An Hypothesis about Jung's Collective Unconscious and Animal-assisted Therapy

Giuliana Galli Carminati*, Rachel Lehotkay†, François Martin‡ and Federico Carminati§

ABSTRACT

Jung has described the collective unconscious as a layered structure starting from a *central fire* (Jung 1925), and composed by several groups (layers) of beings arriving progressively to the individual. In this schema Jung describes animal ancestors as one of the more ancient groups involved in human development. We relate this vision of the unconscious to our clinical experience with animal assisted therapy. Although properly speaking, animal-assisted therapy is not a new technique, we have adapted the approach to a specific context of intervention as a complement to conventional therapy, where the animal plays an intermediary role between therapist and patient. In case of patients presenting psychiatric disorders, animal-assisted therapy with a dog permitted a significant decrease in behavioural troubles with a real improvement of mood. Animal assisted therapy, used in the context of other therapeutic mediations, appears to have a significant impact in the population with severe autism spectrum disorders that cannot be easily treated verbally. In this study we explore the hypothesis that the improvement of the relationship with the others, obtained via the animal, can be related to a *rewinding* of the patient's unconscious to very primitive phases of his development. The patient relinks himself with a very ancient (temporally far and yet present) component of his unconscious. The present study offers elements of reflexion involving the therapeutic process in animal-assisted therapy and the Jungian theory of the collective unconscious.

Key Words: Jung's collective unconscious, Animal-assisted therapy, autism spectrum disorder, intellectual disability, behavioural disorders

NeuroQuantology 2013; 3: 451-465

1. Introduction

The presence of an animal in psychotherapy has been shown to improve the relationship with other persons and we speculate that this could be related to a *rewinding* of the patient's unconscious to very primitive phases of development. The patient reconnects with a temporally very ancient, and yet present, sane portion of his unconscious.

According to a schema described by Jung (Jung, 1925), the individual psyche is a small summit upon a layered unconscious, where layers of increasing depth are the "collective" unconscious of larger and larger groups, such as the family, the clan, the nation, larger groups such as Europe or Asia, our primitive ancestors, our animal ancestors in general and finally a *central fire* (Figure 1).

In the therapeutic context, it has long been known that animal-assisted therapy can be a powerful technique in several psychiatric disorders, although no complete explanation

Corresponding author Dr. Giuliana Galli Carminati
Address: *Rue Tronchin 4, 1202 (Geneva, Switzerland), Association pour le TRAvail Groupal thérapeutique et social (ASTRAG) and Simposietto; email: Giulianagallicarminati@hotmail.com. †Mental Development Psychiatry Unit - Adult Psychiatry Service, Department of Psychiatry, University Hospitals of Geneva (Geneva, Switzerland) and Society for Human -Animal Relationship, Research & Education (SHARRE); email: rachel.lehotkay@hcuge.ch. ‡Honorary research fellow at CNRS; e-mail: martin@lpthe.jussieu.fr. §Physicist at CERN, 1211 Geneva 23, Switzerland; email: Federico.Carminati@cern.ch.
Phone: +41 79 553 64 84 and **Fax:** +41 22 305 43 90
✉ giuliana.gallicarminati@hotmail.com
Relevant conflicts of interest/financial disclosures: Nothing to report.
Received June 5, 2013. **Revised** August 4, 2013.
Accepted August 17, 2013.
*e*ISSN 1303-5150

has been provided for its effects. More recently, following Freud's conception of the unconscious, Levinson (Levinson, 1969) proposed that the solution to neurosis is to restore a healthy connexion with one's inner self, (unconscious animal nature) which can be achieved via the establishment of a positive relationship with real animals. The restoration of this connection, achieved via different therapeutic mediations (Galli Carminati, 1998; Galli Carminati *et al.,* 2004), appears to have a significant impact even in the population with psychiatric disorders who cannot be easily treated verbally.

The presence of a psychiatric disorder is a major obstacle to social integration and adaptation in socio-educational institutions, and improving some form of social behaviour is often a primary therapeutic goal. In the case of adults with severe psychiatric disorders, where verbal communication is affected, limited or absent, conventional psychotherapeutic interventions provide only limited improvement, and thus we must look elsewhere to find effective interventions. It is here that animal-assisted therapy (AAT) could play a crucial role in improving the quality of life of these patients. Although the effects of this therapy have been observed experimentally, we feel that the formulation of a hypothesis explaining these effects would help to refine the technique and ultimately offer opportunities to enhance its effectiveness.

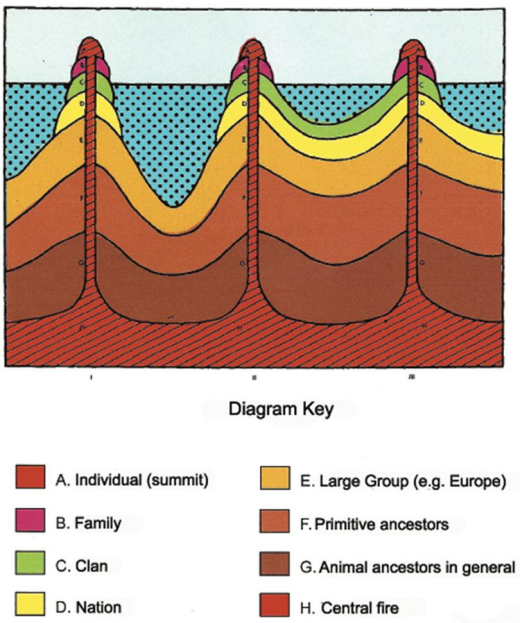

Figure 1. Jung's volcanoes diagram.

