

The Wings of Imagination – the missing link in the origin of consciousness?*

Revisiting the Mystery of Consciousness – a sketch of an alternative perspective to elucidate the emergence of conscious thought

Abstract

Under the broad theme of consciousness studies, the origin of consciousness is examined through the focus of the evolution of imagination. The imaginary is proposed to be both a process and result of the organism-object relationship, and source of the capacity of imagination. Based on Castoriadis, Damásio and Donald, the hypothesis of a third level to the flow of images is suggested to explain the evolution of imagination, and a hypothetical scenario to its evolution in the human species is sketched. The *status* of the representation generated by the imaginary is examined, and is regarded as being at the same time real and fictitious. The role of the imaginary in education, art and science is briefly analysed. It is suggested that the capacity of imagination is essential to understand the creative way in which human beings learn and (re)construct their reality.

Key-words: imagination, consciousness, evolution

1. Introduction

The mystery of consciousness is in simple terms the enigma of the sprouting of mental images – in particular those ones which form conscious thought – from physical, chemical, biological and neural phenomena which occur in the brain. How from these events can be explained the emergence of consciousness of the world and of oneself, essential characteristics of the human being? On the way to elucidating this mystery, neuroscience and philosophy often cross each other's paths bringing mutual inspirations in a "singular but positive alliance" (Damásio, 2000, p30).

In this search there is a need, amongst other aptitudes, for much creativity to create explanatory models which synthesise in a coherent manner new perspectives and theories on consciousness in confrontation with available empirical evidence. Furthermore, creativity is what is needed nowadays to solve several problems of our technological civilisation. This has unfortunately shown itself unable to solve old and new problems, such as peace, security, hunger, poverty, housing, health, education, employment, pollution, preservation of the environment and natural resources, sustainable growth...

The curious fact, however, is that 'creativity' is not regarded as a central subject matter of scientific studies in either neuroscience or philosophy. There are few researchers as an exceptions (Boden, 1994; Mithen, 1998; Hameroff et al, 1998, part XV; Fauconnier&Turner, 2002). It is as if creativity is an inherent faculty of human beings. But if so, how is it so? How does it operate? How did creative ability develop in the emergence of the human species? Following this reasoning, why do creative people display so much imagination? After all, what does imagination have to do with creativity? Finally, what does imagination have to do with the emergence of consciousness?

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Traditionally, imagination means the capacity to evoke fictions and illusions about reality and denotes the fantasies themselves created. They are seen as imitations, reproductions or combinations of images of the senses, which are perceived in the person's own experience. In this way, “it is only possible to imagine combinations of what we have already seen or felt in some way” (Herculano-Houzel, 2002, p154). The imagination is thus viewed as a mere by-product of the human capacity to perceive, evoke or think. I believe that we may (and must) go beyond this. Here, I intend to conceive the capacity of imagination as an essential part of both the origin and evolution of consciousness.

I start the journey examining Castoriadis' thesis on the imaginary as the power of creation (Castoriadis, 1987, 1997a, 1997b, 1999). Next I identify where his thesis may be located in the 'mystery of consciousness'. I begin then the sketch of an alternative perspective, based on Damásio's theory of the emergence of the self as “the feeling of what happens in an organism caught in the act of interacting with an object” (Damásio, 2002, p9). I suggest that the representation itself emerges from this organism-object interaction as a creation of the living being. The hypothesis of the flow of third order images is raised to explain the creation of symbolic representations, and then I describe a hypothetical scenario for the evolution of the consciousness by means of the evolution of the imagination. I sketch a new conception of imaginary, examining the *status* of the representations generated. Finally, I examine briefly the role of this redefined imaginary – in Education, in Art and in Science, seen as a result of the creative imagination.

2. Imaginary as Power of Creation

The central thesis of Castoriadis' philosophical work (Castoriadis, 1987, 1997a, 1997b, 1999) is that the imaginary is responsible for the constitution of the human species; it is an original substance of human beings, and is operative in the individual institution of the self, as well as in the collective institution of language, culture and society. However, how could the imaginary – the source of fancies and illusions – have such an importance in human beings? Let us carefully examine the meaning of the imaginary defended by Castoriadis, its form of being, and its role in the sprouting of consciousness.

The imaginary presents two interdependent meanings. First, it is the capacity of mind to create representations of objects, be them existent or not: the power to create images. Second, the imaginary is the product itself of that power of creation, the representations created. The way of being of the imaginary explains why their meanings are at the same time distinct and inseparable. The imaginary is formed by a dynamic and uninterrupted flow of representations generated in the mind, from the perception of the senses up to the highest levels of abstraction. This representational flux also presents the characteristic of being generated by the living creature and, simultaneously, of being constituent of the living creature itself. Thus, the imaginary – as power of creation and as representation created – constitutes and represents the living being, as well as its own world (*Eigenwelt*) (Castoriadis, 1997a, p262; 1997b, p326).

The imaginary is 'radical' because it creates in first instance the representation (image, form, idea, quality) of a given object, be it concrete or abstract. This radicalness of the imaginary means that the interaction of the living being with its external environment, which generates a representative flow, precedes the distinction that it makes between 'real' and 'fictitious' (Castoriadis, 1997b, p321). It is only

by the effective interaction of the living being with its environment that it will certify in itself the *status* of the representation created, and will distinguish the real from the fictitious.

For instance, in physical nature there are no colors, sounds and smells, only electromagnetic waves, vibrations of air and kinds of molecules, known as 'primary qualities'. Colors, sounds and smells are regarded as 'secondary qualities'. However, the electromagnetic waves, vibrations of air and kinds of molecules do not “explain” the color, sound and smell perceived by the living being, they just establish a correspondence correlation with the perceptions of the color, sound and smell which it needs to imagine to compose its own world (Castoriadis, 1997a, p351; 1997b, p323). It is in this way that the radical imaginary is before the distinction between 'real' and 'fictitious'; it is an original source for the construction of the reality of the living creature.

Another important feature of the representative flow of the imaginary is that it is at the same time representative, affective and intentional (Castoriadis, 1997a, p338). The power of creation, and the representations created, are both results of an active disposition of the living being whenever interacting and exploring the surrounding environment. In this sense, the imaginary is already present in the simpler living beings, even if they do not possess a central nervous system. As explained by Maturana and Varela (2003), the division between the interior and the exterior of an organism, of a paramecium for instance, already makes it capable of 'representing' actively its external world. It is able to perceive a sugar gradient in the environment, to represent it biochemically, to be affected by and to react actively to reach the food source. In short, it is an autonomous agent from a biochemical viewpoint, as defined by Kaufmann (2000, ch3), and hence there is no passivity of the living being in relation to its surrounding environment (Castoriadis, 1997b, p323).

According to Castoriadis, the imaginary of all living beings except the human are basically fixed, regulated and functional in terms of their biological need satisfaction (Castoriadis, 1997a, p262). This means that the creative capacity of representations is regulated biologically to the fulfilment of the most immediate survival needs – food search, self preservation, procreation. For instance, a frog is born already “knowing” instinctively what is food. On the other hand, mammals have to learn what is food by observing their own parents. However, once it has learnt what is food, the imaginary has already fulfilled its biological function; a young fox for instance, which has already created an 'image' of the rabbit as a possible food source, will keep it in mind for all its life.

In the human being, according to Castoriadis, the radical imaginary suffers a rupture by means of an over development of the brain and a distinct organisation of its components (ibid., p262). It becomes autonomized and defunctionalized in terms of the fulfilment of strict biological needs. The human imaginary becomes capable of disconnecting itself from the external X of the perceived thing and, with this, it turns back on itself in an endless and recursive cycle. The object of the imaginary can then be the imaginary itself. Thus the human being becomes able to create images of the images themselves. This relative disconnection occurs together with another crucial change: the representational pleasure exceeds organic or natural pleasure (ibid., p263). With such alterations the human being became able to create symbolic representations of representations and by means of which, was able to institute human language, culture and society. Let us examine step by step how Castoriadis explains the emergence of social institutions from that autonomization of the imaginary.

