DOES THE UNIVERSE CONSIST OF ONLY MATTER, OR ALSO OF SPIRIT?

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1. Introduction

The ideas expounded here are not the common ones which cover the spirit. To avoid any misconceptions, I want to make immediately clear that I am not a spiritist, because I do not consider mediumship an adequate path of knowledge for modern human beings. Also, I try to preserve what is the most important contribution of modern science: conscious and clear thinking, observations without prejudices, precise description of phenomena and formulation of ideas through concepts directed to understanding and not to feelings. My scientific approach is a proper superset of the current materialistic scientific approach, that is, I admit all scientific *facts*, and also many scientific judgments, but I also admit other facts and judgments that are not covered by present materialistic science.

Section 2 characterizes what I understand under materialism and spiritualism, briefly covering the evolution of thinking under these points of views. Section 3 shows that current science is materialistic, and sections 4 and 5 expound evidence which confirm the spiritualist hypothesis, from the point of view of the universe as well as of each human being (that is, which may be observed personally by any person in him/herself). Section 6 shows my original theory answering a millenarian question: how is it possible that something non-physical may act upon something physical? Section 7 shows how one may expand the present scientific paradigm to investigate the non-physical world. Section 8 presents a discussion of the fact that every person should choose the spiritualist or materialist hypothesis and orient his/her life accordingly, and section 9 describes the consequences of choosing one or the other, touching traditional religious thinking. Section 10 shows an existing spiritualist view

of the world which I consider to be satisfactory, with a brief exposition of some of its characteristics. Section 11 contains an abstract of my working hypotheses and some brief conclusions. Section 12 contains bibliographical references.

Hereinafter I will use the simpler traditional masculine forms of pronouns (he, him, himself), but in fact I refer to both genders (s/he, her/him, her/himself).

This paper is a translation of the original in Portuguese, "Por que sou espiritualista".

This is a subtle subject. As I cover non-standard points of view, I invite readers to send me their reactions, comments and suggestions.

2. Materialism and spiritualism

There exist two mutually exclusive views of the world (*Weltanschauungen*) about the human being and the universe: the materialist and the spiritualist. I will use here the word "spiritualist", although in English it carries strong connotations with spiritism, because I want to express an opposition to "materialist". I characterize materialism as the view which considers that everything in the universe, and humans in particular, are purely physical systems, subject exclusively to the physical behavior of physical matter and energy.

The spiritualist point of view adopted here as a working hypothesis considers that, in living beings, particularly in humans, as well as in the whole universe, there exist processes which cannot be reduced to physical ones. I will call them generically as "non-physical" processes. I prefer to use this word instead of "spiritual" processes to avoid misconceptions connected to the word "spirit". I show in sections 4 and 5 that it is not difficult to admit the hypothesis of the existence of non-physical processes. For this, I expound some of the strong evidence that everyone may find in the universe, in living beings and inside oneself. This evidence gives confidence for admitting the spiritualist hypothesis. As we will see, I consider that non-physical phenomena may in certain cases influence physical ones. We will also see how it is possible to understand that this influence may exist.

It is obvious that physical matter and energy exist in the universe. On the other hand, non-physical phenomena are not apparent, because our physical senses and all fabricated instruments detect exclusively physical phenomena.

If we presently do not have a perception of the non-physical world, this clearly was not the case in antiquity. For example, in ancient India people gave more importance to the non-physical world, associating to it more reality than to the physical one, which was considered as *Maya*, an illusion. One may admit that the perception of super-sensible phenomena common in those times was clearer than the perception of physical phenomena, because sense organs were not yet so well developed as it gradually occurred until they reached the clarity which exists since at least the 15th century. Furthermore, thinking was not so developed as it occurred later, so what was perceived in the non-physical world was not transmitted through concepts, but through written images and parables. A tradition that a non-physical world existed behind the physical one lasted for millennia. All the ancient myths and writings, from the oldest epic that we have notice of, the legend of Gilgamesh, passing through the Baghavad Gita, various Books of the Dead, and the Bible, treat the non-physical world as a reality. But, gradually, the human being "fell" more and more into matter. With this descent of the human being, what was previously considered as a perceptible reality to non-physical organs of perception remained only as a vague intuition or tradition. From the 15th century on, the human being increasingly directed her/himself to his sensorial impressions. With this, the physical universe acquired

more and more importance, until a complete denial of the existence of a non-physical world was reached. The first written manifestation of this fact seems to be J.O. de la Métrie's book *L'Homme-machine*, which appeared in 1748, a demonstration that already at that time there was a doubt that humans could be something more than a purely physical system. This evolution was accompanied by an increasing conceptual clarity, initiated by the ancient Greek.

Notice that it is wrong to consider the human being a machine, because every machine has been designed and constructed by humans (eventually with the aid of other machines), and no human was designed and built (some may have eventually been well planned by their parents, but they were certainly not designed and built…). This is the reason why I use the expression that, in the materialistic point of view, a human is a "physical system", and not a "machine" as people are used to say nowadays. Lately, I have become quite radical: I think there is absolutely nothing in any living being that is purely mechanical and could be regarded as a machine. Take, for instance, a movement of our arm. One could say, in a first approach, that it behaves like a lever, some muscles contracting and some expanding. But, in fact, there is no lever with the complexity of our arm muscles and of the corresponding movement. Consider, for example, that the muscles are formed by a great number of fibers, which are formed by cells. The fibers interact, and the cells also interact. Thus, the final movement is a result of an enormously complex system. No lever has been designed with such complexity, and one may doubt if it will ever be possible to design and construct a mechanical system working exactly like our muscles. Moreover, why did the muscle fibers contract or expand? Suppose there are some electric signals producing their movement. But what was the origin of such signals? Suppose they were generated in the spinal cord or by the brain. Wonderful, but what gave origin to this generation? If we follow in every process of a living being such a sequence of causes and effects, one always gets to a point where it is necessary to say: "we don't know". But in every machine, we know precisely why some movement or action is taken, and the function of every part. Furthermore, it is possible to replace any machine part with a similar one. In a living being, this is not the case. If a cell is extracted from a body, it is not the original cell anymore – it does not function exactly as it did in its former place, because it depended on its environment and on the whole organism. If some part of a living organism is replaced, it will take some time until it gets adapted by the organism, and its functioning will never be the same as the original part. In fact, every living being is a whole; this whole is influenced by each of its parts, and each part influences the whole.

Obviously, a materialist will not agree with the expression I used above, that in ancient times there was "clearly" some perception of non-physical phenomena, because for such a person these phenomena simply don't exist. In section 9 I will show the consequences of this objection.

3. Materialistic science

The materialistic view of the world is the current one in modern science. The typical argument used by scientists is "There is no other possibility than all phenomena being purely physical." With this prejudice they simply limit scientific research. Since, for almost every scientist, this position is not subjected to discussion, I call it the "Central Dogma of Contemporary Science" (CDCC). For example, using the CDCC neurologists and cognition scientists adopt the principle that thinking is generated by the (physical) brain. They would enormously expand their research if they would make the hypothesis that mental activities are not physical, and some phenomena that occur in the brain and in neurons are a consequence of these activities, and not their origin. I will come back to mental activities in section 5.

Another example of the CDCC is the Neo-Darwinist evolution theory. It tries to show that evolution in living beings is due exclusively to physical causes: genetic mutations followed by natural selection. Nevertheless, the infinite wisdom that is found in living beings and their interaction suggest some planning and some objective, which may have influenced evolution. It is not difficult to expand Darwinist evolution to encompass non-physical planning and objectives, that is, an "intelligent design" (see on my web site a letter I wrote to the editor of *Scientific American* on this subject): it suffices to suppose that not all mutations were random and not all natural selection was "natural", that is, some of them may have been directed according to some (local or general) plan. Please note that the "intelligent design" does not need to have been made in one or a couple of strokes by an abstract non-physical entity who many people call "God", as believed by religious creationists. It may have been commanded by non-physical elements present in each living being or connected to each species, following various trials and perfecting the model of each species and its interaction with other species. Notice that I am not arguing that there was no evolution; what I am proposing is that evolution was not totally casual. In section 11 I will mention a possible overall objective for evolution. Please note that I was cautious, using the expression "not totally casual"; this way I open the way to continue with the neo-Darwinist view in some cases.

In particular, a purely casual evolution, based exclusively on physical forces and conditions, eliminates completely any sense to the existence of living beings, of the human being and of the universe. If someone would like to admit the hypothesis of a sense to life, he cannot adopt Darwinian evolution as a hypothesis, and much less as truth, as it is commonly (and erroneously) taught at high school level and propagated in popular scientific literature. One should never forget that Darwinian evolution is a theory, and not a scientific fact – to begin with, it was not directly observed. By the way, Alfred Russel Wallace, the famous New-Zealander biologist who discovered the theory of natural selection in parallel and independently of Darwin, used to say that laws that applied to animals should not be simply transposed to humans. This was due to the fact that he had a spiritualist (in fact, spiritist) view of the world, contrary to Darwin, who was a materialist. This is clear in the way Wallace ends his book on Darwinism: "Thus we find that Darwinism, even when it is taken to its last logical consequences, does not contradict the belief in a spiritual side of human being's nature, but in fact offers it decisive support. Darwinism shows us how the human body has developed from lower forms according to the law of natural selection. But it also teaches us that we possess intellectual and moral capacities, which could not have developed in these ways, but must have had another origin. For this origin we can only find a cause in the invisible spiritual world." [HEM, p. 102, my translation.] In fact, I think Wallace is generally ignored, mainly in high school biology (how many people in the world who know that Darwin discovered the theory of natural selection also know that Wallace did it too?), because of the general prejudice against any spiritualist view of the world.

Wallace's doubts about how to explain the evolution of the human being's inner capacities in Darwinist terms is part of present evolution theory. For instance, anthropologist Ian Tattersall expresses it this way: "[…] we cannot attribute the advent of modern cognitive capacities simply to the culmination of a slow trend in brain improvement over time. Something happened other than a final physical buffing-up of the cognitive mechanism." [TAT, p. 44.] In particular, the appearance of language is a big evolutionary mystery: "[…] we have to conclude that the appearance of language and its anatomical correlates was not driven by natural selection, however beneficial these innovations may appear in hindsight to have been." [p. 49.]

