Knowledge and Mystery: The Impact of Contemporary Science on Metaphysics

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Abstract
The article, meant to address philosophers and scientists as well as the interested layman, expresses the views of a physicist on the strong impact that contemporary science has on the traditional approach to metaphysics, implying an in-depth revision of many concepts that have been happily used for centuries. The implications of taking seriously the main message of contemporary neurosciences – there is nothing else than interacting atoms in our brains – are explored. Free will, and its reconciliation with scientific determinism, is used as an illustration. Contemporary science has shed new light on the circularity of knowledge and allows for a clearer separation between science and metaphysics, between knowledge and religious beliefs. At the same time it reveals the fundamental inability of knowledge at unravelling mysteries such as knowing why the world exists, rather than nothing.

Introduction
We all wonder about questions of a metaphysical nature such as: What is there after death? What is the meaning of life? Does God exist? What about our free will? While such questions are as old as the hills, we keep discussing them using the jargon of the cultural environment in which we grew up, with words and non-dits that are peculiar to our own clan.

It is now time to use a common language in addressing such questions. One can no longer ignore what other clans are teaching us. Wearing blinkers does not make one see better. For us, laymen venturing beyond the borders of our own clans, the details of the lessons that the members of other tribes are teaching us are unimportant. What matters is to extract the essential, the main substance, and to try hard to be as faithful to it as possible, to prevent our glasses from distorting its outline. The main message of contemporary biology, and in particular of neurosciences, is what Francis Crick was modestly calling in 1994 ‘the astonishing hypothesis’, which one would probably be entitled today to rename ‘the
astonishing evidence’ as it has since been corroborated by such a host of new observations: it is the physics and chemistry of our cells which govern our bodies and our minds, our feelings, emotions and consciousness.

Many refuse to accept such a hypothesis, arguing that the picture of the world which science has drawn for us is neither clear nor complete. They are right, many dark areas still subsist. But time has come to take this picture seriously. The reader is not supposed to accept it but only to accept, as an intellectual exercise, to spend a few minutes in exploring its implications. Our natural difficulty to assimilate new ideas should not make us wear a pretentious mask of enlightened scepticism that would simply hide our ignorance.

The use of different jargons in addressing metaphysical issues is often seen as an asset, an illustration of the richness of human mind. When different conclusions are being reached, one praises the diversity of the views that such questions are stirring up. While probably politically correct, such an attitude is intellectually unacceptable. Diversity is not a goal in itself. If praising diversity simply means praising tolerance and open-mindedness, fine, I am for it. But if Peter tells you that two plus two make four and Paul that two plus two make five, the idea of praising the diversity of their views will not come to your mind. What neurobiologists and neuropsychologists teach us is the result of thousands of rigorous observations and of skillful analyses and interpretations [1]. They argue in a general framework that keeps establishing itself stronger and stronger: that of evolution, of molecular biology and of genetics. Before doubting their arguments, one better makes sure to understand them well.

We who listen to dialogues between members of different clans, we must learn to spot possible disagreements having their origin in the ignorance that one of the tribes has of facts which the other masters. To the extent that such facts are relevant, it is easy to choose whom to listen to.

We must undertake our exploration with an open mind in order to learn from others rather than looking around through the filters of our own field. The recent advances in neurosciences impose a radical revision of the traditional approach that has been developed by philosophers who left a deep imprint on the history of ideas, such as Plato, Descartes, Leibniz, Spinoza or Kant. Being familiar with the way they have argued and with the systems of the world which they have constructed is of course an asset, however of little help to assimilate the new ideas. Of as little help as Schrödinger's cats, Gödel's incompleteness theorems and Turing's test, which are often invoked in other circles.

I have chosen to expand on two themes which seem to me particularly well suited to the aim. One, free will, is an excellent illustration of the upheavals caused to the traditional way of thinking about major metaphysical questions by the recent
discoveries of contemporary neurosciences. The other, circularity of knowledge, helps to clarify the limits of knowledge and to better mark its boundary with metaphysical and religious beliefs. Both bump deeply into our common sense and their assimilation requires a major effort of reflection. Both are equally important and compel us to revise radically the concepts with which we used to construct our argumentation: the self, body and mind, subject and object, concrete and abstract, real and ideal, conscious and unconscious, and many others.