The rupture of the radical imaginary has resulted in a relative disconnection between the representative flow and the external X. To understand this rupture, let us consider the case of a fox in relation to a rabbit. The setting in place of a representation (of the rabbit) occurs through an 'image' or a generic representation, that is, through the capacity of the fox to view what is saliently the same in that representation, neglecting secondary elements (simple differences of time and space). This preserves what is essential, as far as need and usage are concerned, as the 'same image' (ibid., p261). In the animal, however, the perception of the 'sameness' is supported as the simple generic image, and corresponds to the elementary mental level, notwithstanding that such perception already contains a reasonably logical and aesthetic organisation of elements.

The rupture of the imaginary in the human being has made the perception and the awareness of the 'sameness' dependent – here we enter into the human realm – on something that is there *for* the image, that is, something *for* something else – a symbolic *quid pro quo*. The fixation upon an image as representing such or such thing, which goes beyond it, is supported by a sign or word (Castoriadis, 1997a, p261; 1997b, p329). As already argued, the creation of a perception may be conditioned by an external X, however they are not “caused” by it. Thus, an electromagnetic wave of a certain frequency is not “blue”, does not cause the color perception as color, it only induces (*Anstoss*), under certain conditions, the creation by the living being of the image of “blue” constructed by means of its radical imaginary. In the human being, however, there is more than this, there is the creation of the word “blue”, a genuinely human creation which is learnt and shared generically and socially. In human beings forms and qualities are more or less transitory or permanent, more or less generic or singular creations.

The symbolic capability of the autonomized imaginary has led to a revolution in the animal kingdom. The human psyche constitutes a decisive turning point in the evolution of imagination: the redoubled and potentialized capacity in a limitless and recursive cycle to see a thing in another one, and still another thing in the previous one (metonymy), an imaginary symbol representing anything, be it existent or not be, which has no relation to what it “represents” (Castoriadis, 1997a, p262). We have not only representations provoked by external 'shocks', but images that arise from the “hallucinated” representational flux turning back on itself, constituting the wings of the human imagination.

For instance, “a composer getting a musical idea is not “reacting” to anything, at any rate *not* at *this* level and certainly nothing “external”... This 'reaction' is not 'an idea in the mind': it is a total state of the subject ('body' and 'soul')” (Castoriadis, 1997b, p324). Yet it is possible to speak about a tree in general without any tree being present. However, we know quite well that there is no “tree in general”. This is an abstraction constructed socially from the observation of several trees, which is not consensual as is important to stress, and as such it is a creation of the imaginary. Thus in the human kingdom we have the possibility to create representations of non-existent things such as “dragon”, “big bad wolf”, “Santa Claus”, “immortality”, “Virgin Mary”, “bogyman”, etc.

Castoriadis contends, as did Freud, that nothing allows one to distinguish in the human psyche between a 'reality' and a 'representation invested with affect', the representational cathexis (ibid., p328). Thus the predominance of pleasure in representations over the pleasure in biological organs occurred by means of the creation of invisible objects: imaginary social creations (Castoriadis, 1997a, p265). In short,

the relative autonomization of the radical imaginary from the external object, and the prevalence of the representational pleasure over the biological, dislocated the object (of the representational cathexis) from strict biological needs to “social needs”, i.e. those created socially. The cathexis of objects started to be the social activities and representations themselves. Human beings started to create and to make sense of their life by means of symbolic forms and representations about reality, such as word, triangle, number, concept, value, taboo, clan, nation, property, goods, family, love, God, marriage, art, freedom, science, democracy, etc, and thereby started to institute imaginary language, culture and society (Castoriadis, 1987, ch6).

Finally the emergence of human consciousness, of itself and of the world, arises as a result of the reciprocal and recursive interaction between the autonomized representative flow of each singular human being, and the imaginary already instituted previously and collectively in language, culture and society. There is something crucial in this recursive interaction: according to Castoriadis the rupture of the imaginary could only occur when language, culture and society had simultaneously appeared. These are what re-establish a function for the “hallucinated” imaginary, now as “social function”, since the autonomized imaginary has defunctionalized in strictly biological terms (Castoriadis, 1987, p312; 1997a, p323). This means to say, in order that the representative flow of human psyche could set itself free from the purely biological drives, it would have been obligatory that something external – language, culture and society – could offer the forms (representations, qualities, images, words, ideas) of imagery significant (and affective) for young human beings since infancy.

In synthesis, both the social subject and the language, culture and society are a result of an endless interactive and recursive process whereby they construct themselves mutually through the generations. Current human consciousness is therefore the result of an individual and collective construction of generations and generations of human beings, since the human species has appeared with its biological characteristic of autonomized imaginary.

There are problems, however, in the thesis of the imaginary. I point out two of them. Firstly, Castoriadis conceives of thinking capacity and language as almost synonymous. Thus somebody who did not speak, for instance, would not be able to think. Yet neuroclinical evidences show clearly that conscious thought and language do not conflate (Damásio, 2000, p107). There are several clinical cases of conscious people who are not able to speak, although it is equally clear that the full development of consciousness is only possible through language, be this vocal, gestural or tactile one. The cases of Zaslavsky and Helen Keller are prime examples of this (Donald, 2002).

Secondly, the idea that the autonomization of the radical imaginary would have occurred by means of a rupture with the consequent simultaneous appearance of language, culture and society, is enigmatic and unreasonable in biological terms. In order for the autonomization to have occurred it would have to have been more gradual, with perhaps several moments of rupture. I believe only in this way it is possible to defend the idea of the autonomization of the imaginary. The perspective sketched here will adopt such a position. In the following I will examine where exactly the thesis of the imaginary may fit into the enigma of consciousness.

3. Consciousness as 'The Feeling of What Happens'

Based on Damásio and Chalmers, I assume the mystery of consciousness is divided into three main parts, related to the means of generation in the mind of: a) the neural patterns and maps which compose the images; b) the subjective experience of mental images of perception, evocation and thought; and c) the conscious experience of the self, that is, the consciousness of *my* self in relation to the world.

Chalmers explains that the great advance in neuroscience has occurred in the first part calling it “soft problems” of neuroscience (Chalmers, 1996, 2002), which Damásio defines as the mapping of the cerebral regions involved in the generation of the “movie-in-the-brain” (Damásio, 2002). For each mental function it is possible to identify distinct parts of the brain that contribute to the production of a function by working in concert, such as of the memory, the sight, the motor reply to a sound, etc. Close correspondence exists between the appearance of a mental state and behaviour and the activity of selected brain regions (ibid., p8). It is fully possible to identify the neural base of the movie-in-the-brain. “This “movie” is a metaphor for the integrated and unified composite of diverse sensory images – visual, auditory, tactile, olfactory and others – that constitutes the multimedia show we call mind” (ibid., p7).

The second part of the mystery of the consciousness is defined by Chalmers (2002) as “the hard problem”. How does the subjective experience, of a perception for instance, appear from the cerebral physical process? The pure description of how the brain manipulates stimulus and information, of how the behavioural and cognitive functions related to the consciousness occurs, in short, of how the movie-in-the-brain is generated, leaves intact the following question: why does the accomplishment of all those functions happen together with a subjective experience? Chalmers reminds us that “there are facts about the conscious experience that cannot be deduced from physical facts about the functioning of the brain” (ibid., p93).

The third part of the enigma of consciousness is that which Damásio theorises in detail, and concerns the subjective consciousness of the 'self', that is, how we generate the sense of ownership for the movie-in-the-brain (Damásio, 2002, p7). For instance, I see a red rose in front of me and at the same time I am conscious that it is me who is seeing it.

The second and third parts involve directly the old problem of *qualia*, that is, the issue of the origin and the explanation of mental images formed in the mind from physical processes to represent forms and qualities of objects, which are perceived by the organism when interacting with them (Levine, 1983, 1999). The issue of 'the explanatory gap' combines philosophy and neurosciences in an exemplary form, and should not be underestimated, however a detailed evaluation of several trends, as well as a critical analysis of them is beyond the scope of this paper. Briefly however, there are basically two ways to face the problem of *qualia*. Firstly, the mental images are regarded as a sort of reflection in one way or another of an “external reality” of the organism. In this sense, for instance, Dawkins (1982) has created the concept of “memes” to explain the constitution of the mental representations which are regarded as the “genes” of the human culture and as even able to evolve.