2. What is animal-assisted therapy (AAT)

AAT is not strictly speaking a new technique, but it introduces a new element, the animal, in the context of existing therapies. As early as the 17thcentury, it was thought that caring for an animal could restore harmony between body and mind. During the 18th and 19th centuries, various species of animals were part of the environment of several health care institutions in England and elsewhere (Serpell, 2000). In the 20th century, Boris Levinson (Levinson, 1969; 1984), who is considered the father of AAT, published many papers on the subject, but it took until the end of the century for research to develop and show empirically the benefits that the presence of an animal can have on the physical and psychological health of humans (Antonioli and Reveley, 2005; Brickel, 1986; Corson and Corson, 1980; Bouchard and Delbourg, 1995; Folse *et al.,* 1994; Friedmann *et al.,* 1980; Kruger *et al.,* 2004; Mallon, 1994).

AAT belongs to the more general domain of animal-assisted interventions (Kruger *et al.,* 2004). Conducted by a duly trained professional with the help of a carefully selected animal (Lehotkay and Seitert, 2009), AAT aims at improving the mental or physical health of a person, or simply his quality of life. The animal provides a source of sensory, motivational and socializing stimulation via the significant contact and activities it generates. The climate of security and support introduced during a session of AAT is favourable to improvements in several areas (Lehotkay, 2009a).

The therapist works with the animal, considered here as a therapeutic adjunct, which takes an integral part in the treatment process. This technique does not consist simply of the presence of an animal in the course of the therapy; it rather consists in work based on the interaction among the therapist, the patient and the animal.

Several studies tend to confirm the beneficial effects of the presence of animals with different populations, including children, adolescents, adults and the elderly (Baun and McCabe, 2000), whether they have a disability or not (Duncan and Allen, 2000; Kruger and Serpell, 2006; Scholl *et al.,* 2008; Turner, 2003), and positive effects have been also observed with many different psychiatric diagnoses, such as post-traumatic stress

disorder (Altschuler, 1999), borderline personality disorder (Sato *et al.,* 2003), anxiety in children (Athy, 2006) and adults (Morgan, 2009; Schwartz and Patronek, 2002), loneliness and depression (Antonioli and Reveley, 2005; Banks and Banks, 2005; Holcomb *et al.,* 1997; Jessen *et al.,* 1996; Le Roux and Kemp, 2009; McVarish, 1995;), behavioural disorders in children (Katcher and Wilkins, 1998; Soutar-Freeman, 2003), emotional and behavioural disorders in adolescents (Drawe, 2001; Ewing *et al.,* 2007); attention deficit disorder with hyperactivity (Somervill *et al.,* 2009), and learning disorders (Limond *et al.,* 1997).

Nowadays, the use of animals in therapy is increasingly widespread, ranging from the simple presence of an animal to the most complex sessions of individual therapy. A growing number of studies show remarkable behavioural changes resulting from the presence of animals, and several authors suggest that animals – especially dogs – encourage social interaction (Corson *et al.,* 1977; Limond *et al.,* 1997; Martin and Farnum, 2002). Being a neutral topic of conversation, the animal seems indeed to facilitate contact between people and has been characterized as a "social lubricant" (Hart *et al.,* 1987; Kruger *et al.,* 2004; Mader *et al.,* 1989; Messent, 1983; Nielsen and Delude 1989).

In other situations the simple presence of an animal in the room, typically a cat, produces a de-dramatisation of the presence of the therapist introducing a distractor and a facilitator at the same time.

The calming effect of the presence of the animal has also been demonstrated in several studies, which confirm the fact that petting a dog causes a drop in blood pressure and heart rate (Friedmann *et al.,* 1983; Jenkins, 1986). The anti-stress effect of the animal is visible at the physiological level, but its presence is also beneficial at the psychological level (Antonioli and Reveley, 2005; Barker and Dawson, 1998; Muschel, 1984; Pavlides, 2008).

In people with severe psychiatric disorders or with intellectual disability (ID), communication impairments add to the difficulty in the management of their condition (Lehotkay, 2009a), which requires a treatment adapted and specific to each case (Galli Carminati and Lehotkay, 2008). Conventional educational or psychotherapeutic interventions provide only limited improvement, as they are often based on verbal communication. As communication and isolation problems often also cause outbursts of behavioural disorders, it is reasonable to assume that an intervention aimed at improving communication and isolation would lead to a reduction of these disorders. AAT aims precisely at alleviating communication disorders (among others) and isolation in people (Galli Carminati, Gerber, Baud *et al.,* 2007; Galli Carminati, Gerber, Constantin, *et al.,* 2007; Lehotkay *et al.,* 2009; Galli Carminati, Gerber, Baud *et al.,* 2007).

The benefits of the presence of the animal consist not only in the activity it enables, but also in the highlighting by the therapist of the skills that the patient shows with the animal.

In the psychoanalytic approach the presence of the animal permits a naïve opening of the internal reality of the patient attributing to the animal a part of his inner world. The patient could declare that "Doggy is sad today" or "Today I think that the Doggy is nervous, or angry or worried" speaking about his personal feeling without have to confess them, and often without even having to recognize them consciously.

3. Comments about the evolution of psychiatric patients

The approach with AAT for the psychiatric population has had several positive effects, including de-dramatization of psychiatric care, improvement of communication through increased dynamism, sensory and cognitive stimulation, and the improvement of relations with others, thanks to the mediation of the animal.

Although many studies on animal-assisted interventions tend indeed to demonstrate that this method is beneficial, it is still rare for the benefits to be fully explicated.