**On free will**
Free will, and its apparent incompatibility with scientific determinism, provides a particularly clear illustration of what the new ideas imply. In the past fifty years, molecular biology, genetics and neurosciences have made spectacular progress that command respect; they draw the picture of a man who can be fully described in terms of the atoms which he is made of and of their interactions, a ‘neuronal man’ as J.P. Changeux says. Our acts, thoughts, feelings, emotions, creations can all be explained – meaning described – in terms of the interacting atoms which our brains are made of.

We must always keep in mind the continuous evolution of the brain from embryo to adult and from earlier species to ours. In this process, the brain gets organized and structured with the aim of putting more and more order in the signals that it keeps receiving. Such organization and structuring, accurately coded in the genome in the course of evolution, allow the newborn baby to start elaborating some elements of logics, to establish relations, to identify objects and follow them in time, to draw an image of space and time, and so on. At the same time, the education from parents and teachers, together with acquired experience, help in building a sum of knowledge that gets organized according to a common general scheme. A minor part, but essential for the conduct of our life, is accessible to our memory, which is able to recall it; the rest is not – it may be partly revealed on the occasion of dreams or traumas – but obviously plays an important role.

The materialism of such a picture should not make us see the brain as well oiled clockwork or as a supercomputer. Both models can only cause confusion. The brain is alive, it keeps changing, it keeps reshuffling, going over and checking through the information that it has in store. Its plasticity, its ability to handle multiple information in parallel, to interact with the signals that it keeps receiving, to generate images to be used later on as references, are among its most remarkable features.

It is now time to address the question of free will, hoping that its study might shed light on the picture we have of the brain. Let us define the problem as simply as we can. You have decided to raise the right arm; only you know that it is the right arm and not the left arm that you decided to raise; and you raise it. You might have decided to raise your left arm instead, and you would then have raised your
left arm. Apart from you, no one can know in advance which had been your decision. You are free to decide which arm you will raise. Yet, if one believes the picture of the world which science is drawing for us, all your movements in the time interval that starts a few seconds before you took your decision and that ends a few seconds after you raised the arm, are subject to the laws of physics and, therefore, predetermined: once the initial state is known (before decision taking) the final state can be uniquely deduced from it. The contradiction is obvious and kind of baffling, even for scientists: remember Jean Hamburger admitting that if our spiritual world is only a matter of the physics and chemistry of a tangle of neurons, if their determinism is hiding behind each instant of our mental life and governs them secretly, “we may as well forget about our freedom of thought. We may as well forget about our freedom of choice” [2]. It bewilders philosophers, even those, as John Searle, who are well-disposed towards science: “Ideally, I would like to be able to keep both my commonsense conceptions and my scientific beliefs [...] But when it comes to the question of freedom and determinism, I am – like a lot of other philosophers – unable to reconcile the two” [3]. Finally, its emotional load is enormous: remember Dostoyevsky predicting that science will transform human beings into piano keys or organ pull tabs the day it will tell them “that, to say the truth, they have neither will nor whims of their own; that, by the way, they never got any [...] and that, to top it all, there exist laws of nature; so that all what they do is not the result of their will but happens on its own, in conformity with such laws” [4].

Let us try to identify what the problem consists in. There is no problem with taking a thought-out – or better, well motivated – decision. It is easy to imagine the mechanisms that are at play, even if one does not understand the details. Take the example of a thirsty donkey, a cousin of that of Buridan, standing in front of two buckets, one empty and the other full of water; it will promptly see the buckets, notice that one is empty and the other full, decide to reach the latter and drink. Its brain will have made a choice between two possible futures (among many others): to go to the empty bucket or to go to the full bucket. A donkey is, no doubt, able to make such choices. Much more simply, most micro organisms are able to move along the concentration gradient of what they use to be fed from, sunflowers are able to follow the path of the sun; in such cases, one cannot talk of decisions, there is no need for a brain. Yet, the decision of the thirsty donkey is in the wake of such tropisms, its brain being simply a much more complex and subtle tool than those used by the amoeba and by the heliotrope. Such a ‘decision’ is not in direct conflict with the laws of physics: one might imagine a sophisticated robot taking it.

Let us now assume that both buckets are initially full. Then, according to the laws of physics, the donkey should die of thirst for being unable to make a choice: making a choice would break the symmetry of the problem. Yet, whatever Buridan might have thought, it is a safe bet that the donkey will pick a bucket and drink out of it. Of course, in practice, it will always have a small reason to prefer one to the
other (it is closer, it smells better...), but this is not what we are concerned with here. We assume that the buckets are strictly identical and that the problem is perfectly symmetric. From a scientific point of view, it should then be impossible to make a choice. Moreover, from such a point of view, there is no difference between a donkey and the ‘neuronal man’ implied by Crick’s ‘astonishing hypothesis’: our free will is in obvious conflict with scientific determinism.