Many scientists call themselves "skeptic". According to *American Heritage*, skeptic is "One who instinctively or habitually doubts, questions, or disagrees with assertions

or generally accepted conclusions", that is, someone who doubts everything. An interesting question is this: does such a person doubt his own existence? In this chase, such a person should at least be a schizoid… Anyhow, this is not what one can observe: in general, those that call themselves "skeptic" doubt anything that has to do with religion and have a deep belief in anything that has a scientific character. It is obvious that one should not doubt any truly scientific fact; but a completely different attitude is having a belief in scientific judgments, that is, those based on scientific facts and theories. For instance, measurements of radioactive decay are scientific facts. Using them to say that the Earth is 5 billion years old is a scientific judgment. In fact, this Earth age is obtained supposing that the decay has always been the same and by making an extremely coarse extrapolation (if one considers 50 years of very precise radioactive decay measurements, one would be making a fantastic extrapolation of $1:10^8$). In my opinion, in this case one should say that "the extrapolation of radioactive decay measurements gives a result of 5 billion years", instead of calling it the "age of the Earth".

Besides beliefs in scientific judgments, another typical attitude of those that call themselves "skeptic" is having prejudices and refusing to seriously study and investigate anything that has to do with non-physical processes. Thus, "skeptics" are in general simply preconceived materialists. One typical example is Michael Shermer, who formerly maintained the "Skeptic" section in *Scientific American* (see www.skeptic.com). He is clearly a believer in science and the exclusivity of natural phenomena, having prejudice against any idea of anything non-physical, which, in general, he ridicules.

I consider myself a skeptic, in the sense of not having prejudices, of not believing in anything. But I don't doubt everything: I don't doubt my existence, I don't doubt my working hypotheses until I get sound evidence that they are incorrect – and I am always ready to revise them, that is, I don't have any faith and follow no dogmas. In this sense, I perfectly understand the attitude of scientists who know only the apparent spiritualism of many religions and faiths. For instance, it is obvious that the biblical Genesis is an image, a parable, and not a description of reality. Thus, taking literally those images, for instance that the "days" of Creation were 24-hour days (clearly, they are not, because the Sun and Moon were "created" in the 4^{th} "day", cf. Gen. 1:14-19), or saying that the age of the Earth is about 6,000 years (the so-called Young Earth Creationism), can only produce opposition from scientists. Moreover, simply constantly speaking about God (whoever this entity is) does not make a person a spiritualist in the characterization I gave in section 2 to this view of the world; a much stronger indication is the way a person thinks and regards the world. I will return to this subject in section 9.

4. Universal evidence

4.1. The origin and limits of the universe

The outer evidence to the existence of non-physical processes, which I consider to be the most emphatic, is the origin of matter and energy in the universe. Clearly, their origin does not make physical sense. One of the scientific explanations given to this origin is mathematical, that is, it has nothing to do with physical consistency, with reality: a discontinuity in space-time. Another approach has been to suppose that the universe contracts and expands continuously; but from a physical point of view, how did this process start? Some cosmologists say that these questions do not make sense, so they are simply skipped.

The argument of the origin of matter and energy is so powerful that many scientists clearly speak about the "moment of creation". Nevertheless, practically all of them,

albeit admitting the influence of something non-physical in the "beginning" of the universe, and in order to stay inside materialism and the CDCC, assume that, after "creation", physical nature was left to act upon itself, that is, any non-physical influence ceased to exist. Curiously, they are spiritualists in the initial creation of matter and energy, and are materialists as far as the subsequent time is concerned…

In the same vein, the borders of the universe do not make sense. It does not help saying that our universe is like a tridimensional surface of a bubble, thus having no limits in the dimensions of that surface. But every bubble has a topological space inside and outside of itself. What could be in these spaces in relation to the physical universe? Even if these "outside" and "inside" would have four dimensions, they should have physical projections in three dimensions. I am aware of the theory of multiple universes, based upon a speculation of existing infinite universes. Nevertheless, this is a ghostly mathematical theory that I think is not worth being considered as having physical reality – anyway, in practice it is absolutely non-verifiable.

As I have mentioned a four-dimensional space, maybe it would be interesting to mention here an observation by Rudolf Steiner: if one would like to imagine the non-physical world, one should not think on higher dimensions, but on two. In fact, in a two-dimensional space there exists no physical matter because, say, its thickness would be null.

4.2 Other characteristics of the universe

To express results of experiments at atomic and astronomic levels, modern physics needs elements in its mathematical formulas which are absolutely incomprehensible from the point of view of knowledge based upon our sensorial experience. This is the case, for instance, of the relativity of space-time and certain quantum-mechanical phenomena. This may indicate that in the astronomic macrocosm or in the atomic microcosm matter does not behave in a "material" way as it may be understood from our sense-experience. This occurs, for instance, with quantum non-locality, in which, independently of distance, a particle transmits in instantaneous time its state to another particle, "entangled" to the former. If detected, the state of the second particle assumes the same state as the first one (see, for instance, [GRE, ch. 4]). Another example is the spin of particles, which is by no means a spinning movement as the name implies, because it has characteristics that cannot be associated with classical, macroscopic rotation of an object. In fact, quantum mechanical spin has no classical limit, that is, it cannot be associated with a known energy and be understood based upon our sense-experience.

Other examples are "dark energy", which produces the repulsion resulting in the supposed expansion of the universe, constituting ¾ of its contents [CON, p. 25] (but it does not affect "small distances" as those of our galaxy); "dark matter" which should constitute 85% of all matter in the universe [p. 27]; time, which is so much perceptible, mainly the "now", which does not occur in physics as it should be expected [GRE, p. 131].

In the case of atomic particles, the duality wave-particle also seems to me an indication that at this level one is not in a purely physical realm. Note that "wave" is a mechanical concept that was transported to a realm that perhaps is not mechanical anymore. This happened, for instance, in the conclusion that light is a wave, from interference experiments: a light beam passing through two thin, near slits, directed to a screen behind the slits. This produces an alternation of bright and dark zones, with certain simple mathematical properties which are used to calculate the "wave" length. From this experiment one should at most conclude that light, after *interacting*

with the slits and reaching the screen, produces a phenomenon to which one may associate a wave-like behavior. Saying something about the nature of light *before* the interaction with the slits and before hitting the screen is a speculation. Curiously, it was precise quantum mechanics that introduced the idea that experiments influence the behavior of particles, e.g. Heisenberg's uncertainty principle. In one of its versions, the more precisely one measures the speed of a particle, the less one can precisely measure its position, and vice versa. Note that this principle uses measurements made by instruments (speed and position), i.e. it says nothing about natural reality. Turning back to the slits, one should obviously consider that the slits and the screen alter the nature of light.

It's interesting to note that to observe any object, it is necessary to insert and/or extract energy from it. It turns out that the slightest quantum of energy that is inserted into and/or extracted from a subatomic particle changes its state. Therefore, with its current paradigm, physics will never know what a subatomic particle is in its natural state. Since atoms are made up of such particles, physics will never know what an atom is in its natural state. What particle accelerators do is to change the natural state of particles. Their measurements depend on the instruments that measure the particles; they don't measure anything outside of what they are capable of measuring – apart from the fact that at the atomic level they decisively alter what they are measuring. The conclusion is that physics, with its current paradigm, will never know what matter is at its atomic level.

In quantum mechanics, the wave is a probability wave. But this is a purely mathematical concept; how is it possible that such a concept generates physical phenomena? It would be the same as simulating a fire on paper or in a computer and running away with the fear of getting burned… Furthermore, this probability wave transcends our capacity for imagining and understanding the reality that it should express. For instance, how does a probability wave propagate itself? This also seems to me an indication that we are dealing with something that transcends the physical level of our senses, the foundation of all materialism. But the strongest indication of this fact at the atomic level is that one cannot understand what atomic particles are. Contrary to popular belief, induced by physics education, the electron is not a tiny little ball, and it does not revolve around the nucleus (Rutherford's 1911 and Bohr's 1913 models). If it did it would irradiate electromagnetic energy and would fall into the nucleus in a spiral movement (e.g. see https://en.wikipedia.org/wiki/Rutherford_model).

All these facts, and much more, seem to me indications that atomic microcosmic or astronomical macrocosmic matter transcends the physical realm. Maybe at those levels matter ceases to have a purely physical constitution – thence it having to be described through incomprehensible, complex mathematical models. For example, String Theory, a recent approach used to model the behavior of particles, is a model with 11 dimensions, that is, totally incomprehensible. Maybe matter is a "condensation" of something non-physical. That is, non-physical phenomena, of the same nature as our thinking, would be the origin of everything. That's why purely mathematical models express their experimental behavior. This leads to a monism of thought, instead of a monism of matter, as established by materialism. Rudolf Steiner was a precursor of this idea [STE].

4.3 Forms of living beings

To begin with, "life" is a big scientific mystery. But there are other, simpler facts that cannot be explained in scientific terms. For instance, the extraordinary symmetry shown by some species, from plants to humans, is a big question. Look at some kinds of butterflies with exquisite designs in their wings. How can the symmetry of these

beautiful figures be explained? One obvious explanation is that the form is in the genes. But growth in living beings is not precise; there are always some apparently random variations, so one would expect that the symmetry would not be so precise. It is also impossible to imagine one part of a wing somehow physically communicating to the corresponding part in the other wing how much it has grown or what color it has attained, so that the latter follows the former, keeping the symmetry; click here to a picture, taken by myself at a Brazilian beach, of a beautiful butterfly showing this symmetry. The same happens with our ears, which do not stop growing during one's whole life but keep quite a good symmetry. If the ears of two different people are compared, their difference is striking; but the differences between both ears of one person are in general very small. The same applies to hands, which grow up to a certain age, keeping their high symmetry. There are plants where the tip of the branches or leaves form a characteristic curve which we may recognize with our thinking. Click here to open a new window with a picture of a vase with a Swiss-cheese plant/Split-leaf philodendron/Ceriman, *Monstera deliciosa,* showing a clear curve made by the borders of the leaf parts; click here to open a new window with a picture of a palm tree in the Northeast of Brazil clearly showing the curves followed by the tips of the large branches, with a tendency of forming a sphere. Observe the conic shapes of some species of pine trees. The tips of the stems and of leaves of some species of fern, so common in my country, form typical, elongated arrow-like curves.

