

Subjectivity, Ecology, and Meditation.
Dynamics of Heart-Meditations and potential Implications for
the Ecological Self

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Master's Degrees by Examination and Dissertation

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“Nature is like a person, no, thousands of persons because it isn’t just one thing...A person is like a tree. If the tree bears fruit, it is the same with people. Taking care of a tree is the same. If you cut a branch off a tree it is like cutting a finger of the foot. To cut a tree down is like doing it to yourself. It is the same to our heart, it is not good. The jungle is like the heart of a person”

Child (name unknown) from the Amazonas¹

¹ Kahn, Peter H. (2003): *The Development of Environmental Moral Identity*. In: Clayton Susan, Opatow Susan (eds.): *Identity and the Natural Environment. The Psychological Significance of Nature*. Cambridge: The MIT Press, 117

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1. Abstract

In this dissertation I analyse and discuss the subjective correlation between the effects of “heart meditations” from the Christian, Buddhist and Sufi traditions on the individual perception of nature, nature connectedness and the resulting sense of ecological self. Along the various spiritual traditions, I also discuss data from cardiological and neurological research, as past research has shown that meditative practices can lead to a change in the physical body thus affecting the behaviour of the practitioners.

The overall aim of the dissertation is to evaluate the potential role of heart-based meditations from the Christian, Sufi and Buddhist traditions on the individual perception of nature and thus to evaluate the potential role of these meditation techniques in developing an ecological self.

The chosen research method is a literature review coupled with already existing semi-structured and structured interviews with practitioners of heart-based meditation from the Christian, Sufi, and Buddhist traditions. I also include insights from cardiological and neurological research into the evaluation.

I hypothesize that the key qualities to develop an “ecological self” are empathy, gratitude, a sense for the interconnectedness of life, and the ability to identify with nature, including human and nonhumans as well as water, air, rocks and the land in general. Whether meditation practices are helpful in facilitating the construction of an ecological self within the practitioners is assessed through the potential of the practices to influence the level of empathy, gratitude, feeling of interconnectedness and ability to identify with other living beings.

Even if it is not possible to prove a causal relationship, meditation and in particular heart-meditation seems to facilitate the feeling of connectedness in general and in specific cases of connection with nature as well.

The present dissertation has been a first attempt to show the relationship between heart, heart meditation, ecology and ecological self. Initial studies concerning heart-meditations in general and mindfulness in connection with nature connectedness seems to suggest the existence of a positive correlation between heart-meditations and the development of an ecological self.

The main contribution of the present work does not lie in providing answers but rather in arising a new question – the role heart meditation in shaping an ecological self- which has so far escaped wider academic discussion.

2. Introduction

“Climate change is the defining challenge of our time, yet it is still accelerating faster than our efforts to address it. Atmospheric levels of carbon dioxide are higher than they have been for 800,000 years, and they are increasing. So, too, are the catastrophic effects of our warming planet – extreme storms, droughts, fires, floods, melting ice and rising sea levels.”² These are the introductory sentences by the United Nations Secretary General António Guterres for the UN annual Climate Change Report 2017. It is not a question of debate anymore whether climate change is taking place or not. More than ever the ecological crisis is urging us to find solutions to mitigate the dramatic consequences of our damaging behaviour towards nature. For this, we need a clear understanding and analysis of the causes for the environmental destruction that humans are causing.

As far back as 1972 Bateson argued in a paper called “The Roots of Ecological Crisis” that the main causes for the environmental crisis are found in technological advances, population growth and misconception about human nature and its relation with the environment. Various authors assume that, since the beginning of industrialism, individuals in modern societies have developed a new sense of “Self” in which the person became the basic unit replacing the community.³ Over time, the increased sense of separation and the loss of connectedness with nature, so the hypothesis, have led to the destructive behaviour humans are displaying towards the environment.

Aldo Leopold⁴, the father of “Land ethics”, argued that a sense of connectedness to nature is an essential to resolve the environmental crisis. He wrote that “all ethics so far evolved rest on a single premise: that the individual is a member of a community of interdependent parts---the land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively, the land.”⁵

While Leopold focuses more on a feeling of “resonance” with nature rather than identification with it, deep ecologists use the term “ecological self” to describe a deep feeling of interconnectedness with nature which includes the expansion of the “Self” to encompass all of

² Guterres, António (2017): Foreword to the UN Climate Change Annual Report 2017. In: <https://unfccc.int/resource/annualreport/> (20.11.2018)

³ Cynthia Frantz, Mayer Stephan, Norton Chelsey (2005): *There is no “I” in nature: The influence of self- awareness on connectedness with nature*. In: Journal of Environmental Psychology 25, 427-436

⁴ Leopold, Aldo (1949): *A Sand County Almanac: With Essays on Conservation from Round River*. New York: Ballantine Books

⁵ Leopold, Aldo (1949): *A Sand County almanac and sketches here and there*. New York: Oxford University Press, 203-204

nature. Studies in environmental psychology have also shown that when people extend their self-identification to include nature, they are more likely to engage in eco-friendly behaviour.⁶

From the point of view of the “ecological self” - a notion that will be discussed at length in a later section – the current ecological crisis is a spiritual crisis. Spirituality, according to Colleen Delaney⁷, is a multidimensional phenomenon that includes four overlapping domains: Self-discovery, relationships with others, higher power/universal intelligence and Eco-Awareness. Eco-awareness is defined as “an integral connection to nature based on a deep respect and reverence for the environment and a belief that the earth is sacred.”⁸ If the roots of environmental problems are to be found in the domain of spirituality, it seems obvious that “spiritual techniques” like contemplation and meditation may be an important intervention to shift our understanding of humanity’s relationship with the earth and with all its inhabitants, from an anthropocentric norm to a biocentric or geocentric norm⁹ in which the role of humans is not that of dominion over nature but of an equal, interdependent member of the natural world. As the Zen nun, Newell Barbara said: “True freedom as well as real change in the behaviour of human beings, is realized not through mere intellectual criticism and debate, but by a change of heart that comes from touching the profound interconnectedness of all things.”¹⁰

Based on the hypothesis, that **the key qualities to develop an “ecological self” are empathy, gratitude, a sense of the interconnectedness of life, and the ability to identify with nature, including human and nonhuman beings as well as with water, air, rocks and the land in general.**

I will analyse and discuss the subjective correlation between the effects of “heart meditations” from the Christian, Buddhist and Sufi traditions on the individual perception of nature, nature connectedness and the resulting sense of ecological self.

