowledge function. (4) Introduction to the Fundamental Relations. (5) The Principle of the Theory of Consciousness: the Theory must be global. (6) Explaining how the knowledge function complying to the Fundamental Relations satisfies our definition of the feeling of consciousness. (7) The Theory of Consciousness as a new paradigm in Physics. We will then give a quick explanation of the overall architecture of the Theory presented here below.
[Edouard Asseo. **Theory of Consciousness.** *Academ Arena* 2016;8(5):69-77]. ISSN 1553-992X (print); ISSN 2158-771X (online). http://www.sciencepub.net/academia. 7. doi:10.7537/marsaaj08051607.

Keywords: Theory; Consciousness; conference; Postulate; Objectivity; science; knowledge; formulate; awareness; mathematical function

1. Architecture of the Theory



2. Consciousness and subjectivity

2.1. Definition

Consciousness and subjectivity are linked to each other. The self-conscious person is before all, the one who has a knowledge of being and a knowledge of this knowledge. But this double knowledge appears as a mystery because it is based on nothing, it is linked to nothing, it imposes itself: it is what we will call *immediate knowledge*[1].

[1] Knowledge here does not mean conceptual knowledge; therefore awareness might be a better English word but we will keep " knowledge " for the sake of consistency with our books.

The singularity of consciousness cannot be found in knowledge in general, since a knowledge function C(X) can be clearly used in cognitive science, but rather, in what appears as knowledge of knowledge.

Knowledge of knowledge is a concept which seems to defy any possibility of a mathematical definition, because a definition would establish a connection to something else. But knowledge of knowledge depends only on itself: a concept impossible to define, then, and nevertheless certainty for the self-conscious person.

Notice that we are considering the feeling of consciousness as opposed to consciousness as being thought of. Saying: « I am not conscious » means: " I am conscious not to be conscious ". The above mentioned properties are given to us; we know very well what they are, they are an experience we are certain of and we cannot escape them. Nevertheless, we cannot explain them by reason; they are based on nothing and are self-defined. We know and we know that we know: consciousness is, before everything else, the living experience of knowledge of knowledge. Therefore, as a starting point we define consciousness (the feeling of consciousness) as:

- knowledge of knowledge (reflexivity condition)
- knowledge of being
- knowledge of something else (not me)

The knowledge implied in this definition is called "immediate knowledge" (or simply knowledge in this presentation).

2.2. Knowledge in itself - knowledge for itself[2]

As it appeared, consciousness is an experience, i.e. my knowledge, or the knowledge of what is commonly referred to as "the subject". At this point, we will simply say that the subject[3] is knowledge itself. Then what knowledge is for the subject is what knowledge is for knowledge, which is generally designated by the expression: *knowledge for itself*.

So doing we are distinguishing in a classical sense, two sides of knowledge: knowledge in itself and knowledge for itself.

- Knowledge for itself: what the thing is for me: my experience of it.
- Knowledge in itself: what the thing is objectively.

Just to give an example: a piece of chocolate can be described objectively in terms of its physical and chemical properties. But this is certainly not what it is for me: for me it is taste, pleasure, anticipation, memories etc. Furthermore I know what I am knowing: I have a knowledge of this knowledge. It is already of interest to notice that if the piece of chocolate can be objectively described as what it is at each instant of time, but for me what chocolate is, is spread over time including memories and anticipation.

This distinction between knowledge in itself and knowledge for itself bears utmost importance.

It is well known that some authors have imagined the following experience.

A series of question is submitted to both a computer and a human being without knowing who is who. Then it is shown that it is impossible to differentiate from the series of answers the computer from the human being. Assume that this result is experimentally verified, it could lead to the conclusion that consciousness can be reduced to a deterministic phenomenon (like a program in a computer) that could be objectively observed.

Nevertheless the computer does not have any knowledge of what it says: it does not have any knowledge of its knowledge. This simple remark shows that the experiment referred to above completely missed the point. On the contrary it shows that knowledge of knowledge which is an absolute certainty for the subject cannot be objectively observed: I know that I am conscious but you cannot be sure that I am.