For centuries, the paradox had been discussed in philosophical terms but it is only recently that neurosciences have shed such new light on it, causing much of the earlier debate between compatibilists and non-compatibilists, soft and hard determinists, physicalists and libertarians to be superseded [5]. What was wrong, in our reasoning, was the implicit assumption that the donkey’s brain obeys the symmetry of the problem. It obviously does not, it is what it is, the result of its evolution from the time when the donkey had been conceived by its parents. As we shall see, this leaves room for processes that allow for making a choice without violating the laws of physics.

One must never forget the unbelievable complexity of the brain, its characteristic plasticity and the swarming activity that it shelters. Its role is determinant; one may not ignore it when talking of an initial state. The immense majority of the operations it is executing are not accessible to our consciousness. Our thoughts and the consciousness we have of ourselves – of our self – are part of the tiny minority of those that are. In particular, our consciousness has no access to most of the mechanisms which govern our choice making and decision taking; our brain keeps preparing choices in order to decide on our future actions without us being aware of it; eventually, the final decision may have to account for other possible choices of which we are conscious, and in the development of which we have consciously taken part; such thought-out choices, if they are present, will get priority; but in the absence of such choices, in some sense by default, what the brain had prepared will become a decision and action will follow accordingly. In this sense, the brain is able to make choices ‘of its own’; indeed, too long an hesitation is never very good for the survival of a species and it would not come as a surprise that evolution favoured such an aptitude. These ‘default’ choices have been prepared by the brain without us being conscious of it; our consciousness only knows about the outcome. As a minister, who only needs to sign the file that has been prepared for him by his cabinet, has the impression, when signing, to be taking a decision, our conscious self believes that it has decided what our unconscious self prepared for him in the dark. For having ignored it, we had wrongly concluded that determinism and free will were incompatible. How it works in practice is far from being understood in all details but scientists such as G. M. Edelman or A. R. Damasio [1] have drawn for us possible scenarios. b

How the donkey’s brain decides to favour the bucket on the left rather than that on the right is not a problem: even if the external symmetry of the problem is perfect,
information of relevance, such as the various ‘representations’ of the buckets, are stored in the donkey’s brain in a non-symmetric way; for example, the image of the bucket that was seen first is likely to have been centrally processed before the other.

When you have decided to raise the right arm, you have in fact become conscious that such was the choice which your brain was presenting; you were equally conscious of the possible reasoning that had contributed to your choice; but you were not conscious of other operations that had also contributed. Under such conditions, it does not come as a surprise that the choice appears to you as resulting from what you feel is your decision: you can only perceive your self through what you are conscious of. The apparent paradox was not with the laws of physics but rather with this impairment which is (fortunately!) preventing us from being aware of the whole activity of our brain. The feeling we all have, when we make a choice or take a decision, that our free will implies something else than the laws of nature is indeed an illusion. Whether free will itself is or not an illusion is a matter of defining more precisely what we mean by free will now that we better understand the mechanisms of choice making and decision taking. Had we understood it before coining a name, we probably would have chosen other words: ‘free’ might have sounded too arrogant in such a context.

It is easy to say the same thing in a less aggressive way. It is sufficient to modify the meaning that we give to ‘I’ or to ‘self’, to simply agree that, for what concerns the activity of our brain, the self does not simply cover what we are conscious of but the whole of it. Then, yes, we may say ‘I’ have decided, ‘I’ have chosen. It is now the words ‘to choose’ and ‘to decide’ that have lost their original arrogance. ‘My choice’ and ‘my decision’ simply obey the laws of physics. No need any more for a so called free will coming down from God knows where, as a deus ex machina, in order to change the course of the world. And that does not turn me into a piano key or an organ pull tab since there is no one to play the piano and the organ. This ‘I’ is made of all ‘my’ past: ‘my’ knowledge, ‘my’ experiences, ‘my’ thoughts, ‘my’ interactions with ‘my’ environment. There is a long way between this self and the self that was suggested by Descartes’ “idées claires et distinctes”: they turned out to be sources of illusions.