In the past, neurological research of meditative practices has shed some light on the effects of meditation on the brain. This provides clues on how self-centred thinking is affected by meditative training. This could possibility also apply to research conducted on the heart and the

⁶ Clayton, Susan (2003): *Environmental Identity: A conceptual and Operational Definition*. In: Clayton & Opatow (Eds.): *Identity and the natural environment. The psychological significance of nature*. Cambridge: The MIT Press

⁷ Delaney, Colleen (2003): *The Spirituality Scale: Development, Refinement and Psychometric Testing of an Instrument to Assess the Human Spiritual Dimension*. Dissertation, University of Connecticut

⁸ Delaney, Colleen (2003): 6

⁹ Berry, Thomas (2006): *Evening thoughts. Reflecting an earth as sacred community*. San Francisco: Sierra Club Books, 43

¹⁰ Newell, Barbara (2008): *Peace in Oneself, Peace in the World: The Real Heart of Engaged Buddhism, A Response to Lisa Kemmerer*. In: *Human Architecture: Journal of the Sociology of Self-Knowledge*, Vol.6, Issue 3, 147

effects of heart-meditations on the behaviour of practitioners. For this reason, I will discuss data from cardiological and neurological research.

The overall aim of the dissertation is to evaluate the potential role of heart-based meditations on developing an ecological self. Conceivably, this will contribute to the debate about causes and solutions to the urgent environmental crisis.

3. Literature review and methods

With heart-based meditations at its centre, my thesis will bring different fields of knowledge together: deep ecology, from which the concept “ecological self” is derived, neuroscience, and the meaning of the heart with its corresponding heart-meditation- techniques from three different spiritual traditions.

For the discussion of the “ecological self”, I will mainly draw from the insights of the deep ecologists Arne Naess and John Seed, as well as from Tracy and Aaron McLaughlin-Volpe’s idea about the necessity of “self-expansion”. Based on the belief that anthropocentrism – which sees human beings as the primary locus of existence- is the root cause of environmental destruction through humans, deep ecology proposes a shift in human consciousness as a catalyst and long-term solution for social, political, cultural and economic changes. The core of such transformation of consciousness is the development of an ecological self that puts humans back into an inter-dependent and intersecting web of ecological systems.¹¹

Based on the work of Elisabeth Bragg, I will argue that the “ecological self”, once established within individual subjectivity, needs to be consciously maintained and reinforced. This can happen for example by using different kind of meditation or contemplative techniques.

In line with Bragg, Felix Guattari¹² suggested the concept of “three ecologies” – environmental, social and mental ecologies. He argued for the need of new practices of the Self in relation to others. “In the absence of such changes at the level of mentalities, that is, of real existential mutations, even the proffering of technocratic solutions lacks the resolve for their authentic deployment.”¹³

Even if the link between neuroscience and ecology might seem unusual, studies on the effects of meditations on human behaviour have led to interesting insights relevant to environmental

¹¹ Berry, Thomas (2006): *Evening thoughts*. Reflecting an earth as sacred community. San Francisco: Sierra Club Books

¹² Guattari, Felix (2000): *The Three Ecologies*. New Jersey: Athlone Press.

¹³ Genosko, Gary (2009): *Subjectivity and art in Guattari’s >The Three Ecologies<*. In: Herzogenrath, Bernd (Ed.): *Deleuze/Guattari & Ecology*. New York: Palgrave Macmillan, 105

debate. Eugene d'Aquili and Andrew Newberg from the University of Pennsylvania, for example, have shown that practitioners of compassion meditations “thin down” the area of the brain which calculates spatial orientation. This includes the sense of where one own’s body ends and where the world outside the body begins. Hence, due to the changes in the brain structure, practitioners of compassion-meditation can develop more easily than others a sense of oneness or unitive consciousness.¹⁴ The conclusion of these studies has been that “like an athlete conditioning and transforming the body, people engaged in compassion meditation and other contemplative practices can rewire their brains not only for greater stress reduction, peace and joy, but for increased empathy and heightened awareness of oneness with all of life.”¹⁵ For my thesis, I will mainly use research results from the HeartMath Institute and other independent researchers in affiliated fields of neuroscience and cardiology.

Few studies have been conducted on mindfulness meditations and similar techniques and their effects on the development and/or maintenance of a sense of ecological self. One such research was conducted by António Carvalho. Carvalho¹⁶ concludes that deep happiness which some practitioners of mindfulness- meditation were able to gain, “indicates a growing sensitivity towards Interbeing, reinforcing the ecosophical¹⁷ dimension of meditation, illustrating its potential to expand the bio-physical domain by fostering decentred forms of affect which go beyond the autonomous modern self.”¹⁸

In my thesis I will link for the first time heart -based meditation with ecology in the attempt to address the question, whether hear-meditation techniques can create conditions within the practitioner’s consciousness for the process of ever widening identification towards the development of an ecological self. The method chosen for this dissertation is a literature review coupled with already existing semi-structured and structured interviews with practitioners of heart-based meditation from the Christian, Sufi, and Buddhist traditions.

As a long-time practitioner of loving kindness meditations and heart-centred meditation from the Sufi tradition, I am particularly aware of the problem of reflexivity in qualitative studies and of my own bias regarding the effects of meditation. The Cambridge Advanced Learner’s Dictionary defines “reflexivity” as someone’s ability “to examine his or her own feelings, reactions, and

¹⁴ McTaggart, Lynne (2011): *The Bond: Connecting through the Space between Us*. New York: Free Press, 174

¹⁵ Quehl-Engel, Catherine Mary (2014): *Deep Abiding: Praying, Living, and Loving from the Inside Out*. Dissertation presented at Virginia Theological Seminary

¹⁶ Carvahlo, António (2017): *Ecologies of the self in practice- meditation, affect and ecosophy*. In: Human Geography, Routledge, 12

¹⁷ Ecosophy or ecophilosophy, as defined by Arne Naess, is a philosophy of ecological harmony and equilibrium. In: <http://www.environment-ecology.com/deep-ecology/216-ecosophy.pdf> (01.04.2019)

¹⁸ Carvahlo, António (2017): *Ecologies of the self in practice- meditation, affect and ecosophy*. In: Human Geography, Routledge, 12

motives and how these can influence what he or she does or thinks in a situation.¹⁹ In ethnography “reflexivity” means taking into consideration who is the author of a study and under what condition the research/observation/study has been conducted. The aim of reflexivity is to critically view how research is conducted and to include the perspective of the researcher into the equation.