In all the examples of plants cited above, how does a branch, or the tip of a leaf, or a part of a leaf tell the corresponding other branches, tips or parts how much it has grown, so that the overall shape is produced or kept? Apparently, the forms of living beings follow a certain *mental model*. But mental models are not physical, they are pure thoughts. I explain the shapes of living beings by the following reasoning: a non-physical archetype model, of the same nature of our thinking, controls the growth and regeneration of tissues and organs. Each living being and each species have such a model associated to it. These models should not be confused with usual designs, for instance in civil, mechanical or electrical/electronic engineering. The latter are static models. It is necessary to imagine the model that regulates the growing of a living being as being a dynamic model. For instance, take a yellow mimosa tree (Queensland silver wattle, *Acacia podalyriifolia*), very popular in Brazil, which produces wonderful bunches of small yellow flowers. The first very small leaves that grow in a new yellow mimosa have the shape of the leaves of an acacia tree, and not like the candle flame shape and thickness of later, typical yellow mimosa leaves (here in Brazil we have a wild mimosa, with acacia-type leaves and less flowers). So, there are models followed by the first leaves, and others for latter leaves. If one considers the various stages of growth of any part of a living being, there are apparently an infinite number of different models which are followed in precise sequences. One should never extrapolate our physical, sense experiences, to the non-physical world. We need to develop a new kind of dynamic, living thinking in order to grasp the essence of the non-physical world. Observe in the picture linked to the previous paragraph how the leaves of Swiss-cheese plants apparently follow specific models coordinating the growing of all the endings of their parts, forming the characteristic curve. With our thinking, we immediately recognize this typical form; in fact, with our thinking we complete the broken curve formed by the endings of the leaf parts; this curve is part of the essence of the models followed by the plant.

Obviously, the non-physical model interacts with the physical structure of a living being, for instance its DNA; changing the latter, there may appear a change in the form of the plant. The environment also plays a role in tissue regeneration and growth. In section 6 I will expound my theory on how an archetype, non-physical model may regulate physical growth.

5. Personal evidences

It is interesting to observe that thinking, feeling (sensations and emotions) and willing (for example, having a will impulse) are inner, strictly individual phenomena "hidden" to other people or instruments. For example, it is impossible to prove to another person that one is having some of these specific inner activities (e.g., that one is thinking about something or feeling something). In particular, sensations and feelings are purely subjective – every person has his own, as we shall see in more detail in section 5.2. Nevertheless, those inner activities are totally "real" for anyone; for instance, nobody doubts that he is thinking of a certain object or fact, or is feeling joy, when they occur. This shows that another scientific paradigm should be adopted, otherwise the human being will never be understood in its entirety. One of the bases of the present paradigm is reproducibility of experiments, which humans don't have (the reader will not be exactly the same after having read this paper!), publicly done (this puts our mental experiences out of the range of science, as far as their meaning to ourselves is concerned), using the regrettable Baconian reductionism – which is responsible for a great part of our present destruction of nature. Furthermore, to be as objective as possible, concepts have to be expressed mathematically (every knowledgeable person should be able to follow mathematical reasoning), and allow for the numerical forecasting of experiment results, a method that goes back to Galileo and Descartes. Lord Kelvin (the introducer of the Kelvin temperature scale) wrote that what cannot be expressed mathematically is not an object of science. With this, qualitative aspects were totally eliminated; but these aspects are part of our day-to-day life!

Let's examine our three inner activities thinking, feeling and willing and draw certain conclusions supporting the idea that we are not purely physical systems. The reader should now turn her/his attention to examining her/himself in order to follow my arguments.

5.1 Thinking

Let's examine a fundamental characteristic of thinking, which will be essential for the sequel. For this, I will suggest two mental exercises I developed, and which may be done by anyone.

Take two objects apparently equal, as for instance two light bulbs of the same brand and model. Put them symmetrically (e.g. with the sockets facing each other) on a homogeneous surface (e.g. a white sheet of paper), preferably without producing shadows, such that they stay approximately in a horizontal position. Be careful that this symmetry be as perfect as possible, for instance by hiding inscriptions printed on the bulb surfaces (because if the printed inscriptions are visible, only one of them would be immediately legible). Observe the two bulbs attentively. Then, close your eyes, and mentally choose one of them to remember, concentrating your thinking at least for some moments on this mental representation of the chosen bulb in its particular position, without thinking on any other image or thought. Observe carefully this inner process of deciding what bulb to remember. If you feel that there is a tendency to remember one of the bulbs (for instance, because you recently saw a bulb in that position), observe that it is possible to direct your thoughts to remember the image of the other one. Instead of electric bulbs, you may use two equal pens, or any other pair of apparently identical objects.

In the second exercise, assume a sitting comfortable position, in some quiet, not too bright place. Close your eyes. Produce an inner calm, that is, try to exclude thoughts and feelings that eventually keep coming into your consciousness, such as worries, anxieties, images, etc. One way of producing inner calm is concentrating for some

moments in one's breathing, without thinking in anything else. This state of inner calm is a very special, easily recognizable sensation. Then, imagine a display, such as one of those with a number used in counter queues, where the digits are displayed in a bright red color. Imagine that the number 100 is being displayed, and innerly "say" "one hundred". Then, imagine the number 99 being displayed and innerly "say" "ninety-nine", and successively with decreasing numbers. *Observe* your thinking process and pay attention to what number you can reach before another image or inner "sound" appears in your mind. Observe that, at some point, in the middle of the decreasing counting, your thought will probably be deviated due to some worry or some involuntary mental association. For example, reaching the street number of your home, you may imagine the plate at its entrance wall or door, then the front of your home, then your family, etc. But the important point is to observe that it is possible to perform the exercise for some numbers. By the way, this exercise serves for testing the capacity of mental concentration. With some training, that is, repeating this exercise, this concentration normally increases, and one begins to reach smaller numbers, without losing concentration. The idea behind using a decreasing sequence is that an increasing one is more familiar, and requires less concentration, making concentration more difficult.

Any person who performs one or both exercises may observe that nothing forces him/her to choose a particular bulb or to stop (at least initially) imagining the display with the numbers. With this, that person would have made the *observation* that, at least for some moments, his/her thinking is *free*, both for choosing one of the bulbs or for continuing to imagine only the display,

One could imagine that this is a *sensation* of freedom in thinking. But in fact, it doesn't deal with a subjective sensation, but with an inner, objective observation of one's own thinking. Notice that I used many times the word "observe" when I described the exercises. It is essential that it be recognized that there may be some objectivity in thinking. For example, a mentally healthy person has an absolute certainty that he is thinking. By the way, of all our inner activities one can only have certainty regarding thinking. According to Rudolf Steiner, this is due to the fact that for thinking there is no need for any other activity than thinking [STE, p. 64]. Moreover, thinking is the only activity where the object is the same as the action or, as he put it, "The observed object is qualitatively the same as the activity directed to it." [p. 66.] In fact, it is possible to think about thinking – for example, when during the two exercises described before one examines what goes on with one's own thinking. With all other human activities, this does not happen. We digest food, and not digestion itself; we walk with our legs, and not with the act of walking; we feel some pain, or joy, due to some cause, and not due to the feeling itself; we sense the sourness of a lemon, and not the sensation itself.

According to Steiner, Descartes formulated his *Cogito, ergo sum* due to the independence of thinking in relation to all other activities, thus providing an independent point of support for our consciousness [STE, p. 65]. Also, thinking is the most controllable inner activity (see section 5.2).

The objectivity of thinking is very clear in mathematics. For instance, the correct concept of a perfect circle is the same for everyone who knows it – but nobody has ever seen such a figure, that is, it is purely mental. So, there are objective mental, or rather, thinking processes. But this objectivity exists also in cognition processes in general. Let me invite the reader to answer right now the following question: what is the object that you can visually perceive at the entrance of your room? Please don't take your eyes from this and the following line. I'll leave some blank lines, so you don't automatically read what I am going to say, thus avoiding my influencing your answer.

Asking this question to the audience in many lectures, the answer was invariably "a door". Asking the people if anyone doubted that he was visually perceiving a door, nobody manifests her/himself. Well, this shows that there is total objectivity in this experiment. Why this objectivity, if everyone has a different visual perception, with somewhat different colors, with different angles of sight? This happens because in reality there was not just a visual perception. The visual perception involves only light impulses, nothing else! The answer was wrong. Nobody visually perceives a "door", simply because "door" is a concept, and concepts are not physical objects perceptible with our physical eyes. What are perceived are light impulses. After this perception, a mental representation of the object was innerly made, and then thinking produced a bridge between this mental representation to the concept "door". Notice how I formulated the question: I have carefully chosen the wording "visually perceiving" and not "seeing". I had to do it because, unconsciously, people consider "seeing" as involving the concept – and I wanted to clearly isolate the perception from the concept reached by our thinking. In fact, without being able to associate visual perceptions to concepts, we *see nothing*! I recommend reading the extraordinary book on the history and nature of light by quantum physicist Arthur Zajonc, where he shows in detail this extraordinary aspect (which in general goes unnoticed) of our visual processes [ZAJ, pp. 5, 183].

As in the case of mathematical concepts, I will formulate the hypothesis that the concept "door", and all other concepts, are non-physical entities, existing in the Platonic world of ideas. Some scientists admit the existence of such a world, for instance the famous mathematical-physicist Roger Penrose [PEN, pp. 97, 428]; his starting point are mathematical entities. In a bilingual later paper I made a clear distinction between concepts and ideas. Briefly, concepts are symbolic (eventually words) expressing ideas. There I show that ideas cannot be stored in the brain – or in any machine. They are in the mentioned Platonic world of ideas.