Besides the social catalyst effect, there are many other elements which lead us to see the animal as a real therapy assistant. First, the motivating effect of AAT sessions can help develop the therapeutic relationship. Accompanied by a dog, a person is seen to be more sympathetic than if he or she is alone (Lockwood, 1983; Pavlides, 2008). The therapist with a dog can then be seen as less

threatening, especially in the case of people who are reluctant to follow any treatment. In this case, the animal acts as a transitional object supporting therapy (Lehotkay, 2012).

Another reason for the initial improvement of the state of these patients is the patients' enhanced social image, which allows them to see themselves in a more positive light. During walks with a dog, instead of holding the hand of the psychologist, the patient holds the dog's leash. In the street, people do not see a psychiatric patient with his therapist but simply two people walking a dog. The patient is then no longer the assisted person, but the person responsible for the animal, thereby improving his self-esteem. The fact of caring for an animal can develop a sense of responsibility, which promotes autonomy. For these patients, who are sometimes not aware of what they know or can do, this simple activity, requiring some focusing toward a living being, helps in the development of their autonomy.

Sensory stimulation through the presence of the animal allows a withdrawn person who is focused only on himself to pay more attention to the outside world, thus reducing any form of inappropriate behaviour (self-mutilation, stereotypical movements) and increasing appropriate social behaviour. In the context of dog-assisted therapy, Redefer and Goodman (1989) showed that with autistic children, the number of social interactions directed toward the therapist or the dog increased significantly, whereas the amount of behaviour directed at themselves significantly decreased. Thus, when the patient is at a coffee bar, instead of focusing on his drink, he listens to the psychologist, who invites him to give the dog biscuits. This activity requires not only motor and visual coordination but also mental coordination, since the patient must first ask the dog to sit, say "gently" to him, and then give the dog the biscuit (otherwise, the animal takes the biscuit too quickly). This not only allows the patient to understand that all good behaviour is rewarded, but more importantly, it prompts a reflection on the consequences of his behaviour.

People with social interaction difficulties can easily decode and understand the dog's or other animals' behaviour. Via simple and repetitive nonverbal actions, the animal allows the patient to get in touch with external reality through tactile stimulation, developing the person's awareness of others. The mobilization of the patient's reflection is also achieved via simple questions put to him about the animal. Gradually, these questions and answers are part of a routine that reassures the patient. The patient, who has learned to recognize certain behaviours in the dog, answers the psychologist's questions correctly. He is then praised for his good responses, which also allows him to improve his self-esteem. One of our patients for instance, mobilised by these questions, stopped repeating the verbal stereotypy that had made his management difficult.

The presence of the animal in the proposed activities can be an occasion for learning in which the animal is used as a model for improving social skills (Kruger *et al.*, 2004). Thus, this routine game of simple questions and answers about the behaviour of the animal has led to more complex questions about the state of mind of our patient. By projection, the goal was to bring our patient to realize that communication is crucial for us to know his own state of mind. The present result is that our patient speaks spontaneously about his mood and says, "I am happy", and when we ask him why, he even gives a reason for this, saying, "Because we're going to drink something".

Involving a walk outdoors, the presence of the animal encourages physical exercise, which may be useful in the case of a population that has a tendency to have little physical activity. In the case of another of our patients, this walk has improved motor coordination and posture. Thus, while this patient previously always stood hunched, having to hold the dog's leash caused him not only to focus on what he was holding in his hand, but also to stand up straight. The pet therapist would point out his hunched posture, asking him to stand upright to be better able, for example, to keep the dog on leash. Currently this patient has better posture; he now walks with his back straight and his gait is more confident and lithe.

The attachment to the animal also helps motivate patients to actively participate in the therapeutic process. Through his attachment to the animal, the patient seems more stimulated, also perhaps because he has emotionally invested in the dog. Indeed, he more often remembers the dog's name than

the name of the therapist. The animal may become a companion that psychiatric patients love to pet and to touch.

In efforts to improve the low level of sensory and affective stimulation of persons with psychiatric disorders, the stimulus provided by a dog is interesting because it is multisensory. It allows them to gradually master physical contact, serving as a mediator between the rejection of social interaction and the acceptance of interpersonal relationships. Because we see the animal as non-judgmental, his presence also brings a sense of unconditional acceptance. Faced with the difficulty of communicating with others, the person with psychiatric disorders may feel anxious. The feeling of unconditional acceptance from the dog can then lead to a decrease in anxiety, which in turn leads to a decrease in behavioural disorders. Apart from improving self-esteem, lowering anxiety in relation to others seems to have been another important element in improving the state of psychiatric patients.

The appeasing routine introduced by the dog's presence, which himself functions on a routine basis, seems to be very appropriate in the therapeutic care of people with psychiatric disorders. Indeed, the animal acquires habits and behaves in the same way each time, which reassures the patient, who recognizes these behaviours. Returning from a walk, for example, the dog is accustomed to jumping on a bench to wait for cookies. The location is fixed and the time too, which allows the patient to know exactly what is asked of him at that moment. He then feels proud to spontaneously ask the therapist, after decoding the dog's behaviour, "I want to give cookies to Doggy".

Finally, this enjoyable activity of walking the dog may also develop the psychiatric patient's consciousness of pleasure and verbalization of it, which becomes clear when the therapist asks the patient what makes him happy, or what he would prefer to do today. These questions also enhance volition, which refers to a person's interests and motivation to engage in new activities (Taylor *et al.*, 2009).

The animal is thus a valuable tool in reducing the withdrawal tendency in psychiatric patients. The presence of the animal allows the therapist to more easily enter into a relationship with the patient. In general, AAT is a dynamic and enjoyable therapeutic framework where the animal acts as a catalyst in promoting social interactions (Kruger *et al.*, 2004; Limond *et al.*, 1997; Martin and Farnum, 2002). The improvement of the contact between the therapist and the patient is certainly one of the main goals in therapy, but it is not the only one.

