

CHAPTER 6 PHILOSOPHY of QUANTIZED THINKING and THE QUANTIZED MIND

6.1 INTRODUCTION

In the first chapter I introduced three categories of thinking:

- the mechanical category in which certainty is possible,
- the generative category, which is sub-certain, and
- the creative category, which is uncertain.

I call the generative and creative modes of operation together non-certain. As long as they are sub-certain they are complementary, i.e. the accurate knowledge of one quantity limits the possibility for a simultaneous knowledge of the other. Stated even stronger: the certain existence of one of two complementary quantities, excludes the simultaneous certain existence of the other.

According to that categorization, quantities, or rather qualities, of the creative kind cannot be properly determined or measured at all. Their very nature is uncertain. Their non-certain creative potential must first become sub-certain before becoming part of reality. This is what I called the action of *aletheia*, truth, which withdraws itself while revealing itself. This uncertain truth is the essence of *What Is*. In quantum physics we find with Heisenberg's uncertainty laws that this fundamental uncertainty is a characteristic of the whole observable universe. With all its material and energy contents it is like a web of interrelated but strangely unobservable quantum fields, ultimately one. Underneath that web and permeating it is the eternal no-space, Nothingness.

From a scientific perspective we can never make a statement as to the whole of *What Is* without leaving the area of finite rationality and entering the field of speculation, which may or may not be legitimate. **When speculating in the sense I use the term (looking into the mirror of the human mind) one has to still be consistent with that which can be known.** I have presented some speculative and philosophical aspects in the earlier chapters. In this present chapter I want to present ideas of physics which are in support of the ideas about the movements of thinking introduced so far. The basic idea remains that:

***What Is*, is Nothingness, is Nothingness-Oneness. Uncertain Nothingness reveals itself in Generalized Thinking (the forces of the universes). It unfolds and enfolds itself in all aspects of the observable and thinkable universes and worlds. And in all of this it allows ideas of freedom, beauty, and love to manifest themselves in thinking-sensing human beings, and possibly other creatures. It is through these ideas that the human mind can see and create in ways similar to the processes of Nothingness-Oneness itself. The human mind can be one with NOB by dancing along with these ideas. This is meaning. The movements of the human mind mirror the movements of What Is. Just as in thinking there is no fundamental difference**

between the thinker, the thought, and the connecting movement of thought, there is no fundamental, separating difference between particles (object and subject) and the connecting, underlying quantum fields.

6.1.1 THINKING TRANSCENDENCE

We must ask ourselves - again - how we can at all talk about some No-thing which is uncertain and unknowable.

I have proposed to talk about that quality in speculative and poetic terms, fully aware that no description is adequate. I do this in the trust that human beings derive their existential and transcendent meaning from those same un-knowable qualities. The way we talk and think about ourselves and about this mysterious area of No-thingness is highly important for everything we do in reality. Thus, I assert that it is possible to talk about No-thing intelligently. It is this way of talking and thinking, not so much its content, which is of highest importance. One can talk and think about Nothingness using scientific or philosophical terms and knowledge as rational background, as long as there is some insight present as well. Without insight both terminologies end up in irrational assertions and beliefs.

We may have a God or Goddess in our lives; we may call him or her by an affectionate personal name or by an abstract notion. **Their description in terms of a reality is always incorrect; their very naming takes away from intended meaning and is uncertain.** Yet, to feel that no God or Goddess exists in our lives, seems to me like an admission of failure as human beings. God or Goddess are names of the unknowable transcendence which we as human beings are. We are one with the Oneness of the God or Goddess, we are one with the Nothingness. We are in between. We are that Betweenness. And yet, our consciousness can feel utterly separate from all meaning.

6.1.2 TRANSCENDENT MEDITATIVE VISUALIZATION

It is important to *'think the Nothingness-Oneness.'*

It is the movement of thinking in which the self loses its grip and control, such that thinking can more freely flow by itself. This *'thought in itself'* is the analogue to Kant's *'thing in itself'*³³⁸ and is part of meditation. Before we can think anything (in a relaxed subject-object division) we must think **about** it. When we not only **think about a thought**, but simultaneously **think the thought**, it can become an integral part of our consciousness and can affect that consciousness without the controlling dominance of the confused self. True learning can take place. Unfortunately, this is also how indoctrination and conditioning do take place. Unless intelligent insight and awareness are present in thinking, any thought content will merely strengthen the confusion of the self and dull the mind as a whole and intelligent, free movement. **This is why no method, scientific or 'religious' can in itself bring about a transformation of the confused self.**

In many branches of Buddhism adepts sometimes attempt to enter the realm of Nothingness-Oneness through methods of repetitive activities, in which a sound or vision is allowed or induced to enter the mind. The *'thinking of the Goddess'* is learnt through visualization of her images, paintings and sculptures, carefully and meditatively crafted with a high sense of beauty, dedication, and devotion. Thus, the thinking is supported by sensing in a psychosomatic process which does not

³³⁸) "*Ding an sich.*"

allow for the complete separation between the sensing mind-body and the sensing process; at least this is the hope.³³⁹ Once the internal visualization has been achieved, the conscious mind dis-appears into the subconscious mind, in which the image and the observing self start to become one, only to completely merge in the Nothingness of the Oneness of the Observer being the Observed. Whether such methods have the result of actually freeing the mind of its conditioning, or whether they succeed in limiting and controlling the mind, is an open question. If such freedom is achieved it is still questionable whether it is a result of the practice.

It seems to me that the only insight possible is that no practice and no method can lead from the miserable self to the blissful, intelligent participation in the beautiful dance with Maya. Any practice or method is in vain if done mechanically. The mechanicalness is the problem. This is the essence of Buddhism, its wisdom and compassion, its Sat-Chit-Ananda.

Let us examine nevertheless what truth could be behind the practice of meditation in the visualization of images.

The meditation on a transcendent Buddha for example, the God or Goddess image, corresponds very much to the abstract thinking about the creative unknowable movement of thinking. The three abstract stages of mechanical, generative, and creative thinking correspond to the three stages of meditating visualization. One could say that meditative practices are important activities which allow the mind to learn about itself. They are part of the mind's 'laboratory experiments.'

- In the first stage we talk about and encounter those things which can be talked about in certain terms. Observer and observed are well separated. The self is separate from its content of thinking.
- During the second stage the self, the thinking process, and its content become less certain and allow a slow merging of thinker, thought, and thinking process.
- In the third stage all three, the thinking self, the thinking process, and the object melt into an unknowable Oneness-Nothingness. The observer and the observed are one.

The three stages happen simultaneously as described in the model of triadic thinking³⁴⁰.

This process is similar to what happens in any true learning. When studying the abstract formulas and ideas of physics, one learns first **about** them. In laboratory settings the theories are tested in practical experiments which require active participation of all our senses. After long acquaintance and practice, the abstractions become part of one's thinking structure and consciousness, and seem to be reaching into the areas of non-certain thinking, sensing, and acting. It is then, that intuition and insight into the truth of mental abstractions are possible.

In the transition from **insight to reality** the non-certain oneness takes on a form, which restricts the oneness, and at the same time creates a limitation. The more the quantity becomes real the more it loses its quality of oneness and truth. It is aletheia, truth which withdraws itself while

³³⁹) See section 4.3 "*The Three Levels Of Human SAT*" on page 266.

³⁴⁰) See section 1.4.5.2 on page 73.

revealing some limited aspect of it. It is Maya, the creative energy, which creates illusion in her display of *What Is*.

Thus, it is important for the mind to have an understanding and comprehension of itself, which does not automatically put the *self* into the straight jacket offered by the various insane asylums called nation, race, culture, tradition, caste, morality, church, etc. This freeing insight into itself is necessary for any mind to be able to activate its *SAT* '**immune system**,' whenever necessary. Just like the physical body fights off unfriendly intruders, so must the mind be able to free itself of 'self-destructive' thoughts and forms of conditioning. The various models of thinking developed in this book, just like the images and mythologies mentioned here have this same purpose: To help the mind free itself.

In a strangely circular way, the most abstract ideas of mystic insight and the most abstract theories about matter seem to point to the same mysterious Nothingness-Oneness underlying both mind and matter and all. Quantum-field theorists talk about an unobservable eternal quantum-field ether. Mystics talk about No-thingness-Oneness-Betweenness. **Both ideas merge in the idea of the mechanical-generative-creative movements of *SAT* as thought-time-matter-space.**

All categories of material behavior, including the generative and creative ones, have their natural correspondence in thinking itself. They must have. Most of thinking is either non-observable or observable with sub-certainty. That is, the greatest part of the thinking process resembles 'phenomena' which behave quantum-mechanically. The thought that thinking is quantized can be conjectured by observing that consciousness influences its own operation and content whenever it tries to observe itself. I am proposing to talk about the transcendent properties of the mind in terms of quantum theoretical terminology. The structure of the theoretical physicist's language corresponds to the statues of Tantra Buddhism.

The Yab-Yum sculptures are like the Heisenberg uncertainty principles, namely metaphors for the complementary nature of actuality, the ultimate Oneness of sameness and difference.

But Heisenberg's uncertainty relations can be used for accurate calculations in reality, the meaning of these calculations brings out their complementary nature. The Yab-Yum sculptures are completely useless if they are disassociated from their meaning.

In other words, they both do say that **Reality is not Truth**; what is real has a necessarily conditioned component to it. But this is meaning which can be ignored by the practitioners of reality. Only intelligent reflection will bring out their meaning and reveal that it is impossible to know *What Is* with absolute certainty. In our exploration we are concerned with meaning, not with useful applications.

What Is, is not what is real, and what is real is not *What Is*.

In this vain the notion of quantized thinking seems to be appropriate. My starting point is that the complex wave functions of quantum physics are not merely mathematical devices to calculate certain aspects of reality, but they are actual and contain potential characteristics of reality. It is in interaction with other unobservable and observable aspects of the environment that particular characteristics become manifest. With this assumption in mind I propose to consider **thinking also**

as the movement of complex quantum wave-functions. Neither the **observing** thinking waves nor the **observed** waves can be looked at with the conscious mind. Whatever can be 'looked' at and/or directly thought **about**, is already a concrete thought. One can see that easily, when one tries consciously not to think, for example. **This relationship between consciousness and its content, in which the observer and the observed correlate very closely and non-causally, can be likened to what is called quantum physical behavior in the area of atomic and sub-atomic physics.**

The human mind, the totality of thinking together with the underlying material processes of the brain, is essentially a non-deterministic movement with some observable and measurable sub-movements. Its creative essence, which in my language implies intelligence, freedom, and spirituality, can neither be determined nor measured.

6.1.3 CORRESPONDENCE BETWEEN MIND AND MATTER

Anything the mind can learn about the world, including itself, is a 'reflection' of itself. **There is no independent movement in reality and actuality which would allow an objective study of the mind as a whole.** The only movement and tool the mind has to describe and understand is thinking, i.e. its own activities. Therefore, the description and comprehension of the world is ultimately a self-description, a description of the mind's own capabilities, properties, activities etc., projected onto the mirror of actuality. What we can see in this mirror is a product of the movements of our mind, the play of a-priori conditions of understanding.

The material processes which operate in the brain while we think involve extremely small energies in the electron-volt range. Quantum-mechanical low energy material processes going on in the brain while we think - about this sentence for example - must correlate with the rational content of this thinking process.

So, ultimately I infer that the relationship of the observable processes of the mind to the whole movement of the mind, is similar to the relationship of the observable processes of matter to the whole movement of matter. More, the whole of the processes of energy-matter ultimately reflect themselves in the whole of the processes of mind.

In the behavior of matter we can observe quantum physical effects, and we infer the creative processes of **What Is**, for example, the intelligent creation of the whole universe out of Nothingness. In thinking we observe processes of consciousness in which this consciousness suspends itself.

We can see its operations in which thinking gives rise to the ideas of freedom, love, and compassion. We can see how it creates the knowable world of things. We infer from all this that the mind is free and intelligent, and we infer that the nature of **What Is**, is freedom and intelligence.

As any thought is a statement of the mind, one may prefer to say that mind is the creator of matter, rather than to say that matter is the creator of mind. Both statements ultimately say the same, but it seems more rational to say that mind creates the world, because any statement about, or experience of, the world, depends on thinking. Both ideas can be pushed to the extreme, which then lose some or all of their meaning.

But before the mind as **SAT** can observe any movement in the material world, it must have played this movement for itself. **The mind cannot conceive of the idea of causality, determinism, free will, self-suspension, creativity etc. unless it has inwardly performed the operations implied in what it observes.**

6.1.3.1 THE ACCIDENTAL VERSUS THE ILLUSORY MIND

In the Asian Indian reality, one encounters the statement that the world is a product of the illusory powers of the mind. All is Maya or deceptive illusion. In the West one encounters the equivalent statement that the mind (with its thinking and values etc.) is an illusory meaningless product of the random behavior of mechanical matter.

If the thinkers who pretend to subscribe to these ideas would take them seriously, they would have to realize that these same ideas must be the outcome of this illusion, and are therefore be illusion as well. But unfortunately, most people imagine that the processes of the mind, particularly their own, are absolutely separate from their content.

This attitude is typical for mechanical thinking, which creates and maintains the separation between the world and our own thinking. It believes that what it can find in the world or in its mind has been put there by independent forces of truth (God, for example) which have nothing whatsoever to do with the processes of thinking in the observer. Thus, to think that all is illusion or randomness is a statement which is neither unusual nor profound nor radical. It comes from the same confusion.

Let us leave those extremes aside. I shall try to illustrate the relationship between consciousness and its content some more.

6.1.3.2 CONSCIOUSNESS AND ITS CONTENT

One can compare the physical letters or hieroglyphs in a written text with the meaning of the whole text written on a wall. The whole text represents the content of consciousness. The individual thoughts correspond to the letters on the wall.

If this text describes the color of the wall, its material composition, figures, symbols, and so on, then the letters and hieroglyphs on the wall would correspond to the relatively fixed thoughts of consciousness which try to describe it. Without the letters there is no text, without the thoughts there is no consciousness. Without the letters there are no writings on the wall. The wall is still there, just like the material brain is there without thoughts. But the reality of the wall comes into being through the meaning of the text written on it. In the case of the text on the wall, the meaning must be given to it through an outside agent that makes the connection between the object wall and its describing text.

Let us consider thinking. The meaning of consciousness, and of the Self, is inseparable from its content. The material living brain creates content and its meaning on its own; it creates its own consciousness, words, symbols, and rules, to describe, interpret, understand, give meaning, enjoy. In this process the mind, the self emerge simultaneously with its understanding and perception of what it calls the world, objects outside of itself in space and time. When we separate consciousness (including its sense of self) from its content we do this in a wrong analogy with the writing on the wall, whose meaning must come from the outside. The meaning of the mind is enfolded into the three movements of thinking which together one may call consciousness. This includes the human mind, the biological brain matter together with the synapses and electro-chemical interactions. It ultimately includes matter at the subatomic level, i.e. the quantum fields. The matter of this mind was all created through the creative intelligent process which started some fifteen billion years ago with and in our universe. Speaking in ciphers, one may say that intelligent Nothingness in its absolute freedom *'thought'* that it wanted to be and become. This Nothingness was absolute Oneness as well, as there was no-thing else. Its potentiality being its actuality, thinking is being, the *thought*

created time, matter, and space, and potential human thinking, which can reflect back on its origin. The thought became actual and real. “The word became flesh.”

6.2 QUANTUM PHYSICS AND PHILOSOPHY

Quantum theory provides us with a set of rules which are supposed to be of unlimited generality. They can be applied to any system and will tell us how our classical concepts have to be modified and how quantum features arise in the system under consideration.

Still, some people, including physicists, would argue that the discovery of quantum physics is of no general relevance and certainly not to philosophy, because quantum physics supposedly does not play any direct role at the macroscopic level. Evidently, I don't subscribe to that point of view.

It is correct that quantum physical effects are all of a statistical and microscopic nature.³⁴¹

It is of course exactly the question as to how these microscopic events can be measured, or not measured, and how the particular experimental setup determines a particular outcome of a measurement, which is of great significance to our understanding of reality.

But the fact that one can successfully install a diode or a microchip on a circuit board without knowing anything about electronics or quantum physics, does by no means imply that electronics and quantum physics are irrelevant in a **larger context**, which for a philosophical consideration is the relevant context. It is already present through the fact that there are things like diodes and chips, whose properties would be impossible to understand without quantum physics. The very existence of stable atoms as positively charged nuclei surrounded by clouds of negatively charged electrons would be equally incomprehensible. One can say without exaggeration that the modern technological world is a result of the discoveries of quantum physics. Furthermore, the phenomena of superfluidity, superconductivity, and black body radiation are macroscopic facts which have no satisfactory classical explanation whatsoever.