Sometimes, those who ignore scientific advances get themselves cheaply a clear conscience by claiming, with Bouveresse, that metaphysics arguments are about something else, something “of another kind”. The honest man refuses taking such a claim seriously. It reminds me of these textbooks in philosophy of science (alas, they are still in use!) which state that science makes calculations without understanding them but that philosophy is here to understand what is hiding behind!
I chose to talk on free will but I might as well have chosen many other topics which would have been as apt to reveal the upheavals that science is causing to the traditional approach of major metaphysical questions. I might have talked on pain or on artistic creation the result would have been the same: a drastic revision of traditional concepts.

Before closing this section, I should say a few words on the ethical side of the question. Ethics and metaphysics are not the same thing but they often lead to reflections that feed each other; this is particularly true in the case of free will. Becoming conscious that the feeling we have about free will is an illusion triggers often comments that reveal a deep misunderstanding of what science is teaching us, such as “As everything is written in advance, I cannot be held responsible of my actions; I may therefore kill as I please.” Such a statement implies a complete misunderstanding of what ‘I’ means; it implies the belief that the common sense ‘I’, the ‘I’ which science has just made obsolete, the deus ex machina, is still around, ready to make use of his free will in order to decide to kill as he pleases.

Another common misconception is to think that two distinct selves reside in our brain, the conscious self and the unconscious self, each able to make choices and take decisions, the conscious self being morally responsible and the unconscious self being not. This misconception is the result of misunderstanding what is meant by conscious self. There is only one self, but our consciousness has access to only part of what it is made of. There is only one step in the chain of processes leading to a choice to be made where the choice is actually made, the decision actually taken. But some of the processes that led to this choice are accessible to our conscience, others are not.

What science is teaching us is the death of the obsolete idea we used to have of our self. Our new ‘I’ came into existence when the egg from which we were born got fertilized. Since then he kept being enriched by new experience, acquiring new knowledge, thinking, making choices and taking decisions. He did all this thanks to the amazingly efficient and complex tool which our brain is. He obeys the laws of nature, which, incidentally, he himself and his kind have been developing. Our muscles and guts obey the laws of nature, no one complains; our brain obeys the laws of nature, one feels offended. We must dispose of this slightly ridiculous picture of a supernatural, quasi divine ‘I’, who was able to intervene on the course of our life from outside (but which outside?). It is such a picture which is the illusion.

The fact that the new ‘I’ obeys the laws of nature does not make ‘me’ irresponsible toward the society. The society is a set of individuals like me, their thoughts and actions obey the laws of nature. We all feel that, when we make a choice or take a decision, we somehow escape the tyranny of the laws of nature. If we share this illusion, we need an ethics well suited to such illusion, don’t we? Of course, for
whom wishes to talk about responsibility toward some God, it is a different matter. But the scientific point of view does not lead to an ethics of irresponsibility. It simply suggests us being more modest and humble than we thought being entitled to be.

The circularity of knowledge
While free will has been and still is extensively debated by philosophers in relation with the recent findings of neurosciences [5], the topic that I am now addressing is not. It brings up questions that have been discussed by philosophers for centuries, not to say millenia, and that are considered today as commonplace bread and butter philosophy. They now need to be rethought by taking due account of the new vision of the world that contemporary science is providing us with. In so doing, even more than in the case of free will, we must be attentive not to be imprisoned in the words and concepts that we have been using all along. The temptation to keep referring to earlier philosophers is strong, but earlier philosophers were unaware of contemporary science and whatever they have written, as deep and brilliant as it might be, needs to be reconsidered in the light of recent findings.

The new vision of the world which contemporary science is providing us with also implies a new vision of the nature of scientific knowledge, often quite different from that given by traditional epistemology. It is therefore useful to spend a few lines in sketching it.

Who is not familiar with contemporary physics often mixes it up with mathematics and sees nothing in it but cabalistic formulas without any relation to the real world. As Feynman wrote, mathematicians prepare abstract reasoning ready to be used by the physicist who describes the world and must give a meaning to each of his sentences: “It is something very important that many of those who come to physics from mathematics do not understand. Mathematicians help physicists. But in physics you must understand the relationship between the words and the real world” [6]. Mathematicians, like those who came to physics from mathematics, make indeed a clan of their own. The members of other tribes often mistake them for the archetype of a physicist.