Secondly, the images are regarded as a creation of the living being. Castoriadis defends this approach and conceives of a simple and direct mechanism: the creative power of the imaginary. Damásio

does not explicitly defend this approach, however his theory explaining the consciousness of the self fits coherently into the idea that mental images are also a creation of the living organism. So I will make use of his neurobiological description basis, as well as his definitions and concepts, in order to re-examine and combine with them the philosophical thesis of the imaginary.

Damásio's central idea is that the consciousness of the self arises from within the movie-in-the-brain. To examine similarities and differences between the conceptions of Damásio and Castoriadis in this respect, let us see how the production of the multimedia show occurs in the movie-in-the-brain.

According to Damásio “there is no mystery regarding the question of where images come from. Images come from the activity of brains and those brains are part of living organisms that interact with physical, biological and social environment. Accordingly, images arise from neural patterns, or neural maps, formed in populations of ... neurons, that constitute circuits, or networks” (Damásio, 2000, p322). In this scheme, an image is a dynamic mental pattern “with a structure built with the tokens of each sensory modality – visual, auditory, olfactory, gustatory, and somatosensory” (ibid., p318). The later includes the sense of touch, pain, temperature, time, as well as affection, such as fear, hatred, love and joy. “Images in all modalities “depict” processes and entities of all kinds, concrete as well as abstract” (ibid., p318). Thus “the process which we know as mind... is a continuous flow of images... which advances in time, slow or fast, in an ordered or tumbling way, and sometimes follows not one, but many sequences. Some times the sequences are competing, another times convergent and divergent, or still overlapped” (ibid., p318). Hence, “Images are constructed either when we engage objects, from persons and places to toothaches, from the outside of the brain toward its inside; or when we reconstruct objects from memory, from the inside outside, as it were. The business of making images never stops while we are awake and it even continues during part of our sleep, when we dream” (ibid., p319). Images may be unconscious, that is, not all the images constructed by our body/ brain become conscious, since there are too many images being generated and too much competition for the “window” of the conscious mind. “In other words, metaphorically speaking, there is indeed a subterranean underneath the conscious mind, and there are many levels to that subterranean” (ibid., p319).

Very close to the flow of images, Castoriadis defines 'representational flux' as a simultaneously representative, affective and intentional flow, from which the representations in the mind originate. The author has elaborated this notion from the studies of philosopher Merleau-Ponty who criticises Heidegger's idea that 'the soul *has* representations', and the philosophical version of Heidegger's body-mind division, which rests on a mechanical model of vision. In this model:

“I am supposed to be quite distinct from what I see, not implied therein; sight is, in a sense, at my disposal inasmuch as, for example, I can always close my eyes or turn my head. likewise, therefore, I dispose of an internal screen, on which I project at will this or that image. There is a metaphorical third eye, an internal dark room, a projection screen. Behind the third eye stands a “mind” that, by flipping a switch, lights up the screen and then “has” a representation” (Castoriadis, 1997a, p281).

Against this mechanical model which results in the brain-mind division, Castoriadis argues that the mind is constituted by a representational flux:

“The “mind” is, first and foremost, this perpetual “presentation” of “something” that it is not there *for* something else (re-presentation, *Vertretung*) or *for* “someone”. Perception, dreams, reverie, memory, phantasm, reading, hearing music with eyes closed, thought, are first and foremost that, and they rigorously enter under the same heading. Whether I open or close my eyes, whether I listen or stop up my ears, always, except in dreamless sleep, *there is* that itself – and, to begin with, nothing but that – which is in and through this presentation; there is absolute “spectacle”, which is not spectacle of another trans-spectacle, nor is it a spectacle for a spectator, the spectator herself being, inasmuch as she is at all, on stage” (ibid., p282).

Damásio considers similarly that it is within the multimedia show itself – the dynamic flow of images produced in the movie-in-the-brain – that the subjective consciousness arises:

“Self-awareness is actually part of the movie and thus creates, within the same frame, the “seen” and the “seer”, the “thought” and the “thinker”. There is no separate spectator for the movie-in-the-brain. The idea of spectator is constructed within the movie, and no ghostly homunculus haunts the theater” (Damásio, 2002, p11).

In an almost identical way, Castoriadis argues that the second order thought, the self consciousness for example, is a posterior construction, a supervening metaphor which follows from a thought of turning back on the representational flux; it is a sort of illumination which arises in and from the interior of what is not initially illuminated (Castoriadis, 1997a, p282).

Lastly, Damásio considers that the consciousness of the self comes out as a feeling:

“objective cerebral processes sew the subjectivity of the conscious mind from the fabric of the sensorial mapping. As the most basic thing of these [processes] belongs the physical states and is represented as feeling, the sense of the “self” in the act of knowing appears as a special type of feeling – the feeling of what happens in an organism caught in the act of interacting with an object” (Damásio, 2002, p11).

Up to this point both descriptions are of an amazing similarity. However Castoriadis considers two different hypotheses regarding the form that the subjective consciousness takes, from the flow of images generated in the movie-in-the-brain. Firstly, the flow of images has the power to create representations of the external world, the radical imagination. Damásio does not conceive of the flow of images as possessing explicitly such a power. Although, curiously, the author seems to suggest it, at least implicitly, when he argues that the “neural patterns and the corresponding mental images are as much creations of the brain as they are products of the external reality that prompts their creation” (Damásio, 2000, p320).

In a second hypothesis, Castoriadis considers an interactive and recursive mechanism between the images constructed by the human brain psyche and the images already instituted by the society, from the language already instituted. In other words, the consciousness of the self and of the world would appear from the flow of images, as Damásio contends, but only when that flow of a singular individual interacts with an already instituted social environment, enclosed in its language, culture and society.

4. The Wings of Imagination in the Origin of Consciousness

“neural patterns and the corresponding mental images are as much creations of the brain as they are products of the external reality that prompts their creation”

Damásio, *The Feeling of What Happens*

From the ideas of Castoriadis, Damásio and Donald I will formulate the sketch of an alternative perspective which seeks to conceive of the origin of consciousness by means of the evolution of the capacity of imagination. I will draw upon Damásio's theoretical description, reformulating it with the addition of Castoriadis' and Donald's ideas.

I regard the flow of images of the brain as generated in three levels. We would have, thus: a) the first order flow, produced from neural patterns resulting directly from the body, which maps the body and, at the same time, the external environment by means of the five senses; b) the second order flow, which maps continuously the transformations of the organism in relation to the object with which it is interacting at the moment, and which already produces the primary and swift sense of the self; and c) the third order flow, which maps the previous mapping and creates a non-transitory meta-representation of the self and of the interacting object. This third order flow of images, based on the representational flux of Castoriadis, is an original idea of the present paper. The first two flows are part of Damásio's theoretical explanation.

In order to explain the three levels of the flow of images I adopt Damásio's strategy of examining them by parts. Although they occur in an intertwined form, it is convenient to separate them to examine their differences. Such flows can only be understood by means of the two “actors” of the mind, the *organism* and the *object*, and as function of the relationships they maintain when interacting (Damásio, 2000, cap5). The mind originated from a part of the organism, the brain, specialized in mapping the organism and the object, as well as its dynamic interaction. The object is any thing which interacts with the organism.

In order to survive, the organism engages in a relationship with some object, and the object in this relationship causes changes in the organism. In this interaction the first order flow of images continuously maps the organism internally in such way that any alteration which threatens the physical integrity of the body can be readily responded to reestablish the organism's homeostatical balance. The organism's structure needs to be steady, cannot suffer radical alterations; and the nervous system has unconscious mechanisms that allow it to give fast responses to those alterations. A simple example is our reflex reaction to withdraw the hand when touching something very hot.

The same first order flow maps, simultaneously, alterations in the organism provoked by the object in the body parts responsible for perceiving objects, the five senses. It is worthwhile noting that perceptions are all physical and corporeal, originating from the changes that the object induces in some parts of the body. This mapping of the primary flow of images already exists in the simplest animals, and corresponds to the proto-self. In higher animals this first level is vital so that the brain can “know”, still unconsciously, what happens to its body and to the external environment when interacting with some

object. It is important to observe that consciousness would be impossible without this primary corporeal mapping continuously carried out through, and brought up to date by, the first order flow of images while we are awake.

Yet the second order flow maps the relationships between object and organism in a second level when some object is interacting with the organism at that moment, and generates then a second representation, that of the organism interacting with the object, called 'core self' by Damásio. In his words,

“core consciousness occurs when the brain's representation devices generate an imaged, nonverbal account of how the organism's own state is affected by the organism's processing of an object, and when this process enhances the image of the causative object, thus placing it saliently in a spatial and temporal context” (ibid., p169, italic in the original).