As a regular mediator, I have experienced in my personal life the benefits of meditation and in a non-academic context I would advocate the advantages of practicing meditation for almost any area of life. At the same time, I believe, that a qualitative study like this dissertation can only give hints about correlations but not about causalities. In this specific case, one possible result could be the assessment of a positive or negative correlation, or the absence of any correlation, between heart-meditations and developing nature-connectedness. Within the scope of this thesis, it is not possible to establish a direct causality between the two.

A certain fuzziness in attempting to answer such a question will always remain. The acceptance of this kind of “fuzziness” in academic research, in particular in social sciences, is one of the consequences of the so-called “reflexive turn”, a shift of perspective that occurred during the 1980s in the humanities. The “reflexive turn” questioned the nature of reality and how it can be understood by scientists. This went so far that “postmodern ethnography...abandoned the attempt to prove a neat, ordered narrative” challenging the belief that there is an objective reality “external to the way we think about and experience it.”²⁰

The impossibility to describe an objective reality is particularly true for meditation studies where reported experiences are highly subjective and often not translatable into words.

Nevertheless, to use the words of Karen O'Reilly, we don't need to abandon the idea of a reality outside our self that we can study and learn from. A good compromise seems to consist in acknowledging some authority of the academic author, simultaneously remembering that “studies are put together by human beings who make choices about what to research, interpret what they see and hear, decide what to write and how, and that they do all of this in the context of their own personal biographies.”²¹ This applies, of course, also to the present dissertation.

4. Theories of the Self and of the Ecological Self

¹⁹ Cambridge Advanced Learner's Dictionary. In: <https://dictionary.cambridge.org/de/worterbuch/englisch/reflexivity> (22.11.2018)

²⁰ O'Reilly, Karen: *Reflexivity* In: <https://karenoreilly.wordpress.com/what-is-ethnography/reflexivity/> (22.11.2018)

²¹ *ibid*

The separation of mind and nature²², and in a broader sense the separation of the individual sense of “self” and nature, has been debated as one of the fundamental reasons for the current environmental crisis. As a possible solution, deep ecologists advocate the development of an “ecological self”. The “ecological self” of “deep ecology” is an “integral self”, whose identifications extend to the entire natural world.

Before attempting to more closely define the “ecological self”, the first part of this section is dedicated to the attempt to define the “Self” and “Self-identities”.

According to George H. Mead, an American sociologist and psychologist, the “self” is the result of a set of “anticipated responses that individuals form as the generalized other.”²³ In other worlds, the “self” is the result of an internal dialogue between the “generalized other” and the “I”, the spontaneous part of the self. In this light, the self can be viewed as a product of multiple relationships through the lifespan of an individual.²⁴ According to other scholars like Stryker²⁵, the self is the sum of identities which are hierarchically arranged within the self-concept.

Depending on the individual’s commitment to a specific identity, it is more or less likely that a certain identity will manifest in a given social situation. This commitment is also called “identity salience”. Identity salience is not only based on the commitment toward a specific identity, but is also widely determined by the emotional relation to that constituent of the self (which could for example, be nature). Identity salience and commitment represent an interactive complex which allows us to make predictions about a person’s behaviour.²⁶

Because the social aspects of identity are so important and undeniable, sociologists and psychologists often overlook the impact of non-cultural and non-social objects, like nature, in creating and defining identities and, thus, the self.²⁷ But the self is not only made by social identities and social interactions. William James describes in his “Principle” a multi-self, an *empirical self*, or me, consisting of three components: the material self, the social self, and the spiritual self.²⁸ “William James’s concept of the self reveals that, in addition to a broad range of social objects, the self can also include one’s body and psychic powers, one’s clothes and house,

²² Bateson, Gregory (1972): *Steps to an Ecology of Mind*. San Francisco: Chandler, 496

²³ Zavestoski, Steve (2003): *Constructing and Maintaining Ecological Identities: The Strategies of Deep Ecologists*. In: Clayton Susan, Opatow Susan (eds.): *Identity and the Natural Environment*. Cambridge: MIT Press

²⁴ McLaughlin-Volpe Arthur & Tracy, Mashek Debra, Lewandowski Gar, Wright Stephen, Aron Elain (2004): *Including others in the self*. In: *European Review of Social Psychology*, 15, 102

²⁵ Stryker, Sheldon (1980): *Symbolic interactionism: A social structural revision*. Menlo Park: Benjamin Cummings

²⁶ Zavestoski, Steve (2003): 299

²⁷ Clayton, Susan (2003): *Environmental Identity: A Conceptual and Operational Definition*. In: Clayton Susan, Opatow Susan (eds.): *Identity and the Natural Environment*. Cambridge: MIT Press

²⁸ Levin, Jerome David (1992): *Theories of the Self*. Washington: Hemisphere Publishing Corporation, 73

one's ancestors and friends, and even one's land."²⁹ The sense of self can include anything that one cares about, everything in that one is emotionally invested. This means that any object, animate or inanimate, human or nonhuman, can be part of the self. The reason for this is that, while empirically everyone has a defined sense of "me" or of the empirical self, the line between me and mine is not clear. Our identity is not confined to our bodily or mental self. This is why nature can become part of the "self" and "self-identification", and why this leads to what is called an "ecological self". In a single phrase, the "ecological self" is the broadening of the self to include all different aspects of nature.³⁰ *Ecology* is here defined as "the total relationship of the animal to both its organic and its inorganic environment."³¹

According to Arne Naess, it is a quality of human nature, once reached a certain level of maturity, to identify with all living beings, "beautiful or ugly, big or small, sentient or not."³² As a matter of fact, the individual's identification with nature and his or her concern for its wellbeing arising from it varies significantly from person to person. As reported by Milton, "identification with nature and natural things is most explicitly developed in the work of deep ecologists, but it is also important in motivating those concerned with the rights and welfare of non-human animals, and those concerned with the conservation of biodiversity."³³ Identification with nature is, therefore, a crucial aspect of environmentalism as it provides the long-term motivation to protect nature and its habitants.