Our thinking can reach this Platonic world – because both are of the same nature – and has the capacity of observing it. Standard cognition scientists will say that this is nonsense, because the concept "door" is stored in our brain. But they cannot turn this speculation into a scientific fact – they are not even able to show where and how our brain stores the number 2 and how it uses it! Imagine then the quantity for 2, an abstraction of all representations of that number; this is a pure concept, without representation. How is it possible that such a pure concept may be somewhere and somehow physically stored? Obviously, those scientists will employ a common argument when faced with something they don't know: they will say that we don't know these brain processes today, but tomorrow they will be known… Anyhow, I have presently the right of formulating such a hypothesis, because it does not contradict any known scientific fact. It contradicts, for sure, judgments made by followers of the CDCC (see section 3 above), that is, practically every scientist.

It is important to put in its correct place the present experiments with the brain: what is known today about mental processes (certain types of thoughts, memories, emotions, perceptions, etc.) is that, depending on the types of process, certain areas of the brain are more active than others. This is detected by images produced by magnetic resonance, PET scanning, etc. But from them, at most one should

scientifically conclude that those areas *participate* in the mental processes; one should never declare, unless as a speculation, that those processes *originated* in those areas. A typical example of an undue statement along this line is the speculation on the origin of certain mental processes that disappear or change when there are lesions in the brain. This is the case of author António Damásio, whose book *Descartes Error* [DAM] starts with the well-known case of Phyneas Gage, who was injured in his head in 1848 by an iron rod during the construction of a railroad. Part of his brain was torn away and with this there was a change in his social behavior. Damásio immediately concludes that this behavior was generated in the affected part, and from these and other similar experiments he concludes – in a typical application of the CDCC – that the mind is identical with the physical brain. This is his starting point to say that Descartes was wrong, because the latter considered mind (the soul) and brain as separate entities. Damásio should instead have scientifically concluded that the injured part of the brain was *involved* in the social behavior, and that the brain somehow participates in that behavior. If a part of the brain is injured, certain mental capacities are lost. One could conjecture that what is lost is consciousness of the corresponding processes, and thus they cannot be controlled anymore. This leads to the following.

If the brain is not necessary for originating those inner activities, why is it necessary? Steiner gives an interesting answer: the physical brain, or the neurological system, is necessary because it works as a mirror, reflecting mental processes to consciousness. If a person looks at her/himself in a mirror, s/he becomes visually conscious of her/his face as it is at that moment. It is impossible to have this experience without something which reflects the face. For instance, s/he could watch her/himself in the mirror, and make some grimace and follow this process, controlling the face gestures. Breaking the mirror, s/he will not have the instantaneous consciousness of the face anymore and will have no idea if s/he is making the grimace with the desired effect. Nowadays, instead of a mirror s/he could film her/his face with a web cam and immediately project his image on a computer screen, but then the whole system works as a mirror; if the system stops working, a similar situation to the broken mirror will occur. Thus, when we think, the brain permits that we have consciousness of what we are thinking; this way, we may control our thoughts. Note that, due to an ancient intuitive knowledge of these processes, the expression "to reflect" is a synonym of "to think". This may indicate that there was a notion of what thinking really means, as indicated here.

Thus, the physical body is an essential part of normal mental processes and should by no means be despised.

We have still to deal with the problem of how a non-physical process may influence a physical one. I will deal with this question in section 6.

Let us now turn to one's inner observation of being able to freely determine the next thought – that is, without being forced by outer or inner impulses, by feelings, etc. This shows that there are inner processes that cannot be materially explained. From matter no freedom, that is, self-determination, can arise. Physical characteristics impose a certain behavior for matter and for energy. We don't have the freedom to make our arms perform any movement whatsoever, in all directions, but we have the freedom to decide what we want to think. Our arms are dependent on our physical constitution, our thoughts are not (only our being conscious of what we think is dependent on our physical brain, as expounded above). We also don't have freedom in our perceptions, which are determined by the perceived objects and our sense organs, and we don't have freedom to have some emotion. For instance, either we like or dislike something; we cannot decide to start liking something we dislike (maybe with time such a feeling may change, but this cannot be done in a short period of time). Neither is our will free: if we are hungry, we feel the impulse to eat;

we may refrain of doing so, but the impulse will continue to exist; we simply cannot eliminate it (we may eventually forget it temporarily if we distract ourselves from something other than food).

Freedom of thinking shows that there is something non-physical connected to this process. In some sense, Descartes was in fact wrong. The correct formulation should be *cogito, ergo non sum*, that is, precisely because I am able to think, and I may have freedom in my thinking, I may reach the conclusion that something non-physical, that is, physically non-existent, goes on inside myself (this "inside" should be taken in a large sense, not just physically).

In the second exercise, I mentioned a state of inner calm. The possibility of producing this state also seems to me an indication that there are non-physical processes inside any human being. If we were totally dependent on our matter, the worries, and anxieties, so common and intense nowadays, "stored" in it, would not permit that we create a state of inner calm.

5.2 Feelings

Both animals and humans have sensations and feelings. Let's make their difference clear. When someone licks a lemon, the sensation of acidity and the typical lemon taste felt by that person are *sensations*. After having these sensations, the person experiments with it a *feeling* of pleasure or displeasure (there are people who just adore licking a lemon!). Liking or disliking, that is, sympathy and antipathy, are due to more basic feelings: attraction and repulsion, respectively.

Examining these two processes, it is possible to observe that sensations and feelings are absolutely individual and subjective. The sensations someone senses when licking a lemon only that person can sense. (I am trying not to use the same word "*to feel*" for feeling a sensation and for feeling a feeling or emotion; in German the verbs are totally distinct: *empfinden* and *fühlen*, respectively.) Also, the pleasure or displeasure that a person feels only this person can feel. He may somewhat describe through facial expressions, gestures, or words what he is sensing or feeling, and another person, through empathy, may recognize a similar sensation or feeling, but the latter won't be able to sense or feel the sensations and feelings the former is having. For instance, someone may describe to another person how happy he is, and this other person may, through empathy, rejoice with the former's happiness. Nonetheless, the joy that the other person feels is her own joy, and not the former's.

Compared with thinking, it is possible to see that there is a fundamental distinction between it and sensations and feelings, besides the possibility of controlling the former (cf. section 5.1): thinking can be universal, if it is focused upon a universal idea, such as a mathematical one. As I have already said in the last section, the correct idea of circle is the same for all people. Every sensorially and mentally healthy person will recognize a door at the entrance of a room. Thus, thinking has a character of objectivity. On the other hand, sensations and feelings are absolutely subjective and individual. With thinking, one may connect oneself with the universe, one belongs to it. When feeling, one has the experience of one's own individuality. It is due to sensations and feelings that the world is not an indifferent one to any person; the world would be totally indifferent if that person were a purely cognitive being, as has been noted by Steiner [STE, p. 126].

Here comes an important point: matter has no individuality, in the sense of having feelings, so matter itself cannot have them. A living being must have a nervous system to be able to have sensations and feelings. But the nervous system is made out of matter. It is its special functioning – in my working hypothesis, as a

consequence of a non-physical action – mirroring sensations and feelings to consciousness, in a way analogous to that described for thinking, that we have consciousness of our sensations of feelings.

The argument of non-individuality of matter may get clearer when considering machines. They are universal, and never individual, because all machines of the same brand and model have exactly the same design and were eventually constructed precisely in the same manner. (Let us recall that humans, animals and plants were not designed and built.) Two empty refrigerators of the same brand, model, and color, when having their thermostats set to, say, position 2, after some time they attain slightly different temperatures. But this is not sufficient for associating individuality to them. In my paper on Artificial Intelligence [SET], I used this argument to show that machines will never have feelings (recall what I wrote above: human feelings are individual and subjective). In particular, every digital machine (such as a computer) is a universal machine because, given enough storage capacity and time, anyone may simulate another one, as Alan Turing demonstrated in 1935 (see, for instance, http://en.wikipedia.org/wiki/Turing_machine).

If we follow the process of having a sensation, we may get another glimpse that something that transcends matter is involved. Let us take a visual process, like for instance looking at a red surface. Its light impulses reach the retina, through a relatively mechanical process. The retina transforms the light impulses into electrical impulses, which go through the optic nerves. Attention: one should not imagine that through the optic nerves passes a minute (inverted…) image of the viewed object – it has been verified that what goes through those nerves is a signal like noise. Moreover, the nerve bundles which come from the half closer to the median of each eye (that is, closer to the median line of the face) cross themselves and, together with the lateral halves of each eye, they build the optical tract of each side. Thus, the optical tract at the right side is constituted by lateral nervous fibers coming from the right eye and median fibers coming from the left eye. The signals coming from these bundles go to five different areas of the brain cortex, dedicated primarily in the right hemisphere to visual perception, movements in the visual space and optical memories; and perception of form and color in the left hemisphere [ROH, p. 17]. There is a problem here: how do these five different areas produce a unique, whole mental representation of a visually perceived object? How and where precisely this representation is formed, how is it turned upside up? Nobody knows. Moreover, as we have seen in section 5.1, it is a fact that without being able to associate something visually perceived with some concept, nothing is seen. According to what was seen, ideas are not physical, but there is some non-physical process going on even with a sensorial perception! But let us continue with the process of looking at a red surface. We make a mental representation of that surface, and then we have the inner sensation of red. How is this sensation produced? This is a great mystery to cognitive science! Just think deeply about that simple sensation: how can any material process in the brain (or wherever) be transformed into an inner reaction corresponding to a sensation? In section 6 of my paper on Artificial Intelligence [SET], where I discuss these matters, I inserted the following paragraph by A.I. scientist Haugeland:

"It is surprisingly difficult to gauge the bearing of these matters [the various kinds of feelings] on Artificial Intelligence. Even sensation, which ought somehow to be the easiest case, is deeply perplexing. There's no denying that machines can "sense" their surroundings, if all that means is discrimination – giving symbolic responses in different circumstances. Electric eyes, digital thermometers, touch sensors, etc. are all commonly used as input organs in everything from electronic toys to industrial robots. But it's hard to imagine that these systems actually feel anything when they react to impinging stimuli. Though the problem is general, the intuition is clearest in the case of pain: many fancy systems can detect internal damage or malfunction and even take corrective steps; but do they ever hurt? It seems incredible; yet what

exactly is missing? The more I think about this question, the less I'm persuaded I even know what it means (which is not to say I think it's meaningless)." [HAU, p. 235]

It is clear that Haugeland shows a deep perplexity when he tries to understand what it means having sensations. In fact, as I said, whenever one tries to follow in living beings a chain of causes and effects up to their ultimate origin, one gets to something unknown – particularly in humans.