Damásio's proposal for the core self is based on what follows (ibid., p169). The organism is mapped in the organism's brain within structures which regulate its life and signal its internal states continuously. The object is also mapped in the brain, in the sensory and motor structures activated by the interaction of the organism with the object. Both the organism and the object are mapped as neural patterns in first order maps which may become images. The sensory-motor maps, which represent the object, continuously cause changes in the maps concerned with the organism. Such changes may be represented in other maps, the second order maps which then represent the relationship between organism and object. The neural patterns fleetingly formed in the second order maps may also become images. As the representative character of the images generated is not separable from the affective ones, the mental images which represent the relationship between organism and object arise as a feeling. The feeling that is me who is in front of a red rose, for instance. In short:

“as the brain forms images of an object – as a face, a melody, a toothache, the memory of an event – and as the images of the object affect the state of the organism, yet another level of brain structure creates a swift non verbal account of the events that are taking place in the varied brain regions activated as a consequence of the object-organism interaction. The mapping of the object-related consequences occurs in first-order neural maps representing proto-self and object; the account of the causal relationship between object and organism can only be captured in second-order neural maps ... [It is as though the] swift, second-order nonverbal account narrates a story: that of the organism caught in the act of representing its own changing state as it goes representing some else” (ibid., p170, italic in the original).

That is the way in which the knowable entity of the living catcher, the representation of itself, is created in the narrative of the catching process:

“The images in the consciousness narrative flow like shadows along with the images of the object of which they are providing an unwitting, unsolicited comment. To come back to the metaphor of movie-in-the-brain, they are within the movie. There is no external spectator” (ibid., p221).

The person knows that she is conscious, feels that she is in the act of knowing, because the subtle

imaged account that is now flowing in the stream of her organism's thoughts exhibits the knowledge that her proto-self has been changed by an object that has just become salient in the mind. Still,

“You know it is *you* seeing because the story depicts a character – you – doing the seeing. The first basis for the conscious *you* is a feeling which arises in re-representation of the *nonconscious* proto-self *in the process of being modified* within an account which establishes the cause of the modification. The first trick behind consciousness is the creation of this account, and its first result is the feeling of knowing. ... You hardly notice the storytelling because the images that dominate the mental display are those of the things of which you are now conscious – the objects you see or hear – rather than those that swiftly constitute the feeling of you in the act of knowing” (ibid., p172).

Summarising, the second order flow of images of the core self requires the presence of the *proto-self*. The biological essence of core self is the representation – in a second order map – of the proto-self being modified. The transitory 'self' of the core consciousness is then generated from any object interacting with the living being. As there are permanently available instigator objects, the core self is generated continuously and thus the sense of 'self' seems continuous through time.

As Damásio notes, something remains in the mind after the sequence of ephemeral emergences of core self. In the human brain, endowed with vast capacity of memory, the fleeting moments of knowing, where we discover our existence, are facts which may be recorded in our memory. They may be also categorised and related to other memories concerning the past lived, as well as the future foreseen, and are normally constructed in a long learning process. The result is the development of an autobiographical memory. From the reconstitution of the personal records in images an autobiographical self starts to form. This is what allows the swift core self to transform into the named, situated, characterised, unified, and more or less permanent self, forming the base of our extended consciousness which characterises us as human beings.

The difficulty with Damásio's proposal begins in his definition of 'concept' as what is recorded in memory. “The concept exists in the form of dispositional, implicit memories contained in certain interconnected brain networks, and many of these implicit memories can be made explicit at any moment” (ibid., p174). Yet he affirms that “the autobiographical self is based on a concept in the true cognitive and neurological sense of the term” (ibid., p173), but he does not explain. Later, when he argues on the prevalence of the nonverbal account over the verbal one, in my opinion correctly, he affirms: “Words and sentences translate concepts, and concepts consist of the nonlanguage idea of what things, actions, events, and relationships are. Of necessity, concepts precede words and sentences in both the evolution of the species and the daily experience of each and every one of us” (ibid., p185). Yet he argues that the words of language do not come out of nowhere, cannot be a new translation of a nothingness before them. Thus “when my mind says “I” or “me”, it is translating, easily and effortlessly, the nonlanguage concept of the organism that is mine, of the self that is mine. If a perpetually activated construct of core self were not in place, the mind could not possibly translate it as “I”, or as “me” ...” (ibid., p186).

However, where does the construct which Damásio calls 'concept' originate from, such as the “I” or the autobiographical records? It is patent that the author avoids facing the *qualia* problem when he

affirms: “the focus of our enquiry here is not the matter of how neural patterns in any map become mental patterns or images... We are focusing on... the problem of self” (ibid., p170). Now, in so far as the first and second order flows of images construct more or less “simple” representations, which constitute proto-self and core self, the absence of a consistent answer to the *qualia* problem is not problematic yet. However, when we come to the level of autobiographical self, the lack of an adequate answer is more problematic. The complexity of representations on the level of the enhanced consciousness demands one searches out a more satisfactory explanation of the formation problem of the mental image from the neural patterns and maps.

Moreover, I do not believe it is possible to split, as Damásio does, the two problems: that of the subjective engendering of the mental images and that of the equally subjective formation of the feeling/sense of self in the act of knowing. If the author affirms that the emotions are not separable from consciousness and that the extended consciousness is based on the formation of autobiographical accounts, recorded in memory, then how could he separate the two problems? The feeling of self in the act of knowing always involves a knowledge which is also and always a representation. Yet this is constructed by means of mental images which are simultaneously representative and affective. Hence, how would be it possible to examine in a separate way the engendering of the sense/feeling of self in the act of interacting with an object, and the formation of the mental image of this object and of the self? In my opinion, the two problems are strongly interlinked.

Coming back now to the *qualia*, they are “the simple sensory qualities to be found in the blueness of the sky or the tone of sound produced by a cello” (ibid., p9). The basic components of the images generated in the movie-in-the-brain are made of *qualia*. As already argued, there are at least two pathways to answer the issue of the image formation. First, the concept (construct, image, representation, quality, form) is given externally to the brain with enhanced consciousness. A simple example, Kant's concept is something transcendental which is in some place in hereafter and which the human beings can or cannot catch. Another alternative, already mentioned, is that the concept would exist in the form of “memes” and brains with extended consciousness would be a sort of “store” of such mental representations. The problem of these alternatives is they are metaphysical, surreptitiously reintroducing the old antinomic dichotomy between the physical and objective brain and the abstract and subjective mind.

A simpler alternative is to conceive of the mental images and all their associated *qualia* in the same way as the sense of self in the act of knowing, as being born from within the movie-in-the-brain, as an integral part of the flow of images generated in the mind in the act of knowing the world and the own self. The argument is that, in the same way as self-awareness is part of the movie and thus creates, within the same frame, the “seen” and “seer”, the “thinking” and the “thinker”, also the subjective mental images are created by the organism itself, as an integral and inseparable part of the movie-in-the-brain. The mental images and their *qualia* are creation of the living being in the act of knowing the reality. In this manner, the mental images are what create the “seen” and the “seer”; they create a mental representation, in original and radical form, of the “thinking” and the “thinker” .

Stated otherwise, in the same way there is no separate spectator for the movie-in-the-brain, there cannot be a separate mental image for the movie-in-the-brain. The idea of representation, as a subjective mental image, is constructed within the movie and hence no mental image – external or independent of

the organism as a ghostly homunculus – can haunt the theater.

Now if we assume the hypothesis that the mental image is a creation of the living organism, the need to understand how this creation would be carried out remains. Castoriadis provides an initial part of the solution, claiming that the flow of images has the active power to create the mental images, in an original and radical way, a power called *radical imagination*. The idea is simple: the radical imagination is able to create the representations of the environment which the organism needs to survive, from simpler living beings to the human being. Exactly how this creation of the radical imagination is carried out will clearly continue being subject of researches in neurosciences. Here I do not intend to “solve” the problem of consciousness, I just raise an alternative perspective for the research in the area, that is the mental image and all its *qualia* is a creation of the living organism.