In summary, our clinical experience could confirm that, considered as a social catalyst, the dog, for instance, facilitates social interaction. Its presence offering a pretext for speaking, it promotes verbal exchanges and communication in general. Because the animal requires a lot of attention, its presence allows activities that encourage the patient to become fully engaged, and a patient with psychiatric disorders can be diverted, at least temporarily, from repetitive or obsessive thoughts. When the dog walks next to the person in a street, it allows contact with external reality through the stimulation of movement in a social environment, thus developing consciousness of others in the patient. It allows the patient to gradually master contacts, serving as a mediator between rejection of social interaction and acceptance of interpersonal relationships. The animal can thus be seen as a valuable tool in reducing the withdrawal tendency of the person with psychiatric disorders. It allows the therapist to enter more easily into a close relationship with the patient.

4. Discussion about Jung's collective unconscious and AAT

The hypothesis of a universal "soul" which includes all living beings is a very ancient one. We can cite as an example the Veda[2] writings that represent the most ancient texts of Sanskrit literature. More recently, in the 19th century R. W. Emerson, founder of the transcendentalist movement introduced the concept of over-soul (Emerson, 1836; 1837). Schopenhauer in his best known philosophical work, "The World as Will and Representation" (Schopenhauer, 1818) introduced the concept of a world driven by a continuously unsatisfied will permeating all acts of the living. Many

[2] '"That particle which is the Soul of all this is Truth; it is the Universal Soul. O Swetaketu, thou art that." "Will it please, my Lord, to explain it again unto me?" "Be it so, my child" replied he', The Chándogya Upanishad of the Sama Veda With extracts from the Commentary of Sánkara Ácharya, translated from the original Sanskrita by Rájendralála Mitra, Printed by C.B. Lewis, Baptist Mission Press, Calcutta, 1862.

philosophers have treated the concept of universal consciousness. Nietzsche (Nietzsche 1885) introduces the concept of over-soul as the crucible of the super-man. We could say Adler reworks the Nietzsche's concept of will for power (Adler, 1964) in his personality theory about the will to power and Freud also is inspired by this concept in his psychoanalytic theory of the drive for pleasure. A detailed discussion of this subject would however go beyond the scope of this work. Soon after the discovery of Quantum Mechanics at the beginning of the last century, a tantalising similarity was observed by the fathers of this discipline and of psychoanalysis between the quantum world and the human psyche. Werner Heisenberg said, "*The same organizing forces that have shaped nature in all her forms are also responsible for the structure of our minds*" (Heisenberg, 1971). This connection between quantum mechanics and the structure of the human mind was the subject of the lifelong friendship and scientific collaboration of two of the fathers of the respective disciplines, Pauli and Jung (Meyer, 2001) in one of the best examples to date of interdisciplinary work. In particular, the concept of Synchronicity (Jung, 1952), introduced by Jung, and the Quantum Mechanic concept of entanglement (Schrödinger and Born, 1935) seems to be two different expressions of the same apparently paradoxical mechanism, independent from space and time and acausal. Stimulated by this analogy, several authors have proposed a physical-mathematical language description of the concept of universal consciousness (and the unconscious) in the terms of an immaterial quantum field (Baaquie and Martin, 2005; Galli Carminati and Martin, 2008, for a very extensive review, see Altmanspacher, 2011).

Consciousness is generally indicated as the splitting point between human beings and animals, but, in fact, the very concept of consciousness is not so clearly defined. There are various views about consciousness. One, which is assumed by most neuroscientists, is the *materialist* view (Seth *et al.,* 2006). This view postulates that consciousness is an emergent property of the brain reducible to its neural complexity. The emergence of consciousness from a neural structure is probably a necessary step in its appearance. However we believe that the complexity of a system is a condition that is probably necessary but not sufficient for the appearance of emergent behaviour. Some authors (Mensky, 2000; 2005a; 2005b; 2007a; 2007b,), introduced the Extended Everett's Concept (EEC) as an extension of Everett's original work (Everett, 1957) and developed the concept of "post-correction", proposing that the "evolution of living matter is [...] determined not only by causes but also by goals, first of all by the goals of survival and improvement of quality of life". Supposing that the concept of post-correction is similar to a concept of project, we can consider the need of an *immaterial universal quantum field* as the warp on which individual consciousness develops itself as the weft, or as some authors consider, consciousness could be a particular excitation of this underlying universal mental quantum field (Baaquie and Martin, 2005; Eccles, 1994; Beck and Eccles, 1998). In this view, consciousness, through the neural complexity of brain, is correlated to the neuronal structures, probably via quantum entanglement. Some authors define the states of unconsciousness as quantum states and the states of consciousness as attractors in a classical non-linear dynamic system (Khrennikov, 2002; Martin *et al.,* 2009; Orlov, 1982).

There subsists however a problem in the definition of the field of consciousness and the collective unconscious. The theorisation of a common field of consciousness is usually implicitly or explicitly limited to humanity, which we believe is an unnecessary restriction.

As Galli Carminati says in her chapter *Planetary Brain* (Galli Carminati, 2011):

> "We have to clarify our view of consciousness. As Penrose says (Penrose 1990) 'It is not without doubts that we are the only living creature with the gift of the consciousness. How the lizard or the codfish could have their own consciousness we don't know'. As for the lizard or the codfish, it is difficult for us even to imagine how the WEB could have its own consciousness. So most probably we are not even in the position of deciding if this consciousness already exists" (Penrose, 1990; 1994).