Our insight and understanding of the beginning of the universe is based on quantum field theory. Many physicists believe that quantum fields are the essential actuality. Physicists would choose the term 'reality' rather than 'actuality,' which I have defined earlier. I prefer to use the terminology developed here in this book. **Physicists might say that nothing else exists but quantum fields.** I take up this idea and include the human thinking processes.

Our comprehension of the quantum fields of actuality is an activity of 'quantum fields of thinking.'

The fundamental properties of thinking and human consciousness display characteristics which resemble very much quantum-physical behavior. The thinking movements which have to do with suspending, i.e. the simultaneous negation of a thought, its preservation, and its elevation to a new level, correspond to a thinking which I characterized as **generative or creative**. These are non-mechanical movements. (See subsection 1.4.2 “*Three Movements Of Thinking*” on page 54 ff.)

With the discovery of quantum physics we can see that the classical concepts of causality, continuity, predictability of physical processes are inconsistent in themselves. They are aspects of

³⁴¹) For additional non-mathematical introductions into the problematic and fascinating issues of particle and quantum physics, I recommend the books by Brian Greene, “*The Elegant Universe*” and Steven Weinberg, “*Dreams Of A Final Theory*.”

a larger actuality of complementary processes. The most important argument for linking the meaning of quantum physics with philosophy lies in the fact that without the subcertain processes described by the equation and the Heisenberg uncertainty laws, the idea of human freedom and responsibility could not be saved. They would be in contradiction with science, an unacceptable proposition for the great physicists of the last century from Bohr, to Born, Heisenberg, Schrödinger and Einstein, to name just a few. But thinking is a material process and must not be in contradiction with our comprehension of the laws of matter at their most fundamental level.

In this context one can show that the idea of a meaningful human existence is incompatible with pure causality or statistical probability in the physical world.

It is most fascinating to see that material processes behave in ways compatible with ideas which we generally call intelligence, freedom, and oneness. **The very fact that one accepts the idea that human thinking is meaningful and neither random nor causally deterministic requires that there be a level of material behavior which is also neither random nor deterministic.** (We don't accept the hypothesis that there is a spiritual world **separate** from the material world.)

6.2.1 THINKING AND QUANTUM PHYSICS

Newtonian physics had a great impact on philosophy because it provided the link between the laws of logic, by which our thinking arrives at an understanding, and the seemingly causal behavior of objects in reality. Newtonian physics describes reality in terms of infinitesimally small massive points moving on top of a non-physical empty grid of space. The parameter for change is the self evident quantity of time. The location and speed of these points can be determined, controlled, predicted, and measured with arbitrary accuracy, only depending on the quality of instruments used. Theoretically, there is no limit as to the accuracy to which a measurement can be performed. Newton's laws are applied to these mass-points and give us an accurate, causal, deterministic picture of the whole universe.

One should note the extension of geometric concepts to physics. In geometry, as it was taught and practiced for thousands of years, the thought of a point, a line, a circle was transferred to actuality. A circle drawn on a board with a compass was identified with the thought of a circle in a one-to-one correspondence. Similarly, classical thinking about physics assumes a one-to-one correspondence between our mathematical descriptors and the actual characteristics in nature. It was Zenon who pointed out indirectly that the thought of a point was incompatible with the actual point of an extended object in real space. The whole of thinking does not consist of logic only, but is a much more subtle and non-logical, subconscious movement as well, as has been well known to many reflecting men and women throughout the ages.

6.2.1.1 QUANTUM CAUSALITY

I compare the relationship between classical physics and normal logic to the relationship between quantum physics and subcertain thinking. Quantum physics encompasses classical physics, and subcertain thinking does not exclude mechanical thinking. By accepting the ideas of these generative processes we allow for an unbroken oneness between thinking and matter.

The microscopic level *determines* the macroscopic level causally and quantum causally. ***By the latter expression I refer to a thinkable quantum physical process which leads in subcertain***

ways to observable effects. In the area of physics these subcertain ways are described by the laws of quantum physics, in particular by the Heisenberg uncertainty relations. On a much more encompassing scale these subcertain 'ways' are possible because of a wholeness of *What Is*. That is, I propose to think the *actuality* of *What Is* as one undivided whole without any dimensional extension. Dimensions, space-time-matter-thought come into being in the process of becoming actual, to which corresponds the mental operation of **thinking becoming sub-conscious**. At the next observable level **actuality becomes real** through the mediation of consciousness. The subconscious domain can also become conscious in similar ways. The *underlying space*, common to uncertain thinking and to uncertain matter, is the *creative space* I talked about earlier.

The classic concept of causality refers to the interaction of mechanical things in a mechanical reality on top of a passive grid spanned by space (and eventually time, in the theory of special relativity) as independent and separate phenomena. There, every change is continuous and has a deterministic, controllable cause. The change of the velocity of a projectile, for example, is caused by a force. The change of human behavior is equally caused by some **discernable** action of the environment.

I use the notion of *quantum causality* as a **metaphor** which refers to the uncertain areas where we cannot determine individual causes, like in creative (and maybe generative) human thinking, sensing, and acting. The creation and suspension of human consciousness can be thought of in similar terms. The exact biological, electro-chemical processes underlying our thinking are unknown. The other domain of quantum causality can be found between the existence of a quantum physical wave function and its manifestation as a measurable effect.

An illustration of quantum causality is the transition of an electron from one energy level to another. An electron, in a hydrogen atom for example, occupying the energy level (2) emits a photon and then occupies energy level (1). The energy of the emitted photon is exactly the energy corresponding to the energy gap between level (1) and (2). The electron does not try out a range of energies. It emits the exact amount necessary for a transition. Nevertheless, we know of no mechanism or connections, between levels (1) and (2). One can say that the electron 'knows' about the other possible energy levels, because, the whole atom, with all energy constellations is an undivided wholeness. Such 'reasoning' is what I refer to as a quantum causality.

David Bohm writes ³⁴²:

"More generally, no transitions from one state to another take place unless the rest of the universe, in its coordinated movements, is ready to absorb (or emit) the energy which has to be exchanged in this transition."

This is implied in the Feynman diagrams representing the fundamental force fields between particles and energies in the universe. During the time in which the virtual field particles are being exchanged, they are unobservable. They seem to form an infinitely dense unobservable field-web underlying all observable interactions in the universe.³⁴³ The creation of the universe in the **Big Bang** is a fact to which we cannot even attribute quantum causality.

³⁴²) D. Bohm and B.J. Hiley: "*Einstein And Non-Locality In The Quantum Theory.*"

³⁴³) For Feynman diagrams of forces and non-locality see also page 458. For *non-locality and creative space* see also section 1.4.1.1 on page 51 and pages 461 ff.

Some aspects of evolution may be explainable through quantum causal circumstances. For example, a set of potentially successful mutations may be 'caused' by a quantum causal interaction between the genetic structure of a living organism and its environment. I don't think that the current explanation of evolution through mechanical trial and error mutations is satisfactory.

Conventional philosophy subscribes to the mechanical world view and arbitrarily introduces a cut which separates the microcosmos from the macrocosmos and claims that only the macrocosmos is relevant because it is causally observable. The processes of thinking as well as the genetic changes which lead to cell mutations occur at quantum energy levels and are not observable without interfering with the processes themselves. If one insists on the mechanical concepts to argue that human beings are mechanical and deterministic, further confusion is unavoidable. There is an underlying and unnoticed value system at work here, which says that anything which is not mechanical or certain could or should not exist.

We have in quantum physics an excellent theory which has been proven correct in innumerable instances, but which is not complete, and cannot be completed **in the sense that it would explain all and everything, NOB**. Still, quantum physics is **the most important scientific theory (and fact) of modern times, whose depths and meaning we have barely started to fathom**.

Observable and measurable phenomena are to physics what certain definitions and proofs are to analytical philosophy. Both are relative ordering parameters which can be embedded in a larger theory, part of which is the theory and interpretation of quantum physics. In quantum physics we have found a knowledge about nature which limits the notions of certainty and measurement in a fundamental way.

Our integrity as scientists and philosophers requires that we look at the ontological and philosophical implications and ramifications of such a fundamental theory. If we find that some cherished belief systems are misleading, we should have the strength and honesty to drop them.

6.2.1.2 THINKING AND QUANTUM PHYSICS

In thinking processes I have distinguished between causal successions of observable events (fixed thoughts) on the mechanical level, and subcertain processes on the generative level, which can become thought. In the latter movement we cannot determine with certainty which thought follows which. A non-certain level of thinking is the creative movement of thinking.³⁴⁴

We have to do with an overall flow of thinking of potential thoughts, some of which may eventually manifest themselves as objective thoughts, separated from the whole sea of thinking by some active idea. Here, it may be the unconscious idea which, together with other unknowable factors, selects a potential thought and guides to become a real and objective thought. Once this has happened, consciousness is able to focus on the thought. This is not a thinking at random, but it is also not causal in the conventional sense. The transition of the potential, non-certain, thinking to a real conscious thought may be called non-causal or quantum causal.

Some additional facts about quantum physics should be mentioned in this present context, to better appreciate the analogies with our own thinking:

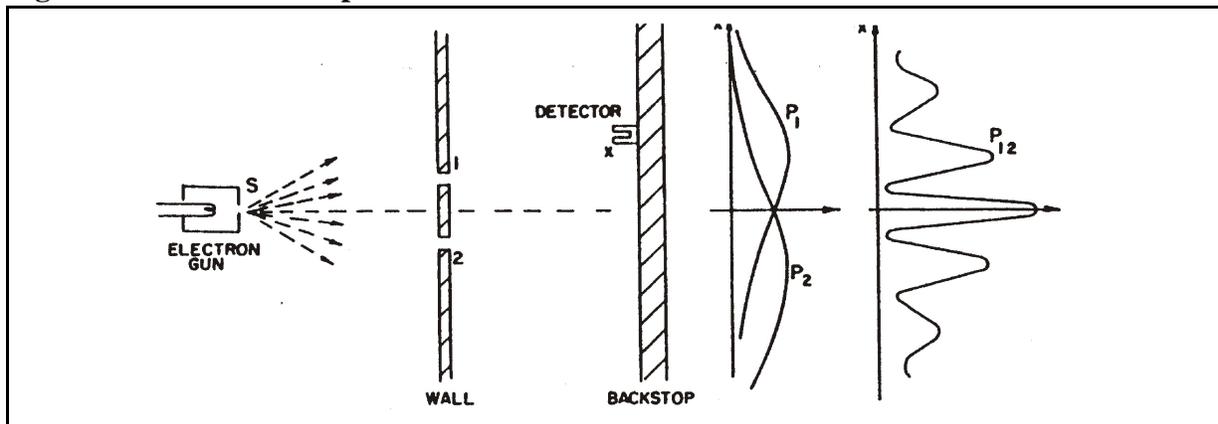
³⁴⁴) See the section 1.4.2.3 on *Creative Thinking* on page 58.

The existence of separate energy levels in atoms and the discontinuous transition of electrons from one energy level to another without any intermediate location, allows, among other things, the formation of molecules. See also the earlier discussion of *generalized SAT* applied to the electron energy transitions in the atom on page 249.

All objects in the universe have both wave-like and particle-like characteristics as potential characteristics. Depending on the environment, either one of these complementary (actual and subcertain) characteristics can become real and observable in the statistical aggregate. Classically, a wave is an energy that moves in ways characterized by its wavelength, frequency and velocity. A wave is extended in space and time. A water-wave for example can pass around an obstacle, or through several holes in a wall simultaneously. This holds for all waves.

A particle, on the other hand, is characterized by its mass and its exact location and momentum in space and time. The evolution in time of a particle is described by the infinitesimal continuous changes of location and momentum in time³⁴⁵. If the particle is smaller than the hole, it can pass through. If it is larger, it cannot. It cannot go through both holes simultaneously. An

Figure 67 Double Slit Experiment With Electrons



elementary particle like an electron cannot break up in several parts, because it has no internal structure. Evidently, such a particle cannot be at two different points simultaneously. This would violate causality.

To make things worse, in quantum physics the evolution in time of any object is described in terms of a complex, unobservable wave function, which contains all the potential properties. Any of the complementary properties of an **individual** wave cannot be measured anymore simultaneously with arbitrary accuracy, and they cannot be determined with one single wave-function. A statistically sufficient number of experiments (or events) is necessary, a fact which is quantified by Heisenberg's uncertainty relationships. There are some properties which can be measured accurately for a statistical ensemble of waves or particles. These are called eigenvalues (proper values) belonging to eigenfunctions. They can be called objective or *real* properties.

In the so-called double slit experiment there is experimental evidence that depending on the environmental setup electrons behave as classical particles, little billiard balls, or as quantized matter waves. In this experiment electrons are being fired at a screen with two adjacent vertical slits in it.

³⁴⁵) Hamilton formalism.

The electrons pass through either of the slits, in classical parlance. Behind the screen is a set of counters which records and measures the impact of electrons at all locations. If only one slit is open at a time, we will observe a bell-shaped curve P_1 and P_2 behind each slit, respectively, showing the random incidents of the electrons or bullets. If both slits are open however there is a dramatic difference. If the experiment is done with bullets, the pattern behind the screen shows a probabilistic distribution, more or less in the shape of two superimposed bell curves P_1 and P_2 . With electrons on the other hand one suddenly observes the pattern which is typical for light waves being shone through the two slits, a so-called *interference* pattern³⁴⁶ P_{12} . To ensure that the electrons do not interact with each other one can send them slowly one after another towards the openings, with any time gap between them. They will still form an interference pattern. How do the electrons succeeding each other in unconnected intervals, know that a second slit has been opened, and that they now should behave like waves? This crude question illustrates the mystery posed by all of quantum physics. The fact that electrons form an interference pattern, each one contributing to it, implies that an electron does not pass through either one or the other of the slits, but rather behaves like a light wave which is scattered. In other words, **the electron passes through both slits simultaneously, and it knows beforehand that it should do that while approaching the double-slit screen, even though there is no known physical connection in the current formalism of the quantum theory which would account for this fact.**

It seems that a behavior like this is not possible to understand through classical physics or through classical thinking. One could say that the electron enters a different quantum state when approaching the two slits, so that it is actually a quantum wave and can then go through both slits simultaneously. This is what we think happens. However, then one may ask how the electron “*knows*” to enter into this quantum state when approaching the double slit. This is a similar mysterious behavior which the electron displays when it makes a quantum jump from one energy level to another inside the shell of an atom. It emits a photon of the exact frequency corresponding to the difference in energy levels. It disappears on the former energy level and reappears on the new one. Somehow it *knows* about the whole of the atom, the whole of the situation, the whole of the universe.

In some sense one can say that an electron, just like any other particle in the universe has *information* about the Whole built into it. Every part is an *image* of the whole and remains correlated with every part, no matter how much they are separated from each other. Which brings us back to the idea of a holomovement. What Is, even at the level of reality-actuality, cannot be analyzed into separate parts anymore which are causally, observably, linked. While the links are being established through unobservable, uncontrollable, and

³⁴⁶) In physics interference implies a superposition of several waves which together form a new wave. Interfering waves can diminish, extinguish, or enhance each other at various locations. In quantum physics (i.e. physics of the smallest parts of reality and actuality) all objects are represented through complex waves. In an observation of an object, both the wave of the observing entity and the wave of the observed entity form a new wave through interference. Thus any causality gets lost in such subtle observations. Only statistical or probabilistic statements can be made. Furthermore, in fundamental physics it has become necessary to accept the notion that all objective entities in nature are both wave-like and particle like, a fact which was discovered by the physicist de Broglie. It states the fundamental complementary nature of the observable universe, which leads to *Heisenberg's uncertainty relationships and the Schrödinger equation*. An excellent description of quantum physical interference phenomena can be found in the “*Feynman Lectures*,” FL, volume III, chapter 1 and David Bohm's great book “*Quantum Theory*.”

unpredictable quanta, the whole system cannot be regarded as consisting of separate parts. Ultimately this is correct for the whole universe at all times.