To develop an "ecological self", love for nature is not enough. John Seed, a long-time deep ecology movement activist, describes his experience of an ecological self as follows:

"I try to remember that it is not me, John Seed, trying to protect the rainforest. Rather, I am part of the rainforest protecting itself. I am that part of the rainforest recently emerged into human thinking. What a relief then! The thousands of years of imagined separation are over and we begin to recall our true nature."³⁴

²⁹ Zavestoski, Steve (2003): 300

³⁰ Naess, Arne (1989): *Ecology, community and lifestyle*. New York: Cambridge University Press

³¹ Krebs, Charles J. (1994): *Ecology*. New York: Harper Collins College Publishers

³² Milton, Kay (2002): *Loving Nature. Towards an ecology of emotion*. London: Routledge, 55

³³ Milton, Kay (2002): 56

³⁴ Seed John, Macy Joanna, Fleming Paul, Naess Arne (1988): *Thinking like a mountain: Towards a council of all beings*. Philadelphia: New Society Publishers

This quote suggests that the “self” is more than the result of social interaction. It is also the product of inner processes which are phenomenologically difficult to describe. John Seed characterizes his experience in the forest as “a spiritual one.”³⁵

According to Aron and Tracy McLaughlin -Volpe³⁶, “self-expansion” is a fundamental human motivation and need. This expansion of the self is achieved by widening the range of objects of identification. Nature seems to play a fundamental rule in this process of “expansion”. “For some people” so Clayton³⁷ “it is experienced as a spiritual dimension, a connection with Mother Earth, or a unity with Gaia; for others, it is simply a way of fitting oneself into the larger picture, as a part of an environment, a world, a functioning ecosystem.” The natural environment, along with the social environment, seems to provide a fundamental source of self-identity based on the interaction of the person with nature and on the self-knowledge that individuals draw about themselves in an environmental context.³⁸

The concept of “ecological self” was coined by the father of the deep ecology movement, Arne Naess, a former professor of philosophy at Oslo University.³⁹ Deep ecology is based on eight basic principles as summarised in the following manifesto⁴⁰:

- 1.) All living beings have intrinsic value.
- 2.) The richness and diversity of life has intrinsic value.
- 3.) Except to satisfy vital needs, humans do not have the right to reduce this diversity and richness.
- 4.) It would be better for humans if there were fewer of them, and much better for other living creatures.
- 5.) Today the extent and nature of human interference in the various ecosystems is not sustainable, and the lack of sustainability is rising.
- 6.) Decisive improvements require considerable changes: social, economic, technological, and ideological.
- 7.) An ideological change would essentially entail seeking a better quality of life rather than a raised standard of living.

³⁵ Seed, John (1979): *Beyond Anthropocentrism*. In: <http://www.morning-earth.org/DE6103/Read%20DE/Beyond%20anthropo.seed.pdf> (15.10.2018)

³⁶ McLaughlin-Volpe Arthur & Tracy, Mashek Debra, Lewandowski Gar, Wright Stephen, Aron Elain (2004): *Including others in the self*. In: *European Review of Social Psychology*, 15, 101-132

³⁷ Clayton, Susan (2003): 50

³⁸ Clayton, Susan (2003): 51

³⁹ Seed, John (2006): *The Ecological Self*. In: *The Trumpeter*, Vol. 22, Nr. 2, 96-102

⁴⁰ Naess, Arne (2008): 28

- 8.) Those who accept the aforementioned points are responsible for trying to contribute directly or indirectly to the necessary changes.

The concept of “ecological self” was born out of the recognition that, to tackle the present environmental crisis, ecological ideas alone, like those of the deep ecology manifesto, are not enough. According to Arne Naess, we need an ecological identity, an ecosophic self⁴¹, that engages not only the cognitive part of the mind, but also ecological feelings. Together these lead to ecological actions. The involvement of the ecological self in the perception and experiencing of reality would naturally lead, says Naess, to a natural fulfilment of strict environmental ethics.⁴² The ecological self is part of a personal identity that needs to be constantly sustained. One way for this to occur is deep inquiry into personal values and beliefs about nature. This should ultimately lead to the sacred, spiritual dimensions of daily life, “with many options for expanding our understanding, compassion, and range of, actions and active feelings.”⁴³ Beside deep inquiry, John Seed recognises rituals and regular meditation practices as essential for maintaining an ecological self.

The need to maintain the ecological self is due to an innate human tendency “to forget who we really are”⁴⁴ and therefore to wander off, into socially constructed identities which are disconnected from nature and the natural environment. In her research, Dr. Elisabeth Bragg has shown that, unless people engage in regular practises that enhance the sense of an ecological self and of interconnectedness, “consciousness fades back into the logic of the eddy, and we remain trapped inside a skin encapsulated ego floating towards the abyss.”⁴⁵

Dr. Bragg developed a scale for measuring ecological identity, and used a questionnaire which she gave to participants of deep ecology workshops in Russia, North America and Australia. She found a statistically significant increase of ecological identity in participants directly after the deep ecology workshops. But unless participants continued these practices, the effect vanished significantly after only six months.⁴⁶

In this dissertation I hypothesize that the key qualities to develop an “ecological self” are empathy, gratitude, a sense for the interconnectedness of life, and the ability to identify

⁴¹ Ecosophic self is the recognition that everything is connected, and that nothing exists in isolation. In: Witoszek Nina, Brennan Andrew (Eds.) (1999): *Philosophical Dialogues. Arne Naess and the Progress of Ecophilosophy*. Lanham: Rowman&Littlefield

⁴² Naess, Arne (1988): *Self Realisation: An Ecological Approach to Being in the World*. In: Seed John, Macy Joanna, Fleming Pat, Naess Arne: *Thinking like a Mountain-Towards a Council of All Beings*. Gabriola Island: New Society Publisher

⁴³ Naess, Arne (2008): 39

⁴⁴ Seed, John (2006): 100

⁴⁵ Seed, John (2006): 101

⁴⁶ Bragg, Elisabeth: *Towards an Ecological Self*. In: www.rainforestinfo.org.au/deep-eco/shaman.htm (27.10.2018)

with nature, including human and nonhumans as well as water, air, rocks and the land in general. Whether meditation practices are helpful in facilitating the construction of an ecological self within the practitioners is assessed through the potential of the practices to influence the level of empathy, gratitude, feeling of interconnectedness and ability to identify with other living beings.