The scheme of the perspective sketched here could be thus described as follows: the first order flow of images creates representations of the environment, but in an instantaneous way, almost reflexed or reactive. This flow is already present in the simpler living beings and forms the proto-self. We could say its “imagination” would be, so to speak, on the level of a *proto-imagination*. On the other hand, the second order flow is able to create secondary representations, those of the organism interacting with objects of the environment, hence creating the primary sense of core self as much as a feeling of the 'self', as an image, transitory and non-verbal of this “I”. To introduce the hypothesis of the third order flow I will first try to explain how that would fit over the “building” of the previous flows.

By means of the first and second flows of image, the animals which possess them create ever more elaborated representations, and respond better to environmental changes. However, the core consciousness enhances the image of the causative object, the “attention is driven to focus on an object and the result is saliency of the images of that object in mind” (Damásio, 2000, p171), and is not the saliency of the image of 'itself', the protagonist creator of the images. Moreover, core self, being swift but fleeting, is not able to elaborate the experiences lived, to apprehend with them, to generate mental representations for them, and to keep their records in memory.

In order that the protagonist can refer to itself, to fix the image of itself (produced by the core self in the act of interacting with the object), it must be able to become object in the mind. I posit that this can be only carried out by means of a third order flow of images, capable of creating from the previous flow – the fleeting and continuous one of the core self – images of images, but in a non-transitory form. Extended memory does not suffice, because this does not explain the symbolisation capacity. Now in order that this capacity of non-transitory symbolisation emerges, still as an imaged, nonverbal account, I posit the need for that third order flow of images, which is able to have as its object the images of all modalities, including the images produced by the third flow of images itself. That is Castoriadis' representational flux, capable of turning back on itself. Neither the second order flow of images – continuous, swift and under saliency of the object – as defined by Damásio, nor the extended memory of autobiographical self would be able by itself alone to create the images of the autobiographical records of a person, or any records of the reality. It is necessary that the brain has the capacity to create these records, to give them form and meaning, a mental image to them, that is, to imagine them, so that then they can be stored in the enhanced memory and also reconstituted as images in the memory, again as a third order flow.

Continuing in the alternative perspective, the third order flow is capable of creating representations in a third level, images which in non-transitory form represent core self and the objects which interacts with, creating an account of third order, still as an imaged, nonverbal image, which can be certainly kept in the memory. For in such a way, a co-evolution of the capacity of imagination and of the extended memory has probably occurred.

The central feature of this third order flow of images is that it allows the organism which possesses it to apprehend the experiences of its life such as observations of the environment and its fellow creatures. The third order flow is the basic condition by means of which the first forms of language could appear, first among the animals, and later the symbolic language in the human being. In this way, animals such as monkeys, elephants and dolphins already possess to a degree a developed third order flow. Within certain limits and in varied forms they are capable of relative self consciousness, communication, and construction of some knowledge of self and of the world.

What would be the empirical evidences of the third order flow? As yet, they are few and badly elaborated. Damásio describes the structures of the primary flow of proto-self, the oldest of the brain, as being several brain-stem nuclei, hypothalamus, insular cortex, among others (ibid., p155). Now the structures of second order flow of core self, closely related to the primary flow are the cingulate cortices, thalamus, superior colliculi, among others (ibid., p193). In this point I need the aid of specialists in neurobiology. As I am not one of them I am only able to suggest ideas. Perhaps the structures of the third order flow would be the ones which Damásio regards as being “image space” and “dispositional space” (ibid., p219); or perhaps they would be the brain structures which form “the workspace of the mind” as theorised by Baars (1997). In a similar line, the “structured conceptual spaces” and their locations, transformations and blendings could be also very useful in this search (Boden, 1994; Mithen, 1998b; Fauconnier & Turner, 2002). Another pathway to find empirical evidence of the third order flow would be using the theory of neuronal group selection (TNGS), especially as theorised by Edelman and Tononi, who similarly consider consciousness as derived from a dynamic and unified flow of images (Edelman & Tononi, 2000, ch13). A possible sign of the third order flow of images would be its longer time of duration: while first and second order flows are quicker, lasting about 10 to 200 miliseconds – not usually linked directly to conscious states –, the third order flow lasts longer, about 400-500 miliseconds (Edelman & Tononi, 2000, ch12), is within a longer time frame of awareness (Donald, 2002, ch3) and uses commonly vast areas of brain and are clinically matched to normal conscious states of mind (Damásio, 2002, p219-26).

What should be stressed here is that the presumable strength of the hypothesis of the third order flow, so far, does not come so much from direct evidences, but from the intuition that the mental image must arise as a creation of the living organism itself. In such way, to coherently conceive of a gradual evolution of consciousness from the simpler living beings to the present-day humans becomes possible. Of course, this is clearly not enough and experimental evidences to prove such working hypothesis are being sought.

5. A Hypothetical Scenario for the Evolution of Consciousness

To complete the sketch concerned here, and based on Donald's ideas, I reconsider Castoriadis' rupture of the flow of images, but now in a gradual way, removing its enigmatic feature. In higher animals the third order flow of images is basically regulated by and functions for the fulfilment of the most immediate biological needs such as self preservation, search for food, procreation, etc. In a gradual evolution, the brain of the first upright walking hominids was gradually increasing and extending on a wide scale the brain structures which produce the third order flow of images, and those that are responsible for the extended memory.

I posit that during the evolution of human beings there must have been a *gradual* rupture of the radical imaginary which gave it relative freedom from biological and instinctive regulation, allowing the images produced to start reporting anything and everything of the life of the hominids, particularly their communal relationships. With this they became capable of expressing episodic stories, probably in mimicry and gestural language (Corbalis, 2003). Yet, in order that this could occur it was also necessary that, with the gradual rupture of the radical imaginary, the latter had become relatively disconnected from concrete sensory objects of here and now and immediate biological drives. It thereby started to enhance the capacity for symbolic abstraction. Moreover, the attention of the individual had effectively refocused away from the events of the environment, as occurs among chimpanzees for instance, to her own self relating to the other members of her species (Donald, 2002, p262-69).

Thus, with the gradual increase of the symbolic capacity, provided by the gradual increase of cerebral structures which produce the third order flow of images, probably a community of hominids originated which possessed a proto-language – already symbolic, however limited, a proto-culture and a proto-society. The crucial feature of the episodic self of these first hominids would be that the knowledge generated in learning processes – new discoveries and the invention of tools, for instance – could be orally shared by the community and passed ahead to future generations by means of the proto-language, hence forming the initial base of a hominid proto-culture. From this period the evolution of the hominid brain, with episodic consciousness, stopped being only biological. It became hybrid, a bio-cultural co-evolution (ibid., p202-4], hybrid evolution of a “community of minds” (ibid., ch7).

About 140 thousand years ago the bases for a jump in the bio-cultural evolution were ready for the emergence of a vocal language, now wholly symbolic. In accordance with Donald, this would never have appeared without a community of hominids which already possessed a proto-language with which it could share and pass on knowledge of their proto-culture. Therefore they were already organised in a proto-society. The third order flow of images then made a qualitative jump when, in the bio-cultural evolution, brain structures specialised in the generation, reception and processing of vocal language appeared. This allowed, in a nearly totally free way, the creation of symbolic images which may represent anything in an imaged, nonverbal level of the third order flow but which, particularly, may be readily translated to the form of words and sentences. Thus the symbolic narrative consciousness of the current human species appeared. A similar alternative of a gradual rupture, though not entirely in accordance with the above description, is proposed by Steven Mithen, who regards that 'autonomisation of the imaginary' as a gradual process of the human brain acquiring a 'cognitive fluidity' (Mithen, 1998b).

A basic feature of this narrative self is, however, that it is not conscious that the cultural representations which society constructs and reconstructs through the generations are its own creation, that of individuals interacting with the nature and between themselves. For example, when we say Jesus was born at Christmas on the December 24th of 2005 years ago, we are referring to a *story* already traditional and instituted which thus far makes sense to our society, to some degree, and which most importantly up to now occidental civilisation has lived in.