One might think that by setting up an additional counter right behind each slit, that one could determine through which slit an individual electron would go. This however cannot be done without interacting with the electron in unpredictable and uncontrollable ways. Any observation is an interaction! The result is that one observes a probabilistic pattern instead of an interference pattern. The interference is destroyed. The electron is being forced into a mechanical bullet behavior by this observation. This means that our classical assumption, which is that the observing instrument does not effect the outcome of the experiment, is not correct at subtle levels. Observer and observed become increasingly one movement. As any matter is wave and particle, the observing wave can get information about the observed wave only by interacting with it, i.e. by forming an *interference* pattern between the two waves. In section 1.4.1.1 "*Locality And Creative Space*" of the first part of this book on page 51 I discussed locality³⁴⁷ and non-locality in the context of the EPR experiment. We saw that it makes sense, even from a physicist's point of view, to talk about a quantum wholeness. The energy jumps of an electron from one energy level to another in an atom suggest the same underlying wholeness, non-separation, non-locality, or no-thingness. All of quantum physics displays this wholeness. Things are separated in time and space, and they are objects of conscious thinking. Their thingness aspect appears to our mechanical consciousness as reality, their no-thingness aspect can be approached in reality through probability calculations. **Their behavior between actuality and reality can be called quantum causal.** We can comprehend it in terms of complementary models, guided by quantum physics in a **mathematically causal** way, but the **various stages in the causal chain are not measurable** to provide us with a classical, mechanical, certainty or causality.

6.2.1.3 THINKING AND THE DOUBLE SLIT EXPERIMENT

Conscious thoughts, can be compared to the behavior of particles which are being observed at every instant. Whenever we are conscious of a particular thought the thinking as a whole is being suspended in favor of the focus on some certain content. While reading these sentences, for example, one can observe that at first their uncertain meaning enters the whole of our thinking. It gets enfolded in uncertain ways into parts of our sub-conscious thinking. The way this is done depends on our past, our knowledge, our attention and so on. A conscious understanding emerges out of this whole and uncertain movement of thinking, comparable to the formation of a vortex on a quiet water surface. A possible meaning for consciousness thus unfolds. In this process the observing consciousness and the observed content of consciousness are being separated. The thinker (consciousness, center of thinking) can then focus on the mechanical thought content, and treat it like a regular thought-object. We then can say: "I know, I have understood with certainty."

³⁴⁷) See also later on page 462.

6.2.1.4 MANIFESTATION OF THE SELF THROUGH OBSERVATION

In terms of quantum physical analogies it seems as though an incoming sub-certain wavetrain activates other waves of the brain. Being of a quantum physical nature (complex wave-functions), neither wave can be measured. We can only assume that they are somewhere. Where the two movements superimpose, they form an *interference* pattern³⁴⁸, thus creating a new order and observable structure in and as consciousness, which can be compared to the screen in the double slit experiment. **Intelligent thinking as a whole creates an observable thought and a self-conscious thinker.** It is this self-conscious thinker which then says that it observes a pattern of thoughts. Subconsciously *we* continue to correlate with the various parts of thinking waves in a non-intentional and non-deterministic fashion. We can only focus on that part of its meaning which is mechanical, that is, that part which has a rational content in the interaction with the self. This is only possible while the self is being separated from its object. The separation is done by the thinking overall which is not under the control of the self.

It is this last stage which I call mechanical thinking. The processes leading to this conscious thought seem to have quantum physical properties. They are non-local processes, which cannot be observed as such, and depend on the whole system and movement of human SAT (sensing, acting, thinking)³⁴⁹ of the thinker.

The enfolding and unfolding processes are simultaneously activating many levels of our non-conscious thinking and internal sensing. As the potential meaning of these processes takes form, the content of thinking becomes mechanical and so does consciousness. The observing consciousness appears to be looking at a content separate from itself. But the content, the separation, and the observer are of course one movement. They are being maintained and nourished by the overall energy of thinking. This means that while the conscious object is formed there is a non-conscious suspending and negating movement going on, which is non-mechanical. At the end of this movement thinking as consciousness looks at another sub-movement of itself as content.

6.2.1.5 UNCERTAINTY PRINCIPLE OF THINKING

The way we look depends on the particular focus, which has been created by an underlying idea. It is this idea which has triggered the creation of consciousness and its object. The idea of self can become a constant stimulus such that the self is being created all the time. This habit makes it almost impossible for thinking to relax to a point that the self can be suspended and the more sub-certain movements of thinking be observed. A totally mechanical worldview and self can then be the result.

At the mechanical stage we can say that consciousness is made up by its content. This mechanical self can be a conscious self-observation or a conscious thought of a thing. This consciousness is thing-like, and can be put in correspondence with the mechanical behavior of a particle. It is completely determinable for and by mechanical thinking. But the whole process of thinking, receiving information from the outside, integrating it into our consciousness, and rearranging and transforming it to conscious meaning cannot be explained mechanically.

Thus, I think it is fair to say that thinking has typical quantum physical properties which can be summarized by an uncertainty principle of thinking:

³⁴⁸) See the footnote on page 432.

³⁴⁹) Cf. chapter 4.

IT IS IMPOSSIBLE TO OBSERVE THE PROCESS OF THOUGHT FORMATION WITHOUT DISTURBING IT IN SUCH WAYS THAT IT CHANGES FROM WHAT IT WOULD BE WITHOUT OBSERVATION.

As far as I know there is no other reasonable explanation of these processes available. The comparisons with digital and analog computers are far too limited, and a neuro physiological explanation has not gone beyond the correlation between neuron firings and some general association with thinking or sensing processes but without being able to infer a meaning or content.

6.2.2 DANGER OF COMPLETE EXPLANATIONS

Before I continue to elaborate on a quantum physical conceptualization of the mind, I want to consider a few general dangers in such an undertaking. I do this as a notice of caution to myself and to the reader.

Whenever a new scientific discovery has been made, there are many attempts to integrate all of human knowledge into those new patterns. The scientific claims of religion in terms of the creation of the universe were dealt a severe blow, when Immanuel Kant showed convincingly that the galaxies and solar systems could be explained based on Newton's laws of gravitation. Darwin dealt a similar blow to the biblical concept of the seven day creation of the universe with all its species of animals, plants, and so on. However, human knowledge is never just knowledge in the sense of a mechanical system of *SAT* patterns. Any knowledge requires the seen and unseen movements of generative and creative sensing, acting, and thinking of the whole indivisible mind-body and beyond. Knowledge, being formalized to a very high degree, appears to be independent of the metaphors and ciphers of art, religion, and philosophy. It appears to be a static thing in a predictable flow of mechanical time, space, and thought.

So, we easily are deceived to conclude that given enough time, we can come up with a complete scientific understanding of the Whole, be it the whole universe, the whole human mind, or the *ONE*.

But we forget in this conclusion that science and mathematics are processes. Neither process is continuous, causal, predictable, or mechanical when looked at more closely. This means that neither mathematics nor physics satisfies the requirement for the possibility of a complete and unconditional understanding. I have pointed out before that the generative and creative movements of *SAT* are inseparable and sub-certain. Their possible degree of separation is necessary and adequate for a formal theory and understanding. **But the price of any formalization is limitation.**

Nevertheless, as I have shown before, the oneness and nothingness aspects of our thinking produce the intelligent and intellectual will to understand all being and existence as one consistent order through formal knowledge, which, through the emptiness of form, can be shaped to fit any content. The correctness of form does not imply the correctness and/or truthfulness of content. Knowing is therefore always not merely an epistemological and logical challenge but also a philosophical and ethical one. This becomes evident, if one considers the consequences of an imagined complete knowledge.

An example in point is the mechanical image of the self. If the self could understand All, both, the self and All, would be completely mechanical and therefore be neither free nor one in the sense I have explained. As a matter of fact there would be no understanding any more.

The belief in the **possibility of complete causal and mechanical explanation of the universe implies a complete understanding of the human being**, and effectively sets the stage for destructive self-contradictions and conflicts. The particular content of such a belief system is irrelevant, it may be a religious doctrine, a scientific, positivistic, communist, or any other theory. Any so called complete explanation is in a very serious sense anti human and anti truth. A characteristic of Western science in the last few hundred years has been that **all preconceived notions about what science could or should do were effectively cast aside by the powerful idea of free and untethered scientific research.**

We should always bear in mind that the self is a **whole movement of understanding and comprehending**. Being insightful into its own incomprehensible nature is a creative movement **between freedom and knowledge**. The self as a whole and its activities are free but that freedom must be cared for intelligently in order to manifest in reality, because in its nature it is not a mechanical object.

The ideal goal towards a completion of knowledge must be pursued, because we can never know its actual limitations, and the demand for oneness, ultimate order, is part of our being, as is the possibility for knowledge. We embark on the process to that oneness through abstraction, i.e. negating conditions, which we have seen as the unfolding of nothingness. **It is this dialectic of the idea of nothingness and oneness which unfolds in human beings as the energy to know and understand ever more, but which itself withdraws from any mechanical understanding.** Normally we are unaware of these receding barriers, and it seems as though we can understand all and everything, if not now then in a not too distant future. We have to encounter these non-mechanical non-observable limitations in our meditation, so to speak, in order to see them.

But once we have seen these barriers, we know that they are and always will be, in spite of all 'evidence' to the contrary which we might find in our reality. **Once we believe that a theory is completed, intelligence should tell us that it isn't, that it can't be, even if we have no formal evidence at this point in time for its incompleteness.**

6.2.2.1 DIFFERENCE BETWEEN PHILOSOPHY AND SCIENCE

In this light one may understand that it is the duty of science to push its limits further and further in an unending pursuit of knowledge. But *What Is, Being* and *SAT*, is of a higher degree (power) of infinity than any conceivable theoretical infinitude of knowable thought. We can see that this must be so, if we trust Gödel's theorem. Any knowledge that can be achieved requires a higher wisdom which creates this knowledge.

The ever remaining difference between this higher wisdom and the knowledge it generates is similar to the difference between the potential power to perform of a computer and the potential to be and create of the human being itself. The knowable infinity is always bound to the conditions of knowing in a reality, whereas the human mind as well as *Being* and *SAT* create those realities. Science stops to be science and becomes poor philosophy, if it claims to be capable of eventually covering the whole. If the great astrophysicist Stephen Hawking is correct in his belief that soon physics will understand the creation of the universe in some unified field theory, this will be an example of how science expands the limits of what we think is the whole. But, whatever can be **correctly** thought as the whole is not the whole. If Hawking is correct, we will soon explore the creation of other universes and their connection with ours.

The same is true with philosophy, if philosophy claims to know with certainty. It is up to science to know, but this should only be done before the background of fundamental doubt, which is a philosophical attitude. Karl Jaspers addresses this issue in a poignant way (emphasis by FW):

*"It is at this border line that freedom reveals itself. **For science there is no freedom.** It is no object of research, but the infinite space of clarification of what a human being can be as him or herself. Here is the decisive point at which the revolution occurs.*

We recognize the philosophical mode of thinking in the great philosophy of the millennia, which does not know progress, but only the loss and the reconstruction and change of its manifestations under the conditions of the prevailing reality and knowledge.

This philosophy is difficult to hear and to listen to nowadays. This has its cause in the looming errors of the recent centuries. Because the excellent modern sciences as cogent knowledge in an unbounded progress rejected philosophy as the permanent and for a scientific view erroneous knowledge. To satisfy this new science philosophy wanted to be like it. There was neither a clarity on the specific nature of the knowledge through research nor on philosophical thinking.

Philosophy, not being clear about itself anymore, felt obliged to measure up to the new science and wanted to establish itself as the most exact of all sciences. In this attempt it lost philosophy, itself, in a fiction of a 'scientific philosophy,' which lasts up to this day. On the other side, many prominent scientists allowed, unscientifically, that their knowledge became a worldview and the knowledge of their method a general epistemology.... ³⁵⁰

Jaspers continues with a criticism of René Descartes and Francis Bacon in their role as fore fathers of this kind of scientism which is still the tacit value system of most of the scientific world, and has a particularly distorting influence on people scientists and non-scientists alike.

6.2.2.2 SCIENCE AND ETHICS

We can see the dangerous aberrations of logic and philosophy at all times, but maybe never as clearly as today during the scientific revolution. "**Science is a whore,**" as Nikolaus von Cues has said. The same could of course be said for philosophy, religion, or the arts. Integrity is a rare quality, and philosophers, scientists, religious people are on average as corruptible or incorruptible as anyone else. Through all times, science or rather knowledge, shaky in its own philosophical foundation, has served very opposed 'philosophies.'

There were a good number of German scientists who worked on the atomic bomb for Hitler. The same can be said for scientists working for Stalin. There are always scientists who would work on weapons of mass destruction even for the most evil and abominable power groups. Actually, there is nothing very unusual in this behavior. What is at fault is our erroneous assumption that well

³⁵⁰) Karl Jaspers, "Wahrheit und Bewahrung," JWB, page 95.

educated people, doctors, scientists, etc. know better how to differentiate between good and evil than the average person on the street, so to speak.

If one considers that practically none of our scientists or engineers are required to at least study some ethical or philosophical issues during their education at the various universities, Heidegger's statement that "*science does not think*" sounds well justified. Until we realize that Heidegger himself did not think either when he willingly and enthusiastically served as a propaganda tool for the Nazis. Which goes to prove that the study of philosophy, ethics, or religion has again little to do with the actual, existential human behavior. If we go beyond mere studying to the actual life commitment of people to philosophy, religion, or science the same observation can be made. Mistakes, deception, fraud, abuse, and abominable human behavior can be found in the best and most revered professions. And we can find heroic and true ethical behavior in people from who we would least expect it.

In general, we may say that any human activity, be it philosophy, science, religion, or any other lose their meaning and move on the path towards potential evil, if they become merely mechanical. They almost inevitably drift down that road unless there is an existential comprehension that **reality is not truth, and that ethical human behavior is our gift and responsibility through freedom.**

6.2.2.3 COMPLEMENTARITY BETWEEN SCIENCE AND PHILOSOPHY

Science and philosophy (taken at their best) are profoundly related, in that they are complementary, like negative and positive philosophy. Science must be embedded in philosophical thinking, and philosophical thinking must not (and cannot) be in contradiction with science. We can meditate intelligently on the whole of *What Is* through the timeless and uncertain thinking of philosophy, as love of wisdom. We may try to create a model of the whole, but should always be guided by the insight that it cannot be. Any model of the whole is only a finite structure susceptible to the measurements of cogent science. No such model can be final, and it is crucial that its incomplete and reality-bound character is not being ignored, in spite of all the uncounted successes which may come along with it. And above all, **we must not forget that it is uncertain creative thinking which gives meaning to models, science, and realities.** It requires great care and attention to be aware of this fundamental distinction. What we need is scientists who can philosophize and philosophers who know science.³⁵¹ Karl Jaspers discusses a similar issue in his work "*Of Truth*" describing the history of thinking about the whole (emphasis by FW):

*"Each time the whole is being considered as such and named as divine architecture, as logos, as substance, as mechanism, as life, as mind, and so on. Anything which is there is being deduced as plan according to the blue prints of ideas, as schematism of all categorial possibilities, as infinite succession of accidental combinations, as circle of eternal return, as origin of successive evolution, as a dialectic process of mind, and so forth. **The whole is being objectified and known as such. Each time this happens by turning a particular into an absolute.** A manifest being and happening in the world is being considered as blue print for the whole and universal being, which is being understood in the form of a particular.*

³⁵¹) Karl Jaspers, "Von Der Wahrheit;" JT, page 875, translated by FW.

*However, in a true philosophizing more is meant by this form than what lies in the particular thought content of this applied category. **The particular thought form is a metaphor. Thus, the coercion to an objective mode of knowing suspends itself. The absolute rendition of something known is not carried through. Rather, through an apparent absolutization one actually transcends, and in the particular metaphor something unknowable is revealed. The metaphoric character is demonstrated by the fact that the thought must not be thought precisely and in well defined terms without showing its breakdown, but also by the other fact that the thought must be carried through with all its consequences to make it break down. Philosophizing goes this way and can be called upon in the metaphor of the breakdown of thinking. Knowledge based on opinion avoids this way and clings to vague, uncertain, and undefined thoughts, through which alone it can deceive itself into the belief of having insight and knowledge of the whole.***"

A philosopher-scientist can see in his or her best moments that even limited certainty requires the idea of the whole, and any consideration of the whole requires the limitation of certain knowledge. Certainty requires formalism, which is a form of nothingness. The human being is an integral movement of and between both freedom and oneness, nothingness and unity, knowledge and wisdom. Without their complement any of these ideas cease to be, and with the end of these ideas comes the end of meaning of the human being.