In order to well understand the circular nature of knowledge, it is necessary to first dispose of prejudices that are often attached to the notions of theory, observation and abstraction [7]. Take as an example the observation that the sun sets in the west. One easily gets convinced that this is not an observation but indeed a theory. Speaking of the sun implies having imagined that the red circles, which one sees disappear each clear evening behind the horizon, are one and the same thing which one sees reappear each clear morning on the other side; naming the sun implies having already a theory of the sun. Speaking of the west implies having learned to define a direction despite appearances (seen from here, the sun sets on the right of the tall pine tree on top of the hill, but seen from a bit farther
away, it sets on its left), naming the west implies having already learned some geometry. What I mean, is that as soon as we undertake a description of what we observe, we start transforming the raw data of the observation into sentences, numbers, information that our brain keeps in memory and that are already making up a theory.

It is often said that the role of a physical theory is to relate among themselves the quantities used to describe phenomena, the observation of which one attempts to give an account of. But such a statement implies essential preliminaries, the identification and definition of such quantities. It is in this preliminary step, if anywhere, that one may see abstraction. Whether one speaks of material points, vectorial forces, space-time quadrivectors, Hilbert space vectors or superstrings, such quantities are not \textit{a priori} obvious objects, they first need to be conceived in the brain of a scientist. It is worth pointing at the \textit{ad hoc}, not very rigorous nature of this abstraction process which is the preliminary phase in the elaboration of any physical theory. The completed theory is sometimes so elegant and apparently perfect that one may tend to forget it. It would be a major mistake to let oneself get dazzled and to erect the theory into absolute truth. One must always be ready to revise the bases on which it has been built if new bases make it possible to construct a better one, more general or more accurate.

Classical mechanics is not as good a theory as special relativity but it is not less abstract. It only seems so to whom is so much at home with it, that it kind of became its common sense: he forgot that it too was resting on abstractions. Very often, criticizing science for being too abstract simply reveals the difficulty we have in racking our brains.

It makes no sense to criticize a theory because it is too abstract: all theories, even the simpler among them, are abstract; indeed, their role is precisely to abstract. One should not either criticize a theory because it goes against common sense, common sense is nothing but the theory that has been previously assimilated: its reality is purely subjective, even though such subjectivity is usually collective. It is nothing but the theory that has been assimilated by the majority. Science is always ready to accept a new theory, whatever effort of abstraction it may require, as long as it is better than its predecessor. As an obvious corollary, it gives up any claim at reaching some absolute truth.

The fascination of mathematics is blatant. You start from apparently innocent hypotheses and you discover an unexpected and wonderful universe. In the same way as language makes it possible for us to play with words and to create magic worlds, mathematics make it possible for us to play with axioms and to create a whole hierarchy of infinites, Peano curves, undecidables and so many other wonders. Such is the way they are made: the contrast between their richness and the simplicity of the hypotheses at their root is amazing; as are the beauty and
elegance of their constructions and the feeling of purity that they convey. In contrast with science, which depends on the phenomena that it tries to understand and to explain, mathematics succeed to free themselves by making axioms out of the little bits of help that nature gives them to start their explorations in the right direction. While science must constantly revise its hypotheses, mathematics are immortal. And like philosophy had parted from science because it did not accept limiting its scope to phenomena, mathematics have parted from science because they could aspire to dispose of phenomena.

What is known about the genesis of the brain, whether at the level of the individual or at that of the species, suggests that mathematics and logics owe much more to phenomena than one had thought up to the middle of the twentieth century. It was then often implicitly accepted that logics was there first. *Ab initio erat Verbum.* Logics, Verbum, Logos...But it is difficult, today, to imagine logics as being wholly coded in our genes. At which stage in the evolution would such a coding have appeared? Of course, some of the aptitudes required for the elaboration of logical reasoning are innate, there is no reason to doubt it. But no more nor less than some of the aptitudes required for the elaboration of language. When, after one week or so, the newborn baby has succeeded to elaborate a ‘theory’ of his mother – having established correlations among the many images of her smiling face that he has kept receiving, and having associated them with the sound of her voice that he was already hearing before being born – hasn’t he already developed several fundamental concepts of logics?

The reader, by now, should have disposed of some of the prejudices he might have had [7]. But the more difficult part, understanding the circular nature of knowledge, is ahead of us. We first need to define more precisely what we mean by knowledge. Anything we know results in elements of information that our brains have in store and keep reshuffling. Incidentally, we may talk of us collectively, at the scale of the whole species, as such an important role is played by culture, namely by the ability enjoyed by the members of our species to communicate and to exchange knowledge. Much knowledge belongs to single individuals, such as ‘this morning, when I woke up, I saw a bird sitting on the window-sill; no one else could have seen it’. Such knowledge is uninteresting in the context of the present discussion, we may include it or not in what we call the knowledge of the species, it is unimportant.