Arne Naess, in particular, stressed the importance of identification for the ecological self:

“we need environmental ethics, but when people feel that they unselfishly give up, or even sacrifice, their self-interests to show love for nature, this is probably, in the long run, a treacherous basis for conservatism. Through identification, they may come to see that their own interests are served by conservation, through genuine self-love, the love of a widened and deepened self.”⁴⁷

The following sections investigate how heart-based meditations from the Christian, Sufi and Buddhist traditions effect the “ecological self” of practitioners. The investigation is limited to three exemplary spiritual /religious traditions because of the space limit of the dissertation. Many other traditions could have been included as well.

According to the concept of “embodied consciousness”⁴⁸ shifts in subjectivity are accompanied by physiological alterations. In other words, shifts in consciousness have a physical manifestation. This physiological alteration has been clearly demonstrated for the brain and increasingly also regarding the functioning of the physical heart. Because of the connection between consciousness and the physical body, the next section addresses the neurobiological perspective on the heart and its role in subjectivity/consciousness.

5. Scientific Perspective on the Heart

Studies of meditation have been mostly focusing on the brain and the effects of meditation on the structure of the brain. Since the 1970s, neurobiology experienced major paradigm shifts as it has been shown that the brain possesses a remarkable ability to regenerate and change its modus operandi. This ability has been named “neuroplasticity.”⁴⁹ This is the ability to adapt neuronal

⁴⁷ Naess, Arne (2008): 85

⁴⁸ Rosch Eleonor, Thompson Evan, Francisco J. Varela (1991): *The Embodied Mind: Cognitive Science and Human Experience*. Cambridge: MIT Press

⁴⁹ The concept of neuroplasticity is pertinent to the idea of an “ecological self?”. Assuming that a particular behaviour can affect the structure of the brain, and that in turn the structure of the brain affects human behaviour, it can be

pathways to life circumstances and to replace neurons which have been damaged. Repeated engagement in certain mental activity activates corresponding neurological pathways. This increases the efficiency and processing capacity within these neural circuits as the neurons that fire together also wire together.⁵⁰

Neuroscientists have shown that meditation practices have the potential to enhance neuroplasticity.⁵¹ Such discoveries, have reinforced a shift from a reductionist view of human nature to a more holistic, system-oriented perspective⁵² in which the interplay of the different body systems and their adaptability is more and more seen as key aspects of the functioning of the human body. Following such a holistic approach, in the past 25-30 years, studies of consciousness and systematic neurobiological research have been widened to include not only the brain, but also other body systems like the heart.

One of the most renowned institutes which have explored in depth the physiological mechanism of the heart is the HeartMath Institute (HMI), a non-profit organisation founded 1991 by Doc Childre in California.⁵³ Amongst the most significant discoveries of the HMI is the finding that the physical heart possesses a series of neuronal ganglia, complex and autonomous enough to be characterized as the brain of the heart. The heart-brain is able to act independently of the cranial brain to learn, to remember, to make decisions and even to feel and sense.⁵⁴ It will be discussed later if the ability of the heart to have independent feelings from the brain might be relevant to the development of an ecological self, especially in connection with heart-based meditations.

The notion that only the brain affects the functioning of the heart has been proven to be wrong. In fact, a two-way dialogue between brain and heart is constantly taking place reciprocally influencing both organs.⁵⁵ The heart communicates with the body with the brain through four path-ways: neurological communication (nervous system), biochemical communication

speculated that “consciousness” can indeed be transformed. This means that a physiological correlate of an ecological consciousness is thinkable and that in turn a certain behaviour might facilitate the neurological activation of relevant areas of the brain connected to ecological consciousness.

⁵⁰ Hebb, Donald (2002): *The organization of behaviour: a neuropsychological theory*. In: http://s-f-walker.org.uk/pubsebooks/pdfs/The_Organization_of_Behavior-Donald_O._Hebb.pdf (20.11.2018)

⁵¹ Ramachandran, Vilayanur S. (1993): *Behavioural and magnetoencephalographic correlates of plasticity in the adult human brain*. In: Proceedings of the National Academy of Sciences, 90, 10413-10420

⁵² Chiew, Florence (2012): *Neuroplasticity as an Ecology of the Mind*. In: Journal of Consciousness Studies, 19, No. 11-12, 32-54

⁵³ <https://www.heartmath.org/about-us/team/founder-and-executives/> (01.07.2018)

⁵⁴ In: Science of the heart. Exploring the Role of the Heart in Human Performance, [https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018)), 5

⁵⁵ In: Science of the heart. Exploring the Role of the Heart in Human Performance, [https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

(hormones)⁵⁶, biophysical communication (pulse waves), and energetic communication (electromagnetic fields). These four pathways of communication between the brain and the heart highly influence the way we perceive the environment. Studies conducted by Karl Pribram, for example, have shown that our perception of time is created not only by the brain but through the interplay between heart and brain.⁵⁷

One of the hormones produced by the heart, the Atrial Natriuretic Peptide (ANP), has the ability to influence motivation and behaviour.⁵⁸ Another hormonal product of the heart is the peptide oxytocin, a neurotransmitter commonly referred as the social-bonding hormone or “love neurotransmitter”. Could oxytocin influence how we feel about nature? Research conducted at Duke University, in North Carolina in the United States, showed that after receiving oxytocin, middle-aged male participants displayed an increased sense of awe and of interconnectedness⁵⁹ with life and with non-human beings. Participants who received oxytocin gave higher ratings to statements like “All life is interconnected” and “There is a higher plane of consciousness or spirituality that binds all people.”⁶⁰ Oxytocin has the potential to promote empathy, one of the prerequisites for developing a sense of ecological self. Commenting on studies from Duke University, Christopher Bergland notes that “one of the most exiting takeaways >of this research< linking oxytocin and spiritual connectedness is the idea that Nature can embody a tangible entity that you bond in an intimate way.”⁶¹ Considering all this, can we say that the heart, as a source of oxytocin can re-enact what John Muir called “the archetype of our oneness with the earth”⁶²? Despite these discoveries about the biochemistry of the heart, further investigation is needed to assess how and if heart-based meditation influences the physiological activity of the heart (in the same way as, say, compassion meditation affects the structure of the brain). In that case, heart-meditations could have the potential to influence the behaviour and feelings of practitioners towards nature.