The distinction between knowledge in itself and knowledge for itself provides the answer to this apparent paradox:

Knowledge for itself: what knowledge is for the knowing subject

Knowledge in itself: what the object is (objectively).

2.3. Knowledge of being-Knowledge of existing

Knowledge of existing can be objectively defined. I exist as any other object or living creature in this world. My physical characteristics and my behavior can be observed and analyzed (perhaps partially) by an observer in terms of effects and causes, as any other phenomenon.

In other words, existing means existing at each instant of time: existing is a function of time.

From an objective point of view, the feeling of being is difficult to define.

As a concept "the being" bears different meanings in Philosophy. We prefer to start by accepting that it is objectively undefined although it is an absolute certainty for me. Here again the duality knowledge in itself/knowledge for itself, plays a central role:

Knowledge of existing is related to knowledge in itself

[2] This concept is to be credited to Hegel

[3] Further in the Theory the subject is defined as a mathematical operator

Knowledge of being is related to knowledge for itself.

But if existing is a function of time, we cannot say so for the feeling of being: I was a child, I am a man, I will be an old man, but this is still me. The knowledge of being is the knowledge that I stay or last beyond or above time.

Therefore we adopt the following definition:

Knowledge of existing is reflexive knowledge in itself and is a function of time.

Knowledge of being is reflexive knowledge for itself and is not a function of time.

2.4. Immediate knowledge, perception, thought and the brain

- Immediate knowledge is obviously not thought; it leads to the feeling of consciousness. An important part of the Theory (not described in this presentation) is devoted to showing how thought appears.
- Immediate knowledge, as defined above, is not perception since it is not through our five senses that we have the knowledge of being. Perception is obtained by the medium of our senses.
- From our definition one can see that we do not formulate any assumption relative to the "nature" of consciousness, and at this point we have no reason to reject the idea that the brain complies to the laws of nature. In the Theory it is shown that the brain is "a piece of equipment" which makes consciousness to appear.

2.5. Conclusion about subjectivity

Consciousness (the feeling of) appears as a property of a knowledge function which bears two sides: knowledge in itself and knowledge for itself. If we consider only the objective side of knowledge (knowledge in itself) we will never reach consciousness. For this reason today science based on the postulate of objectivity cannot provide an answer to the question of consciousness.

3. Science and subjectivity

3.1. The postulate of objectivity

Science is based on the postulate of objectivity: from a methodological standpoint, science considers that the objects or phenomenon it is aware of are independent of the knowledge by which they are known. The effectiveness of this postulate is indisputable, but - based on what we said- if we wish science to consider subjectivity, we should call into question the postulate, otherwise subjectivity would remain outside the scope of science. Reciprocally, if we succeed, we will reach a global vision including subjectivity and objectivity. By definition a postulate cannot be demonstrated, then the irrational attitude would be to hold to what cannot be proved. Reason requires the postulate to be called into question. Here we may be tempted to say that the postulate should be kept true until it is proved wrong by experience, but so doing, we would forget that taking the observed thing as the absolute reference is precisely asserting the postulate and, by this, we would neither prove nor refute anything. Remember that calling into question the Euclid postulate did not revoke geometry, on the contrary it took it to completion. The Theory of Consciousness does not revoke science, it takes it to completion. By this we mean that science will be global, i.e. will become able to address:

- the field of objectivity (Physics)
- the field of subjectivity (Consciousness).

A Theory of Consciousness is necessarily global.

3.2. Objectivity and the concept of logical subject

In the previous paragraph we said: "science considers that the objects or phenomenon it is aware of are independent of the knowledge by which they are known". It seems that the human subject is implied here. For instance, as it has been considered in some interpretations of Quantum Mechanics, that the Physicist modifies the phenomenon he is observing just by the fact that he is observing or measuring it. This is not what we mean here.

