

### **III. MUNDO Y EXPERIENCIA**



# *Theory of Consciousness* A “*Mathematical*” reformulation of the Hegel System

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## I. INTRODUCTION

The theory of consciousness is essentially a “mathematical” reformulation of the Hegel system. As such it gives a vision of the universe as an all-inclusive whole comprising the objective world that physics addresses and the subjective world.

Using mathematics seems to be contradictory with the spirit of the Hegel System; the purpose of this paper is to explain how this has been achieved. The main reasons for this are :

1. The being is form (with the meaning of matter and form) and a form can be expressed mathematically in two ways. The passage one into the other of these two expressions of a form actually happens in the universe. It is expressed by a mathematical operator which *actually occurs in the universe* : the Fourier transform.
2. One side of a form is a function of time, the other is not (a set of pure waves).
3. A relation between forms is also a form.

The Hegel system is based on the duality of the Being and the Nothing but, in fact, the Being and the Nothing pass into one another, and this passage, called by Hegel the Becoming, turns out - in our theory- to be nothing other than what we call time.

Because, in our theory, the being is knowledge of being, the passage between the Being and the Nothing is also the passage between *knowledge for itself* and *knowledge in itself*. This is why the theory preferentially starts from the concept of knowledge and formulates it as a mathematical function complying to the so-called *Conscience relations* to which this paper is an introduction.

## II. THE THEORY IS GLOBAL : THE THREE PARTS OF THE THEORY

### II.1. THEORY OF KNOWLEDGE

Our theory goes much further than the Hegel system because the Conscience relations are developed mathematically and it is shown that the fundamental laws of modern physics (Quantum Mechanics and Relativity) can be derived from the Conscience relations. This yields a new paradigm in physics. As a consequence retrieving the laws of physics is a proof that the theory is true at least on the objective side of knowledge.

### II.2. CONSCIOUS SYSTEMS

A conscious system is a system which implements the Conscience relations. The main characteristics of human subjectivity have been connected to the Conscience relations ; the principle of operation of the brain and the corresponding architectures are derived. The process expressed by Hegel by which knowledge becomes consciousness is formulated.

### II.3. THE SUBJECT UNIVERSE

A philosophical presentation and interpretation of the theory.

## III. THE KNOWLEDGE PROCESS INVOLVED IN CONSCIOUSNESS

In our experience, consciousness and subjectivity are linked to each other. The 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 does not come from a deduction, it is based on nothing, it imposes itself : it is what we will call *immediate knowledge*.

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. The above mentioned properties are an experience we are certain of. We know and we know that we know: consciousness is, before anything else, the living experience of knowledge of knowledge and knowledge of being. But we must add that consciousness is also knowledge of what is not myself. Therefore, as a starting point we define consciousness as follows.

IV. LIMITED DEFINITION OF THE FEELING OF CONSCIOUSNESS:

- knowledge of knowledge (reflexivity condition)
- knowledge of being and existing
- knowledge of something else (the thing)

KNOWLEDGE IN ITSELF - KNOWLEDGE FOR ITSELF

As it appeared, consciousness is *my* 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 is knowledge itself ; (further in the theory, the subject is defined as a mathematical operator). 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.

KNOWLEDGE OF BEING / KNOWLEDGE OF EXISTING

Assuming we have solved the reflexivity condition, let us replace, in the previous statement “the thing” by “me” , we obtain :

Knowledge for itself : what ”me” is for me : my experience of being.

Knowledge in itself : what “me” is objectively : knowledge of existing.

Indeed, 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 seen and analyzed (perhaps partially) by an observer in terms of cause and effect, as any other phenomenon.

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

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 last or stay beyond or above time.

Therefore we can say :

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.

PRELIMINARY CONCLUSION ABOUT THE BEING  
THE NON-BEING AND TIME

Being and knowledge of being are the same.

The being is related to knowledge for itself (it lasts)

The non being is related to knowledge in itself : existing at each instant of time.

It may be surprising that we call the non-being, existing at each instant of time. But actually an instant having a zero duration is nothing.

*The non-being is existence at each instant of time (duration = zero).*

*The being lasts.*

V. THE CONSCIENCE RELATIONS (SIMPLIFIED)  
THE FIRST CONSCIENCE RELATION

Consider the statement :

“let S be a subject and O an object”.