The individuality of feeling, especially in humans, and the fact that matter has no individuality in the human sense, shows that there is something more than matter in humans.

The feeling that could be characterized as being the "most elevated" in humans is unselfishness, that is, altruistic love, a conscious feeling of loving something or someone without any trace of egotism, that is, without having any personal interest or even pleasure in the relationship, and in resulting acts. It may only be due to an act done in total freedom. If there is any sentimental pleasure or instinctive imposition, an act of love is not really altruistic. A counterexample is parental love, which is connected to heredity and feelings due to living together. Darwin speculated that altruism appeared in humanity because of (obviously…) evolutionary reasons: presumably, altruistic persons were more accepted by their communities and thus had a greater chance of surviving and leaving a greater progeny. Richard Dawkins, in his book *The Selfish Gene* [DAW] goes further: he says that genes are egotistical, doing whatever possible to perpetuate, and altruism is a consequence of this fact. One should become really flabbergasted: in both cases, altruism is a consequence of egotism! One should not use the argument that altruistic love is due to an instinct, eventually developed during evolution. Firstly, it should be necessary to show how this (and any other) instinct is engraved in our matter and how it acts upon the organism. Secondly, according to my characterization of altruistic love, if it is due to an instinct, then it is not altruistic. Animals cannot exercise altruism, because they lack thinking, self-consciousness, and freedom.

We have seen that thinking may be free, that is, it may occur independently of an internal or external imposition, as it would be the case if it depended on genetic, instinctive, or emotional influences. Starting with thoughts, with mental representations, one may imagine an altruistic action and realize it. Thus, to me altruistic love is one more piece of evidence that there is something non-physical in humans. I recognize that I am supposing the existence of altruistic love. A materialist cannot recognize this existence. From matter, altruism cannot arise.

5.3 Willing

The question of willing is even more complex than feeling. For instance, I am looking at a book in front of me. I decide, on an impulse of will, to grab it. But what makes my arm, and my hand execute the movement they performed? Some muscles were contracted, others were expanded or relaxed. But what made these muscles change their state? Maybe some electrical impulses but, as I mentioned in section 2, if one follows a chain of causes in a living being, one always gets to a point where it is not possible to continue.

Rudolf Steiner gave an interesting image associating states of consciousness to thinking, feeling, and willing. He said that thinking corresponds to our vigil state of consciousness, feeling to a state of dreaming, and will to a state of deep sleep. In fact, in thinking we may have full consciousness of what we are doing and may have full control over it (at least for some moments – and when we lose control, we may

become aware of this fact), the same degree of consciousness we have when we are awake. As for feelings, they are not so clear, they are vague, hazy, and many times illogical, as in general dreams are. They indicate something, but we cannot trust them. For instance, we may dislike some food, but recognize that many people like it, so we may conclude that our eventual judgment that the stuff is not healthy is certainly wrong. Thus, feelings of sympathy or antipathy should not be a base for our cognition, because they express much more something about ourselves – the individuality connected to the feelings – than about the object that gave origin to those feelings. This means that, if we feel antipathy towards someone, we should not take conclusions about her/his personality, because it is a consequence of a feeling that could radically change if we get to know that person better, finding in her/him many good qualities. As for willing, it comes from the deepest of our unconscious, as I pointed out in the last paragraph; in deep sleep, we are totally unconscious.

It is interesting to observe that we have a certain perception that we "think with our head" – a relatively recent concept in our history. On the other hand, the region of feelings is somewhat diffuse – sometimes it seems that they have something to do with our heart, as frustrations of love, or even with the throat (there is an expression in Portuguese "it produced a knot in the throat"). But we have no consciousness where our will comes from (the feeling of hunger is not the same as the impulse of eating something).

Now it is necessary to be more precise about thinking. It was expounded that we have the freedom to think, at least for some moments, about what we decide to think, in a process of mental concentration. It was pointed out that this was an indication that we have freedom in our thinking. In fact, thinking is in this case an instrument that we may use to experience freedom. But freedom was not in thinking itself but on the *decision* to concentrate it, eventually on certain words, e.g. a poem recited innerly, or on a certain image. Other examples were the cases of the two electrical bulbs or the display showing the decreasing numbers in section 5.1. So, this freedom is in our will. The wording "free will" shows precisely this fact!

5.4 Memory

Memory does not seem to be physical, in spite of many people having the impression that it is, mainly due to the strong computer metaphor. Firstly, apparently our memory seems to be infinite: every one of our experiences is "stored", almost all of them in the unconscious or in the subconscious. This fact was used by none less than famous mathematician Von Neumann to calculate in 1958 our "storage capacity", multiplying the apparent capacity of each "standard receptor" (he estimated 14-bit impressions per second) by the estimated number of nerve cells (10^{10}), and a life of 60 (!) years ($2x10^9$ seconds), giving a total of $2.8x10^{20}$ bits [NEU]. But we don't have the impression that our memory is limited, much less than it is discrete (see below).

Secondly, one may verify that, looking attentively at some object and then closing the eyes trying to remember its image, the visual perception or, better, the mental representation of the object being seen (a mystery for science), is much more precise and detailed than its memory. It is interesting to note that, if an object is a relatively simple geometrical one (like a cube, for example), and homogeneous in its color, it is possible to remember it with all sharpness, because in reality what is done is to mentally recompose it: in fact, its remembrance is its mental creation. If our memory would be a purely physical system, our recollection of our usual visual experiences should be as clear as the corresponding perception. To explain why it should be so, I am going to use a typical evolutionary reasoning: if our memory is a purely physical system, evolution should have certainly given preference to people that had the advantage of remembering with more precision the details of what they perceived.

With the flow of many generations, the memory of sensorial perceptions would have attained exactitude, as with computers! So, the fact that memory is not perfect is an indication that there is something more than physical processes involved in it. The same reasoning could be used for the duration of memory: there should be no reason for forgetting, but here there could be an objection: if physical, our memory would be finite, and it would not be possible to "store" every experience we have, so some memories must be "forgotten". But we don't have the inner experience that our memory is finite, as I said above.

Thirdly, we don't have the perception that our inner processes are discrete, or digital, as is the case with all modern computers. If computers were not discrete systems, there would be no determinism, this characteristic that gives them an essential part of their power: imagine the disaster if a computer, given on two occasions the same state of the machine, the same input and the same program being run, would produce different results for each processing! On the other hand, if the "storing" process would be analogical (that is, apparently continuous), as with old music records (vinyl disks) or cassette tapes, the computational metaphor could not be used. We would not have practically instantaneous access (as far as our inner perception of time is concerned) to any memory. Without a discrete structure, a linear search for something stored would have to be performed, at least partially, as for instance knowing the track of a disk but having to fully scan it to find what is being searched. This would take a long time due to the huge amount of stored data.

Finally, fourthly, the fact that memory has many levels, such as short-, medium- and long-range memories, and the fact that we may forget something, shows that it does not consist of a known physical system. For example, a computer does not "forget": either something is stored, or it is not. The access to a stored piece of data may be blocked, but this blocking may be changed with the execution of an appropriate program. That, is, the way to unblock some stored data is known. But when we forget something, in general there is no rule on how to remember it: many times, we may make a tremendous mental effort, but we simply cannot succeed in remembering what we need (aged persons like me know too well this phenomenon…). Suddenly, without any mental effort, the memory comes to consciousness. Another interesting characteristic is that very old people start remembering facts from their infancy, that were completely forgotten – on the other hand, they may have difficulties remembering simple recent day-to-day facts.

All these characteristics seem to me evidence that memory is not physical. Again, this does not contradict known scientific facts; as I have already said, science simply does not know how and where we "store" simple facts as the number 2! The normal manifestation of memory obviously depends on the physical brain; if the latter is not healthy anymore, certain memories may be impaired. But this physical dependence just shows that the brain takes part in the process of remembering, that is, making conscious of what has been "stored", and not that it really stores the memories. Recall what I spoke about having consciousness of thoughts and feelings: the physical brain may be necessary to reflect our memories to consciousness.

6. How can "something" non-physical act upon something physical?

This is a millenary question. It is obvious that only a physical force may produce a physical change. To cover this question, I am going to use two original arguments, one applied to our nervous processes, and the other to the forms of living beings. Both are based upon the notion of non-deterministic state transitions, inspired by the theory of formal automata, such as the Turing Machine.

Let us take the case of a neuron. According to the present knowledge, it is known that if certain electrical impulses reach a neuron through its input synapses (that is, connectors linked to other neurons through their output synapses), this neuron may or may not fire, that is, emit an electric signal to other neurons through the dendrites that constitute its output connections. Apparently, this firing is random for the same input impulses, that is, sometimes it happens, other times it doesn't. Let us associate two different states to this neuron: state A corresponding to the situation before receiving the input signals, and a different state B right after receiving those signals and firing, emitting a signal to the other neurons to which it is connected through its output synapses. If this neuron does not fire with a certain input, then it remains in state A after having received the input impulses. If it fires, then it changes to state B. We have then two different possible transitions with the same input impulses, from A to A (when there is no firing) or from A to B (when there is firing). Thus, these two transitions are, apparently *non-deterministic* – there is nothing that physically determines, for the same input, if one of them or the other is going to be taken. Now comes my crucial hypothesis: the *decision* of which transition to take among a set of non-deterministic transitions does not require energy. The transitions themselves may require energy, but not the choice of which one should be taken.