Donald calls 'oral-mythical' the culture of narrative self of these first human beings (Donald, 2002, p295). I believe this narrative self defines the evolutive stage of the mythical consciousness. Stories and traditions of the ancient peoples are essentially mythical, they narrate a closed world, telling who they are and how they appeared, and bringing a representative and affective meaning to their lives under the form of myths. Moreover, the culture of all societies molds the individual through socialisation. As Castoriadis explains, the process of socialisation starts with birth and finishes with the death of the individual. It turns the human being into an entity which speaks, has a social identity, a social state, is inhabited and determined by rules, values, and ends, an entity possessing motivation mechanisms which always are more or less adjusted to the maintenance of the existing society (Castoriadis, 1997a, p155).

The last jump of the third order flow of images was not biological, but occurred when the society created writing and thereby a form of memory external to the brain (Donald, 2002, p305). The knowledge accumulated, created and passed down verbally through generations of ancient cultures, started then to be kept externally by means of written records. It is not a mere coincidence the rudimentary basis of the sciences of astronomy, mathematics and physics started being created from the invention of the external memory. In particular the birth of philosophy in the ancient Greece signalled the beginning of the emergence of a new kind of consciousness, the reflexive or questioner consciousness (Castoriadis, 1997a, p87).

Up to the creation of philosophy by the Greeks, and up to now in some sense, human consciousness has been dominated by the traditions, and mythical stories of the world and of the human beings which made sense to the society and to people's existence and, most importantly, which *were not questioned* by them. However, the accumulation of written knowledge made possible the creation *sui generis* of a new kind of society with a new kind of individual, the Greek in the case, to whom the questioning of the traditions and myths was an integral part of their culture. The Greeks questioned explicitly the prevailing visions about nature, about themselves and also about the laws of their own society (ibid., p267). Again it is not mere coincidence that philosophy appeared in the same Greek society which created democracy, a new form of reflexive and conscious self institution of the society laws (Castoriadis, 1997b, p274).

Reflexive consciousness was later re-energised in the Renaissance period, and resulted in current philosophy, science and the democratic movement. The sciences, in particular, have been created by people with an extended questioning consciousness, which reached as far as possible into nature, society and themselves confronted reality itself. (For example, here I am looking for theorising the wings of imagination as an essential part in the origin of consciousness.)

Summarising this sketch, the relative autonomy of the third order flow of images, in the human

being allowed the emergence of higher order consciousness, first as an episodic self. Later, with the emergence of the totally symbolic vocal language, this consciousness has extended to the narrative and mythical self, although still alienated from its own stories. Finally, with the invention of writing, and more recently with symbolic technologies – all external memories –, the extended consciousness reached the level of the reflexive and investigative self that we have in present-day society.

In all the evolution of the human consciousness, the radical imaginary autonomized with its power of original and radical creation of new images – which I call the wings of imagination – assumes central role. I emphasise neither Damásio or Donald explain how records of autobiography and the world appear. They do not perceive that the extended memory and the external memory are not alone able to make the appearance of the new ideas which, accumulated in the form of knowledge, production and culture in general, have resulted in the rich symbolic world that we have in current civilisation. Our symbolic world is the result of continuous construction and reconstruction of the creation of the radical imaginary of endless generations of human beings.

6. A New Conception for the Imaginary

The delineated perspective above suggests a new conception of imaginary. Here I propose to sketch it giving a nuance which seeks to break down the antinomy between “real” and “fictitious”. I will examine the relationship between the representation created and the object perceived in order to consider that the imaginary appears as relationship between the living organism and the object of interaction and, as such, the imaginary denotes – in a continuum – a range from real things on one side to any fictitious things on the other.

The starting point for redefining the imaginary is the particular form which assumes the relationship between the main “actors” of mind, the organism and the object. The idea may be synthesised as follows: the imaginary is constituted by a flow of images produced by the body/brain of the living organism when interacting with objects. Objects are any concrete or abstract, exterior or interior things which incite the organism to generate images. The later are formed by given dynamic neural patterns which, combined and interlaced, compose an uninterrupted flow of images. The flow of images of the imaginary is continuous while the organism is awake, and constitutes the images and representations with which the organism constructs its own reality.

Conceived in this form, the imaginary appears as an interactive, continuous and dynamic relationship between organism and object. As a physical-chemical, neurobiological and psychic phenomenon, the imaginary is simultaneously a process and a result of that interactive relationship. As a process, the organism-object relationship continuously generates images of objects of reality. As a result of the organism-object relationship, the representations are born. They are the forms of the imaginary momentarily constructed both as a radical and original creation, and as a reproduction or reaffirmation of what were already created. As process and product, the organism-object relationship creates and constructs the “reality” *of* the organism *for* the organism.

This conception of imaginary is materialistic but non-reductionist: the act to generate representations and the product generated are inseparable. There is no subjective and abstract

representation separated from the objective and concrete act of living of a subject. Thereafter, living is knowing and knowing is living. Hence, as a complex synthesis of a relationship, the imaginary is inseparable from the organism which generates it and from the object that prompts it; the imaginary appears simultaneously as a construction of the living organism and as a product of the object of interaction.

Finally, the complexity of the organism-object relationship reaches a new qualitative level when, in the evolution of human beings, the imaginary autonomizes itself (relatively speaking) from the immediate object of the here and now, linked to the satisfaction of biological needs; The object of the organism-object relationship started to be the organism-object relationship itself. That is, the object of the imaginary started to be the imaginary itself. This made possible the creation of images from images, representations from representations, in a recursive cycle without any precedents in the biological world. This also made possible the emergence of human language (wholly symbolic), culture and society. Yet this qualitative jump was not carried out individually, but through a community of human beings endowed with an autonomized imaginary.

7. The *Status* of the Representation

“Never does the soul think without phantasm”

Aristotle, *De anima*

From this conception of imaginary – as a flow of images generated in the organism-object relationship – we may examine some of its consequences, since it deals directly with the issue of the *status* of the representation regarding the interacting objects. What is the *status* of the image regarding the object? Does it present as a faithful picture of the object? In other terms, how real is the image of the object?

An analogy of the mental image with the visual perception is useful here. Damásio explains that when we look at an external object we form comparable images in our brains. We know this because two people can describe the same object in very similar ways. But this does not mean that the images they see, constructed in a representation, are the copy of the object outside, because:

“the image we see is based on changes which occurred in our organism – including the part of the organism called brain – when the physical structure of the object interacts with the body. The signaling located throughout our body structure – in the skin, in the muscles, in the retina, and so on – help construct neural patterns which map the organism's *interaction* with the object. ... Thus the images you and I see in our minds are not facsimiles of the particular object, but rather images of the interactions between each of us and an object which engaged our organism, constructed in neural pattern form according to the organism's design. The object is real, the interactions are real, and the images are as real as anything can be. And yet, *the structure and the properties in the image we end up seeing are brain constructions prompted by an object*. There is no picture of the object being transferred from the object to the retina and from the retina to the brain. There is, rather, a set of correspondences between physical characteristics of the object and modes of reaction of the organism according to which an internally generated image is constructed. And since you and I are

similar enough biologically to construct a similar enough image of the same thing, we can accept without protest the conventional idea that we have formed *the* picture of some particular thing. But we did not” (Damásio, 2000, p320, italic is mine).

In summary, in the perception of an object, the signalling located throughout our body constructs neural patterns which map the organism's interaction with the object establishing a set of correspondences between physical characteristics of the object and modes of reaction of the organism. From the neural patterns mapped an internal image is created, whose structure and properties are constructions of the brain inspired by the physical characteristics of the object. The represented object is a product of the physical characteristics of the object and, at the same time, is a creation of body-brain of the organism, and, therefore, the representation of the object “is” and “is not” the object.

The image is objective in the sense of being a product of the object, though indirectly, through the mediation of the interaction of the object with the organism's body. But, at the same time, the image is subjective in the sense of being a creation of the living subject. This means that the image of the object has double dimensions: in the objective dimension, the image “is” the object, since it is from the later, with its particular physical characteristics, that the objective image started from. In the subjective dimension, the image “is not” the object since the image is a subjective construction of the body-brain, molded in accordance with the particular neurobiological and psychic characteristics of the organism which interacted with the object.

Let us examine closely the subjective dimension. It only could appear when the living organism developed the capacity to create a representation of the object, which obviously may have correspondences with the object, but which is not the object. This capacity to create a mental image of the object, which does not coincide with the object, is actually the power of *seeing in an object what it is not*, that is the creation capacity of imagination. In Kant, there is the following definition: “imagination is the power to represent an object into the intuition, even in its absence” (Castoriadis, 1997b, p246). Much earlier, Socrates had already affirmed that the imagination is “the power to represent what it is not” (ibid., p246).