Indeed, if we adopt the wider conception of the collective unconscious postulated by Jung, we can suppose that the corresponding quantum field encompasses all living beings,

so that animals could be considered to be participating to this common field.[3]

Speaking about archetypes at a symposium in London in 1919, Jung said (Jung, 1960): "*The archetypes are being 'engraved on the human mind'*". Hogenson (2001) interprets this engraving as having happened during biological evolution and he argues that "*This latter expression is taken by some commentators to be indicative of Lamarckian tendencies in Jung's thought*" (Stevens, 1990; 1996; 1998). We would like to take this remark even further and suppose that the "engraving" did not begin with *Homo Sapiens* (which, like all biological species, is the abstraction of a progressive evolution), but it started even before, during the biological evolution that led to the appearance of man.

This sentence from Jung correlates the archetypes, defined as "form without content" to the experience of our psychic structure which "puts content in the form", content which is influenced also by the familiar, social and historical environment: *"There are as many archetypes as there are typical situations in life. Endless repetition has engraved these experiences into our psychic constitution, not in the form of images filled with content, but at first only as form without content, representing merely the possibility of a certain type of perception and action."* (Jung, 1959, para. 99, emphasis in original). However, following Hogenson, Jung was interested in the evolutionary history of the mind with no implied commitment to any particular theory of evolution. It could be interesting to note that although Darwin (1809-1882) disliked the association between his theory and the theory of Lamarck (1744-1829), we have to remember that the work of Gregor Mendel was rediscovered only in 1900. The divergences between the Darwinian and Lamarckian theories were, in fact, essentially speculative in the absence of Mendelian studies and the more recent discoveries on the interdependence between the genome and the environment. If contemporary genetics offers a solid foundation to Darwin's evolution theory of random change and natural selection, it also explains how the environment can affect the genome, offering an interesting synthesis between the Darwinian and the Lamarckian theories (see for instance Bird, 2007).

To say that the appearance and evolution of archetypes is linked to evolution does not mean that we know where archetypes are "stored" (in the brain? are they coded by the DNA? will we find a "gene of the archetype"?). Moreover one should also explain how the archetypes constitute an "evolutionary advantage" that has been selected and preserved. Even advocating evolutionary theory, we still find a fundamental difference between archetypes and, for instance, language. Human languages have diverged over the course of centuries, while archetypes have remained, as far as we can judge, substantially invariant across time and space.

Martin et al. (Martin, 2013) proposed an alternative view of the archetypes, which could answer some of these questions. They describe a universal field (Archetype, big A), whose excitations (archetypes, small a) are the actual representations. These are quantum systems that simply contain quantum information and could be quanta of the Universal Unconscious Quantum Field. This model justifies the universality and apparent "stability" of the Jungian archetypes (or Archetypes with "A" in this description) as basic entities of the deep Collective Unconscious and *vis formandi* themselves void of form (Jung, 1971). The actual archetypal representations (or archetypes in this description) are the result of the interaction of a conscious and unconscious psychic structure (which contains personal and cultural elements) with this field, memory playing an especially important role. These archetypes can be considered as "pointer-states" of the psyche, but of a very special kind. Contrary to what occurs in quantum physics, these archetypal "pointer-states" of the psyche coexist in the same representation, in the same archetype. In this way archetypes are conjunctions of opposites. The contemporary presence of opposites could be explained as we observe *our* quantum system, the psyche, from *within* the detector and not, as in a physics experiment *outside* of it. The evolution of the archetypes is therefore dependent upon the evolution of the interacting psyche rather than the evolution of the field itself, which remains constant. This

[3] And somehow we even do not see why stopping short at animals. At the cost of a much more comprehensive view of consciousness, we could include in this field all existing entities, whether living or not. This would then be the counterpart to the material universe or the "other" component of the Unus Mundus.

interpretation opens the possibility to other psychic structures to interact with this field, and therefore to create archetypical representations (archetypes with "a"). These, although possibly very different from those in humans, still share with them the same universality of the Archetype field. There is little doubt that my dog is sad when I leave and happy when I come back and that he is constantly trying to check the boundary of what is permitted and what is not in a subtle power game which includes as targets my time, the physical space within the house and the set of established rules. There is also little doubt that he has enough moral sense to be surprised when unfairly punished and to show guilt when punished for something he knows he should not have done. All this could well be simply instinct, whatever this may mean, but it could also be the expression of some deeper form of universality of representation of reality that we share and through which we communicate. The evolutionary element in this case is not the Archetype (or rather Archetype field), but rather the way in which the psyche of the individual being interacts with the excitations of the field, or archetypes.

In their paper of 2005 B. Baaquie and F. Martin (Baaquie and Martin, 2005) describe the human psyche itself supposing the existence of two kinds of quantum fields. One refers to the specific individuality of the person, and which should be more or less localized with the person's specific existence and excludes another person's individual quantum field. The other quantum field represents the universality of the human psyche, which can overlap and include others' consciousness. It is natural to represent the individualized state of the human psyche by a fermion field $\psi(t, x)$ and the universal character of human consciousness by a boson field $\varphi(t, x)$, where t, x are time and space coordinates.

They propose also a simplified model for the ground state of the human species. This ground state $|G(T)\rangle$ represents the total sum (or rather the total product) of all the excitations of the vacuum state $|\Omega\rangle$ of the "consciousness field" that has been effected by human subjectivity over the entire period of human evolution. It is on this ground state that the present day psyche of human beings is standing, and the entire theoretical structure that we are born into is encoded in the ground state $|G(T)\rangle = |G\rangle$, where T stands for our contemporary time. Let us notice that this ground state $|G(T)\rangle$ is an unconscious state[4], and that it has a structure close to what Jung called the Collective Unconscious (Jung, 1961; 1991).