The second example deals with cells of living beings. Given a cell in a certain state A, three transitions may occur in the next "moment": 1. The cell stays in the same state; this is equivalent of a transition from state A to the same state A. 2. It may begin to subdivide in two cells (meiosis or mitosis), jumping to a state B where a subdivision starts to take place. 3. It starts to die (apoptosis), jumping to a state C corresponding to the actions of dying. According to present knowledge, it is not possible to examine a cell and foresee to which of the three states it is going to jump to, that is, from A to A, to B or to C. One may suppose that these are also non-deterministic transitions. Again, the *choice* of one of the possible transitions does not require energy.

As in both examples no energy is required to make a decision, it is there that the non-physical entity or model connected to the living being may interfere and influence the physical transmission of the brain signals or the development of the tissue where the cell is inserted.

In section 4.3 I described the forms of some living beings, dealing with shapes and symmetries. A possible explanation for them is that the genes regulate the growth, that is, the growth rate is controlled by the genes. In the case of symmetries, the rate is about the same for the corresponding parts. But in living beings there are no isolated physical forces which act, for instance, in crystals, controlling their geometrical growth forms – by the way, crystals grow by outer deposition of salts, but living beings grow through the inner process of cell subdivision. What the DNA or genes can at most do is producing an independent growth in each part of a living being. But without a permanent control of the whole form, the (apparent) inherent randomness of living beings, and also different influences of the environment (for instance, in the case of plants, different lighting, direction of winds, humidity, the presence of other plants, influence of animals like insects, etc.) would not permit the production and maintenance of the extraordinary forms and symmetries one may observe in nature.

I mentioned in section 4.3 the characteristic form and symmetry of the ears of each individual. But the DNA in each ear cell is the same as the DNA in a fingertip cell. How come one produces an ear and the other a finger? A biologist would say that the different forms depend on the different boundaries provided by cells of ears and fingers – but they cannot explain in detail the whole process involved. Furthermore, how does it begin? In the embryo, in the initial stages, up to the second week after conception, there is no cell differentiation. How and why this differentiation begins?

By the way, the development of the human embryo is such a marvel that it looks like a miracle – and from a strictly physical point of view it really is a miracle! If someone examines, for instance, how the heart is formed in its various stages, with incredible torsions, folding and unfolding [ROH, p. 186], that person will probably start believing in miracles… This is a big scientific mystery, which may lead us to the hypothesis that there exists a non-physical model regulating the whole process of growth. But attention – as already mentioned in section 4.3, one should not transpose to the non-physical realm our models based upon our sensorial perceptions. For instance, in different plant species, flower buds in general have approximately the same shape, acquiring their distinct shapes in their subsequent development. Also, in a plant many times leaves begin with round forms and only later assume the forms characteristic of their species, with indentations, round or elongated forms, etc. Early animal embryos of different species look all the same – like the human embryo (which may lead to a hypothesis that the non-physical human model is the starting point to the forms of animals). There is a story that the famous Haeckel once forgot to label bottles containing early embryos of different animals and later could not specify to which species everyone belonged.

Going back to DNA, it is interesting that the same DNA gene may give origin to different proteins. Maybe there is also a non-determinism here, where the non-physical model may influence the development and regeneration of a living organism. After all, proteins constitute the basic building blocks of living organisms, and not DNA. Some scientists associate the latter with a "program". But every program must be interpreted – rigorously speaking, a computer program, in its most basic code, called "machine language", is not executed by the machine, as it is generally assumed by laymen, but it is interpreted by the logical circuitry. Where is the DNA interpreter? On this subject, see my paper "Considerations about the DNA hype".

In some plants, the tips of leaves or branches produce a recognizable virtual curve typical of their species. This is the case, for instance, of the arrow-like form produced by many fern species, so common in my country, both with the tips of big and smaller branches (those that start at big branches and contain the small leaves). Or take the typical conic form of some conifers and the pinecones they produce – the wonderful Araucaria Brasiliensis tree even produces edible seeds in their beautiful cones, the seeds forming spiral figures. How does a branch or a seed tell the others to grow in the same rate so that the symmetries and virtual forms are not broken?

How do we recognize the species of plants and animals? Mainly by looking at their forms and using our thinking, which puts us in contact with the essence of the living being – the dynamic *model* typical of each species. But models are ideas, they are thoughts! Thus, it is possible to formulate the hypothesis that there is a non-physical model, in the Platonic world of ideas, of the same nature of our thinking (that's why our thinking is able to grasp it), which regulates the growth and regeneration of living beings. In my theory, this is precisely done by the model by influencing, in each instant, the choice of one of the three transitions described for cells, or other non-deterministic transitions.

One of the fundamental hypotheses of spiritualism is that there is an individual non-physical essence in each human being, of the same non-physical nature as other humans, but each one distinct from the others. This essence is responsible to what may be called "higher individuality", which transcends heredity and the influence of the environment (animals don't have it). Thus, besides the genes and the influence of the environment, recognized by materialistic science, spiritualism may recognize the existence of a third, non-physical essence. This essence may be mostly responsible for the unpredictability of every human.

Other theories have been advanced to explain forms and behavior of living beings. For instance, Rupert Shelldrake introduced his "Morphological field", which supposedly pervades all matter in the universe [SHE]. But for him, this is a *physical* field. Physicist Amit Goswami considers that quantum non-locality (the property that a subatomic particle instantaneously influences another, "entangled" particle, independent of the distance separating them – see section 4.2) may explain many characteristics of living beings [GOS]. But this is a phenomenon that occurs with particles subjected to specific conditions; for instance, two entangled particles have to be generated from a single one (such as a photon subdivided in two by a partially reflecting mirror), which does not occur in living beings. Anyhow, the phenomenon is a purely *physical* one. Once I heard a lecture by astronaut Edgard Mitchel, where he tried to explain certain phenomena occurring in living beings using quantum holograms. Again, a *physical* explanation. All these explanations are in fact materialistic: they do not recognize the existence of something really non-physical, as I do.

7. A new scientific paradigm

Suppose that, through a true miracle, many scientists would decide to abandon the CDCC (see section 3) and would cease having prejudices regarding the existence of non-physical phenomena in living beings and in the universe. With this, the present scientific paradigm should change through some extensions. I insist that I am not proposing to change science, but to expand its present methods and points of view. It is essential that scientists realize that, with those extensions, they do not have to give up the basic fundamental principles of scientific activities, such as objective observation and transmission of results exclusively through concepts.

It is clear that the present scientific method has been the cause for the development of the fantastic technology which we have nowadays. But it is now the time in which we have to question if its ill effects have by far surpassed its benefits – just regard the questions of global warming, generalized pollution, weapons, etc. Restricted experiments lead to a particular view of effects of machine and chemical compounds that were invented and are in use, disregarding global effects. It seems to me that a fundamental principle has been adopted: nature is not sufficiently good and should be improved. One example is genetically modified plants and animals. I think this is due to a lack of respect and veneration to nature – a typical consequence of the CDCC. Furthermore, it is a fact that technology is nowadays mostly turned to the satisfaction of ambitions, greed and egotism, which are anti-social by nature.

Just to illustrate what could be done to extend science, I am going to describe here some suggestions. Unfortunately, if covered in detail this topic would constitute an article by itself.

One of the first steps in the change of the present scientific paradigm should be to use a deductive method, from general aspects to particular ones, and not the inductive, reductionistic, Baconian method, which tries to go from the particular to the general.

A classic example of the reductionistic method is Newton's Theory of Color. To conclude that "white light" is composed of all colors, his starting point was an extremely particular experiment. He used a beam of light of a certain diameter, in his own words, "[…] at a round hole, about one third Part of an Inch broad made in the Shut of a Window [sic]." [NEW, p. 26 (Prop. II, Theor. II, Exper. 3)]. Thus, it was not a *foramen exiguum*, a very small hole, as it was wrongly called latter. Even if he had used a small hole, it would have been an extremely particular case. Goethe, in his Theory of Colors (*Farbenlehre*), points to this methodological fault; his general

starting pointing in his rigorous own experiments, were beams of any size, showing how the phenomena caused by particular beams could be explained in terms of the general situation [GOE, Vol. 3, p. 48: *Der Newtonsche Optik – Erstes Buch, Erster Teil* (Newton's optics – first book, first part), Props. 86-93]. André Bjerke shows a generalization of Newton's optics, demonstrating that every one of his propositions and experiments can also be performed with "beams of darkness", obtaining the complementary colors in Goethe's sense [BJE]. By the way, Goethe's theory of complementary colors is used in computer software: in a text editor, if a part of a text has letters of some color, selecting that part with the mouse cursor makes the letters be displayed in the complementary color. Moreover, the basic *rgb* (red, green, dark blue) colors employed in video displays are complementary to the *cmy* (cyan, magenta, yellow) used in color printers – because in the first case we have a light beam on a dark screen background and in the second we have a complementary dark beam on light paper.

In general, the reductionistic method does not lead to global knowledge. For instance, it is obvious that a cell taken out of a living organism is not the original one anymore: only in its original place it shows all its functions, behavior, and development. Goethe already considered a living organism as a manifestation of a whole. This means that one will never have complete knowledge of a living organism if one uses as starting points, for instance, its cells or genes. Along this line, see my paper, already cited, "Considerations about the DNA hype".

A second change could be a partial return to qualitative science. An example of this science was the old plant Systematics. It is necessary to recognize that mathematical modeling leads to control and forecasting of nature, but never to a deep knowledge about it. A trivial example is Newton's formula of gravitational attraction: it does not explain anything about the nature of gravitation (still a big question nowadays). Mathematical formulas in physics express the measurable outcomes of experiments, and not reality itself. Moreover, the measuring instrument may alter what is being measured; this happens with atoms and light. Furthermore, all measurements are approximate, never exact (exactitude exists only in mathematics).