It is with these ideas in mind that I propose the models of a quantized mind. One might object to the consideration of 'unscientific' models. But before a model can be 'scientific,' it is of a conjectural and playful nature. One can propose a model, think it through as far as possible at a given time, and if there are no insurmountable difficulties and the model provides one with a new set of explanations, then one might carry the model further. Also, one cannot or should not reject a model, because it has not yet been experimentally verified. Evidently, only out of a new kind of thinking a truly new model can arise, and only afterwards can I measure something. Then I can modify the model and eventually reject or improve it.

Before I can measure something I must at least have a way of talking and picturing what I want to measure eventually. I need some intuitive sense of what may be going on.

6.3 CORRELATION AMONG MOVEMENTS OF SAT

6.3.1 CLASSICAL TRANSITIONS

So far we have arrived in previous sections at a description of the mind- body totality by means of nine qualities of mechanical, generative, and creative sensing, thinking, and acting: S1, S2, S3, T1, T2, T3, A1, A2, A3. (S stands for sensing, T for thinking, A for acting; 1 refers to the mechanical, 2 to the generative, and 3 to the creative mode.) It seems that we need at least this many components to describe somewhat consistently the activities of our mind body. I call these nine quantities the psychosomatic SAT-operator. The mind-body is in different states according to which of these components are active, and according to their interaction at a given moment. For matter I have proposed similar components of a generalized SAT.

Then we have to find connections and interactions among those nine modes. This is evidently a rather complex undertaking but makes clear that we are very far from an adequate comprehension or understanding of the mind-body mystery. But we would need to understand how the connections between sub-certain thinking, sensing, and acting are made with the corresponding mechanical

levels. By pointing out these various quantities I merely want to show how far we are from a better scientific understanding of the psychosomatic processes.

What happens in a scientifically verifiable way when we love, fear, hope, delight, enjoy?

6.3.2 QUANTIZED TRANSITIONS

A quantum physical set of analogies seems to provide at least the beginning language in which one might discuss the sub-certain mind-body interactions. In a way, this whole book is a **philosophical** attempt to illuminate such possible differentiations and relationships.

The difficulty is clear. A conscious thinking which leads to cogent and precisely measurable results can have as its proper objects only things, i.e. never the mind as a whole, or the mind in its essence. We must therefore in our description of thinking heed the incompatibility between thought, which is observable with certainty, and processes of which we can be subcertainly aware in a state of suspended subject-object split. Thinking, sensing, and acting processes occur in the mind and body at the mechanical and quantum-mechanical levels. It seems that the important processes, where our human psychological and spiritual being is involved, require a model similar to that quantum physical interactions and correlations.

In quantum physics of simple matter we are dealing with non-measurable mathematical functions which lead to measurable phenomena. I compare those non-measurable modes to generative and creative thinking of which we can be subcertainly aware and which are operative in every human being. Such an operation can only be determined quantum causally with limitations similar to those encountered, when we want to determine the quantum-states of a wave-particle: **As long as we don't subject the mind to a causal test it is free to behave quantum physically. When we do test it, we can be certain that the 'object' revealed in our testing appears in its causal aspects. Any test brings out merely a potential property. Another test brings out another property. The sum total of all potential properties can only be seen in the statistical aggregate of many potential environments. None of this implies that the mind can be modeled as an only causal or deterministic structure.**

6.3.2.1 QUANTUM LIKE BEHAVIOR OF THE MIND

A great number of properties which one can observe in our mind cannot be accounted for by any classical models. This is why I introduced already in the beginning the idea of a quantum physical model of thinking and carried it through this whole work, showing at each occasion that it is justified and helps us to better comprehend human actions.

Let me just summarily recall the properties of thinking, sensing, and acting which seem to imply a quantum like and non-causal behavior:

- (1) Thinking, sensing, and acting are fundamentally inseparable, but yet appear to be separate to the conscious thinking process, the conscious self.

- (2) Thinking can move with certainty and is then a flow of separable thoughts, but in such a state it cannot contemplate or meditate. The price of certainty is that thinking severs the Self from its underlying

movement. *'Thinking cuts off its own head in order to nourish its creation of the self and its thoughts.'*³⁵² The states of certainty and non-certainty are complementary.

(a) The conscious and certain will (desire) cannot touch sub-conscious and unconscious movements of mind or body in a predictable and controllable way.

(b) The attempt to determine one's state of mind disturbs that very state and puts it into a mechanical, i.e. observable mode, at the price of observing something different than was originally 'there.'

(c) Creative insights come independently of consciousness in the sense that cannot be caused by it. But creative insights require a particular environment (mode, knowledge, readiness, etc) of consciousness for their manifestation. Their possible connection with sub-certain and certain states is uncertain or quantum causal. Ideas can be vague but be as powerful as conscious determination.

(d) If one has something to say, one doesn't know the exact wording, before one says it. Thinking and speaking can be holistic movements.

(3) For an *idea* to 'change a mind,' it must have exactly the right form of **idea-manifestation**, the '*correct wavelength*,' metaphorically speaking, to be 'picked up.' If it is of the 'right form,' the smallest quantity of it can bring about a revolution in the mind, individually and globally.

(4) Art, religion, philosophy at their best creative level, as well as scientific inquiry are sub-certain expressions of *SAT*. Their essence manifests itself in the human mind, independently of time, and space. We find similar ideas in China, Tibet, Europe, Egypt crossing time spans of five thousand years. The manifestation of these ideas can be understood by potentially every mind.

(a) The "ideas" of beauty, the facts of love, joy, and compassion are artistic and spiritual manifestations.

(b) The "ideas" of freedom as well as the mental processes which lead to creations and discoveries of mathematics and the sciences are meta-physical, i.e. non-causal movements. The reason why most of the ideas of modern science and technology manifested themselves in Western countries is probably related to the free environment of thinking which was much less controlled by tradition and religious dogma than in non-Western countries.

³⁵²) This is the symbolism contained in the figure Chinnamasta page 209.

(5) There is a universal conscience and morality, even though the form of the manifestations of that conscience and morality differ. The fact that their (conscience and morality) existence can be doubted speaks for the uncertainty and sub-certainty of the mind.

(6) The very fact that we have discovered quantum physical 'universal' laws of nature speaks for the quantized nature of *SAT*. The mind finds the image of its own operations 'outside of itself.'

These ideas have been described in previous chapters, but one of my main points here is the perception of the idea of a dialectical or **complementary movement of Nothingness and Oneness between certainty and uncertainty in its manifestations ranging from freedom to God, ideas which are nothing for causal thinking and all for our existence and transcendence.**

6.3.3 QUANTUM PHYSICAL INTERFERENCE OF SENSING AND THINKING

We know about energy transfers of our nervous system by means of ions in the range of millivolts. Such energies can be described adequately as electromagnetic phenomena by Maxwell's equations. Similarly, we can produce certain responses of the body by electrically stimulating certain of the brain.

However, there is no way of telling what kind of electromagnetic movements are producing the specific thoughts of a human being, the thoughts of the reader at this moment, for example. We have not the faintest concept as to the electromechanical difference between the thoughts of 2 plus 2 is 4, and 2 plus 2 is 5, even when those thoughts are recalled mostly from a 'mechanical memory bank'. Yet, we know that one meaning is right or correct, and the other is not. To find the electromagnetic equivalents for the determination of meaning is another notch more difficult. What happens when we actually conceive of a new idea?

From a formal point of view both thought forms of '2+2=4' and '2+2=5' are adequate. However, the fact that we reject one thought and accept the other indicates that something significant must or can be going on in our mind-brain, apart from the mechanical determination of identical repetition. One could program a computer to accept the wrong result, but one could never convince a **thinking** human being of it. In order to see that thinking cannot think a contradictory statement one has to actually engage in thinking, which for many people is not as simple as it may sound. One can train human consciousness not to think and just to repeat indoctrinated and conditioned thought patterns which are scattered in consciousness as separate pieces. This seems to be the story of most education systems, even when they try to communicate 'critical thinking.'

To see the difference between true thinking and mechanical formal thinking one should only try to formalize and program ideas of freedom, honesty, and truth. They cannot be mechanically represented as pure form only, because their essence is meaning which requires the non-certain thinking processes of comprehension and insight.

If we assume that in processes like thinking, energies of much smaller orders are involved than the ones measured in electro mechanical experiments, say, energies of a few electron volts (eV) and less, then we should consider quantum physical models. Ultimately, not even quantum physics

will be able to explain creative thinking. Just like there is a cut-off level in the actual world, below which the conditions of all phenomena, i.e. time and space concepts, break down, so is there a level below which thought structures break down.

If we look at the whole nervous system either in terms of a highly structured crystal lattice or in terms of a quantum fluid, we might get some insight or new thought avenues to follow in our exploration of the mind and the brain.

6.3.3.1 THE MIND AS QUANTUM FLUID AND THOUGHT WAVES

In the theory of quantum fluids the energetic states of the macroscopic fluid are the product of the totality of individual excitations and display the macroscopic effects of a quantum wholeness. Energy levels correspond to the whole system and not to individual particles. Elementary excitations can be considered as if they were particles, they are being called quasi-particles.

In a quantum fluid of the Bose type elementary excitations (which are not present in the ground state) can appear and disappear individually.³⁵³ A fluid of this kind has the remarkable property of super fluidity, i.e. it flows without friction.

David Bohm describes a similar super conducting state in his paper "*An Ontological Basis For The Quantum Theory*"³⁵⁴ and notes:

"Similarly, in the super conducting state of a many electron system, there is a stable overall organized behavior, in which the movements are coordinated by the quantum potential so that the individual electrons are not scattered by obstacles. One can say indeed that in such a state the quantum potential brings about a coordinated movement resembling a ballet dance, while in the non-superconducting state the movement is similar to that of an unorganized crowd of people, who are all acting more or less independently. That is to say, the quantum potential arising under certain conditions has the new quality of being able to organize the activity of an entire set of particles in a way that depends directly on the state of the whole. Evidently such organization can be carried to higher and higher levels and eventually may become relevant in living beings."

One may use such a system of quasi particles as another model for the mind-brain totality. David Bohm's quantum potential is a mathematical device which allows for a connection between the whole and the parts in a reality. It seems to be a link between the non-local oneness maintained in creative space with the local, and separate thingness of phenomena in reality. The terminology of causality seems to be misleading though. I use the term causality only in the classical sense in a reality, where there is a clear separation between space, time and thought. Newton's laws provide the scientific basis for this kind of causality. David Bohm's *quantum potential* does not refer to any known or measured force. The non-locality of the quantum potential also puts into question the general mechanical concept of space and time. In my view the 'connections' thus established mathematically refer to an 'underlying' non-certain oneness, a domain which by definition is beyond the certainties of mechanical time, space, and matter. The quantum potential is an ingenious mathematical way to create a better connection between the sub-certain domain of creative space and the domain of reality with its mechanical space.

³⁵³) Landau Lifshitz, "*Theoretical Physics*," LL, volume IX, part 2, page 87.

³⁵⁴) David Bohm DBO; see also Bohm & Hiley "*The Undivided Universe*," BUU.

I try to think creative space as a no-space. Just like 'nothing' is a 'no-thing' and 'No-thingness' is 'intelligence.' To say that something is happening in no-space, is saying that our rational thinking processes, which require time, space and causality as their indispensable condition, do not know what is going on. Quantum-theory is able to clarify the picture somewhat, but it seems that we still need a meta-physical or poetic language to make some kind of sense out of the mathematical formulas and the scientific experiments based thereon. Any common language has indispensable metaphysical elements like "meaning" in it, and ultimately it is through common language and classical macroscopic environmental settings through which we arrive at what we call understanding.

The Schrödinger equation is the most fundamental equation of physics and describes the behavior of matter, with or without a quantum potential. But it describes mathematically a 'movement' of a 'complex' state function in imaginary time and therefore also in imaginary space.³⁵⁵ But there is no such *thing* as an imaginary space or time, that is the problem, or rather that is the 'proof' that rational thinking has found its limits in the **Heisenberg Uncertainty Laws**.

The complex state function is itself directly not observable or measurable, yet it represents all our knowledge of the 'particle.' Or, one may say that it contains all potential properties of a particle. A measurement of the complex state function is only possible in a statistical or probabilistic sense. An individual, objective (real) measurement of such a quantum actuality is not possible. The evolution of a single quantum state in time (in reality) cannot be determined. (See the double slit experiment for electrons, discussed earlier on page 431.)

If *What Is*, is a movement of **NOB** (Nothingness-Oneness-Betweenness) - this is my proposition - the concept of a quantum potential which provides an 'invisible' connection in no-space and no-time between objects in reality makes a lot of sense and is useful for a mathematical causal understanding of the situation. I am interested in it here also from a philosophical, or meta-physical point of view, a point of view not seriously considered by most scientists. As a concept of a **non-local connection** the notion of a quantum potential facilitates our thinking about an underlying wholeness, an order which is not in space and not in time.

Back to the description of the thinking processes in terms of quasi particles: What holds for quasi-particles in a quantum 'fluid' like, for example, a superconducting metal, seems to be applicable easily to movements of thoughts.

Individual thoughts can be considered to be elementary excitations of an underlying 'fluid.' They are the already manifest results of movements of quantum thoughts, which I liken to unobservable quantum waves. The appearance of an objective thought can then be looked at as the **interference** pattern between several such waves, one of which would have to be the wave of a sub-conscious self. It is only such **interference** patterns which can be conscious to a self-consciousness, which is itself such a pattern but also the background for individual smaller patterns. A conscious observation, at whose center is a conscious self, and an observed thought are both **interference** patterns.

Such thought waves could be movements of quantum waves in that quantum fluid scattered from numerous disturbances, provided by classical nerve excitations. **Interference** patterns of **quantized thought waves** could be conscious thoughts, whereas holographic residues of all thoughts

³⁵⁵) 'Imaginary' and 'complex' refers to the number 'i'. ($i = \sqrt{-1}$). We can construct such numbers mathematically, but they have no representation in normal three-dimensional space, which is like the space of our consciousness.

distributed throughout the whole brain matter might provide the 'material-spiritual' base of the self and the notion of the self.

This would mean, for example, that the content of such a hologram and its interpretation through the mind are one movement, and it would explain the phenomenon that a self and its thinking, sensing, acting change with its reality.

Pushing this idea further, it may not be necessary to localize these quantized thought waves in the brain. They can be anywhere and at any time. As long as they are not manifest real waves or thoughts, they are not bound by mechanical time, space, or matter. I defined generalized thinking³⁵⁶ as a movement which creates difference and connects sensing and acting. It creates an order through difference, and vice versa, it creates difference through an order. Creative generalized thinking can be thought of as consisting of the corresponding quantized waves which transcend mechanical time and space. All movements of creativity can be thought of in this fashion as being contained in quantized *SAT* waves, which materialize when the appropriate situation arises.

6.3.3.2 A CLASSICAL AND QUANTUM PHYSICAL HOLOGRAM

Let us consider a few concepts associated with holograms. A conventional hologram is an *interference* pattern which can be fixed on a film emulsion. The waves which are producing such interference patterns are classical electro magnetic waves. Lasers provide us with the necessary highly coherent light waves of particular wavelengths. Electronic holograms produced by waves of electrons, i.e. matter waves, have also been produced. The most interesting aspect of holograms is the fact that any segment of the hologram is an image of the whole hologram, though somewhat 'unsharp.'

Thus, in a hologram every part contains the whole, and through 'connections' in creative space distant actions influence local ones. One can speculate that even electrons themselves (and all particles, thus, all matter) are holograms, so that a hologram of electrons would actually be a hologram of holograms 'imprinted' on the 'emulsion' provided by space-time-matter-thought holograms.

Electron waves are not classical but quantum physical movements. Thus, the waves themselves cannot be directly observed without being disturbed. Such a concept is also needed for the description of **thinking**, not as a succession of individual separate thoughts, but as the underlying non-certain movement which gives rise to thoughts.

6.3.3.3 THINKING CONSIDERED AS QUANTIZED WAVES

If the brain-mind quantum fluid were able to produce quantum waves of low energy, which are extremely coherent, similar *interference* possibilities like those in an electron hologram might arise. Free brain-mind quantum waves might be produced by the quantum fluid. Undisturbed by outside excitations of the nervous system they might provide us with the mental possibility to create and perceive time and space as our fundamental ordering principles for a conscious interaction with an outside world as it is accessible to our sensing-thinking.