Actually S and O designate two objects, the real subject being the one who makes the statement. S and O are external to the subject.

A statement bears always the form : “I say : there is...” Or : “my knowledge is : there is...”

In other words :

- a. The subject knows only his knowledge of the objects. What the objects are for him : knowledge of knowledge or *knowledge for itself*.
- b. But as he does not realize this process, he says : “the object I see, exists as such” ; and he considers the thing as being objective : the thing in itself.

Therefore :

- knowledge in itself is built from knowledge for itself.
- knowledge for itself is built from the knowledge in itself.

In other words :

KNOWLEDGE FOR ITSELF AND KNOWLEDGE IN ITSELF PASS INTO ONE ANOTHER  
BY THE KNOWLEDGE PROCESS.

Let us formulate this condition

Let C be the objective knowledge (knowledge in itself)

Let C' be the subjective knowledge (knowledge for itself).

Let £ be an operator (£ reads L, the word “operator” does not presume anything about its nature), which operates the passage between C and C', then

$$C' = \text{£}C$$

But this is impossible because £C cannot be expressed objectively because it is a subjective knowledge ( I know...).

Thus it seems here that it is impossible to formulate objectively, subjectivity

and subjectively, objectivity.

Let's look for a condition under which this formulation would be possible.

To achieve this we need a relation  $C1$  which links  $C$  and  $\text{£}C$  in a way that knowing one side, we would know the other one.

Then it would exist  $C1$  such as :  $C1(C, \text{£}C)$  exists.

But again this relation will be objective and we need to consider  $\text{£}C1$  to which the previous reasoning applies :

Then it exists  $C2$  such as  $C2(C1, \text{£}C1)$  exists, etc.

To avoid an infinite loop we must satisfy two conditions :

–this relation must be  $C$  itself,

–this relation must stand true on both sides : objective and subjective. In other words, in the universe (the thing  $C$ ) and in consciousness ( $\text{£}C$ ).

This yields :

$$C(C) \equiv C(\text{£}C)$$

$C$  and  $\text{£}C$  are the same from knowledge standpoint.

#### REMARKS

$C$  and  $\text{£}C$  are different things which become the same by the knowledge process. This is expressed by the sign “ $\equiv$ ” :  $C$  and  $\text{£}C$  pass into one another.

From knowledge standpoint there is nothing else than knowledge. Therefore from knowledge standpoint  $C$  is the objective totality and  $\text{£}C$  the subjective totality.

These considerations lead to the first Conscience relation  $CS1$  (simplified).

$$C(C) \equiv C(\text{£}C)$$

From the knowledge standpoint :

$C$  and  $\text{£}C$  pass into one another

$C$  is the objective totality;  $\text{£}C$  the subjective totality.

#### MEANING OF THE FIRST CONSCIENCE RELATION

When  $CS1$  is satisfied the knowledge function satisfies 2 conditions of consciousness;

Reflexivity

If it exists  $C$  and  $\text{£}C$  complying to  $CS1$ ,  $C(C)$  is defined by  $C(\text{£}C)$  :  $C$  is reflexive.

Knowledge of being

$\text{£}C$  is knowledge of the subjective totality : the being (above time).

Then  $C(\text{£}C)$  is knowledge of being

$C$  is knowledge of the objective totality : the non-being at each instant, i.e. existing. Then  $C(C)$  is knowledge of existing.

Consciousness appears where the Conscience relations are effective.

CS1 is circular, the knowledge process is sterile and the subject knows only itself. The third condition “knowledge of something else” cannot be satisfied by CS1. This leads to CS2.

## VI. THE SECOND RELATION OF CONSCIENCE (CS2)

### 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 (CS1 satisfied), 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 are defined in the theory.

### 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 satisfied again. 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 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 Conscience relation CS2, is then:

$$C(C) \equiv C(\text{£C}) + M \quad \text{CS2}$$

M is externalized by the knowledge process

### KNOWLEDGE OF SOMETHING ELSE

When CS1 is not satisfied there is an unknowable object M. But since CS1 is an object of knowledge, this fact is known : it is a form. Therefore : the subject knows that there is an unknowable object whose form or presence is known. In the subjectivity domain, this object is the unconscious in proper sense. The



theory of knowledge shows that this object is matter known by its form.