A third change could be recognizing, in the search for causes and effects, that some causes may be non-physical. For instance, present cognition research tries to explain our thinking, feeling, will and perception as originating in neurons. If it would make the hypothesis that neural activity may be their consequence, and not their cause, it would greatly expand its field of research.

A fourth would be to do research on the manifestation of non-physical elements, especially in living beings. I conjecture that, with the present paradigm, it will never be possible to explain satisfactorily from forms of plants to sleep and dreams in humans. In section 3 I mentioned briefly how to extend Darwinian evolution: by assuming that not every mutation and natural selection were random. This could extend the research done in this field. An interesting example of this research is the paper by Craig Holdredge showing that the old and popular Darwinian idea that giraffes developed their long necks to reach higher leaves in trees is not sustainable (e.g., female giraffes are smaller than male, the giraffe has a great difficulty to drink, etc.) [HOL].

One should not ignore the importance of Darwinian evolution for the development of mankind: it contributed to eliminating the power of faith, which goes against the tendency of modern human beings to search for understanding. One of its fundamental consequences was spreading the CDCC. But it is now time to make it independent of the CDCC, so we may enlarge our understanding of the world. For instance, it is clear that Darwinian evolution cannot explain many aspects of

evolution, for instance the differences humans have to animals. I am referring here not just to mental capabilities, but also physically, e.g. the fact that we have a vertebral column with its double S, the opposition of the thumb) non-existent in monkeys), why we don't have fur, leather or feathers, etc.

8. The fundamental existential hypothesis

I think that everyone who wants to have a life coherent with his ideas should make a conscious choice between two mutually exclusive working hypotheses: being a materialist or a spiritualist, according to the characterizations given in section 2. This choice is essential because from these world views (*Weltanschauungen*), two absolutely different types of actions should be followed. For example, if the human being is a purely physical system, let us use machines in teaching, that is, let us use computers in education. On the other hand, if a spiritualist view is embraced as a hypothesis, it follows that learning is something very complex, involving the development of the non-physical members of children and adolescents. Maybe machines disturb this development – after all, there is no neutral machine, each one has some influence upon its user. For instance, if somebody holds a hammer, what comes to his mind? Naturally, hitting it with strength on some surface, on a nail, etc. On the other hand, holding a pillow induces thoughts and feelings of calm and rest; nobody thinks in using it in some violent action (unless for children – how wonderful is a pillow war!). Television induces a state of drowsiness in the viewer and thus lends itself to conditioning rather than information and education. Another typical example today is the computer: as it is a mathematical machine, its use forces the use of logical-mathematical reasoning, although this is not apparent - except in the case of programmers, where the imposition of this type of reasoning is total (see my articles on this subject). Television induces a state of drowsiness in the viewer and thus lends itself to conditioning rather than information and education. Another typical example today is the computer: as it is a mathematical machine, its use forces the use of logical-mathematical, symbolic, algorithmic reasoning, although this is not apparent – except in the case of programmers, where the imposition of this type of reasoning is total (see my paper Electronic media and education: TV, video game and computer and the more recent one Electronic media and education, at home and school: a synthesis of problems and recommendations.

I regard the choice of one of the two hypotheses as the adoption of the most fundamental existential hypothesis everyone has to make. It is interesting to note that this adoption can be made in full freedom: it is not possible to physically prove that there are non-physical phenomena, and it is not possible to disprove their existence. I want to make it clear that I don't find it correct if someone chooses the spiritualist hypothesis due to some personal satisfaction or to tradition. In these cases, the choice will not be a free one. In this paper, I tried to point to various evidence which may indicate that the spiritualist hypothesis is a reasonable one – possible it certainly is.

9. Consequences of the materialist and spiritualist views

The adoption of the materialist view by someone should have deep consequences for that person. Fortunately, many, possibly most materialists are not very consistent people. For example, many of them admit freedom in human beings, as is the case with academics and researchers, who value academic and research freedom (i.e. teaching and researching as they see fit). I think I made it clear in section 5.1 that this does not make sense from a purely material point of view: matter or energy must follow physical "laws" and conditions.

Materialists are also incorrect because they are based on the fact that there are only physical substances and processes in the universe. However, as shown in iem 4.2, it is impossible to observe subatomic particles and atoms in their natural state; physics does not know and, with its current reductionist paradigm, will never know what matter is in its smallest part. In other words, materialists have a notion of what matter is in observable objects, but they don't know what it is at the atomic level. In this sense, materialism simply doesn't hold up. That's why I formulated the following parable: "A materialist is a person who lives and works in buildings that don't have a physical first floor."

Another incoherence of many materialists is the fact that they admit human responsibility. Einstein was a materialist for a long time (if not during his whole life). He said that he understood perfectly well why somebody could perform ill deeds, because that person was determined by his organism (quite along with the determinism of Spinoza, whom he admired), thus having no responsibility. But then the Nazis came, and when he got to know the horrors of concentration and extermination camps, he put responsibility for them not only on the Nazis, but on the whole German people [JAM, ch. 3; p. 71 in the Brazilian edition]! Without freedom, there can be no responsibility.

But this is not the only contradiction I find in Einstein. He was a great humanist, demonstrating a deep love for humanity (see, for example [EIN]). But, as we have seen in 5.2, this altruistic love also does not make sense from the materialistic point of view.

Without human freedom, there is also no human dignity. If humans are determined solely by their matter, their attitudes are all automatic. With this, there is no sense in life.

An interesting problem, which will be covered here briefly, is the following: is it possible to be free and follow social laws? An example is driving on a street and reaching a red traffic light. One may stop at it due to the fear of getting a fine, or of colliding with a vehicle coming from the other direction and being hurt. However, when one acts due to fear, that is, due to some feeling, one does not act in freedom. Another possibility is to think that the social law that enforces one to stop at a red light is full of sense, because it protects citizens from accidents, it organizes traffic, etc. If someone recognizes the validity of a social law, and consciously follows it, s/he will be doing it in freedom. By the way, I greatly admire the fact that Brazilians are very critical concerning laws (they even have a saying like "laws were made to be circumvented"). For instance, driving late in the night, in general nobody stops at a red light – one diminishes the speed, pays attention to the other streets and then drives ahead (this has become a necessity in large cities, because of the danger of being assaulted).

One of the sad consequences of the materialist view is that history makes no real sense. Marx has tried to introduce historical materialism, but what he did was to turn history into the most tedious subject: everything is a consequence of class struggle, be it in the ancient caves, in antiquity, or presently. Obviously, he could not admit that humans have changed throughout history; from a materialist point of view, the sole admitted change is the cultural one. From the spiritualist point of view, history may be considered a consequence of changes in the non-physical human constitution. This way, it begins to make sense. For instance, in the best of hypotheses materialism may consider ancient religious manifestations as superstitions and invented stories. But from a spiritualist view, they may be initially considered as the outcome of supersensible perceptions due to the existence of non-physical organs which, as I expounded in section 2, gradually decayed along history. Along with the loss of

supersensible perceptions, humans acquired the possibility of observing nature with clarity, of thinking with clearness, objectivity and abstractness, and of expressing ideas through concepts. Clearly, this last capacity did not exist in ancient antiquity before the time of the Greek philosophers, as all religious writings of that time show so well – their expression was done through images, and not through concepts. There exists a passage in the New Testament that illustrates very well this fact: the Parable of the Sower [e.g. Matthew 13:3-8]. After having told it to the people, Christ Jesus' disciples ask him "Why do you speak to the people in parables?" [13:10]. He replied, "The knowledge of the secrets of the kingdom of heaven has been given to you, but not to them." [13:11] and proceeded to explain the conceptual sense of the images [13:19-23]. He advanced the development of his disciples to the point of understanding concepts.

Maybe it is interesting to tell here a personal experience. Once I went to a conference on Creationism organized by a religion confession. There I asked the participants if they thought that the days of Creation were 24-hour days, and the answer was a unanimous "yes". As I had gone there armed with a Bible, I read them the Parable of the Sower, and asked: "If the Christ, in whom you believe, says that he talks to the people through parables, and that there are concepts behind them, why don't you consider the account of the creation of the world in the Genesis as being constituted by images? Moreover, the Sun was created in the 4th day!" One of the participants rapidly shouted: "You are not being a creationist or an evolutionist; you are being a 'confusionist'!" I was very pleased with this remark.

As I mentioned the Bible, let me comment on something that is deeply rooted in many religions: monotheism. Carefully reading the Bible, it seemed to me that in its beginning there was no monotheistic view of the world. In fact, let us examine, for instance, the main Jewish religious invocation, the *Sh'mah Israel…*, in my literal translation, from the vocalized (that is, with vowels, Masoretic version), "Hear oh Israel, Jahveh [is] our Elohim [plural!], Jahveh is one" [Deut 6:4 – in Hebrew, there is no present tense of the verb "to be"]. In this prayer, I had the impression that the reference was to the fact that there existed, at that time, just one divine being (Jahveh, belonging to the category of the Elohim) associated to the Jewish people, but not to the fact that it didn't exist other divine beings. By the way, there should be other Elohim. In Ex 18:11 the reference to this fact is absolutely clear: "Now I know that Jahveh is great among all Elohim…" and, just after it, in the beginning of the 10 Commandments, in Ex 20:3 or also in Deut 5:6, "There should be no other Elohim in front of me" (my translations). In many other passages I could read references to other gods. How astonished I was to read in the magnificent book *History of the Jews* by the (non-Jewish) British renown historian Paul Johnson, that he had a similar opinion, obviously going much farther: he says that the universal monotheistic notion only appears with the prophet Isaiah [JOH, ch. 1; p. 86 in the 2nd Brazilian edition, 1995]. Before then, for the Hebrews Jahveh was a communitarian divinity.

With this I wish to point to the fact that one should make a careful study of ancient religious scriptures, and we should free ourselves of preconceived ideas which are the outcome of traditions. Obviously, it is impossible to do this study from a materialist point of view. As I have already mentioned, this view implies that our far ancestors were all superstitious or produced rubbish fantasies; they were just great storytellers. Ancient myths become not images of non-physical realities, but mere inventions. With this, one creates an unsurpassable abyss between the modern human being and the ancient one, who took religious scriptures quite seriously. Even a couple of centuries ago, most people still had the intuition, the feeling, that those scriptures were facts, realities, told as images, as symbols. On the other hand, spiritualism may permit us to understand the myths and what lies behind the

magnificent images of ancient religious scriptures, creating a bridge between ourselves and our ancient ancestors.