The human mind, being a sub-hologram of the whole uncertain unknown, contains a 'true' but mechanically uncertain idea of the whole of *SAT* (creative being) and in this way produces the possibility for a correct but limited mental, active, and sensory understanding and interaction of the

³⁵⁶) See section 4.1.1 "Generalized Thinking" on page 248.

human mind with the world and itself, which it creates in freedom and oneness. In this process, in which the unknown unfolds in the guise of the known as 'maya,' Man is (potentially) infinitely free and responsible for his realities and himself. One might call this the movement of a quantized holomorphism. **That which constitutes space-time-matter, just as that which constitutes our perception and thinking of it, belongs to the same categories of sub-certain being, which we can call quantized (non-observable) waves. These waves, in interference with each other create actuality and reality with its fundamental ordering system of space-time and objects moving in this space time.**

The essential qualities of human thinking, i.e. freedom, self-suspension, conception of ideas, may arise through some kind of self-creation out of the fundamental oneness-nothingness of which the human mind is a part. But this whole process is unknowable. *Neti, neti.* It is neither this nor that, as Yajnavalkya said three thousand years ago in the Brihad-Aranyaka Upanishad. I don't want to carry this speculation further at this point, but the recent chapter should have shown that we have a long way to go to incorporate and integrate our scientific facts into our common thinking, which itself is the least understood phenomenon and noumenon. Philosophical insight is far beyond even our wildest scientific theories and explanations. But the truth of philosophical insight is inseparable from uncertain freedom, and the truth of scientific insight must be reduced to certain knowledge. At the level of insight both movements of the mind are similar. And certain knowledge cannot be arrived at without philosophical insight and freedom.

6.4 MATTER AS MOTHER OF THE UNIVERSE

From Einstein we know that matter is a form of energy, of which unlimited amounts are also contained in 'empty space.' Actually one can show that any volume of 'empty space' contains a vast amounts of energy, or rather that space-time is the total sum of all the virtual particle fields, which in empty space could be gravitons or "strings." **'Empty space' is not empty.** What is truly empty underlies even 'empty physical space' and is Nothingness, the creating matrix of actuality! But we don't know anything about that. The energy of mass, indeed the energy of the whole material universe, is only a tiny ripple on top of this infinite 'energy of empty space on top of an infinite energy of Nothingness, out of which the universe with its empty space was created.' The concepts of space and emptiness lose their meaning as we go to dimensions smaller than the fundamental length from which no signals can escape, which is at 1.14×10^{-35} meters. If we form a volume with this radius we arrive at an energy density so large that the energy of the whole universe could be fitted in a volume the size of an atomic nucleus. (This number is the result of the assumption that a signal cannot escape from a given energy, and Heisenberg's uncertainty relations.) But even without going to these physical dimensions we can start to appreciate the difficulty, when we actually try to *think* (not "think about") empty space.

What we normally do when challenged to think about empty space is to think of a container which is empty. But this is simply the concept of an empty hole. The reality of empty space in the universe is that it is not empty, and the *reality* of *truly* empty space beyond the universe is **Nothingness**, which is not in the realm of reality any more. We come back to the **idea of**

Nothingness which must be thought as infinite unknowable intelligence and energy, ciphers and metaphors.³⁵⁷

But then what is energy? From a scientific point of view energy is one of the fundamental ordering principles of science, just like time, space, and matter, not to forget thought. Some of its forms can be measured, because they appear together with mechanical space and time. In the domain of the uncertain energy of Nothingness notions like time, space, causality, and measurement lose all logical significance. **From a philosophical point of view, energy can be thought of as the intelligent power to be and to become.** Generalized *SAT* with its intelligence as well as the free will of a human being are similar metaphors.³⁵⁸

Even from a formal scientific point of view this energy can be regarded as the origin and originator, the creator of the universe. The word matter, meaning mother, says as much also. On one hand, matter as energy seems to be the creator, and on the other hand matter as substance seems to be dead and unconscious. But even substance has been reduced to mathematically described energy fields of nothing, unobservable quantum fields³⁵⁹. Matter can today be seen from a scientific point of view to have a strange position between tangible concreteness and pure thought-forms of solutions to complex differential equations. Either view alone is wrong but taken together we can form a suitable model of what is going on.

There are modern investigations into quantum gravity. When we describe matter at such deep levels, we are dealing with equations, whose interpretations fluctuate between the description of nothingness (the physical analogue of this is 'vacuum') and some mathematical specs of space-time-energy, which have some of their physical representation as particles, i.e. small pieces of some complex wave-thing with 'fundamental' properties. (Fundamental properties have a tendency not to be fundamental.) As mentioned above, the smallest possible wavelength of any such particle-wave-energy-pulse would be around 10^{-35} meters. Relativistic quantum physics and the general theory of relativity rule at these dimensions. Unfortunately, we don't know yet how to formulate a consistent theory combining both of them.

Energy as well as mind in their observable manifestations extend their domain from the human mind and brain to elementary particles and the most remote nebulae of the universe. I have proposed to consider a fusion of the phenomena in the previous section in the form of quantized thought waves. The idea of a whole movement of TTMS (thought, time, matter, space) permeates of course this book. Manifestations are not just manifestations. They need intelligent interpretations as to what they are, where they come from, where they are going, and what their meaning and purpose is. And this is where mind and matter (energy) start to interpenetrate each other, visible even for firm supporters of empiricism (perhabs). Throughout history, comprehensions and descriptions of the mind and of matter have ranged from empty nothingness to the totality of all there is.

³⁵⁷) It has been called Maya, Brahman, Shiva-Shakti in Hindu philosophy.

³⁵⁸) See the section 4.1.1 on *generalized SAT* on page 248.

³⁵⁹) See for example: Bryce S. DeWitt. "Quantum Gravity." Scientific American. December, 1983.

6.4.1 SCIENCE BETWEEN SOMETHING AND NOTHING

As we have seen time and again, even in science the distinctions between no-thing and something become increasingly difficult. Like in every other human activity the general tendency is to ignore problematic issues. The distinction between mathematical and physical theories has become sub-certain. We can see that thinking and its mathematical representations, sensing and acting as representations of physics, and the objects of such combined *SAT* in measurements of quantum physical properties become one whole movement with sub-certain and uncertain boundaries. The question whether geometry is a pure and empty product of thought, an a-priori perception of *SAT*, or a fact of physics, or all three, and more, can be asked with new emphasis. Are the quantum wave-functions just mathematical devices to calculate probabilities, or are they actual physical quantities, even though we can never directly measure them?

What are facts? What is reality? What are the limits of certainty? What are the parameters and presuppositions for a certainty?

These are important questions which can evidently not be answered from within an accepted reference system, because the reference system itself is under question. This whole book attempts to break out of the conventional reference systems.

If thinking at its fundamental levels is inseparable from **creative matter**, a new reference system may be unfolded by the movement of sub-certain betweenness.

6.4.2 TRIADIC MOVEMENT COMMON TO MIND AND MATTER

The old question of mind versus matter can be seen in a new light according to the ideas proposed in this chapter. We know that matter has different aspects to it, which reveal themselves according to the interaction with the probing mind via its controlling tools of senses and actions.

Only at their mechanical level appear things to be clear cut. There, matter behaves according to the classical, and deterministic laws of physics. There **appears** to be a complete separation between the observing, probing mind on one hand and examined matter on the other hand. This appearance is in its correctness a part of the mechanicalness of the observation, the observer, and the observed matter. Mechanicalness is one possible level of proper movement of the three triadic movements.

Our consciousness can explore not only itself but also physical matter outside of itself. The sensing, thinking, acting movement of the first triadic level can find out with a relative certainty how matter behaves. It therefore seems reasonable to assume that matter itself must have a certainty level corresponding to *SATI* of consciousness. Similarly, sub-certain, and uncertain levels of material movements should exist also. This approach is consistent with the assumption that all matter (and energy) follows the same universal laws of quantum-physics. This is the idea of holomorphism.

As a rule of thumb one can say that certainty is possible and makes sense in the case of distance measurements down to the size of huge molecules, say 10^{-8} meters; sub-certain statistical measurements are possible down to the size of an electron and smaller (10^{-20} meters). At the other extreme, we must say that, as we approach distances of fifteen billion light-years, i.e. the expanse of the universe, our causal thinking becomes questionable also.

6.4.3 HOLOMORPHIC UNFOLDMENT TOWARDS THINKING

Consciousness, a sub-movement of mind and matter, generates and creates a reality through its various forms of SAT.

Science itself has found that matter is of a quantum physical nature at its deeper levels, corresponding to the *SAT2* level of the mind.

At yet deeper levels we seem to find that matter as energy itself is creative. Particles create and annihilate each other. The original 'entity' preceding the Big Bang would have been all there was, except that there was not any 'there' there, neither matter, nor space, nor time. A superstring theory imagines the original existence of one dimensional strings of 10^{-35} meter length. Whatever that first 'being' was and is, it was and is One and it was and is as close to No-thing as thinking can get. The remnants of that Oneness-Nothingness are still with us as the underlying space-time-matter structure of the universe. It is interesting to note that the distance of $1.14 \cdot 10^{-35}$ meters is the smallest possible radius of any object, for example a tiny black hole (see glossary), which has become unobservable in our regular four-dimensional time-space. The corresponding smallest possible time would be $3.81 \cdot 10^{-44}$ seconds. Its temperature would be smaller or equal to 10^{32} degrees Kelvin. The density of matter of such a system is such that the energy of the whole universe would fit into the volume occupied by an atomic nucleus. One can show that such extraordinarily small objects would disappear out of our normal space-time but keep "existing" nevertheless in their own space-time. But even these seemingly outrageous concepts do nothing to explain the creation of the universe.

The best notion I can think of to describe the original potential to be all, before anything was or becomes, is that of *NOTHINGNESS-ONENESS*, an encompassing unknowable which created out of itself and which is infinite energy and intelligence. Out of this *NOB* came the universe, mind, and matter, Man, intelligence and so on. How could one not attribute the quality of a highest intelligence to that *NOB*, knowing well that no cipher of intelligence can even begin to communicate this mystery? It is with us always as the eternal quantum-field-ether in a physicist's terminology, a Nothingness-Oneness outside of space and time. It has all matter and orders and thoughts enfolded in it. In the light of this it seems reasonable to look at this whole infinite 'ocean of energy' as potentially creative and intelligent. No, **one has to say it is Intelligence and Creation.**

We have thus constructed a helix-like **unfolding movement** similar to the one which was introduced before in the case of the unfolding of consciousness.³⁶⁰

It could be described as follows:

Nothingness-oneness creates matter and the universe (maybe infinitely many of them) with (after fifteen billion years of evolutionary games) Man and his and her mind. That mind, based on brain matter, investigates matter and itself and finds that everything seems to be existing at mechanical, quantum physical, and creative levels. Therefore, mind-matter, through its creation of a triadic mechanical, generative, and creative movement of thinking, is capable of comprehending itself through the cipher of *NOB*. But it never understands mechanically its nothingness and oneness, its origin, or meaning. As human mind-matter-energy is creative and free, any true comprehension is a new creation, just like the creation of matter and that of mind, were and are creations of *NOB*. The human mind unfolds in a new order and enfolds that order in the mind. Human - or any other actions of intelligent beings - start at some point to freely interact and interfere with the material

³⁶⁰) See the section 4.3.4 "*THE CREATIVE LEVEL*" on page 281.

SAT of the world and the universe, adding a new dimension of freedom to reality and actuality. The power of creation has been communicated to the intelligent mind which can reflect on itself. **Thus, the helix of unfolding and enfolding - being free and creative - has neither beginning nor end, and can never be totally understood.**

In view of this, the assumption that mind and matter as well as products of mind and matter both exist and are on three qualitatively different levels does not seem to be so far fetched, after all. From the generative to the creative level of this movement the separation between mind and matter becomes increasingly uncertain. **The principle of this model is that thinking, in its creation of a reality, should heed the idea that anything it can approach through understanding, comprehension, or insight will have to be or become similar to itself.**

One might say that the generalized thinking of Nothingness has created the actual universe in a similar fashion as human thinking creates reality therein. By gaining insight into this origin human thinking folds itself back into Nothingness. Nothingness creates human (and possibly non-human) thinking which can create a reality with consciousness. This consciousness can touch and become one with Nothingness in a timeless dance of creation and annihilation, the dance of Maya, of What Is, the dance of the mystery.

6.4.3.1 APPARENT DIFFERENCE BETWEEN MIND AND MATTER

Nevertheless, an important but not absolute difference between mind and matter emerges, even though both exist and are on mechanical, generative, and creative levels. The human mind appears to be capable of producing ideas of freedom and compassion, to be them, as well as to reflect on them and see them as the highest good, transcending any conceivable reality. This is made possible through the 'self-suspending' qualities of thinking, which can transcend itself and its manifestations. In this self-transcending meditation human consciousness can suspend itself as a whole, suspend all reality, and become one with the creative intelligence of Nothingness, which may be the Nothingness common to mind and matter. But thinking in its uncertain capacity remains alive in this self-enfolding. When it is unfolded again, it may have gained conscious insight into its own operation and into that of the formation of realities. This self-enfolding and unfolding seems to be the essence of creative thinking, and may be a holomorphic movement similar to that of the enfolding and unfolding of Nothingness itself.

The human mind is the whole of thinking; it is automatically similar to any idea it encompasses and is potentially one with that idea.

Because it is like no-thing, it can move without resistance or friction, freeing itself of all conditions of reality.

Difference is appearance and vice versa. Both are created by mind-matter in a human and general sense. This is why I trust that mind-matter, the creation of the Nothingness of *What Is*, has qualities of freedom and compassion, and that the *difference between creator and created is itself part of the dialectic between reality and ideality.*

The mind appears to be different from the brain just like Nothingness appears to be different from Thingness. But the difference is ultimately an appearance created by thinking, in order to fulfill its purpose of intelligently creating and maintaining a reality. Difference is part of the dialectic energy of the unfolding and enfolding Nothingness. **This is why we cannot stay with Nothingness but have to think Oneness or Thingness. The dialectic between the two is the Betweenness.**

If we look at the idea of generalized *SAT* (sensing, acting, thinking), where I define thinking as a movement which can create difference and through that difference an order³⁶¹, we can see that this is similar to what the mind is doing.

Let me illustrate this ordering process through an example in the quantum physical realm:

When a positron interacts with an electron, both particles 'sense' each other, interact by annihilating each other and create photons which, though different in some of their characteristics, preserve other characteristics, which the electron and positron had together. That is, there are physical laws of conservation of processes, which maintain the connection between subsequent orders of unfoldment. In this example one can look at the system of photons as a new order. This is similar to the movement of thinking which suspends two opposing thoughts and creates a new one, which contains the previous thoughts enfolded in itself. Only if we reverse the direction of mechanical time, such enfolded entities can become unfolded again. This is possible in thinking as well as in fundamental particle processes. (The **fundamental** equations of physics know no preference for a direction in mechanical time.) Intelligent thinking is capable of freeing its consciousness from the conditioning of the past. This could be called a reversal of psychological time. **Thinking can undo its products in thinking as long as they have not been translated into mechanical actual facts outside of thinking.**

I do not want to create the impression that I propose a new scientific theory here. What I do propose is a new way of thinking which can give rise to a better comprehension of what we already know. No matter how far we progress with our scientific and philosophical understanding, we must bear in mind that the certainty of knowledge itself is the invincible barrier of uncertainty. *What Is* remains the total incomprehensible movement of mother-mind-energy, out of which ideas of freedom and compassion can manifest through the human mind in a reality.

One may attribute intelligence to matter because the mind is intelligent and fundamentally inseparable from that whole movement which unfolds mind and matter. But we are talking in terms of ciphers, reflecting insight which is uncertain for consciousness. The whole *What Is*, the whole of being, seems to be intelligent and it has unfolded the universe and the human mind, which, when talking about intelligence has only its own limited thinking and experience as a reference. We don't know what matter is ultimately, or the mind, or the whole creating movement of NOTHINGNESS. But in the awareness of our ignorance, our knowledge loosens its smothering grip on our reality. And this may be a new beginning of intelligence and knowledge in a reality.