#### VII. THE PRINCIPLE OF THE THEORY OF CONSCIOUSNESS

The knowledge function is our starting point. Notice that CS1 is « acting », the passage must occur effectively for consciousness to appear.

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. These considerations lead to the Principle of the theory of consciousness :

“Let be” the knowledge function complying to the Conscience relations

To summarize :

The passage described by CS1 and CS2 must occur in order for the universe to appear : consciousness is first.

The passage described by CS1 and CS2 must occur in order for consciousness to appear in the universe.

CS1 and CS2 are given properties of the universe which should appear as natural phenomenon. The laws of physics must derive from the Conscience relations.

In a conscious subject, the Conscience relations are implemented.

#### VIII. SOLUTIONS TO THE CONSCIENCE RELATIONS

##### PRINCIPLE OF A MATHEMATICAL SOLUTION

It exists a mathematical structure called a Hilbert space in which CS1 and CS2 can be expressed and solved.

$C$  and  $\mathcal{C}$  are forms in bijective correspondence (with the meaning of matter and form), a form can be expressed in two ways : waves and points linked by the *Fourier transform*.

$C(C)$  is then mathematically defined by  $C(\mathcal{C})$  : the knowledge function  $C$  is reflexive.

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

##### PRINCIPLE OF THE ONTOLOGICAL SOLUTION

CS1 and CS2 must occur and there is nothing else, they are the being and the non-being. The mathematical formulation is just the description of it. The being is on one side, waves and instants on the other side, passing into one another.

##### PRINCIPLE OF THE PHYSICAL SOLUTION

Now we have:

To see that the mathematical approach used in the preceding paragraph is related to a physical phenomenon which can be observed.

To confirm that we can satisfy our definition of consciousness.

To reach this goal we have to underline the physical reality of the Fourier Transform.

#### WHAT A PURE SINE WAVE IS

We have to notice an important physical fact which may look strange.

Very paradoxical indeed is the fact that a pure sine wave is everlasting : it is, was, and will be. It is above or beyond time. One can argue that it certainly started at instant T1, and ended at instant T2, but then its is not a pure sine wave, it is a function which can be developed by the Fourier transform as a sum of pure sine waves which are everlasting.

Now we have at our disposal the principle on which rests the phenomenon represented by CS1 with its mathematical description. In brief :

The thing in itself is a form function of time :  $C(t)$ , for example, the shape of an object in space at each instant of time.

The thing for itself is the same form but not as a function of time :  $\mathcal{F}C$  , (a condensed form of the history of the object, encompassing past, present and future, from the subject standpoint).

$\mathcal{F}$  is the Fourier transform.

Thus:

$C(\mathcal{F}C)$  is the knowledge of a form as waves; beyond time, it is the knowledge of being.

$C(C)$  is this same knowledge but at each instant of time: knowledge of existing.

The relation  $C(C) \equiv C(\mathcal{F}C)$  is a resonance, i.e. a wave.

The knowledge of « CS1 satisfied » is the knowledge of a wave: knowledge of being which passes into to the knowledge of a form at each instant of time, i.e. knowledge of existing.

When CS1 is not satisfied (CS2), the presence of something else is known.

*Consciousness as the reflexive knowledge of being and existing is the knowledge of CS1 satisfied.*

*Consciousness as the reflexive knowledge of something else is the knowledge of CS1 not satisfied.*

#### TIME AND KNOWLEDGE

CS1 describes a circular process by which  $C$  and  $\mathcal{F}C$  pass into one another. As such it defines both a wave and time : the timing of the knowledge

process.

It must be clearly understood that time does not exist "before" knowledge, it is an effect of the knowledge process.

#### IX. THE THEORY OF CONSCIOUSNESS IS GLOBAL

##### THE THEORY OF CONSCIOUSNESS AND SUBJECTIVITY

Further in the theory we formalize such concepts as :

I and myself

Intentional aiming

Will

- The unconscious

The feeling of the "other" and feeling of the "group"

My conscience.

We also show :

how thought can appear with its related consequences.

The principle of the brain as the center of consciousness.

##### 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 appears formally.

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.

But even more generally, in modern physics the so-called invariance 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. Actually they are related to the invariance of the being.

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 starting point is the knowledge function complying to CS1 and CS2. Space, time, matter etc. are "produced" by a universal knowledge process ("produced" is defined in the theory). The theory leads to three "Limit theorems" which are very important in understanding the universe.