On the other hand, the world view of a big number of people that call themselves religious is, in its foundation, purely materialistic, because they limit themselves to speaking about an abstract, incomprehensible divine (thus, non-physical) being, which they call God. But, as we saw, what is today called God occurs in the Bible with two different names, initially the Elohim, which "created" the world, and only in Genesis 3:1 appears Jahveh alone; he appears many times together with the former ones, from Gen 2:4 on. In some translations, the former are translated as God and the latter as Lord, a clear recognition that there existed a distinction in the original. The deep sense of this distinction was lost, and both are nowadays referred to as God. Since some centuries the human being has lost any sense of this entity, who became a pure abstraction. It is not in vain that this God of many religions could only be classified by Nietzsche as being "dead". Compare this notion of a "unique" non-physical divine being with what I have been expressing in this article: the existence of something non-physical in each living being, acting essentially upon each individual and which may be responsible for many observable processes. This is something much closer to our understanding, because we may see its manifestation in ourselves (for instance, in our form and in our thinking, feeling and willing) and in the outer world.

Many religious people do not recognize the existence of non-physical processes in living beings – unless for an obscure "soul" in humans. With this, they do not admit investigating these processes. This produces a total separation between their view of the world and the scientific one, to the point that both scientists and religious people say that religion and science deal with distinct and non-compatible fields. A famous Brazilian geneticist, in a public debate with me at the Institute of Physics of the University of São Paulo (the most important university in Brazil, as far as scientific production is concerned), said something like: "During the week, I wear my apron and go to the laboratory; on Sundays I wear my suit and go to the church, what's wrong with this?" To me, this dichotomy is a tragedy. Every healthy human being is one single individual, with just one personality. It is sad to see that modern notions of science and religion have produced a complete split between them; with it, scientists who believe themselves to be religious have in fact two personalities, with two totally incompatible views of the world. The spiritualism that I am trying to convey here may unify science and religion.

By the way, some religions deny freedom. Thus, they are in fact materialists. To forcefully limit human freedom and even destroy human life due to religious grounds seems to me an indication of materialism of many people that call themselves religious. In fact, as I have shown in an article I wrote against the death penalty (unfortunately available only in Portuguese), a spiritualist world view should be against killing any person, thus being against the death penalty: it interrupts a process of individual development which we don't have the right and knowledge to do. Nonetheless, this does not mean that one should not protect society, confining an assassin until he shows that he has become free of this biggest of all antisocial impulses.

The total lack of an understandable notion of divinity, and the maintenance of traditions which originated in times where conceptual thinking was still not clear, makes almost all intellectuals and scientists abhor, for some reason, everything that has to do with something non-physical. With this I want to say that present-day religions are in great part responsible for the growing materialism that prevails in the world. This was a necessity in former times because without having fallen deeply into matter, humanity would not have developed free will.

The acceptance of the spiritualist hypothesis should have drastic consequences for the individual who adopts it. For example, from this hypothesis one may admit that each human being may be free, that the development of freedom (also in respect to divine beings) was the biggest conquest of humanity, and that the development of unselfish love is the supreme mission of each human. (As mentioned in 5.2, love can only be truly altruistic if it stems from total freedom.) This leads to moral attitudes based upon understanding, and not upon moralism or sentimentalism. For example, it is immoral to restrict the freedom of a person that is not dangerous to society.

This hypothesis may lead to an understanding of various phenomena in a completely unusual way. For instance, let us take the way sicknesses are in general regarded nowadays. They are considered by symptomatic, classical materialist medicine as something – please excuse the paradox – evil, whose symptoms should be eliminated at any cost. On the other hand, a spiritualist view may consider the following. Nature seems to be so full of wisdom and harmony, how is it possible that it would introduce sicknesses, if they are stupid? Maybe sicknesses are human needs, making some individual developments possible. It is not for nothing that one says "I caught a cold" and not "the cold caught me"; the person needed the cold, so he caught it. The wisdom of natural languages shows that there may be some sense behind sicknesses, which are not the outcome of mere hazard. In this sense, the role of medicine should be making it possible that the patient overcomes his sickness making the best use of it – it is a true process of learning and personal development. It is obvious that one should not risk the life of a patient, and everything possible should be done to save her/him if s/he is in danger, with any means. (Attention, this means extending life but not extending the death of a person who is in permanent vegetative state and will not recover to a dignified life.) But this does not mean exaggerating as it is done nowadays. For instance, all Brazilians are forced to be medicated: it is impossible to buy salt without addition of (artificial) iodine. But this goes absolutely against personal freedom! I eat balanced food; I don't need iodine in salt to prevent goiter (the reason for the addition). There are already indications that this addition is producing hyperthyroidism. Lately, in my country, and imitating the USA, which has been using it for a long time, iron and folic acid is added to flour. I want to be free to decide if I take of don't take some medicine!

I will mention here some personal experiences with modern medicine. I began to have cataracts. What did medicine do? Just waited until my cataracts were "ripe" and extracted my eye lenses, replacing them with plastic lenses (with marvelous results). I had hyperplasia of the prostate. What did medicine do? Waited until it grew up to an exaggerated point and extracted a large part of it (with marvelous results). But this is not what one would expect from a medicine that should cure. Instead of curing, in many cases it replaces or cuts out the defective part.

10. Is there a satisfactory spiritualist view of the world?

It does not help simply to be a spiritualist, in the concept presented in section 2. It is necessary to find or to develop a spiritualist conception of the world which, to be a "satisfactory" one, must have in my opinion the following characteristics:

- It should be expressed conceptually, directed to understanding and not to feelings. I consider a spiritualist view of the world centered on feelings as mysticism, inadequate to the present constitution of the human being.
- It should not be dogmatic, requiring positions of faith.
- It should not contradict scientific and historical facts, and what everyone can observe outside and inside oneself.

- It should have practical applications in the various fields of human activity, including daily personal life, enriching them compared with a purely materialistic view.
- It should make it possible to recognize non-physical phenomena in nature and in the human being.
- It should present coherent explanations of nature, mainly the human being, enlarging the understanding presented by current science.
- It should present coherent explanations of historic evolution, so that one may better understand images of ancient religious texts, myths and genuine folk fairy tales.
- It should present a path for inner development, so that any person may follow it and make super-sensible observations.
- It should permanently preserve freedom, individuality and self-consciousness including during super-sensible observations.
- It should not contain anything secret, that is, reserved to restricted circles.

I know of only one view of the world that fulfills these requirements: it's Rudolf Steiner's *Anthroposophy*. If anyone knows another, better one, please show it. It presents an incredibly large body of ideas and practices, for instance its own tested education system (Waldorf Education), medicine (Anthroposophical Medicine), agriculture (Biodynamic Farming), original arts (Eurythmy, Speech Formation, Organic Architecture), social organization applied to society as a whole and to institutions (Social Threefolding), and much more. They satisfy the requirements mentioned above and gives a great confidence that spiritualism is not a ghostly-like fantasy. Anthroposophy was my inspiration to write these and other texts.

11. Summary of working hypotheses

In this section I will simply enumerate the working hypotheses described above, and add other essential ones.

- There exist non-physical processes in living beings and in the universe.
- Thinking, feeling and willing are non-physical processes which reflect upon inner physical process.
- Physical substances (matter and energy) are "condensations" of non-physical "substances".
- Non-physical "substances" and entities are of the same essence as our thoughts.
- Through thinking, one may reach the non-physical essence of physical objects.
- Throughout history, the human being changed its non-physical constitution and characteristics, producing cultural evolution.
- Plants have a non-physical element responsible for life manifestations, hence their distinctions in relation to minerals.
- Animals have an additional non-physical element which does not occur in plants, hence their distinctions in relation to the latter.
- Humans have an additional non-physical member which does not occur in animals, hence their distinctions in relation to the latter. This additional element gives humans their higher individuality, transcending their physical body, their culture, their sex, ethnicity, nationality and religion; morally perfecting this element is the sense of life. This development depends on the physical world, where errors may be committed (otherwise we could not be free). So, the physical world and evolution exist to permit this member to progress.
- It is possible to develop non-physical organs for the perception of the non-physical world. Regular thinking shows that this is possible, e.g. when thinking about mathematical entities such as a perfect circle, but also about concepts

such as "rose", "door", etc. Also, what is usually called "intuition", that is, new ideas apparently coming from nowhere, is an indication of our thinking reaching the Platonic world of ideas.

I hope I have shown that it is possible to be a spiritualist without giving up one's own freedom, self-consciousness, individuality, clear thinking and understanding, and without contradicting known scientific and historical facts. My arguments were purely rational and observational and were not based on abstractions without correspondence in the physical world, or on feelings and images common to practically all religions.

An essential point in this paper is that a personal experience of having freedom in one's thinking is a strong indication that something non-physical must be active inside oneself because, as I have exposed; from matter alone freedom cannot arise.

I also expounded my theory that physical non-determinism may be used by non-physical components of living beings to direct growth and regeneration, producing and maintaining their distinctive forms, which clearly follow mental models, because we may recognize those forms with our thinking. My theory may also be applied to neural activities, reflecting our thoughts and feelings to our consciousness. I am sure that this theory may be further investigated by examining apparent non-determinisms and looking for some phenomena which apparently don't have a physical explanation.

The existence of non-physical processes in the world can be just taken as a working hypothesis, thus expanding scientific research. Why do so many materialists, mainly scientists, who should have no prejudices, strongly reject this hypothesis? It seems to me that this is due to lack of knowledge of this possibility, and also for fear of losing the characteristics and attitudes mentioned in the first paragraph after the list of working hypotheses. But fear is a manifestation of instincts and feelings. Besides lack of prejudice, this attitude should not be expected from a rational scientist.

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