The imaginary, defined as process and result of the organism-object relationship, possesses the capacity to create original and radical representations of objects. It allows the living, inspired by any object, to construct a representative subjective image of the object – presenting objective correspondences, one way or another, but it is not the object – which makes possible the subjective dimension of the organism-object relationship. Stated otherwise, it is the creative capacity of the organism-object relationship which has made possible the emergence of the subjective dimension of the organism-object relation and without it, the subjective dimension of the imaginary would be impossible.

It is by means of the subjective dimension that a real thing – such as an electromagnetic wave of certain frequency, reflected by a red rose – can be imagined or perceived as “real” for the living being. This constructs a subjective image of the form flower and the color red, which in such a case possesses objective correspondence with the object “red rose”. Thus, the constructed image of the object is “real” (or “as real as anything can be”, as Damásio says), however, at the same time, the image is not the object. And, in a sense, the image is not “real”, being a special form of “fiction” or “fantasy” of the object.

Therefore, as a flash of lightning in dark night, 23 centuries ago Aristotle declaimed in his treatise *De anima*: “Never does the soul think without phantasm” (Castoriadis, 1997a, p216). In this case, 'soul' and 'phantasm' correspond respectively to mind and imagination.

In that treatise Aristotle analyses mainly the second imagination, which has an imitative, reproductive or combinatorial character, and which started to be more or less what is meant currently by imagination. However, in the middle of the Book III, he introduces a completely different *phantasia*, without which, he affirms, there is no way for thought to exist (ibid., p220). Aristotle's phantasm or fantasy is the power of creation of the radical imagination – active power to perceive the “real” object by means of the creation of its “fictitious” image . And the imaginary, as a process and a result of the organism-object relation, possesses such power.

On the other hand, the objective dimension of the representation arises from the correspondences that may exist, in innumerable and varied forms, between the image created and the object represented. Several sciences explore the causal, logical, mathematically modellable correspondences of this objective relationship. For example, the representation of the three laws of classical physics, in the Newton's theory, describes the dynamics of material objects in a very high precision, at least to certain speeds and to bodies significantly bigger than the elementary particles.

I claim that there is no other way to perceive reality, or to construct its objective representations, except by means of the effective interaction between organism and object (imaginary). This interaction is simultaneously a physical-chemical, neurobiological and psychic phenomenon, in which certain aspects of the object interact with certain parts of the body of a person, materialised in a flow of images. So, due to the physically mediated and partial way in which the human being interacts and perceives objects, we do not have direct and integral access to the intrinsic reality of any object. In other words, the access to reality is always indirect and partial and, hence, we are unable to perceive the “intrinsic truth” of any object or phenomenon. It is the famous metaphor of Plato's cave.

This conclusion, however, does not affirm we cannot know the reality of objects. It says that the object cannot be perceived in its totality, or in a direct, integral and exhaustive way, but rather, by means of physically mediated and partial interactions, it is indeed possible to perceive innumerable aspects of objects and phenomena, their several partial *strata*. We are thus able to reach convergence about objective knowledge from them. Yes, there can be objective correspondence between representation and object, but there is no way to know either the full extent of that correspondence, or its degree of accuracy.

Therefore, the *status* of the representation in relation to the object is simultaneously “real” and “fictitious”. It is “real” because it is always the product of some object which interacted objectively with the subject, and prompted it to create a certain representation, even though illusory, such as the fictitious worlds of mentally ill people. It is “fictitious” because the representation is always a subjective creation of the live subject interacting with an object, even when it is clearly concrete and real, as, for example, the image of the computer in front of me at this moment. In other words, the quality of an object being “real” is intrinsically interlaced with one of being “fictitious”, since the real or fictitious quality of being also originates from the organism-object relationship, the imaginary. The inverted commas emphasise the impossibility of absolute separation between “real” and “fictitious”. In any “real” object there is always a

fictitious component, and in any “fictitious” object there is always a real component. For example, the representation “big bad wolf” is obviously fictitious. However, the animal “wolf” is real and the quality of being “bad” is also real, even though it is difficult to measure it objectively.

This reciprocal interdependence, the perpetual interlacing between objective and subjective dimensions of the organism-object relationship, does not mean that the extremes do not exist. There are indeed real representations, without inverted commas, which are inseparable from their subjective dimension, as well as fictitious representations, without inverted commas, which embody real elements that are inseparable from their objective dimension. Given this interactive, dynamic and experimental character of the construction of representations, these may correspond to the object in various forms and degrees. On one side, the correspondence is, so to speak, high and the representation can be labeled objective; the representation corresponds to what we usually call real. On the other side, when the correspondence is low, the representation may be generally regarded as subjective, or as fantasy; it corresponds to what we usually call illusion or fiction.

In synthesis, the *status* of the representation is at the same time real and fictitious. This means to say that the representation is *imaginary*, in the precise sense of being a process and a result of the flow of images generated in the organism-object relationship. Due to the interactive form of this relationship, in order that the subject of representation can differentiate the real from the fictitious, and vice versa, she has to certify in her own experience the quality of the representation generated, that is, her own organism-object relationship. Therefore we can conclude that there cannot be representations which are given, *a priori*, as real or fictitious to the subject. It is worth reminding that this singular individual experience is not realised in isolation from other people, but through a socialisation process since infancy.

Foreseeing objections which some readers may raise reading these lines, I will comment briefly on what seems to me are the greatest difficulties in accepting the imaginary as theorised here. The first difficulty is the antinomic vision of some entities of the reality. The classic vision of science separates, in absolute terms, the mind from the body, the fictitious from the real, the subject from the object, life from death, the subjective from the objective, error from truth, the abstract from the concrete, etc. We must acknowledge that the classic vision has allowed an enormous advance in knowledge about nature and society, and has resulted in our present-day technological civilization. However, such a vision is nowadays insufficient to deepen our knowledge about reality, from physics to the sciences of brain and society. Simplifying greatly, the logic of “it is either one thing or another”, of perfectly distinct and separate entities, must coexist, or be absorbed (not substituted!) by the logic of “at the same time, it is this and that, and is neither of them”, of entities deeply interlaced among themselves and often inseparable.

The second difficulty is that, since the Greeks, the search for the truth was associated with *logos* or *nous*, that is, the “reason” of things and thoughts (Castoriadis, 1997b, p244). On the other hand, *doxa* (opinion) was associated with the inexact impressions of senses and to products of imagination, that is to say: what is created are mere illusions and fictions. In this way, the search for the truth would be a problem of reason, seemingly nothing to do with imagination. Creation, since the Greeks, started to be thought of as a holy privilege. It was not possible that natural and social phenomena were conceived under the vision of the creation, or of indeterminacy. In philosophy and science, since their origin, the idea of *determinacy* – in the way of being of things, their movement and their transformations – was

much stronger than that of *creation*, of new things, first from elementary matter, passing through many levels of complexity, and arriving at the level of the human being, with its extended capacity of imagination and consciousness.

8. Imaginary and Education, Art and Science

“What was now proved was once only imagin'd”

William Blake, *The Marriage of Heaven and Hell*

If the imaginary, as redefined here, is correct, it presents deep implications for the current vision that we have of reality and the process of knowing it. A thorough analysis of such implications will not be realised in this article. I will restrict myself to preliminary comments on some evident consequences in three human activities: education, art and science.

It is assumed that the human representations of reality (a) are fruit of the organism-object relationship – the imaginary; (b) have objective and subjective dimensions interlaced; (c) originate from the extended symbolic capacity of a relatively autonomized imaginary; (d) compose form and content of knowledge; and (e) are collective and historical creations of many generations of human beings. Thereby the creation of the representations presents two faces: it can be a “repetition” of the representations already created by the human community and instituted in culture and society, such as science. Or it can be the creation of new ideas and representations, creation *sui generis*, radical and original, which incite new forms of seeing and acting on reality, such as quantum theory, or virtual communities on the internet, among countless other examples. Thus, the process of apprehending knowledge already created, and the process of creating it, are interlaced activities, in that the creative imagination must be present in both activities so that they can occur effectively.