⁵⁶ „Although not typically thought of as an endocrine gland, the heart actually manufactures and secretes a number of hormones and neurotransmitters that have a wide-range impact on the body as a whole.” In: <https://www.heartmath.org/research/research-library/> (01.07.2018)

⁵⁷ Pearce, Joseph Chilton (2012): 76-89

⁵⁸ Telegdy, Gyula (1994): *The action of ANP, BNP and related peptides on motivated behaviour in rats*. In: *Reviews in the Neurosciences*, 5(4): p. 309-315.

⁵⁹ Van Cappellen, Patty (2016): *Effects of Oxytocin Administration on Spirituality and Emotional Responses to Meditation*. In: *Social Cognitive and Affective Neuroscience*, 1579-1587

⁶⁰ Bergland, Christopher (2016): *Oxytocin, Spirituality, and the Biology of Feeling Connected*. In: <https://www.psychologytoday.com/us/blog/the-athletes-way/201609/oxytocin-spirituality-and-the-biology-feeling-connected> (02.07.2018)

⁶¹ Bergland, Christopher (2016): 6

⁶² Peacefull, Susanna A. (2012): *John Muir: An archetype of our Oneness with the Earth*. In: <http://wpas.worldpeacefull.com/2012/03/john-muir-an-archetype-of-our-oneness-with-the-earth/> (02.07.2018)

5.1 Electromagnetic field of the heart

Through a highly elaborate experiment that was undertaken in 1963, Gerhard Baul and Richard McFee were able, for the first time, to detect the magnetic field of the heart. This field is produced through the dipolar electromotive forces within the heart itself.⁶³ Initially, the detected electromagnetic field was quite small, measuring one millionth of the strength of the earth's magnetic field. Through the development of a superconducting quantum interference device (SQUID) a decade later, it became possible to make more precise measurements. These have shown that the electromagnetic field of the heart is the strongest and largest such field produced in the human body. It is 60 times wider and 100 times stronger than the electromagnetic field produced by the electrical activity of the brain and it can be measured up to almost two meters from the physical body.⁶⁴

Studies conducted by the Heart Math Institute could show that there is a direct correlation between the heart-rhythm patterns and the frequency spectra of the magnetic field radiated from the heart. Emotions directly modulate this heart-rhythm patterns and, thus, influence the electromagnetic field, sound pressure, and blood pressure waves produced by cardiac rhythmic activity. These changes are “felt” by every tissue in the body and act as a body-internal signal.⁶⁵ At the same time, what we feel in a particular situation is translated into the frequency spectrum of the heart-magnetic field, radiating up to 2 meters from the body into the surrounding environment. We are thus constantly sending out information about our emotional state into the environment. This is perceived – at least on a subconscious level- by individuals around us. The heart is not merely a pump for blood transportation, but a sense and communication organ, constantly connecting us to the environment, though mostly on a latent level. Studies have proven that “the nervous system acts as an antenna, which is tuned to and responds to the magnetic fields produced by the hearts of other individuals.”⁶⁶ The ability to receive and process “energetic information” is innate. In everyday language we call this ability “empathy” and in a wider sense, “intuition” or “intuitive intelligence.” Heart-meditation- practitioners might develop this inbuilt, empathic capacity even further, becoming sensitive to their own hearts while at the same time becoming aware of their connection to other people's hearts and beyond that with all

⁶³ Baul, Gerhard and McFee Richard (1963): *Detection of the magnetic field of the heart*. In: American Heart Journal, 55(7), 95-96

⁶⁴ In: Science of the heart. Exploring the Role of the Heart in Human Performance, 41
[https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

⁶⁵ McCraty, Rollin (2003): *The Energetic Heart. Bioelectromagnetic Interactions within and between People*. Boulder Creek: Institute of HeartMath, 1

⁶⁶ In: Science of the heart. Exploring the Role of the Heart in Human Performance, 45
[https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

other living forms as well. This reinforced empathy through heart-meditation practice could potentially contribute to the construction and consolidation of an ecological self.

Biomagnetic communication i.e., the exchange of information between individuals through the magnetic fields of the body is possible not only between humans but also between people and animals. An experiment conducted by the HeartMath Institute shows this. A 12 years old boy and his dog were brought into different rooms. No communication between the boy and dog was possible. The boy was asked to visualize sending feelings of love from his heart towards the dog. The heart rhythms of both participants were measured and a “synchronous shift to increased coherence in the heart rhythm” of both the boy and the dog was measured.⁶⁷ Similar experiments were conducted with other people and other animals and led to the same result.

5.2 Heart and Emotions

In the past, it was generally assumed that emotions are generated solely by the brain. Numerous studies have shown, instead, that emotions are more likely to be a product of the brain *and* the body acting together. In this process, the heart seems to play a central role. “Patterns of cardiac afferent neurological input,” as shown by Sandmann, Walker and Baker, “affect not only the autonomic regulatory centers, but also influence higher brain centers involved in ... emotional processing.”⁶⁸ With every beat, the heart transmits to the central and peripheral nervous system complex patterns of neurological, hormonal, physical, and electromagnetic information. These largely determine how emotions are experienced.⁶⁹ An easily accessible phenomenon, that shows the influence of the heart on emotions is breathing. One way to feel more relaxed or to deal with a stressful situation is to take a few deep slow breaths in and out. Most people are not aware, however, that the effectiveness of altering the breath to change the emotional state lies in fact that changes in breathing rhythm directly affects the heart’s rhythmic activity.⁷⁰ The modulation of the heart’s rhythm through respiration is called “respiratory sinus arrhythmia.”⁷¹

⁶⁷ In: Science of the heart. Exploring the Role of the Heart in Human Performance, 50
[https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

⁶⁸ Sandmann C., Walker B., Berka C. (1982): *Influence of afferent cardiovascular feedback on behaviour and the cortical evoked potential*. In: Cacioppo J., Petty R. (Eds.): *Perspectives in Cardiovascular Psychophysiology*. New York: The Guilford Press, 189-222