6.4.3.2 FUNDAMENTAL IGNORANCE

The question of mind and matter being raised here implies the question of a succession in mechanical time. Did matter first exist without intelligence, and then, accidentally develop into higher and higher organized molecules, which then evolved into living organisms? This is more or

³⁶¹) Supra, section 4.1.1 "Generalized *SAT*," page 248.

less the standard scientific belief. Let us explore this position in a fictitious dialogue in terms of knowledge, metaphors, and ciphers :

A.: If we assume that matter accidentally developed into higher organized molecules, why then would matter accidentally not remain at its initial state?

B.: Because the laws of physics caused it to evolve.

A.: But where do the laws of physics come from?

B. : They are contained in matter-energy.

A.: But how did they get there?

B.: At the most fundamental level of energy, at the state which we only barely come to appreciate, the energy of Eternal Nothingness-Oneness, Intelligence, creates a spark of separate energy. This can be thought of as the first wave-function, not yet unfolded, which contains all potentialities of a whole future universe and its time-thought-matter-space in it as potential realities. This includes the most fundamental laws of physics, gravity and space time. It also includes the potential of this one function to break up into many sub-functions which nevertheless contain essential parts of the original function. Through this break up and subsequent interactions of wave-functions all the laws of physics are being created, which have as one potential development the creation of intelligent life forms.

A.: What is a law of physics?

B.: A description of material behavior which in the best cases approaches an intrinsic characteristic of all matter-energy. In the latter case, one might say that the laws of physics are to matter what thinking is to the brain. If that is the case, as I assume, the laws of physics at the fundamental level of quantum physics are about the highest correctness of thought form in a reality that can ever be achieved. The wave-functions are actual and real in a complementary relationship.

A.: This means that Nothingness, which was and is in no-time, had the whole of what was and is to become enfolded in itself as potential actuality and reality. This Nothingness unfolded-enfolded time, space, matter, mind, and thinking into the first spark of seemingly separate energy. In this spark it has enfolded some of its own intelligence as potentiality. This potentiality includes the possibility in some areas to be free and creative. The unfolding of freedom and potentiality is what one may call accidental development or evolution. But if we mean by accidental that there is no intelligence behind the unfolding then this concept is completely wrong.

Conditions, ordering principles, laws and causality did at some point not **exist**. Whatever was **then** was independent of time and therefore **is** forever independent of time, i.e. eternal. The Nothingness which created time, thought, space, and matter, did not cease to be. It never was in time, it never 'existed' in mechanical space-time, but it created space-time. Thus, 'it' **is** as 'it' always was and always will be. We come back to the paradoxical statement of Nagarjuna that Nothing is. There is no reason to assume that the creative process of Nothingness stopped with the Big-Bang, because it was never in mechanical space-time to begin with.

**NOTHINGNESS IS INTELLIGENCE,
IS CREATION,
IS CREATING TIME-SPACE-MATTER-THINKING
IN ETERNITY.**

The NOTHINGNESS of What Is, is totally free. This total independence of time is freedom from all conditions and is absolute freedom. Would it therefore not be adequate to say that Nothing is free and intelligent, Nothingness is freedom and intelligence.?

Maybe this last question and answer is adequate because of its dialectic ambivalence, which reveals the impossibility to think about the whole with certainty and come to non-contradictory conclusions. We can think these thoughts if we allow complementary metaphors. If we reflect such answers diligently, we can resolve their contradictions by suspending the mechanical level of thinking and by lifting thinker, question, and answer to the non-certain complementary levels of being.

But we are then dancing with Maya, embracing Nothingness. This is a positive statement, Sat-Chit-Ananda, the bliss of consciously and non-consciously being Oneness-Nothingness-Betweenness.

The more the mind frees itself from its conditioning, the more it is One with Nothingness. And this may be the ultimate purpose of the mind. What that suspension or meditation does to our mind cannot be known for certain. It seems that it makes the mind freer and more perceptive, thus more intelligent. We may trust that our thinking can create new ordering systems, but we cannot know or plan any of this. We are at the limits of our consciousness.

We should remember that an intelligence which is as all-enfolding as the one alluded to here cannot be properly thought anymore. All we can do is try to think it in dialectical terms.

I trust that human beings are an integral part of the unfolding triadic mind.³⁶² The more we comprehend, the greater our responsibility for ever greater portions of our world becomes. The world is our mind, society, nature, environment, and the universe, from mechanical to spiritual manifestations and ideas.

Insight, which occurs in the self-suspension of the mind, is not in the mechanical continuum of space and time, and can therefore lead to radical changes of consciousness in such a way that the continuity between past and present may be lost. Progress is therefore only possible within the concept of a mechanical chain of cause and effect.

6.4.4 TIME, THOUGHT, SPACE, AND MATTER

I mentioned earlier in the section Triadic Movements³⁶³ that there is a profound connection between time, thought, space, and matter. The way in which the mind determines to see these concepts related is dependent on the level of its operation. This means that Mechanical *SAT* (sensing, acting, thinking) experiences a mechanical world, which is in this context a mechanical and causal universe; Sub-certain *SAT* perceives an interconnected world, changing in sub-certain ways; Intelligent *SAT* creates and sees with uncertainty a world which is inseparable from itself, its

³⁶²) See section 4.3 "*THE THREE LEVELS OF HUMAN SAT*" on page 266.

³⁶³) Supra, sections 1.4.1.3 on page 54, 2.2.2.1 on page 98, and 4.3 page 262

seeing, and creating. The human mind-body totality encompasses all three movements, of which the open self is an integral part. We must learn to think, sense, and act rationally but with an active openness to the non-certain modes of all SAT.

6.4.4.1 MECHANICAL SPACE AND TIME

Time, thought, space, and matter are independent and separate movements for mechanical *SAT*. In some sense they all appear to be absolute. In mechanical physics (classical or Newtonian physics) this finds its expression in the laws of Newton, in which space, time, mass, and thought are totally independent variables and quantities. Thought, being present here in the form of mathematical equations, does not enter them explicitly ever. The appearance of a completely objective description of mechanical phenomena is manifest in Newtonian physics. Thought processes are dualistic in the sense of two objects interacting with each other without affecting the connecting medium.

In Einstein's **Special Theory Of Relativity** space and time variables become dependent on each other. They become inseparable. Mass and energy are equivalent. In Einstein's **General Theory Of Relativity** space, time, and matter become one movement. All of the preceding theories allow measurements with certainty and are in that sense classical. Yet, they point to an inseparable continuous, causal, and predictable space, time, matter continuum, which is however incompatible with the uncertainty relationships of quantum physics. The equations of Newton and Einstein are differential equations using real numbers (initial value problems). We can establish analogies between *SAT* movements of the mind and the movements of matter which can be perceived by them. To the level of *SATI* on which we sense, act, and think with certainty (mathematics, sciences) corresponds a level of *material SATI*, where matter behaves in predictable ways. Matter rather responds through *SATI* to a stimulation through *SATI* of the mind-body of a human being.

On this level the behavior of material objects can be described with the certainty provided by the mathematics of 0 and 1. To the certainty of mathematics, which is a pure **thought-operation** abstracting from time, corresponds the predictable certainty of the natural sciences. **By predictable certainty we understand the fact that we can predict the location and momentum of a point-mass in all future times if these parameters are known at any given instant, taking into account our imprecise sensing and acting facilities. Their imprecision can be determined and corrected, and provides us with controllable limits for our certainty in measurements.**

6.4.4.2 QUANTUM THEORY OF SPACE, TIME, AND MATTER

In Quantum Theory the thoughts of the observer enter the equations as part of the state function in the Schrödinger equation indirectly. The thoughts of the observer determine the experimental setup, which determines which quantum mechanical properties can be measured. The differential equations of quantum physics can be made relativistic in a Relativistic Quantum Field Theory, and then provide the most complete theory of the universe and anything measurable in it. These equations have built into them universality and the uncertainty relationships of Heisenberg. By eventually including a **quantum theory of gravitation** in a **General Relativistic Quantum Field Theory** an **inseparable oneness of space-time-matter-thought (TTMS) will be manifest**. The inclusion of gravity in a consistent relativistic quantum field theory has not yet been possible, as of 2002. But we know that there is a fundamental smallest limit to a space dimension, or to the energy which determines the space dimension. As mentioned earlier this limit equals:

$\sqrt{\frac{\hbar G}{2c^3}} = 1.1 \times 10^{-35} m$ where G is the universal gravitational constant, \hbar is Planck's quantum, and c is the speed of light in the vacuum. This object resembles very much a fundamental black hole, the smallest black hole that can exist as long as the laws of physics are applicable (see glossary). The temperature of this black hole would be 10^{-32} Kelvin degrees, the temperature which existed at the beginning of the universe for about 10^{-43} seconds. This time span coincides with the period of an associated wave-packet.

We already can conclude from what we know today that any material observable processes of the universe, from the creation of galaxies to the subtle movements of the human brain, follow the same laws of nature. There are no **fundamental** distinctions between the operations of the brain and those of the universe as a whole. The same laws apply everywhere where there is space and time.

Looking at the whole scope of the development of science from Aristotle to Newton to Einstein and Heisenberg we can observe an interesting development in the relationship of the constituent elements of scientific theory. **They unfold from a status of complete separation, in which complete certainty appears to be possible, to a dialectic movement of complete Oneness, in which Heisenberg's uncertainty relationships rule.** This does not mean that the world has become more uncertain. On the contrary. **We know more things about matter, the brain, and the universe than ever before, with greater certainty than ever before.** But at the same time the world or our understanding of it has become more complex and non-intuitive.

In quantum physics the concepts of **certainty measurements** of arbitrary variables of a system must be given up. Furthermore, exact quantized transitions between energy levels suggest a non-local, non-certain connectedness and ultimate oneness of the whole universe. The idea that things can be connected non-locally leads to the idea that there is a no-thing like quality underlying the reality which is determined by **separable time, space, matter, thought parameters**. A non-certain Oneness-Nothingness emerges out of this picture. Our comprehension and understanding of this idea remains **between** an understanding of either Oneness or Nothingness. We are as conscious human beings the Betweenness. In Heisenberg's uncertainty relationships we have succeeded in a **certain form** to express an **uncertainty**. There is a fundamental, unavoidable, sub-certainty in the simultaneous determination of complementary quantities like location x and momentum p³⁶⁴,

$$\Delta x \cdot \Delta p \geq \hbar/2$$

or time t and energy E:

$$\Delta E \cdot \Delta t \geq \hbar/2$$

The complementary nature of these quantities emerge from the fundamental complementary "dual" nature of all manifest particles in actuality. They are **both wave and particle**.

It should not be too much of a surprise that momentum and position are incompatible and complementary quantities. The mathematical definition of speed is based on the axiom of a continuous number-line, a pure thought product. **When we project this number line into the actuality of space and time as given to us by our thinking and senses, the incompatibilities of**

³⁶⁴) See section 1.4.5.3 "The Observing Mind (Heisenberg's Uncertainty Laws)" on page 75.

Zeno's paradoxes³⁶⁵ come to bear. A real object is extended in space; therefore it cannot be located at an exact point-like position in the mathematical sense. From quantum-physics we know that no object can be absolutely at rest, there is always a fundamental oscillatory movement present. ("**What Is, is movement,**" comes to mind.) A real object has a mass and an extension. We need a quantity combining movement and mass (or energy), i.e. momentum $p = m \cdot v$. Heisenberg's uncertainty relationship gives us an exact limit as to the accuracy, to which an object can be **thought** to exist at a given location, not merely be **measured**. Thus, it is a limit to our knowledge as to the possible existence of an object in space and time. If the object looks more like a wave packet, it is described by its average wavelength and frequency. As every object is a wave and a particle, we need a connection between the relevant quantities of waves and of particles. It is given by the de Broglie relationships:

$E = h \cdot f$ and $p = h/\lambda$, where f is the frequency of the wave and λ is the wavelength.

Another way of writing these relationships is also very common:

$E = \hbar \cdot \omega$ and $p = \hbar \cdot k$, where $\omega = 2\pi \cdot f$ and $k = 2\pi/\lambda$

The mathematical symbolism of quantum physics is contained in complex partial differential equations, whose main non-relativistic representative is the Schrödinger Equation. (There are other, relativistic equations as well; we include them all in the term "Schrödinger Equation").

The equation describes the fundamental change of **any** material system in time. Actually, the equation and its solutions describe the movement of a mathematical function in imaginary time. The change of this so-called state-function ψ depends on the quantity **H**, the Hamilton operator, which contains expressions of the whole energy of the system. The **interpretation** of these solutions and their linear combinations explain the change of a material system in real time. We have to do with solutions which are combinations of complex wave-functions. The fact that we cannot express quantum physical wave-functions through real numbers but **must** use complex functions is more than a coincidence. The measuring device itself interacts as a similar complex wave-functions with the function to be measured. Both, the observed wave-function and the observing wave-function interfere and become a new wave-function. Many of these taken together in the statistical aggregate form a classically observable phenomenon.

The wave-functions provide us with a means to calculate probabilities for obtaining quantum-mechanical characteristics for the quantum system under investigation. But the function itself and its evolution in time cannot directly be measured. **This is in complete contrast to the classical case where both quantities x and p and their change in time are real quantities and can be measured directly.**

In this sense the ψ functions are not real, and the wave equations of quantum physics have an additional metaphoric character. They imply an underlying Oneness between the observer and the observed, ultimately with all of **What Is**.

Figure 68
Schrödinger Equation

$$i\hbar\dot{\Psi} = H\Psi$$

³⁶⁵) Supra, pages 26, 81, and 217.

Because the quantum wave functions ψ themselves are as such not measurable we interpret them as **probability amplitudes**. The probability refers to either a probability for a possible observation (Bohr) of events which are not observable otherwise, or to a **probability for a thing-aspect to come into existence** (Bell, Bohm). (Both of these concepts of probability are different from the classical probability which refers to things which occur with probable frequencies. See glossary.) The first interpretation may be called epistemological, the second ontological. The epistemological interpretation implies that the wave-functions have no 'reality' outside their measurement. The *ontological* approach is less restrictive and attributes meaning, I would say subcertain meaning, to the wave-functions in themselves. It should be clear, but generally isn't, that neither approach has anything to do with physics. This is philosophy. I have tried throughout this book to develop ideas and metaphors which support the ontological view; to summarize:

What Is generates subcertain thinking and actuality. Subcertain thinking can generate a self and reality in which certainty becomes possible in a limited area. This area is generally seen as the domain of **epistemology**, the domain of what can be known rationally and with certainty. **Ontology**, thinking about *What Is*, refers to the areas of non-certain *SAT*, where **meaning, trust and truth** unfold themselves between human *SAT* and *What Is*, of which human *SAT* is an integral part.

Heisenberg says about the functions of the Schrödinger equation³⁶⁶:

"The **probability function obeys an equation of motion as the coordinates did in Newtonian mechanics**; its change in the course of time is completely determined by the quantum physical equation, but it does not allow a description in space and time. The observation on the other hand, enforces the description in space and time but breaks the determined continuity of the probability function by changing our knowledge of the system."

In his book "*The Part And The Whole*," Heisenberg explains his view further (emphasis by FW):

"Quantum theory is such a wonderful example that one may have completely comprehended a situation and yet knows that one can only speak in metaphors and similes about it. The metaphors and similes are in essence the classical notions of 'wave' and 'particle.' They do not fit into the actual world and are partly in complementary relation to each other and therefore sound contradictory.... Probably, it is quite similar with the general problems of philosophy, in particular metaphysics. **We are forced to speak in pictures, metaphors, and ciphers, which cannot quite express what we truly mean.** Sometimes we cannot avoid contradictions, but somehow we are nevertheless able to approach the actual situation."

³⁶⁶) Heisenberg: "*Physics and Philosophy*," Allen and Unwin, 1958. See QPQ, page 523.

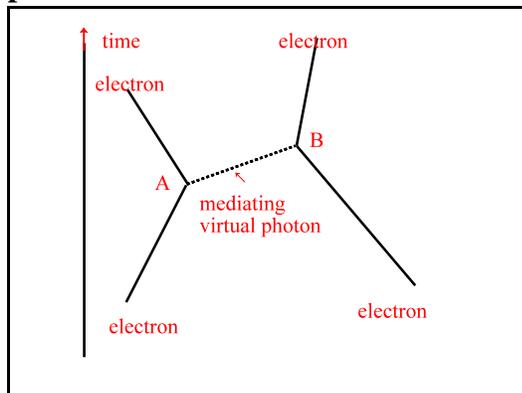
In the context of the certain and non-certain movements of generalized *SAT* developed in this book the epistemological and ontological interpretations should be taken together³⁶⁷. They do not contradict each other, but are another set of complementary parts of a holomorphism. This remains the case if one compares thought and thinking with a quantum particle-wave:

A subcertain thought is a generative movement which does not depend for its being on a certain thought which brings it into focus. **It does not depend on the consciousness to be focused as the observer, yet it requires consciousness as an environment to become real.** Thinking could be compared to a non-localized quantum wave, which is capable of generating thought through a process which creates consciousness together with the object of consciousness. The unobservable quantum wave changes into an observable quantum particle and into a classical particle, corresponding to the movement of creative thinking to generative thinking and mechanical thinking.