To understand what we mean, consider the statement:"let S and O be respectively a subject and an object ". Actually S and O are two objects and the real subject Rs is the one who issued the statement.

Considering that Rs does not play any role in the knowledge process is again asserting the Postulate of objectivity. But if we call the Postulate into question we must accept that S and O do not exist without Rs.

In other words:

There is no objects without subjects.

Of course it would be ridiculous to think that "*subjects*" here means the human subjects as it is obvious that the universe and its objects have been existing long before a human being appeared.

As a consequence a "subject" must be understood as a logical subject involved in the knowledge process[4].

4. The Fundamental Relations

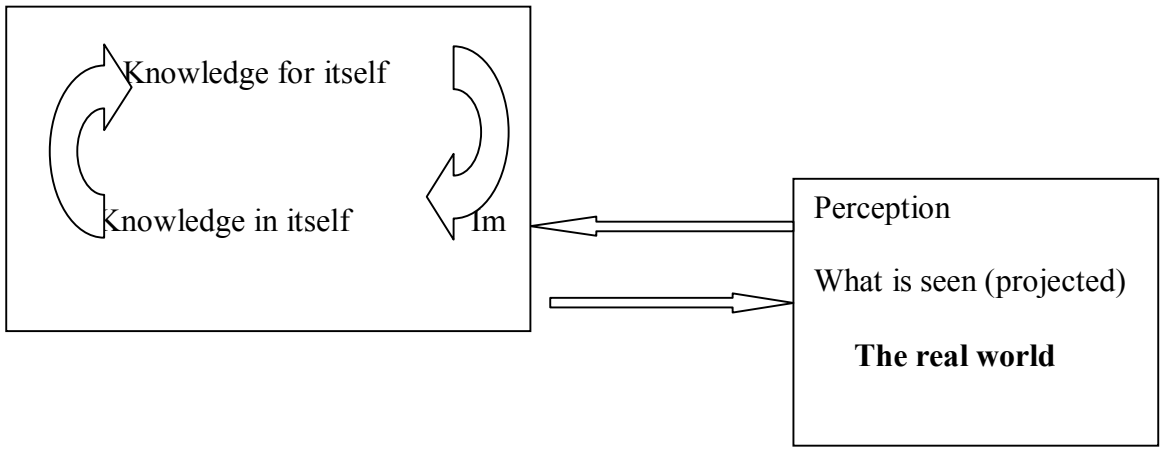
4.1. The first Fundamental Relation

Here, in order to take into account the knowledge function and to come up with the Fundamental Relations, let us consider the following drawing which summarizes the previous paragraphs. The object of the real world is acquired by perception as an image Im. Im known by the knowledge function C becomes C(Im) which is knowledge in itself. C(Im) passes into

[4] In the Theory of Knowledge it is a mathematical operator

knowledge for itself which is then projected and seen as Im. This is a circular process which has to converge in a stable situation when the object is recognized[5].

[5] This process is called intentional aiming by Husserl



The following developments are a simplified version.

Call:

C knowledge in itself

C' knowledge for itself.

Let us write that C and C' pass into one another. We certainly can call £ an operator[6] by which C and C' correspond, then, C' = £C. A this point we do not know what £ is.

In general the experience C' cannot be formulated from the outside because this formulation would be objective (it would not be an « I know »). This last consideration seems to close up on the one hand, any attempt to objectively formulate subjectivity and on the other hand any hope for a subject to exactly know what there is outside himself.

But we have seen that knowledge in itself and knowledge for itself pass into one another by the knowledge process, therefore we are tempted to write:

C = C' = £C.

[6] The word « operator » does not imply anything about its nature. £ has been chosen at random on the keyboard, it reads: L.

But this formulation bears only a meaning from knowledge standpoint, therefore we must write:

C(C) = C(£C) i.e. C = £C from C standpoint

and

£C(C) = £C(£C) i.e. C = £C from £C standpoint

C is the same thing as £C from knowledge standpoint.