Learning means reconstructing the representations already created and instituted in society. In learning, the singular subject constructs and reconstructs its own representations by actively mobilizing its capacity of imagination. This is an integral part of the process, and essential for its success. In my opinion, the conception of the imaginary outlined here fortifies the constructionist pedagogy of education, as well as emancipatory social theories. To learn truthfully – wholeheartedly – demands the liberation and the cultivation of creative imagination.

The “repetition” by the apprentice of something already created is not, in fact, a repetition. The cognoscente subject must create, in her mind in radical form, even though in a non-original way, the representations of what was already created and instituted in society. In this process the subject might sometimes re-create, in original form, the creations already instituted. Art and Science are born from this process of re-creation of representations of reality. If, on one hand, the representation of Art is rather freer in its expression, on the other hand, the representation of Science, its theories and knowledge, is restricted by the specific demand of corresponding most rigorously to given objects, phenomena and layers of reality. Although their objectives are different, the activities realised in Education, Art and Science are “half-sisters” in the sense that, to be accomplished, they demand the subject to actively mobilise her capacity for radical imagination.

The radical imagination is always present in poetical and artistic images, as well as in scientific metaphors, since they are all based on the creation of original images which give a form to something new, not previously determined. Fauconnier and Turner regard this new form or idea as being a 'conceptual blending' (2002), and Kauffman as a 'circle of meaning' (1998). Many of them occur as imaginary "craziness" – for example, Salvador Dali's pictures. In geometry we have the proposition of the quadratic of circle, and in mathematics, the so called imaginary numbers, created from the "craziness" represented by the "square root of minus one". However, such "fictions" can become fairly "real", fully justified and used in science (Fauconnier&Turner, 2002, p24, p270).

The role of the creative imagination is central in science, and can be seen in a clear way in various areas of knowledge. In mathematics, for example, where do the axioms come from? They are creations of the mathematicians. "A mathematical imagination... is an incredible accumulation of non-intuitionable entities – n dimension spaces, or infinite or fractal dimension, without mentioning other creations still more "unrepresentable"; and imaginary" (Castoriadis, 1999, p292; 1997a, p366). That is, "the history of mathematics is the history of mathematicians' creative imagination. And it is this history which discloses the approximate cause of the mathematical axioms being heterogeneous" (ibid., p229). As Castoriadis argues, if axioms were previously determined, they would be deductible and therefore they would not be axioms! Moreover, logical-formal systems are unable to yield absolute certainty for the simple reason that it is not possible to prove all the axioms, and hence formal systems cannot be logically self-proved. As the famous mathematician Chaitin affirms, "if we try to add new axioms, and as guarantees do not exist that the new axioms are not false, then mathematics becomes, as physics, experimental and subject to revision! If basic axioms move, then the mathematical truth is dependent on time, is not perfect, static or perpetual as we thought" (Chaitin, 1999, p21).

In physics, among innumerable examples, we can cite Max Plank's original solution to the question of black body radiation. Briefly, Plank considered the hypothesis that radiation was emitted not in a continuous form – as it had been thought until the end of nineteenth century (which ended with incompatible experimental results) – but was emitted in discrete packets of energy, called *quanta*. In this way, Plank developed a formula entirely in accordance with the experimental curves of the black body spectral displacement (Gibert, 1982, p266), allowing for the creation of *quantum* mechanics.

The pertinent question is the following: from where does Plank get the idea of "packets"? From the "inherent rationality" of the physical world? From the "total freedom" of his imagination? Now, in accordance with the conception of imaginary outlined here, without a physical world which presents layers of regularity and without an already instituted social and scientific imaginary world which enables the scientist to create and re-create forms, images, figures, models of the phenomenon, neither the idea or the image of the *quantum*, nor its theoretical structure would be possible. We recall with Damásio that "the neural patterns and the corresponding mental images [of the *quanta* and the *quantum* theory] are as much creations of the brain [of scientists] as they are products of the external reality [the *quantum* sub-world mediated by observation instruments and pre-existing physical theories] that prompts their creation" (Damásio, 2000, p320).

In short, the history of science discloses clearly that its development is not due to an inherent rationality of the objects or the human being. It is actually the history of the creation of new imaginary

schemes, by means of which people seek to make thinkable and elucidate the totality of the human experience, in accordance with the requirement of internal coherence, and in agreement with the content and forms of that experience. In this sense, a new scientific theory is, under data conditions, the affirmation of a new imaginary figure or model of the intelligibility of a given phenomenon or aspect of reality (Castoriadis, 1997a, p373; 1999, p294).

In accord with what has been argued so far, I conclude that the imagination is essential to explain the origin of human consciousness, with all its rich symbolic representations, expressed in Art and Science. In synthesis: the activities of learning, making art and constructing science are carried out by a community of human beings endowed with the capacity of radical imagination – an integral and fundamental part of such activities.

In relation to Science, the notable verse of the great poet William Blake “What was now proved was once only imagin'd” (Castoriadis, 1997a, p373) – translates a deep and revealing truth, although not fully recognised even today. It is worthwhile to cite again Castoriadis: “We have to understand ... that *there is* truth [even if relative and historical] – and that it is *to be made/to be done*, that to attain it we have to *create* it, which means, first and foremost, to *imagine* it” (ibid., p373).

9. Conclusion

Based on Castoriadis' thesis of the creative power of the imaginary, on Damásio's theory of the emergence of self consciousness, and on Donald's description of the bio-cultural evolution of consciousness, I sketched an alternative perspective for the origin of consciousness. From a brief analysis of the mystery of consciousness, I suggested that the issues of the engendering of mental images and formation of self consciousness must be treated together, since both types of image – those of the sense of self and those of the representation of the interacting object – arise within the multimedia show of the flow of images generated in the brain, creating in an interlaced form “what is seen” and “what sees”, the “thinking” and the “thinker”.

I considered that the flow of images is generated in three levels: the first order flow, which continuously maps the organism and the environment; the second order flow, which maps the transformations of the organism during its interaction with an object, generating in a primary and transitory form the sense of self and the representation of the object; and the third order flow, an original proposal of this work, which maps the previous mapping, generating a meta-representation of the object and of self of the organism, but now in a symbolic and non-transitory form.

To justify this alternative perspective, I considered a hypothetical scenario of the evolution of the human consciousness by means of a bio-cultural evolution of the capacity for imagination, which gives a reasonable pathway to the emergence of the first hominids from the animal kingdom. From proto-self and core self, which compose the swift primary consciousness, consciousness would have evolved to an episodic narrative consciousness, already symbolic, albeit limited. Later, through a 'community of minds', and with the evolution of vocal language, a wholly symbolic narrative but mythical consciousness evolved; and, finally, with the creation of written records and external memories, came the reflexive and questioning consciousness of present-day human beings.

I redefined the imaginary to conceive it as a process and a result of the complex organism-object relationship, having the capacity to create representations of reality actively in a radical and original form. With this new conception, I sought to break up the antinomy between the fictitious and the real, and I concluded that the *status* of representation is simultaneously “real” and “fictitious”, actually forming a continuum between the two extremes, in that it is from the organism-object relationship itself, which is always within a specific society, that the distinction between them is constructed.

Finally I examined the role of this redefined imaginary in Education, Art and Science, using some examples, and I concluded that their activities are closely related among themselves, in that to be successful they require the freeing and the cultivation of the radical imagination by the subject.

The perspective proposed, in this simple initial sketch, needs to be evaluated and developed more widely in order to prove its validity. In particular, empirical evidences that demonstrate the existence, hypothetical so far, of the third order flow of images, and its power to create symbolic representations. I suspect such images are somehow related to those involved in the formation of mental records in extended memory.

Notwithstanding its preliminary character, this perspective already allows me to glimpse some horizons. If it is correct, creativity should be regarded as a result of the radical imagination of individuals, meaning that, for example, to solve the current problems of humanity they will have to liberate their radical imaginary, and to set free all the possible wings of imagination. In this direction, if in fact the flow of images is at once representative, affective and intentional, the liberation of the imaginary means also to liberate and cultivate our capacities: to create, to move and be moved, and to desire deeply; in short, to liberate our dreams .

Concretely, to liberate the imaginary is to set free the wings of imagination in order to create new solutions to current problems, to break up the moorings of conformity and resignation, and to cultivate the dream of living in a better world, fairer, happier, more rational and in permanent renewal. But, to achieve all this, we need first to imagine it.

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