Then, starting from this ground state of the human species and taking account of the contributions of the mother, the father, and all the siblings, the grandparents and uncles and aunts and first cousins and so on, B. Baaquie and F. Martin built an "effective" family ground state[5] $|G_{Effectif}\rangle$ on which we can create an individual's ground state[6] together with the individual's mental states, which can be either unconscious or conscious.

The existence of a universal quantum field of "consciousness"[7] could represent not only the Collective Unconscious but also a universal consciousness or awareness. The metaphor would be the one of a universal ocean of consciousness in which an individual consciousness would be like a wave that comes out of the ocean and eventually returns to the ocean. While this model is suggestive of the Jungian layered description, it seems to take into account, in the terms of the Jungian paradigm of the Volcanoes, only the "last layer" of the structure of the psyche. There is no reason however not to consider a possible extension of this model where the starting point is not human evolution, but ranges back to the appearance of life, starting from the more primitive "families" of animals, and via their development, arriving at us humans. We can wonder whether the animal is nearer to central fire and interacting in the simplest form with the Archetype field.

Orlov (1982) in his studies considers different kinds of decision-making and he introduces the term of "relative probability of choice" in which the act of decision making may be decomposed into two steps, the emergence of the awareness of the necessity to make some choice and the act of the specific choice. This approach touches on the problem of measure that is tightly connected to the problem of the classical view of the world. Following Orlov, an "elementary doubt state" contains information about the truth-value of

[4]From which some components can come to consciousness.
[5]Which is still an unconscious state, from which some components can come to consciousness.
[6]Same as footnote 8.

a proposition. We have seen that in Zurek (1998; 2007) there is a criticism of the purely classical measure and he agrees with Everett's (Everett, 1957) proposal of the decoherence mechanism, without the need for a collapse of the wave function. The central point is that, even for a physical measure, the presence of the unconscious is not absent from the conscious act of measuring.

Following this idea, we can consider the collective unconscious, also, a part of the psyche taken as a detector of natural phenomena. It is difficult in this case, as in the case of the measure of the unconscious (considered as the quantum system seen before), to separate the object of measure and the subject measuring, both being a part of the same field.

The observation of correlations at a distance between minds, just as the observation of synchronistic phenomena, leads us to postulate a non-localization of unconscious mental states. These states are probably not exclusively localized in the human brain. Mental states are correlated (probably via quantum entanglement) to physical states of the brain but they are not reducible to those physical states (Stapp, 1993; 2001; 2012; Georgiev, 2012). With regard to synchronistic phenomena, i.e. meaningful coincidences between a mental state (subjective) and an event occurring in the external world (physical state; objective), they corroborate the fact that the limit between the observed object and human consciousness does not really exist. This remark also provides support for the hypothesis of consciousness as a field permeating space and time.

The attribution of a psyche to an animal interacting with the Archetype field may seem arbitrary, perhaps causing doubts about the difference between man and animal. In reality it is not at all necessary to negate this difference, which is obvious and self-evident, but rather to elaborate on its nature. In other words we only need to agree on the fact that the difference between man and animal is not a question of *nature* but of *degree*. Still there is a difference and still it is profound; however it does not lie in the fact that man possesses some characteristics of which the animal is ontologically deprived, but in the fact that man is endowed with faculties that, although shared in nature with animals, are present in man at a much higher degree. But even if we should come to the conclusion that man has features or functions not to be found in animals, in whatever embryonic or potential form, this would not be proof of the fact that the difference is in nature and not in degree. The (re)discovery of emergence (Johnson, 2001; Aristotle, 350 BC) has shown that systems of the same nature, at higher degrees of complexity, can present features or functions not only not found, but also not even imaginable in simpler systems. Nobody would doubt that a snowflake and a water molecule have the same nature, and yet the likelihood that the study of the water molecule would lead us to the prediction of the many and intricate patterns of snowflakes is very low.

This is not a new dispute in the history of philosophy, and, to limit ourselves to modern thought, can be traced back to the positions of Descartes (the animal-machine, Descartes 1637; La Mettrie, 1747) on one side and Montaigne (the difference of degree, Montaigne, 1580) on the other. Modern ethology is providing heuristic evidence of a difference of degree and not of nature from an experimental point of view. Recent ethology is increasingly finding the use of concepts that were considered exclusively applicable to man to be a powerful intellectual instrument with which to explore and understand animal behaviour. Literature in this field is abundant, since the landmark Nature paper of Whiten et al. (Whiten, 1999).

If we lend some plausibility to the previous discussion, we can postulate that the animal psyche couples with the collective unconscious and with the universal Archetype fields in a way that is similar in nature but different in degree and modality to the coupling of the human psyche. Again this can be regarded as a bold hypothesis, one that should not be made without at least some evidence. While we are not going to provide this evidence here, we note that there is abundant literature on the bond between animals and humans going beyond what can be rationally explained. In particularly we would like to cite here the very convincing work of Sheldrake (Sheldrake, 2000; 2013).

In the case of mental illness or deficiency we can suppose that this coupling is altered or dysfunctional. We do not elaborate on whether this is the cause of the disorder or merely its consequence, because we have no

theoretical ground on which to emit a hypothesis. Nevertheless we find it reasonable to suppose that the disorder mostly affects some "upper" layer of the unconscious, while, moving to lower layers, we encounter simpler mechanisms that are "sane" and still functional. Mental disorder in humans can be broadly described as a failure in higher social and relational functions, while basic psychic functions seem less affected, depending on the seriousness of the disease. From the phylogenetic point of view this makes sense. "Older" couplings of lesser-elaborated beings have had much more time to be "vetted" by natural evolution. The more primitive instincts stand the higher chance of being more "robust" and less affected by disease than those that are relatively new and more complex.