6.4.4.3 SUBSTANCE OF SPACE-TIME: ONENESS OF THE UNIVERSE

The concepts of mechanical time and space as *forms of perception* become sub-certain entities at the quantum physics level simultaneously with the properties of matter. There are four forces in the universe, and they all operate alike through an exchange of unobservable *mediating field particles*. One particle, an electron for example, emits a field particle (a virtual photon), a quantum of energy, and another electron somewhere in the universe will absorb this photon. While the mediating photon is on its way the two electrons seem somehow to be connected, but not in observable space and time. The emitting electron is the 'subject electron' and the receiving electron is the 'object electron.' The force is being established at the speed of light, at which the virtual photon travels. Yet it is a quantum effect, meaning that the force kicks in as a measurable quantity only in the moment the photon has reached its object. Subject and object electron are nevertheless determined at the moment of emission. *'They know about each other.'*

Figure 69. Feynman diagram for the creation of a force between two particles. Mediation.



The subject electron emits a virtual photon of exactly the right frequency in order not to violate Heisenberg's uncertainty relationship. It does violate energy conservation for the time of mediation. For example, if it wants to link up with an electron 10 light-years away, it must emit a photon with the correct energy and frequency. Unless the subject electron is connected *non-causally* to the object electron it is hard to see how such a deed would be possible. By *non-causal* or *quantum-causal* I mean a process which cannot be measured, though we may be able to describe a mathematical process linking the two objects like it was done by David Bohm with the *quantum-potential*.

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³⁶⁷) See section 4.2.1.1 on page 263.

There is this Oneness aspect again, or *non-locality*, of wave-particles which are not observable and therefore do not have ³⁶⁸the normal thingness characteristics. Which is why it looks as if there is a connection between them outside of regular time and space. Space and time become uncertain in as much as energy and momentum conservation are violated. The degree to which this violation is permitted is determined by Heisenberg's uncertainty principle. In my language this connection occurs in creative space time. All four forces work in the same way, in particular also the force of gravity which establishes the time-space-matter structure of our whole universe. **As every kind of energy in the universe is subject to the gravitational forces, one can say that the whole observable universe is a movement on top of an invisible web of virtual gravitons.**

This unbroken and unbreakable Oneness, expressed on the actuality level by one probability amplitude, is not surprising if one accepts the creation of this universe according to the Big Bang theory. The whole universe was originally One Nothingness-Oneness. All the energy of the existing universe was contained in the tiniest imaginable volume of space-time right from the moment space-time and energy became real (see page 455). At that moment, when the Oneness-Nothingness created gravitation and the three other potential forces, the differentiation began. **But every mass, particle, or bit of energy which was successively created remained in contact with every other mass, particle, or bit of energy through the quantized virtual graviton field particles. There never was a separation. Indeed a complete separation is even "unthinkable" as I pointed out earlier³⁶⁹.** Thus, the connection between two field-particles does not need to be established before a mass A sends out a field graviton to mass B. **The connection is always there. It is the non-locality, the actuality of the wave-function itself.** The non-locality implies that the whole universe with everything in it should be described through a single probability amplitude or state function.

The fundamental unfoldment from NOB to the universe "takes place" at the speed of light. Time-space are being created together with this expansion. **Therefore, from the point of view of the expanding wave-front, neither time nor space nor speed exist. As there is also no succession of events for this wave-front, everything happens simultaneously for it. There is also no definable concept of causality for this wave-front.** Thus, one may start to comprehend that also the very first event of the Big-Bang had no cause.

The analogy with thinking can be suggested also. The subject thinker creates an object thought, to which the thinker remains connected even though thinker and thought appear to be separate. To the probing *SAT2* (generative sensing, acting, and thinking) movement of consciousness with its subcertain capacities of generating theories, measurements, and complex machinery corresponds the *passive* response of quantum physical *SAT2* movements of matter, space, and time 'out-there.'

6.4.4.4 TOE, THEORY OF EVERYTHING; SYMMETRY

Attempts to unify all our knowledge about the subatomic behavior of matter have been made in the "Theory Of Everything" or TOE. Here is a brief outline:

The Schrödinger equation is **the** fundamental equation of everything potentially observable in the universe, in as much as it describes the unfolding in time of all potential and actual things

³⁶⁸) See also pages 433 and 462.

³⁶⁹) See section 1.4.1.1 "Locality and Creative Space" on page 51.

of *What Is*. Generalized quantum-field theory discusses the creation of structures and interactions of fundamental particles or fields. In the formalism of quantum-field theory we talk about mathematical operators which create particles out of Nothing, the vacuum, and which make them disappear into Nothing. With the various types of particles the forces come into being. Actually, some of the particles, in their virtual manifestation, **are** the forces. *Permeating all of fundamental physics is a fundamental non-locality, the underlying non-observable, non-substantive Oneness-Nothingness of all of reality.*

Ultimately quantum physics forces complementarity on us. The whole way of speaking and thinking in terms of particles and forces interacting between them on top of time and space becomes inadequate. **Time, space, matter, thinking, particles, and forces become one web of non-observable quantum-waves.**

Essentially, there are the four fundamental forces of the universe: gravitational forces, electromagnetic, strong, and weak forces. All these forces are mediated by quantum-fields called gravitons, photons, gluons, and intermediate or weak bosons. The mediation of these quantum-fields is unobservable and non-local. During the mediation the Heisenberg uncertainty relations are our only connection to what is happening in an uncertain time and space structure. Furthermore, up to the degree of non-certainty provided by Heisenberg's uncertainty relationships, there are some fundamental rules governing all quantum fields.

Time-space is the same anywhere in the universe. This leads to the concepts of 'symmetry' of time and space, meaning essentially, that physical phenomena are not affected locally by the particular location, or orientation in space, or by time. A circle for example is symmetric with respect to any rotation in its plane, an equilateral triangle is symmetric with respect to a rotation through sixty degrees. These properties lead to the postulate that fundamental processes of physics must leave energy, momentum, and angular momentum unchanged. They are the classical conservation laws of physics, which are also valid in quantum physics. It was Emma Noether, a German mathematician in Göttingen of the 1920ies who found these fundamental connections between symmetries of mathematical theories and the conservation laws of physics.

These rules provide a strange link between thinking, mathematical equations, and what we see as reality. Kant had seen this earlier when he stated that "*time, space, and causality are the necessary conditions for our 'perception'... all finite things are dynamically connected*" which is our perception of the world through the various modes of *SAT*, sensing, acting, and thinking.

One other rule not mentioned up to now is called gauge invariance, which all quantum field equations must display. This can be looked at as a degree of freedom which is available in the development of the field equations of elementary particles. Gauge invariance leads to other conservation laws of physics of quantities like charge, strangeness, lepton number, and baryon number.

All these fundamental assumptions provide a rather mysterious mix of requirements which are of thought, about the behavior of matter, and about thought's interaction with matter. **They link causal, certain reality and quantum-causal, non-certain actuality, presenting indeed rules about TTMS, thought-time-matter-space.** One can say without exaggeration that Emma Noether discovered the link between the purest and most abstract form of thought in mathematical equations with the most abstract conceptualization of the underlying principles of actuality as perceivable through mechanical thinking, sensing, and acting. The oneness and nothingness of mind and matter, and the betweenness of human thinking reveal themselves here.

The **spontaneous breaking of the symmetries** found by Emma Noether provide the necessary uncertainty to create a dynamic universe in which freedom and creativity are possible. The breaking of perfect symmetry is the betweenness which separates and re-unites oneness and nothingness. The breaking of symmetry is the fundamental human uncertainty, is the betweenness, is the dance of Maya. This is the uncertain scientific answer to the question "**Why is there something, why is there not nothing.**"

Nothingness (Oneness) has perfect symmetry. It looks the same from any angle, at any location, at any time, under any circumstances. Nothingness suspends itself in its breaking of its own perfect symmetry. In so doing, it creates universes, actualities, realities. It is highest intelligence. This highest intelligence is *What Is*, and human thinking, as everything else, is part of it. Shakti-Shiva (Nothingness-Oneness) unfolds her/himself into Shakti and Shiva as 'objective material actuality' and as reality for any conscious being. **Maya is the Betweenness.**

6.4.4.5 THE CIPHER LEVEL OF MIND-MATTER

If we proceed with our speculation into the ideal realm of creative oneness we should say that to the creative *SAT3* level of the human mind (unknown and unconscious) correspond *SAT3* movements of matter, with the creation of matter and energy out of Nothingness. I mentioned earlier that at distances of less than 10^{-20} meters, time and space concepts start to break down. It is at this level that a proposed concept of division between matter and mind becomes untenable. We should rather speak of mind-matter-nothingness as the unknown creator, creating process, and the created object. For our conscious and limited thinking process this expression corresponds to the equally mysterious notion of *NOB*. The word matter implies all that when we consider its derivation from the Latin word 'mater' for mother.

Mother-Mind-Matter, Nothingness-Oneness-Betweenness, are all that is, transcendence of the human mind. What Is, is Nothingness.

6.4.5 GRAVITATIONAL QUANTUM-WAVES, SPACE, AND NOB

In "*Ether and the Theory of Relativity*" Albert Einstein said:

"Recapitulating, we may say that according to the general theory of relativity space is endowed with physical qualities; in this sense, therefore, there exists an ether. According to the general theory of relativity **space without ether is unthinkable**; for in such space there not only would be no propagation of light, but also no possibility of existence for standards of space and time (measuring rods and clocks), nor therefore any space-time intervals in the physical sense. But this ether may not be thought of as endowed with the quality characteristic of ponderable media, as consisting of

parts which may be tracked through time. The idea of motion may not be applied to it."³⁷⁰ (Emphasis by FW)

Newton thought that the force of gravitation would spread instantaneously through time and space, which he considered to be fixed and absolute. We know today that the force of gravity, and with it space-time, spreads at the speed of light.

The assumption that the observing instruments (including the thought process of the physicist) are independent of this space time structure allow for causal knowledge and causal observation of a reality. Knowledge obtained in this way is universal, and universally verifiable. This is the foundation of the success of science.

We also know today that there is no *action or force at a distance* transmitted through and in the universe of **four-dimensional space-time**. The EPRBA experiment³⁷¹ may suggest the assumption of an actual or real spin-space. You may recall that in the Einstein-Podolsky-Rosen-Bohm-Aharonov (EPRBA) experiment there seems to be an **immediate** action from one spin state of an electron to the spin state of a positron across any distance. We assume that this positron and electron originated from the disintegration of a photon. Even though the two particles may move apart from each other they remain connected in the sense that the change of spin of one particle results in an immediate change of the spin of the other particle. They remain in the same quantum state.

I proposed earlier (1.4.1.1. Locality and creative space, page 51) to consider that the quality of space which is relevant in this situation is not the normal separating mechanical space but rather a 'creative' kind of space which is non-mechanical and non-separating and therefore does not lead to an observable causality. In the particular example of the EPRBA experiment this space is in mathematical terms the quantum-mechanical spin-space, which may be more than just a mathematical construct. This non-locality is part of the sub-certain actuality, already contained in the Heisenberg uncertainty relations. The assumption of a **non-certain underlying Nothingness-Oneness** quality of space-time-matter-thought helps us to comprehend the mysterious behavior of particles in quantum-theory in many other instances as well.

Returning to the consideration of space in the universe we talk in still classical language about force fields of gravitation and electromagnetism, which spread through the universe at the speed of light, $3 \cdot 10^8$ m/s.

According to the "**General Theory Of Relativity**" an acceleration field is indistinguishable from a gravitational field for a small region. This means that there is no physical measurement inside, say an elevator, which would be able to tell, whether the motion is due to the curvature of space-time or due to the existence of a force field. One cannot distinguish between the properties of space-time and those of the gravitational quantum fields. Underlying this fact is the "equivalence principle" which states the fact that acceleration due to gravity and acceleration due to an accelerated reference frame are the same. All objects fall at the same rate irrespectively of their different masses.

Under the effect of gravitation any object will move on a curved path. In the case of planets moving around a star this path is an ellipse. We know that due to all the mass and energy

³⁷⁰) From "*Physical Thought from the Presocratics to the Quantum Physicists*", PQP page 498.

³⁷¹) Supra, page 51 and 433.

distributions in the universe all objects with an energy or mass move on curved paths. In addition, gravitational fields affect time, i.e. in a stronger gravitational field **clocks move slower** than in a weaker gravitational field. (At the moment of the Big Bang, this gravitational field was so strong that there was no time.)The result is that we regard the totality of space-time-matter of the universe as a **curved four-dimensional space time continuum**. In this non-Euclidean curved space-time a "straight" line is defined as the shortest distance between two points. Such a line is called a geodesic line. It is the path followed by a light beam, a photon, or a graviton. If the surface of the earth would represent such a space-time grid, i.e. a spherical surface, we would be able to see below the horizon. Actually we would be able to see the back of our head by looking in any direction. The curved space-time is also called a 'field,' where 'field' is a similar mathematical concept as that developed for electromagnetic fields.

When we ask what these fields are made of and what their characteristics are we are led into the new, non-classical areas of physics, i.e. quantum field theory.

According to this approach, which is generally accepted among physicists, the fields 'consist' of quantum particle-waves which are called mediating bosons³⁷². In the case of the electromagnetic fields, the bosons are photons. In the case of gravitation they are called gravitons. These particle waves are called virtual because they are as such not observable. They have to be forced into reality, so to speak, through an experimental setup. (Accelerating electric charges as well as accelerating masses emit waves carrying away energy. These are the real waves which are measurable and usable as electromagnetic waves, from radar waves to ultraviolet radiation of the sun. Real gravitation waves have, up to the year 2002, not been measured unambiguously.) Abstract quantum field theory tells us where the particle waves are supposed to be and what their properties are. This knowledge can however never be verified in an individual case, hence the term '*virtual*'. But one may and should ask "What do we mean by virtual?" Well, a virtual particle cannot be measured, but what is worse, **for the time of its existence it violates momentum and energy conservation, i.e. the basic assumptions of the properties of real (mechanical) space-time**. (The total energy of the emitting particle is smaller than the sum-total of the energy after emission. For the time of transmission, the energy of the emitting particle is even less than its rest mass energy.) This violation is only acceptable to the physicists' community because of the Heisenberg uncertainty relations, which is why these are being considered to be more fundamental and true than real time and space (cf. page 458). For the system as a whole, every particle is of course emitting and receiving such virtual field particles, and energy is conserved. This is a nice illustration of how one is led to problematic situations if one assumes that the universe is analyzable into absolutely separate parts.

What the term 'virtual' is supposed to mean is not quite clear. Do we mean to say that a virtual particle **exists** but cannot be measured? Is it merely a matter of speaking, of translating mathematical formulas into common language? I have proposed to call such particles **actual** but not real, in analogy to sub-certain thoughts and conscious thoughts. We are encountering the basic challenge of quantum theory, in that the complex wave function of the Schrödinger equation cannot be measured, yet usually that wave function is not referred to as virtual. We call it a probability amplitude, which does not explain much either. So, virtual particles, i.e. all the particles mediating

³⁷²) In honor of the physicist Bose, who after his career as a scientist went on to start a very successful corporation building loudspeakers.

the four fundamental forces of the universe, cannot be measured. Yet they are the foundation of all interactions in the universe, **indeed they are the 'substance' of space-time-matter-thought, that which makes space-time and our reality possible. In the terminology proposed here they form the sub-certain actuality from which reality emerges.** In addition, as mentioned earlier, they are a Oneness-Nothingness (non-locality) a holomovement, in which each movement remains correlated to all other movements transcending space-time separation. When we try to verify the knowledge about a virtual graviton, for example, carrying energy and momentum from one neutrino to the next, we would have to conduct an experiment in which we destroy the knowledge about the graviton. What is interesting in our context is that the gravitons (or maybe some even more basic "strings") seem to be providing the non-certain substance of the actual space time structure of the universe. *They might be* the hypothetical unobservable ether Einstein talked about in the article quoted from earlier. This would answer the questions as to the nature of the mathematical space-time continuum, left unanswered in the classical field theory which is Einstein's General Theory of Relativity. Out of this ether the general properties of space and time should unfold. This means of course that the ether itself is neither static nor moving in the sense of a change of location in time. There is neither speed nor acceleration nor separation in this ether, because it is the unfolding Nothingness-Oneness of *What Is*. It is not a thing at all, it is barely thinkable in the uncertain groping of the mind. It is not observable or measurable. On the other hand, there is no beginning or end in terms of time and space in this ether. It is truly an **eternal (beyond time) Oneness-Nothingness**.