⁶⁹ McCraty Rollin, Childre Doc (2004): *The Psychophysiology of Appreciation*. In: Emmons Robert, McCullough Michael (Eds.): *The Psychology of Gratitude*. Oxford: University Press, 235

⁷⁰ McCraty Rollin, Childre Doc (2004): 236

⁷¹ Hirsch Judith, Bishop Beverly (1981): *Respiratory Sinus Arrhythmia in Humans: How breathing Patterns Modulates the Heart Rate*. In: *American Journal of Physiology*, 24 (4)

The ability to sense what other people feel and to identify with other human beings, and non-human, is an important factor in allowing us to feel connected with the environment. In a paper published in 1996⁷², Russek and Schwartz coined the concept of “Energy Cardiology”, suggesting that the heart is more than a pump for the blood, but a dynamical energy-generating system as well, generating electromagnetic fields that transport information outward to the environment. As stated before, the heart generates the largest electromagnetic signals in the body. These signals, or “information”, have the potential to travel into space for an indefinite distance. The question remains whether this energy information has the capacity to interact with other systems and influence them significantly.⁷³ A series of experiments have shown that the electromagnetic field of the heart is able to cause changes in the structure of water, in the rate of cell growth, and in the conformation of the DNA.⁷⁴

For sure, more research needs to be done in this field. Nevertheless, it is likely that, from the scientific and material point of view, the interconnectedness of all living beings, with the heart playing a significant role, might not be just mere concept, but a physical reality that can be experienced by individuals, through meditation, particularly through heart-based meditations.

Rollin McCraty summarises this with the following words: “I believe that the electromagnetic energy generated by the heart is an untapped resource within the human system awaiting further exploration and application. Acting as a synchronizing force within the body, a key carrier of emotional information, and an apparent mediator of a type of subtle electromagnetic communication between people, the cardiac bioelectromagnetic field may have much to teach us about the inner dynamics of health and disease as well as our interactions with others.”⁷⁵

A particular emotion relevant to the “Ecological Self” is gratitude. The distinct characteristic of this emotion is its requirement by its very definition of interpersonal context or external source.⁷⁶ This might be one of the reasons why, of all virtues and feelings, gratitude is the one most underrated. Especially in western societies based on individualism and independence, the feeling of being in debt that might arise from gratitude is not desirable. “We would rather see our good fortune as our own doing (whereas the losses and sufferings are not our fault)” so Robert Solomon “thus the neglect of gratitude. Like the emotion of trust, (to which it is closely akin), it

⁷² Russek L., Schwartz G. (1996): *Energy Cardiology: A dynamical energy system approach for integrating conventional and alternative medicine.* In: Advances, 12, 4-24

⁷³ Meret, Karl: *An Expanded View of the Heart in Energy Medicine.* In: <http://www.livinginresonance.com/biological-medicine/19-an-expanded-view-of-the-heart-in-energy-medicine-pt-1> (13.07.2018)

⁷⁴ Rein G., McCraty R. (1993): *Modulation of DNA by coherent heart frequencies.* In: Proceedings of the Third Annual Conference of the International Society for the Study of Subtle Energy and Energy Medicine, 58-62

⁷⁵ McCraty, Rollin (2003): 17

⁷⁶ McCraty Rollin, Childre Doc (2004): *The Psychophysiology of Appreciation.* In: Emmons Robert, McCullough Michael (Eds.): *The Psychology of Gratitude.* Oxford: University Press

involves acknowledging our vulnerability and our dependence on other people.”⁷⁷ The gratitude and trust of an ecological self extends to all living forms. This puts humans in a completely different, dependent position rather than in a position of dominion and control over life. From a psychological point of view, this shift can be frightening and disorienting. This could also explain why the “ecological self” as a lived and embodied concept, needs to be constructed again and again through certain practices.

According to Rollin McCraty⁷⁸, it is because of the central role of the physical heart in creating physiological coherence, which in turn is associated with heartfelt positive emotions and intuition, that diverse cultures, religions and spiritual traditions throughout history have viewed the heart – often referred as the “spiritual heart”- as a source of love, wisdom, intuition and courage. “Throughout history, people have turned to their intuitive heart- also referred as their inner voice, soul or higher power- as a source of wisdom and guidance.”⁷⁹ In the following section, I will discuss various religious and spiritual traditions and their “heart-based” meditations/practices, and how these practices may contribute to the construction of the “ecological self”.

6. The Heart – Prayer: a Christian Perspective

The idea that the heart is the source of health, healing and purity is very ancient and can be found in early Christian belief. The Christian tradition regards the purity of heart, and the love that emanates from it, “as the core element of relationship between humanity and the Divine.”⁸⁰

For the Desert Fathers, the goal of a spiritual and monastic life was to restore the image of God in the heart of the believer. “Purity of heart reflected the journey’s goal and visibly manifested the mystery of God in our reality.”⁸¹ The “Prayer of the Heart”, more commonly known as the “Jesus Prayer”, is a form of heart based contemplative prayer from the hesychasm tradition passed down from the early Desert Fathers to the Byzantine Monks of Athos⁸² and known since the 5th century AD. Theologically, this practice is based on the principle of “kenosis”⁸³, or the act

⁷⁷ Solomon, Robert (2004): *The Psychology of Gratitude*. Foreword. In: Emmons Robert, McCullough Michael (Eds.): *The Psychology of Gratitude*. Oxford: University Press

⁷⁸ In: *Science of the heart. Exploring the Role of the Heart in Human Performance*, 58
[https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

⁷⁹ In: *Science of the heart. Exploring the Role of the Heart in Human Performance*, 58
[https://www.heartmath.org/research/research-library/\(01.07.2018\)](https://www.heartmath.org/research/research-library/(01.07.2018))

⁸⁰ Stanley, Ruth (2009): *Neurobiology of Chakras and Prayer*. In: *Zygon* Vol. 44, Nr.4, 833

⁸¹ Stanley, Ruth (2009): 833

⁸² Bowker, John (Ed.) (1997): *The Oxford Dictionary of World Religions*. Oxford: Oxford University Press, 499.