Writing C and £C implies that they are two different entities, therefore C and £C must be two different things which become the same thing in the knowledge process to again separate for the knowledge process to resume. We will say that C and £C *pass into one another* from knowledge standpoint.

One can see that if there exists such conditions as C = £C from knowledge standpoint, it would then be possible to describe objectively subjectivity and subjectively objectivity. The thing in itself becomes the thing for itself and reciprocally.

Since a subject cannot know anything outside his knowledge, from his point of view:

£C = T

where T represents the totality seen from the subject (not objectively).

To £C corresponds C which then is the objective totality as seen by knowledge. The first Conscience relation is then:

C(C) = C(£C) (CS1)
£C(C) = £C(£C) *C and £C pass one into the other from knowledge standpoint*
£C = T from knowledge standpoint.

Notice that the above relations formulate the conditions for C and £C to pass into one another. C is the objective formulation (there is) and £C the subjective formulation (I know). C and £C are unknowable to each other except at the very point where CS1 is satisfied.

CS1 and the definition of consciousness

We have defined consciousness by the three properties:

- Knowledge of knowledge (reflexivity)
- Knowledge of being and existing
- Knowledge of what is not me.

Let us examine how these three properties derive from CS1.

The property of reflexivity

If:

a) The operator £ is actually performing
b) C and £C are in bijective correspondence

Then C(C) is defined by C(£C), knowledge is reflexive.

In this case, C(C) implies that C is an object of knowledge;

C(£C) implies that £C is an object of knowledge

Thus C knows itself by two sides C and £C which pass one into the other.

Temporality

CS1 is a circular relation which implies a periodicity.

Time does not appear explicitly in CS1. But if the process actually develops and accomplishes itself, we are obliged to say that knowledge C is a function of what we, in our experience, call time, but which is in fact the pace of progress of the knowledge process.

But £C is *for the subject* an object of knowledge independent of the pace of progress i.e. above or beyond his time. "Time" (above the instants) is a unity which passes into the multiplicity of the instants: time passes into instants which pass back into time.

Definition

By definition, when CS1 is satisfied, the pace of progress of the knowledge process is called **time of the subject or simply time.**

It must be noticed that t is not a variable which would exist independently of C. The function C is not "in" time. With the knowledge process is associated a pace of progress, based on our experience, we say, it will be for the subject what he will call time. Time is the time of the subject as defined.

The knowledge process is a circular process by which knowledge in itself and knowledge for itself pass into one another.

Objective time and subjective time

Thus from this definition we see that:

On the side of C, the pace of progress is the external time or objective time.

On the side of £C, the pace of progress is the inner time or subjective time.

Subjective time and objective time pass one into the other.

Time being defined as the pace of progress of the knowledge process, we come back on the very important concept of thickness of time which is very close to the Bergsonian concept of duration.

As previously seen, C(X) is a function of time, the object X is knowable at each instant. But knowledge for itself £C, is not, it contains the whole story of the object as seen by the subject: £C is "out of, above or beyond" time. Therefore

C (£C) formulates that knowledge has access to an object spread over time, as in our current experience, we have access to spatial objects spread over space. The objects in space bear a thickness, there exist no objects whose thickness is null. It is then quite natural to say that £C bears a certain thickness in time. This concept will play a great role in explaining subjectivity but here, we see that actually it is a physical notion which is not as surprising as it looked at first glance: all objects having a thickness in each dimension of space there is no reason why they would not have one in the time dimension. This notion will provide a new understanding of the world as we have shown in the Theory of knowledge, and it is a precious tool to understand subjectivity.

Knowledge of being and existing

Thus, seen from knowledge, £C represents the totality in time thickness as a oneness and C this same totality as developing in time, multiple totality which is a series of appearances at each instant. Therefore:

C (£C) is knowledge of the being as the oneness above time;

C (C) is knowledge of what appears at each instant.

CS1 formulates that the being and the appearing pass into one another; at the point of passage, the being and the appearing are the same.