In this perspective, a relationship with animals may allow the activation of "coupling functionalities" or archetypes (small a) that are more primitive and therefore not affected by pathology. Accompanied by a therapist, the patient can then lean on this sane part to establish more satisfactory relations and improve the low level of sensory and affective stimulations that are manifest at higher levels of complexity. In other words, the patient who has problems dealing with the complexity of human relationships and handling the sensory and affective stimulations that they imply, will more easily communicate with a dog and handle the sensory and affective stimulations involved. These "simple successes" introduce a virtuous cycle which, reinforcing self-esteem, allows further progress.

We have considered here the mechanism of man-animal interaction from a phylogenetic point of view. Successive generations of beings have coupled in a more and more complex way with the universal consciousness and Archetype fields and have created more and more layers of collective unconscious. The therapeutic relation man-animal allows a "descent" into the deeper layers and the establishment of an "ancient" evolutionary bond with the animal that is sane and allows partial reparation of dysfunctional upper layers.

We can wonder whether this mechanism can also have an ontogenetic interpretation, related, that is, to the origin and development of an individual from newborn to adult. For this it may be appropriate to consider the theory of the *septenary* elaborated by the Swiss psychoanalyst Charles Baudouin (Baudouin, 1950). In his theory, Baudouin introduces a scheme "of the seven partners of the self" that includes the three Freudian instances of the Id (called by Baudouin the Primitive), the Ego and the Super-ego, the three Jungian instances of the Persona, Shadow and Self (both centre and container of all), plus one instance introduced by Baudouin, the *Automat* (Figure 2). On their opposition, agreement or complementarity depends the ever-shifting balance of the psychic system.

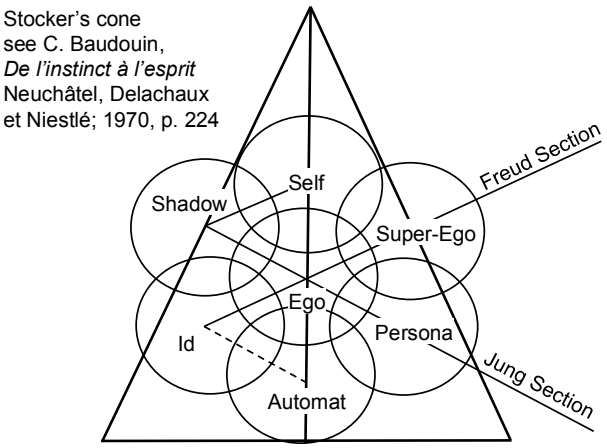

Figure 2. The seven instances according to Charles Baudouin.

According to Baudouin, the Automat is the first instance in our development that contains the basic psychological functions common to all animals, in particular repetition behaviour, pure instinct and the "reactive arc" of experimental psychology (sensation - perception - reaction). These functions are repetitive and therefore reassuring; hence the term Automat. But they enter into conflict with the Primitive (called the Id by Freud), which aims at pleasure, aliveness and freedom. The outside world reacts to this tendency in the child, who develops a Persona, or mask, to show only what pleases others in order to remain accepted by the group. Between the Persona and the Primitive, therefore, tensions arise, leading to inner feelings of chaos. Thus develops a sort of mediator, the Ego, who chooses between the two and often feels compelled to repress parts of the self (usually the Primitive) into the Shadow (Jung's term for the unconscious), where many of our animal instincts are relegated, to join with deep layers of the

psyche common to all humans and animals. However, these vital aspects of our fundamental nature refuse to remain silent, and clamour for expression, creating tensions and often leading to nightmares at this stage of our development. To maintain order, the psyche develops a Superego (comparable to a sort of conscience) to keep the unacceptable tendencies in their place. The entire process, always filled with tensions then a new balance, leads a healthy psyche to a gradual capacity to integrate the warring parts of this inner world. This process, called Individuation, entails the actualisation of the whole being, which Baudouin, after Jung, calls the Self. The closed, repressive morality of the Superego is replaced in the Self by an open, more inclusive sense of what is good. The Self represents that, towards which our most natural unfolding tends, a transcendental movement, never achieved, but always in the direction of our most profound psychic tendencies. In Baudouin's schema, mental illness derives from a breakdown of the harmonious and dialectic relations between these seven instances due to a problem which has occurred during their ontogenetic development.

Here again we will make the ambitious but not unreasonable hypothesis that animals share the same structure, but at a different degree of development. We can admit that the animal has a form of Automat and Primitive as the instances that contain the instinctive drive of the animal toward pleasure. Whether the animal has a conception of itself that we could call Ego is linked to the whole discussion on self-awareness that we mentioned above. We will content ourselves with the idea that this is possibly the case, but at a degree and in a form that cannot be directly compared with what a human calls consciousness of self. To some extent, and possibly only in gregarious mammals, social relations may lead the animal to develop a primitive form of Persona. Whether this leads to the removal of some "unwanted" elements from consciousness into an animal Shadow (repressed aggressiveness for example) is a hypothesis that would need further studies. We do not believe that, at the present point of research in ethology, the other functions can be said to play a role.

As we did in the case of the layered "phylogenetic" unconscious, we can suppose that in some situations the imbalance between an over-demanding Super-Ego and the Automat and the Primitive can be re-equilibrated by the helping presence of an animal that reinforces the "lower" functions and helps them to reassert their "natural right" when faced with the other instances.