It is most interesting to note that the idea of ether as a divine hypothetical primordial substance, the origin of reality, goes back to the earliest speculation about the origin of the universe more than three thousand years ago. It exists in Hindu, Buddhist, and Greek mythology.

If one wants to measure the extremely small effects of a graviton, the measuring instrument and the space-time location need to be of the same (or smaller) length than the wave length of the graviton to be measured. The effects of gravitons are of a magnitude which is about 10^{36} times weaker than similar photon effects. To add to the difficulty of experimental verification of gravitons, the very space time structure, which generally provides the back drop for experiments, becomes an intrinsic part of the measuring device, making a measurement of a graviton all but impossible.

We know that the 'motion' of a quantized wave can be described through the solutions of the Schrödinger equation, which can be considered as carrying **knowledge of the observer and of itself, the quantized wave being observed**. This implies an unbroken oneness between object and subject, and therefore the end of any absolute division between thought, time, matter, and space. If one wants to interpret the solution of the Schrödinger equation directly, one also has to say that the motion occurs in an imaginary space-time, which I have called subcertain and generative, or even creative space. If the quantized waves are in this space, then the objects connected by them are in that space or adjacent to it. One object is thinking, the other is the material object, which interacts with the quantized wave. Thus, the idea of the holomovement is reemphasized. We come back to the insights of Heraclitus, Parmenides, and Nagarjuna, complementing each other: *What Is*, is one, one whole Oneness, one holomovement, which is nothing. *What Is*, is Nothingness and Oneness. Human thinking forms the bridge between abstract thought and knowledge, Nothingness, and the Oneness of that which can become actuality and reality.

To think about virtual particles in a reality space, or to think about actual particles in a sub-certain space are to me equivalent approaches to the mystery of *What Is*. It is similar to the equivalent perceptions of the mystic and the 'realist.'

For the **mystic** the perceptions in his or her mind are the actuality, but are illusion to the **'realist.'** I define the realist as a person who believes that only that which can be measured has meaning. Thus, what the 'realist' regards as the real world is rather an illusion to the mystic. Physicists have the advantage that they can point to a set of mathematical equations accepted by both camps as correct. The mystic and the realist share merely a common language whose formalism implies much less meaning than the equations of physics.

Considerations like these have helped me to introduce the idea of *TTMS* (thought-time-matter-space) as being the structure of the actuality of *What Is*. Actuality is created by *What Is* in unknowable ways. Reality is created out of subcertain actuality through human sensing, acting, and thinking in generative and creative processes.

Considering these ideas we can hardly say that a virtual graviton is real, or a thing, because all **things** need to be measurable and knowable in time and space; and knowledge and measurement are independent of each other in a reality.

Human thinking in the form of quantum theory is the bridge between reality and actuality. This thinking is a manifestation of the complementarity of *What Is*. We know that for the time during which the graviton moves from one neutrino to another, or any other pair of massive particles, energy and momentum conservation are violated, which is consistent with the fact that our knowledge of space and time is also violated.

Let me reiterate in this context what I discussed earlier in terms of the Feynman diagrams on page 458.

If we consider a graviton which travels for fifteen billion years to connect the most extreme distances of the universe, this implies an energy momentum violation, though immeasurably small, for the whole life time of the universe. Heisenberg's uncertainty relation allows this if the energy of the graviton can be made sufficiently small. The fact that the massless graviton can have as small a frequency as is necessary to satisfy this requirement makes it possible. **For the graviton emitting mass not to violate Heisenberg's uncertainty principle it must however "know" beforehand what energy and frequency is required to connect with its counterpart 15 billion years thence.** We can therefore regard this connection as non-causal and non-local, a direct consequence of the **oneness of the wave-function describing the whole universe.**

One may accept this easier if one considers that space and time are for this virtual graviton not the mechanical space time of measurable reality. Thus, the space-time which the gravitons create and are, is analogous to the creative space-time of non-certain thinking. It seems that we must assume an undivided Oneness, or creative and creating non-spacial, connection, or **non-locality**, of the whole universe in what I call creative *space-time-matter-thinking*. All forces of the universe are established according to this same principle. This is implicit in the whole quantum physical formalism. (Bell's theorem.)

Thus we see that space and time with their properties of homogeneity and isotropy emerge from a deeper actuality, that of quantum fields, whose actions imply a Oneness-Nothingness. Space-time is spanned by the continuous unobservable background of the fields of and between elementary particles and energy forms. In some sense this is the ether concept again. Matter, an observable quantity, is just a local excitation of this background, like the whole universe.

This speculation is of course little consolation for those who feel that the prime distinguishing quality of the human life form is that we can know with certainty and act according to such knowledge. If one does not start from the unprovable premise that "what is not certain cannot be true," **it is much easier to live with the fact that our thinking processes and the quantum field processes are fundamentally free and creative and intelligent and therefore unknowable by the tiny subset of thinking which lends itself to certainty.**

The whole area of unification between Einstein's general theory of relativity (including gravitation) and quantum physics is not resolved. The measurements required go far beyond scientific possibilities of today and are made even more difficult because of the Heisenberg uncertainty relations. It may well be that a direct verification of the existence of gravitons may elude scientific experimentation in principle, which would force physicists to rethink the premises of physics, of certainty, of measurement and of the possible meaning of the Schrödinger equation.

The 'empty space' must **be, consist of**, ultimately one quantum wave, on top of which the other quantum waves play, though also remaining one with their "mother wave." **They are not real because they cannot be measured, but they are actual because they create the possibility of an observable universe with space and time as conditions for the possibility of the idea and form of causality.**

The very **foundation** for certainty, measurement in time and space based on causal relationships, becomes uncertain in the so-called objective world, just like this foundation is uncertain in our own thinking. **Creative thinking and creative space-time are equally uncertain. I try to show that this very uncertainty is required for the consistent development of the ideas of a free and creative mind and a free and creative material basis for that mind, and by extension, for the whole universe, for *What Is*.**

***What Is*, is more than the observable universe, just like the mind is more than the observable brain activities.** I trust that the creative intelligence of thinking and the creative intelligence of *What Is*, are ultimately One. They are not identical. A fundamental and absolute **separation is not thinkable**; in the same way, any absolute '*connection*' is prohibited by the Heisenberg uncertainty relation. We have the strange consequence, another statement of sub-certainty and complementarity, that neither absolute separation nor absolute closeness of separate objects are possibilities in classical thinking of and in a reality. This sounds almost identical to the title of the Yab-Yum statue of Vajrasattva (see page 485), the **oneness of sameness and difference.**

One might say that quantized graviton fields are the conditions for the possibility of actuality just as quantized thought waves are conditions for the realities which human consciousness can experience through that actuality. Quantized gravitons and quantized thought waves are unfolded by an even deeper underlying Oneness-Nothingness. **We may speculate that the universe itself with its unobservable space-time-matter-thought is a quantum of the Nothingness-Oneness.**

This might provide us with a minimum structure for time according to Heisenberg's uncertainty relation. As mentioned on page 455, the smallest distance potentially in existence is about 10^{-35} meters, based on black hole assumptions and Heisenberg uncertainty laws. (Black hole assumption: $rc^4 \leq EG$, r is the radius, E the energy of the black hole, G is the universal gravitational constant, c is the speed of light.) This equation can also be written as:

$mc^2 - \frac{mMG}{r} = 0$ A situation like this corresponds to the end-stage of a gravitational collapse

as it may exist inside of a collapsing black hole. According to the general theory of gravity, no causal effects are possible any more (Landau Lifshitz, *Theoretical Physics, Classical Field Theory*).

It requires that all other forces (electromagnetic forces, strong or color forces, weak forces) except gravity have been eliminated. We are beyond the Schwarzschild radius, and according to the general theory of relativity the only motion is a radial contraction or expansion. Rotations are not possible. We combine the black hole assumption above with Heisenberg's uncertainty relation under ultra-relativistic conditions.

$$\Delta x \Delta p \geq \frac{\hbar}{2}; E = pc; \Delta x \rightarrow r; \Delta p \rightarrow p = \frac{E}{c}$$

From this follows that the smallest existing, but not measurable or observable distance is $r \geq \sqrt{\frac{\hbar G}{2c^3}} = 10^{-44} \text{ m}$. The smallest time-span would be the time it takes light to cross the smallest possible distance, namely:

$$\frac{r}{c} = \sqrt{\frac{\hbar G}{2c^5}} = 3.8 \times 10^{-44} \text{ seconds}.$$

At the densities of this fundamental black hole (about 10^{96} kg/m^3) it only takes a volume of an atomic nucleus to contain all the energy of the universe.

If we look at the **universe itself as a quantum**, the *questions as to where it is and what its motion is become as impossible to answer as the question where a photon is when it jumps from one energy level of the atom to another, or where a thought is before it has been presented to our consciousness.*

Physicists think that during the first moment of time between 10^{-44} and 10^{-43} seconds there was only one 'unified force' ruling the rapidly expanding pulse which then was the universe. This could have been something like the fundamental black hole above. This 'pulse' did not consist of any known particle or form of matter.

To sum up this discussion, one might say that the whole of physical theory shows three characteristics:

- It is **one** theory for all situations of movements, and all these movements are ultimately inseparable, described by one single unobservable wave function. **This Oneness is uncertain.**

- It is put into a form which allows for **complementarity between causality and non-causality**. The intermediary state is provided by quantum physics, which is a causal description in which not all quantities can be measured with certainty³⁷³. Its form is extremely abstract (from all objects in a tangible reality), and approaches the pure thinking which is also possible in philosophy, and spirituality. Its Nothingness (non-deterministic, non-causal) is mysticism for the intellect, but yet, it is objective in its measurable results. There are objectively accurate and proper descriptions of reality, but non-observable, non-causal, no-thing aspects are unavoidable. This No-thingness is also governed by uncertainty.

- It is not a self enclosed theory, but one which uses ideas and notions from metaphysical sub-certain thinking open to change. **It keeps questioning its own premises: the ideas of time,**

³⁷³) See section 2.3.1.4 "Certainty and Causality" on page 109.

space, causality, and locality. But it also can temporarily disregard the sub-certain notions and conduct its daily business using terminologies of causal and deterministic concepts. Thus, its characterization as a **Betweenness** remains meaningful.

One can see that physics has the same characteristics as human thinking with its movements of certainty, sub-certainty, and uncertainty.

Immanuel Kant introduced the idea and concept of the '*thing in itself*' ('*Ding an sich*'), and he probably meant something similar to what is said in this discussion. The thing in itself is non-mechanical and gives rise to the things which appear as phenomena. The essence of the thing in itself cannot be determined with certainty and consists of non-certain generative and creative movements.

"It is here that the common but deceptive presupposition of the absolute reality of appearances shows its negative influence of confusing the mind. Because, if appearances are things in themselves, we cannot save freedom."

Kant³⁷⁴ uses the term intelligible to describe the generative and creative levels which I have subdivided, because in quantum physics we may have found a scientific theory which is a link between uncertain being (actuality) and certain appearance (reality). Results on the *SAT2* levels become sub-certain, but we can still project them on *SAT1* levels where proper measurements can be made. On the creative level *SAT3*, however, **even numbers become ciphers**, which makes it impossible to arrive at certain or sub-certain positive results of and on that level. Thoughts of and on that level are possible, but these very thoughts must be seen by the mind as cipher and idea, intelligible visions so to speak. However, as any thought is also operating as *SAT1* and *SAT2*, one may easily (mis)understand a cipher or metaphor as a more or less literal concept with its possibility for certainty.

This is the issue:

Can the mind in its present form of consciousness see the uncertain and temporary limits of itself in a positive comprehension? Can it withstand the deceiving power of its own certain reality, and therefore struggle towards its non-real but essential freedom? This is in so many words the challenge of the Buddha or of Kant.

From the above quote we can see that Kant clearly recognized the illusion hidden behind the presupposition of absolute reality of appearances. This is the maya of the real world. If appearances were absolute then **mechanical causality rather than freedom** would govern human thinking.

One of the titles of the Buddha is "Tathagata," which is usually being translated as "one who has become 'suchness.'" A better translation in the context of our discussion would be: One who has become *What Is*. 'Tathata' is the Buddhist term for the elusive essence of all things in a reality. This is as close as one may get to Kant's "*Thing in itself*." **Being, SAT, essence** point to the creative energy in and beneath all reality, the creative, intelligent *eros* of *What Is*, of *No-Thing-Ness*, of the *Buddha-mind*. I think that Kant is right: Without that, freedom has no meaning.³⁷⁵

³⁷⁴) Immanuel Kant; KV B564.

³⁷⁵) Please refer to subsection 4.1.2 "*Being and Thinking*" page 249.

Niels Bohr wrote on this issue in a very convincing form as well:³⁷⁶

"Hoping that I do not expose myself to the misunderstanding that it is my intention to introduce a mysticism which is incompatible with the spirit of natural science, I may perhaps in this connection remind you of the peculiar parallelism between the renewed discussion of the validity of the principle of causality and the discussion of a free will which has persisted from earliest times. Just as the freedom of the will is an experiential category of our psychic life, causality may be considered as a mode of perception by which we reduce our sense perceptions to order. At the same time, however, we are concerned in both cases with idealizations whose natural limitations are open to investigation and which depend upon one another in the sense that the feeling of volition and the demand for causality are equally indispensable elements in the relation between subject and object which forms the core of the problem of knowledge..."

Besides, the fact that consciousness, as we know it, is inseparably connected with life, ought to prepare us for finding that the very problem of the distinction between the living and the dead escapes comprehension in the ordinary sense of the word. That a physicist touches upon such questions may perhaps be excused on the ground that the new situation in physics has so forcibly reminded us of the old truth that we are both onlookers and actors in the great drama of existence."

6.4.6 EPILOGUE: MATTER AND THINKING

Mechanical matter is to being what things are to the whole of human consciousness. Ultimately, (generalized) thinking and being are one. As consciousness is learning and becoming through things, so is being learning and becoming through matter. Learning is a movement of matter and things, being and consciousness, as the manifold expressions ranging from mechanical repetition in mechanical time to creation and creative transformation in creative no-time or eternity.

Being is movement of one-nothingness, unfolding and enfolding, from creative and non-conscious to mechanical and increasingly conscious *SAT*, from the generalized *SAT* of mechanical unconscious matter to the self suspending creative non-conscious intelligence of the human mind. Being knows through the latter, which is part of itself, what it could be at that time, a time which it has also unfolded within the human mind. Being becomes in its own created reality of mind, matter, and things what it is in a dialectic movement between truth and reality.

We cannot think Nothingness or Oneness. We cannot effectively think the unthinkable, but in the very attempt of such thinking we do think ever so vaguely what we cannot adequately think, and we become aware of our knowing 'ignorance.' Thinking becomes a form of meditation in which our minds may open themselves up to the unthinkable truth of *What Is*. We may get a sense of the unthinkable immensity of which we are a created and creating part, created and limited, creating and free. This is thinking Betweenness, which is what we are.

In this dialectic of thinking we create the possibilities for ever new worlds and realities. We create things just as being creates the universe and matter out of itself, unknowable Nothingness-Oneness, *NOB*. In creation, being and the human mind are an ocean of oneness and nothingness, out of which matter and our consciousness surface. We are conscious in mechanical time but are non-consciously one with being of no-time, with all possibilities of the future and all realities of the past, both of which are not absolutely separate. These possibilities are no-thing in no-time but

³⁷⁶) See "*Physical Thought..*" PQP page 535.

become thing-like realities in time. Intelligent Nothingness, intelligent matter, and the mother Goddess are one.

MAYA, THE UNITY OF OPPOSITES, EMBODIES THE TRUTH THAT ONENESS AND NOTHINGNESS, SAMENESS AND DIFFERENCE, ARE ONE.

Figure 70 Vajra-Varahi, Buddha