If we mean by knowledge anything that is stored in the brains of our species, there exists a single form of knowledge. Of course, one may make a distinction between the knowledge that we acquired from our own experience and that which we learned or inherited from our parents and teachers; or between that which we may have of biology and that we have of our emotions; or between that which we express under the amazingly dense and concise form that mathematics are providing and that which we express with everyday phrases. Such distinctions are irrelevant for
what we are concerned with here. We would be playing with words if we were, at this stage, bringing up the knowledge we learn from a poem, a sonata, the friendship of a child, the love of a woman, the example of a hero, the wisdom of a teacher, the beauty of a sunset. Such knowledge also results in pieces of information which our brains keep in store. It may have a particularly strong impact on our personality and deeply contribute to our way of leading our lives, but this does not change a thing to its nature. We would also be playing with words if we were contrasting the knowledge we may have of quantum theory, of souls, of our wishes and sorrows, of the taste of wild strawberries or of the smell of pine trees.

Yet, to make my point clear, I need to make a distinction between knowledge and belief. I leave in a country where most people believe that we have souls and that the souls of their dead ancestors are still among us; each fortnight, when the moon changes phase, they offer them fruits and other goodies and burn incense sticks in order to please them. It is not trivial to tell such beliefs apart from knowledge: both are stored in the brains of many individual of our species. In order to make such distinction, we need to deal first with scientific knowledge.

Scientific knowledge is nothing but a story that scientists tell us, a story that aims at encompassing, in as simple terms as possible, as much as possible of the information that has been collected by our brains and by those of our ancestors. Their claim of being able to describe reasonably well the time evolution of the world gives them the ambition to include what preceded in the story: big bang, inflation, the formation of atomic nuclei, that of atoms and, much later, of the first molecules of life, of the first cells, of the first living organisms, the development of their central nervous system until it became the brain that our species is hosting, the elaboration and tuning of logics, language and mathematics that we are using to describe in simple terms – we say to explain – what we are observing and experiencing.

We tell such a story as if we were observing an external world from outside, it helps making the story simple. We do as if such a world existed, as if we were around, observing it and describing it. But what do we precisely mean when we talk of the existence of such a world? We are, of course, both subjects and objects; we are part of the world that we are observing. It would indeed be more proper to talk of a world observing itself, with the brains of our species playing the leading role. It is quite tempting to infer that this world would exist even if we were not around. It is indeed what we claim: our species appeared very late in the world history; not only the world is meant to have existed well before our apparition but we feel able and entitled to describe what it then looked like as if we had witnessed it.

But what do we mean when we say ‘to exist’? Nothing but ‘to be part of the story that we are telling’. All we know boils down to that story. If that is what we meant,
we were right to say that the world existed before us being around to observe it: it is precisely what is being told in the story. But we should refrain from giving such existence a deeper meaning. Our claim to be able to describe the world independently from us is not an excuse to forget that the story we are telling is nothing but the result of setting in order the information which our species has been accumulating over the years to build up its knowledge. One may at this stage be starting to grasp the circularity of such knowledge all we know is what the brains of our species have been learning, nothing else. They have learned it by setting in order the information they have received from the world. But such sentences make only sense within the story. It is the story that tells us about brains, about a world and about information being received. Such concepts owe their existence to the story exclusively. We are telling a story that is telling how we are telling a story that is telling how...A perfect auto-reference loop in which we are inescapably imprisoned. The circularity of knowledge prevents us from giving any meaning to statements that claim to be able to escape it.

We are trying to understand phenomena globally and we are using words, sentences, rules and laws in order to describe them. Such rules and such laws, whether of logics or of science, are nothing but our way to convey such understanding and descriptions, nothing but our way to express the phenomena. Logics and science are wholly contained in the phenomena and the phenomena wholly contained in logics and science. I say ‘science’ but I might as well say ‘knowledge’, implying the totality of the scientific knowledge accumulated over the course of time.

Auto-reference confines knowledge within its loop, but, by the same token, makes any discussion that claims to escape it meaningless. By definition, anything outside the loop is inaccessible to us; we are even unable to give a meaning to the phrase ‘outside the loop’. The story that we are telling is so simple, so coherent, that it is tempting to forget its auto-referential nature and to yield to the metaphysical illusion: shadows on the wall of Plato's cave can be nothing but the image of an external reality. The real world would precede us, be already there and ready to welcome us: the door is open to the founding myths of our legends and religions. But our only knowledge is unable to embody such an illusion. To do so, we need to postulate something else than what we know, taking the form of metaphysical doctrines or of religious beliefs that make it possible for us to escape the auto-referential loop and to explore the virgin land outside its circle. Of course, we have the right to do so as long as we do it knowingly.