When CS1 is satisfied knowledge is reflexive therefore it applies to itself.

C(£C) is then knowledge of being

C(C) is knowledge of existing (as any other phenomenon at each instant).

As each knowledge passes into the other by CS1, knowledge of being and existing closely merge providing this vague feeling of being and existing that we very well know.

Knowledge of what is not me

When CS1 is satisfied, knowledge in itself and knowledge for itself pass into one another, the process is sterile and consciousness cannot know anything else than itself, therefore this last property cannot be satisfied. We will see that CS2 provides the capability by which consciousness can access to something else.

4.2. The second Fundamental Relation

The concept of externalization

C and £C pass one into the other by the knowledge process. Saying that CS1 is satisfied means that it could be non satisfied, therefore we must consider the two states:

CS1 satisfied

CS1 non satisfied.

Since knowledge is reflexive, these two states are known; CS1 is, itself, an object of knowledge.

When CS1 is not satisfied, this state is known and this experience, which is the knowledge process itself, is "externalized" in order to go back to the state CS1 satisfied. The concepts of experience and externalization will be defined.

Memory

£C is the totality of knowledge for itself. As a consequence £C cannot vary, i.e. at the end of the knowledge process, £C is found equal to itself: totality as seen by knowledge.

But when something new is acquired, a variation of £C occurred, but this change in knowledge is not only the object (O) but the experience of the object. More precisely, it is the experience of the fact: CS1 was not satisfied, that is to say, the knowledge process itself, which from C standpoint does not exist anymore when CS1 is again satisfied. But what happened cannot be erased. The corresponding object is not knowable since it does not comply to CS1. Therefore it is external to knowledge.

When CS1 is again satisfied, the experience of CS1 not satisfied, which is the memory of the knowledge process, is an unknowable object. It is said to be externalized.

A simplified version of the second Fundamental Relation CS2, is then (with M being the externalized object):

C (C) ≡ C (£C) + M	CS2

4.3. The principle of the Theory of Consciousness

We can see now that the only reference is the knowledge function complying to CS1 and CS2, the object is not the absolute reference anymore. This is how the Theory of Consciousness calls the Postulate of objectivity into question.

Notice that CS1 is « acting », the passage between C and £C must occur effectively. Our starting point is now:

There is the knowledge function complying to the Fundamental Relations.

But we have established that the Theory of Consciousness is necessarily global, encompassing both objectivity and subjectivity. In other words, CS1 and CS2 regardless of their nature must appear as a natural phenomenon in our world. (This is why we can hold to the assumption that the brain complies to the laws of nature).

These considerations lead to the Principle of the Theory of Consciousness:

In the universe there is the knowledge function complying to the Fundamental Relations.

To summarize:

- The passage described by CS1 and CS2 must occur in the universe in order for consciousness to appear.
- CS1 and CS2 are given properties of the universe which should appear as natural phenomenon. The laws of Physics must derive from the Fundamental Relations.

5. Solutions to the Fundamental Relations

5.1. The problem

We have to show that if a function C complying to CS1 and CS2 exists, then C is the immediate knowledge function by which consciousness has been defined as:

- knowledge of knowledge (reflexivity property)
- knowledge of being
- Knowledge of something else.

To which we have to add the conditions:

- the knowledge function should represent a physical observable phenomenon.
- CS1 and CS2 should be objects of the knowledge function.

5.2. Principle of a mathematical solution

We are looking for a mathematical structure where CS1 can be defined.

Assume the objects of the knowledge function are forms (with the meaning of matter and form). A form can be described mathematically: C in CS1 is a form having a mathematical meaning.

It exits a mathematical structure called a vector space in which matrices represent a form or an operator: C(C) is well-defined as an operator applied to a form.

A form can be mathematically described in two ways:

- C(xi) where the xi are relevant variables
- £C (fi) where £ is the Fourier transform and fi the "frequencies" associated to the variables xi.

C and £C are in bijective correspondence.