5. Conclusions

In traditional psychotherapy, taking into account different approaches, such as psychoanalysis, behavioural and cognitive therapy, group and systemic therapies, psychomotor therapies, and therapeutic approaches with mediations (Galli Carminati *et al.,* 2004), above all when patients cannot be easily treated verbally, therapists work on verbal and body exchange, but they consider essentially the field of human interaction. In AAT we introduce the animal as mediator and probably without real knowledge of the implication of the animal presence; we introduce a living non-human in the context of the therapy. This type of approach appears to have a significant impact in reducing behavioural disorders on the population with ASD and severe ID.

Traditionally, in order to evaluate the effects of a treatment in any domain, we start from the theoretical context and then develop a methodology, in which we present the way the change will be evaluated, which variables will be measured and when they will be measured, as for example before and after treatment. It is therefore interesting to note that in the domain of AAT, we start from practise, the aim being to show the beneficial effect of the animal's presence, and the results are then explained in a chosen theoretical framework.

From the phylogenetic and ontogenetic point of view, animals can be considered as part of the same universal consciousness field to which, according to some authors, we belong too. The *therapy of the soul* could use this hypothesis to explain the positive effects of animal-assisted therapy. At a more theoretical level, the fact that AAT helps the therapy can open a reflection about Quantum Mechanics in general and Quantum Information theory applied to the unconscious and consciousness.

The authors have to admit that the presence of an animal improves the clinical situation of persons with psychiatric disorders who present very limited skill in speaking. Could this improvement be explained by a

rewinding of the patient's unconscious to very primitive phases of his development? Could the patient reconnect with the very ancient sane unconscious? The aim of this paper is to open the reflexion on these different points.

About the author(s)

Giuliana Galli Carminati is presently psychiatrist in private practice at Geneva and in the Canton of Vaud. She was until 2013 senior psychiatrist responsible for the Unit of Mental Development Psychiatry (UPDM), University Hospitals of Geneva (HUG), Switzerland. After getting her degree in Medicine at the University of Pavia (Italy) in 1979, she obtained specialisations in Laboratory Medicine and in Psychiatry and Psychotherapy, as well as a Master in Group Therapy and a Doctorate in Psychiatry (Geneva University) in 1996. In 1998 she also got an Italian degree (Laurea) in physics at the Tor Vergata University (Rome). In 2008 she obtained the title of Privat Docent at the University of Geneva. Her research activities deal with intellectual disability and autism and the quality of life of intellectually disabled patients. She is particularly interested in the relations between matter and mind, and in the application of Quantum Information theory to the modelling of the human psyche, a subject on which she has authored several papers. In 2005 she founded ASTRAG (ASsociation pour le TRAvail Groupal thérapeutique et social) and Simposietto, a reflection group on the relations between physics and human mind. She is presently finishing her training to become a member of the Institut International de Psychanalyse et Psychothérapie Baudouin (IIPPB) at Geneva.

Rachel Lehotkay studied ethology and animal cognition during her studies in psychology at Geneva and in Canada, where she obtained her PhD on the attachment between the domestic dog and its owner. On her return to Switzerland, she organized conferences on pet assisted therapy in 2005 and 2009 with the Swiss Association of Pet therapy (ASZ), of which she is now president. Since 2007, she is working as a psychologist/ psychotherapist specialized in pet assisted therapy at the Department of Mental Health and Psychiatry of the University Hospitals of Geneva (HUG). She teaches pet therapy in different institutions and is actively engaged in research in the domain of the human-animal relationship. She is also founding member and president of the Society for Human-Animal Relationship Research & Education (SHARRE), which organized its first international conference in May 2012.

François Martin was born in 1946. After graduating from the Ecole Normale Supérieure de la rue d'Ulm, in Paris, where he studied - among other subjects - quantum physics, he entered the CNRS (Centre National de la Recherche Scientifique) in 1971. He did a 3ème cycle thesis, and then obtained a doctorat d'Etat ès Sciences Physiques on the quantum field theory of electromagnetism. In 1975 he received the Bronze Medal of CNRS (with Guy Bonneau). His career was devoted to elementary particle physics. He worked successively at the Theory Group of the Stanford Linear Accelerator Center (SLAC), at the CERN Theory Group, in Geneva, at the Groupe de Physique Théorique at LAPP (Laboratoire d'Annecy-le-Vieux de Physique des Particules) and at the Laboratoire de Physique Théorique et Hautes Energies (LPTHE), University Paris 6. In 1991 he independently discovered Synchronicity and worked on its possible connection with quantum mechanics together with Belal Baaquie, Giuliana Galli Carminati and Federico Carminati. He retired from the CNRS on the 11th of September 2011 and is now an Honorary Research Fellow.

Federico Carminati is a physicist at CERN, in Geneva (Switzerland) and he is leading a project for the development of a highly optimised detector simulation programme. After getting his Italian degree in Physics (Laurea) at the University of Pavia, Italy in 1981 he worked at Los Alamos and Caltech as a particle physicist before being hired by CERN in the Data Handling Division. He has been responsible for the CERN Program Library and the GEANT detector simulation programme, the worldwide standard High Energy Physics code suite in the 80's and 90's. From 1994 to 1998 he worked with Nobel Prize winner Prof. Carlo Rubbia on the design of a novel concept of an accelerator-driven nuclear power device. From 1998 to 2012 he was Computing Coordinator of the ALICE experiment at LHC. In 2013 he obtained his PhD in physics from the University of Nantes with a thesis on the computing infrastructure of the ALICE experiment. Federico Carminati is currently in training to become a member of the Institut International de Psychanalyse et Psychothérapie Baudouin (IIPPB) at Geneva.

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