What I am saying here differs from the arguments that have been used over the centuries by proponents and opponents of realism. Such arguments do not question the possibility to define an external reality but are concerned with its existence. The point here, in the light of what has been learned from modern science, is that it simply makes no sense to talk about an external reality if we stick
to what we know. There cannot be a debate between proponents and opponents of something that cannot even be defined. The crucial point is the ability to differentiate between what is inside the auto-reference loop and what is outside. If Peter sticks to the inside, which he calls knowledge, he should refrain from talking about an external reality. On the contrary, if Paul escapes outside, into the land of beliefs, he is of course free to believe whatever he likes and to talk about it. Paul might even argue that both his knowledge and his beliefs are stored in his brain and that there is no reason for him to tell them apart. Peter has nothing to oppose to such an argument and there is indeed nothing wrong with it. What makes their views differ is the simple fact that one refuses and the other accepts to escape the auto-reference loop. It is clear to both of them and they can remain good friends without having to change their views. I said earlier that I would come back to the distinction between knowledge and belief, it is now done.

But let us stick, for the time being, to what we know and let us try to better understand the nature of the illusion. The illusion is not to believe in the pre-existence of the real world but to believe that we can give a meaning to such a phrase, a meaning deeper than what auto-reference implies. The point is not to claim that the world did not exist before us being around, a kind of solipsism at the world scale, but to make it clear that such a claim is meaningless. We simply must restrain ourselves from giving to the verb ‘to exist’ a deeper meaning than is implied by the story we are telling.

Many scientists, in the wake of Dirac and Wigner, marvel at the beauty of mathematics and at their miraculous ability to give such an accurate description of nature. With Einstein, they express surprise that the universe can be understood. With Chandrasekhar they wonder “how the human mind can imagine some abstract concepts and find them beautiful; and why such concepts find their exact equivalent in nature” [8]. Implicitly, and more or less consciously, they use the third-person when talking about nature, as if they were looking at it from the standpoint of a Creator. But how could a self-observing world speak of itself other than by using the first-person? As logics and mathematics were forged by the world precisely with the purpose of observing and describing itself, what point is there to marvel about their miraculous efficiency? Which yardstick should we be using in order to evaluate to which extent this is a miracle?

When scientists themselves yield so readily to the illusion of an external reality, it is easy to imagine that those who are less acquainted with science will be even more willing to yield to it. For many, the existence of an external reality is simply an evidence. The French Encyclopedists, after having defined metaphysics as the science of the reason of things, go on explaining that “limiting one’s scope to empty and abstract considerations on time, space, matter and mind is contemptible science: but looking at these from the real point of view is something else” [9]. Alas, still today, many look down upon what we know and revere what
we are dreaming of. For them, what we know is empty and abstract. The real point of view stands somewhere outside the circle, on summits of which we know nothing.

The circularity of knowledge deprives of its meaning any attempt at escaping the auto-reference loop. One often quotes, sometimes indiscriminately, a famous sentence of Wittgenstein that expresses it very well: “It is not how is the world that is the Mystique, but the very fact that it is [...] The proper method in philosophy would be to talk only of what can be told, namely the propositions of natural sciences – something which has therefore nothing to do with philosophy [...] On what cannot be told, we must keep silent” [10].

But is it so easy to keep silent about what cannot be told? Are we forever doomed to talk of nothing else than what we know? May we hope that some day we shall know enough to answer all our questions? Of course, not. Let us take, as an example, one of the simplest questions that may come to mind: ‘Why does the world exist?’ Such a question obviously stands outside the auto-reference loop. It is therefore a question to which we are unable to give a meaning. But are we willing to accept light heartedly to dispose of it so easily? After all nothing is going against there being no world. Of course, we would not be here to observe such nothingness but this does not make the question less important. One may feel satisfied with the statement that the question is meaningless; one still cannot help being disturbed by this observation. Close to the question is the famous sentence by Leibniz, “There is a reason in Nature such that something, rather than nothing, has to exist”.