Therefore, in CS1, £C can be the Fourier transform of C.

CS1 is then mathematically defined: the knowledge function C is reflexive.

A relation between forms is also a form: CS1 and CS2 are also objects of the knowledge function.

These considerations lead to the mathematical solutions to CS1 and CS2.

6. The Theory of Consciousness is global

6.1. Introduction

In § 3.1 we showed that a Theory of Consciousness is necessarily global meaning that we expect this theory to encompass both the world of objectivity (Physics) and the world of subjectivity. In § 4.3, we have established the Principle of the Theory:

"In the universe there is a Knowledge function complying to the Fundamental Relations". To prove that the Theory is global we have to show that:

- the laws of modern Physics can be derived from CS1 and CS2.
- We can derive a satisfactory explanation of how the brain works as the center of consciousness.
- The Theory of Consciousness provides an explanatory platform for subjectivity.

We will give hereafter only introductory considerations inviting the reader to read our books or to visit our Web site (see § 7).

6.2. The Theory of Consciousness and subjectivity

Further in the Theory we formalize such concepts as:

- **I and myself**

When CS1 is satisfied C(C) is knowledge of knowledge at each instant of time: my "I". C(£C) is knowledge of knowledge spread over time: my "myself".

- **Intentional aiming**

Being spread over time £C provides a vision of the future as seen by the subject (not objectively).

- **Will**

The mathematical developments of CS1 show an invariant operator which bears the same form as energy in Physics it is then natural to call it "will" of the subject.

- **The unconscious**

The experience of « CS1 not satisfied », described by CS2, is externalized, i.e. placed outside knowledge. It is the unconscious in proper sense. It is an object (a form) and an operator which acts, but whose action cannot be an object of knowledge. But the effects of this action modifies the known objects. The unknowable objects are known by their effects on the knowledge function.

From CS1 and CS2 we also derive:

- The feeling of the "other" and feeling of the "group"
- My conscience.
- how thought can appear with its related consequences.
- The principle of the brain as the center of consciousness.

6.3. The self-conscious brain

In the real world, the self-conscious subject is the human being. Being in the real world he is submitted to the laws of nature and the question is: how consciousness can appear from these laws ? It must be noted here that consciousness is not submitted to the laws of nature but the brain, as an organ, is.

The book which deals with theses questions is (in French): "Systemes Conscients". We will just give here a few introductory indications.

1. By definition a conscious system is a system which implements the Fundamental relations. Let us get started with the assumption that it is an automaton, a robot.
2. In this automaton the process which leads to the satisfaction of CS1 is performed. We saw that by CS1 the two first conditions entering in our definition of consciousness are satisfied: reflexivity and knowledge of being.

CS1 not satisfied implies that there is something which prevents it to be satisfied. This "something" is not a form (which would be knowable) it is a material object in which the subject operator has been externalized (since the subject passes into the object): this material object is the automaton of our assumption.

3. We see that a conscious system implements a double passage:

- passage of time thickness and instants temporality one into the other by the Fourier transform
- passage of form and matter one into the other by a process which bears necessarily an electrochemical nature.

The general schematic is then:

6.4. The Theory of Consciousness and Physics

The general mathematical solutions to CS1 and CS2 are developed by using the well-known properties of Hilbert spaces. These spaces are commonly used in Quantum Mechanics, the link with the Theory of Consciousness is formally established.

Relativity considers space-time only objectively. By showing that time plays the role of the subject and space the role of the object in the knowledge process, the Theory of Consciousness reaches quite easily the basic relations of Special Relativity.