Unfortunately, we are unable to give a meaning to the question. How could we answer it? We are here very close to Descartes’ cogito: whoever may wish to fool me, I pretty well know that I exist as something that is thinking; whoever may wish to fool me, the world might say, I pretty well know that I exist and that I am not nothingness, I pretty well know that I exist as something that is thinking, I mean something able to think about itself.

What Wittgenstein calls the Mystique – may be should we simply call it the Mystery – is much too important for us to resign ourselves to keep silent about it. In our minds and hearts it plays much too large a part. Having stirred up the metaphysical horns’ nest has done us a lot of good! We have disposed of traditional concepts that had taken centuries to be conceived, and here we are, back to square one, facing a Mystery that we cannot even talk about...

To talk about it, we have the major systems of the world, milestones marking out the history of metaphysics and religions. In order to hold forth on it sensibly outside the auto-reference loop, these are calling for acts of faith, sometimes supposedly revealed, that are the price to pay for our evasion. Inside the loop,
words such as ‘reality’, ‘truth’ or ‘existence’ are synonyms that simply mean ‘belonging to the story that is being told’. Metaphysics and religions credit such words with much more daring semantic ambitions. It is then important to define them clearly and precisely to avoid discussing of the sex of angels.

In most cases, it is inside the loop that one looks for clues which might show the way. As an example, some think that the arcane concepts of quantum physics might be hiding possible keys; but how can they hope to find the key of the Mystery in an illusion of commonsense? All metaphysical systems make use of the logics that is being used inside the loop. Even religions accept it in most cases, rarely taking the liberty of preferring a metaphor of a moral or poetic nature to make their point. But those who wish to extend their reflection in a metaphysical framework should not get fooled by the words they are using. They must not only properly define the concepts – monads, God, infinity, things-in-themselves, and so on – but also, more simply, they must state which logics, which language they are using outside the auto-reference loop: it is not that plain that they should be the same as inside.

Today, we no longer can afford to talk about the Mystery as did Plato, Augustine or Descartes, in terms that ignore what has been learned from contemporary science. Doing so would simply imply turning over and over the same mirages and illusions.

Clearly, we are not prepared to accept light heartedly the absurdity of human condition that is implied by our being imprisoned inside the auto-reference loop. Camus, together with numerous contemporary thinkers, described it well: “an implacable refusal, contrasting with an overwhelming desire for clarity crying from deep inside us” [11].

Knowledge does not close the door to Mystery; its fundamental disability, auto-reference, prevents it from answering a question which sounds to us so important: ‘Why this world rather than nothing?’ On the contrary, it is revealing how deep the Mystery is; it makes us become conscious of the absolute inability of knowledge to unravel it. To whom regards as essential to know the answer to such questions, it offers the possibility of an ethics constructed on the basis of his beliefs, on the basis of such or such a religion or metaphysical system, the founding principles of which he is willing to accept outside the auto-reference loop.

To whom is not ready to accept such postulates, for example because he finds them unfounded, it tells that he will never know why this world is here rather than nothing. He will have no other choice than sheer humanism to base his life on. That is all he may grab hold of. Together with Camus, he will have to accept that “happiness and absurd are both sons of a same earth, they cannot be pulled
apart” and that “fighting for the top is enough to fill a human heart, we must think of Sisyphus as being happy” [11].

Let us remember David Hume who, after having told us how frightened he is by the solitude in which he is placed in his philosophy, comforts us promptly by adding “Most fortunately it happens, that since reason is incapable of dispelling these clouds, nature herself suffices to that purpose, and cures me of this philosophical melancholy and delirium, either by relaxing this bent of mind, or by some avocation, and lively impression of my senses, which obliterate all these chimeras. I dine, I play a game of backgammon, I converse, and am merry with my friends...” [12].

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References
[1] To quote a few among the most representative,
Quantum physics, as is well known, is not deterministic. However, the scale and nature of quantum phenomena are such that quantum physics can be safely ignored when discussing free will. It is not the place, in an article meant to address a broad audience, to argue about this point.

Discussions on free will in the context of contemporary neurosciences often refer to experiments conducted by physiologist Benjamin Libet. While considering these experiments highly valuable, I deliberately do not discuss them by fear of giving them too much weight. There is no doubt that Libet’s experiments are an important contribution to our understanding of free will but I would have written essentially the same article in their absence. What I say rests on the whole of contemporary neurosciences and on the coherence of the picture emerging from the hundreds of observations that have been made and analyzed. The same can be said concerning the role of Alain Aspect’s experiment in discussions concerning the non separability of the quantum world.