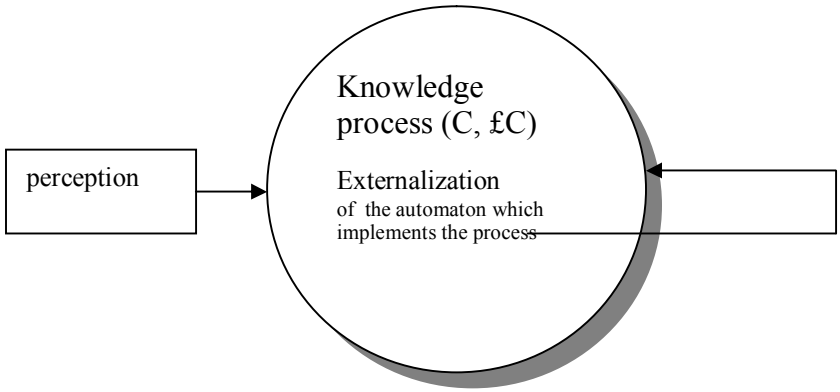
To see how simply the equations of Relativity appear in the Theory of knowledge, let us write that the subject S an the object O pass one into the other by the relation (a rotation on the complex plane):

$S + iO = 0$ (i is the imaginary number = square root of –1)

Or $S^2 - O^2 = 0$

Which leads to, since here the subject is time and the object space,: $x^2 - c^2t^2 = 0$

Where c is simply a parameter adapting the dimensions of space and time.



But even more generally, in modern Physics the so-called invariances and symmetries play a central role as necessary explanatory postulates. In the Theory of Consciousness, they derive from the knowledge process itself and are not postulates anymore.

The Theory of Consciousness is a new paradigm In Physics. Indeed Physics considers that there are objects (matter, time, space, light, etc.) complying to laws. Our Theory starting point is: In the universe there is a knowledge function complying to CS1 and CS2. Space, time, matter etc. are "produced[7]" by a universal knowledge process. The Theory leads to three "Limit Theorems" which are very important in understanding the universe.

6.5. Metaphysics

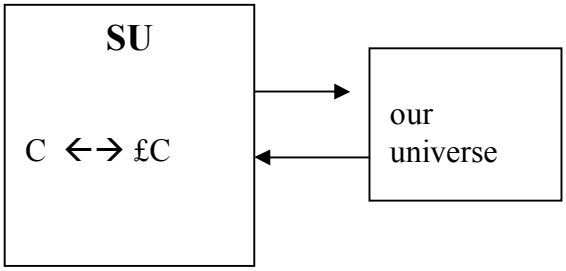
The Theory formally establishes that the universe as described by Physics is the object of knowledge of a self-conscious subject. We have called it the Subject universe or SU**.** It is important to notice that the concept of self-conscious subject bears only the meaning that we gave to it in our definitions. In other words, the SU must be considered as described by a mathematical operator and nothing else.

Nevertheless, if we accept that the Theory of Consciousness is also a satisfactory platform for explaining our human subjectivity, then the conclusion is unavoidable: the universe is the object of knowledge of a self-conscious subject that bears the same subjectivity as we do. The unity of the universe appears here: there is only one knowledge function by which the universe is produced and known.

These conclusions are surprising and controversial. We mention them just as an interpretation of the Theory and not as part of the Theory itself.

Accepting the concept of Subject Universe" (SU) The following drawings summarize the overall architecture of the universe.

The SU is a self conscious subject (based on our definitions) which objectivizes and externalizes the universe. The human being uses the same knowledge process based on the same function C. This is why he can know its universe.



The SU knowledge process « produces the universe »

[7] produced is a defined term in the Theory

our universe

The SU knowledge process has passed in the universe. By using it the observer knows the universe and knows himself.

7. References and published books

References

The Theory of Consciousness is self-contained, its starting point is the Postulate of Objectivity and our definitions.

Nevertheless, if it does not formally rely on any other theory, it is deeply inspired by the works of several famous philosophers: Hegel, Husserl and Bergson, to mention the most important.

Web site

http://theoriedelaconscience.perso.sfr.fr.
(pages in French and pages in English).

Books

The Theory of Consciousness has been published by EDILIVRE.

In English: Introduction to the Theory of Consciousness.

The other books are in French.

www.edilivre.com/auteurs/edouard-asseo-2241.html.

5/25/2016