⁸³ Bowker, John (Ed.) (1997): 541

of “self-emptying” of Jesus’ own will. The starting point is Philippians 2-5 II where the self-giving and surrender of Jesus until his death on the cross is seen as the core life practice that every Christian should follow. During contemplation or prayer, this surrender is practiced by letting go of thoughts and by communing with Jesus Christ.⁸⁴

This contemplative technique involves concentrating on the heart and the continuous repetition of the words “Lord Jesus Christ Son of God, have Mercy on me”⁸⁵ in coordination with the breath. The prayer can be abbreviated to the repetition of the name of Jesus, which is considered to be the sound present in the human heart and conferring the “power of deification.”⁸⁶

Different studies have reported considerable health, resilience and spiritual benefits for practitioner of the Heart Prayer.⁸⁷ For a study conducted by Stephen D. Edwards and David J. Edwards⁸⁸, a small homogenous group of practicing Christians, 4 women and 4 men, with an average age of 48 years, were asked to contemplate the heart through the Jesus Prayer for at least 15 minutes and afterwards to describe in writing what they experienced.

The group was instructed to focus their awareness in the heart space and, while inhaling mentally repeat “Lord Jesus Christ Son of God” and while exhaling mentally repeat “Have Mercy on Me”. The repeated sentence can be reduced to the name of “Jesus”.

The practitioners were identified with the letters A through H. Here are their shortened descriptions of their experiences during the Heart Prayer as reported by Stephen and David Edwards:

“I felt a deep sense of relaxation and peace. I experienced people, places and events that make me happy including my family and Africa... I felt a glow afterwards. It helped me to connect with Christ.” (Practitioner A)

In this case, after saying the Heart Prayer the practitioner A felt more connected and at peace with the environment, including people and places. This attitude resonates with the ecosophical model “of the deeper or comprehensive self.”⁸⁹

Practitioner B reported:

⁸⁴ Bourgeault, Cynthia (2009): *Centering Prayer and Attention of the Heart*. In: Cross Currents, Vol. 59, No.1, 17

⁸⁵ Bowker, John (Ed.)(1997): 499

⁸⁶ Bowker, John (Ed.)(1997): 499

⁸⁷ Edwards D. Stephen, Edwards David (2017): *Contemplative investigation into Christ consciousness with Heart Prayer and Heart Math practices*. In: HTS Theological Studies 73 (3)

⁸⁸ Edwards D. Stephen, Edwards David (2017): 2

⁸⁹ Carvahlo, António (2017): 10

“Focusing on Christ consciousness for the 15 minutes instilled a sense of gratitude and peace over me. I felt a sense of self fall deeper within myself. Saying the name Jesus Christ over and over, gave me an overwhelming feeling of calm... I could feel my breathing through my heart. After the 15 minutes I have a greater sense of peacefulness and clarity.” (Practitioner B)

Remarkable here is the deepening sense of self. This seems to bring a sense of calmness, gratitude and peace. This could be interpreted as a shift in subjectivity, potentially challenging the notion of a fragmented and autonomous “self”.

Practitioner C described feeling a “*state of oneness*.” Similarly, Practitioner D reported:

“Experiencing Christ consciousness is being and feeling one with all created and uncreated reality and things in the world. It is seeing the world through the clearer eyes of the pure child. The world of people, nature, plants and animals are sacred and divine. When and where there is suffering, this means healing all that is suffering. Christ consciousness ...implies the meeting and working together of all religious and spiritual caring organisations. It is a continual call to create and make the world a better place, to improve consciousness, reality, human relationships and things of the world. The implications are infinite, eternal and relentless.”

This description illustrates the feeling of interbeing and interconnectedness – here perceived as oneness- not only with human beings but with all of creation including nature, plants and animals. This is what Arne Naess describes as “ecological self”, a widened state of self, in which we “see ourselves in others” and where the intrinsic – in this case, sacred- value of nature is recognized.⁹⁰ The sense of subjectivity is altered (“seeing the world through the eyes of a child”), and challenges the everyday sense of self. The sense of responsibility not only towards human relationships but towards all that the world encompasses is heightened as well. The practitioner feels that healing the world is a joint project and that everyone is affected by the suffering of others. Therefore, there is no real separation between the individual self and the “other”. Through identification with the “other”, the autonomous, dual self is transcended.

How nature can trigger the feeling of interconnectedness and interbeing is shown by the description of practitioner E:

“The experience was calming and restful. It was difficult to broaden my thoughts at first, to move away from immediate surrounds but the sound of birds helped to move my thoughts to a peaceful calm place where I could feel close to creation and abundance.” (Practitioner E)

Here it was the sound of nature in the form of birds singing that created a sense of being connected (“close”) to nature/creation. The resulting feeling is that of peace and calmness.

⁹⁰ Naess, Arne (2008): *Ecology of Wisdom*. Penguin: UK, 82

In summary, most practitioners experienced feelings of peace, place, happiness, blessedness, of oneness and connection and of satisfaction in oneself, the natural and the human world.⁹¹ Such positive feelings emerging during a contemplation or meditation indicates “a growing sensitivity towards interbeing, reinforcing the ecosophical dimension of meditation, illustrating its potential to expand the bio-political domain by fostering decentred forms of affect which go beyond the autonomous modern self.”⁹²

Thomas Merton, one of the most outstanding teachers of “Jesus’ Near -Eastern kenotic spirituality”⁹³ and advocate of the “Heart Prayer”, was particularly drawn to Sufism and its heart centred practices as described by the 9th century Sufi saint al-Hallāj in his treatises. In his “Conjectures of a Guilty Bystander”⁹⁴ Merton describes the spiritual heart as the “point vierge” the centre of the human being which cannot be touched by illusion or sin. This point “is in everybody, and if we could see it” Merton said, “we would see these billions of points of light coming together in the face and blaze of a sun that would make all the darkness and cruelty of life vanish completely.”⁹⁵ Heart- based spirituality, and its corresponding contemplative practices, are seen by Merton as a way to overcome the different humanitarian crisis we are witnessing on the planet, including the current ecological crisis. The mystical metaphor of the heart is not used in a poetical sense. Rather, it “belongs to a rigorous anatomy of the heart as a spiritual sense of perception.”⁹⁶ The heart here is seen as a sense organ of spiritual perception that enables us to “look deeper than the surface of things”⁹⁷ and eventually recognize the interconnectedness of life.

Thomas Merton was convinced that, in order to solve the ecological crisis (which during the 60s, the years of his later writing activity, was just beginning to show its effects) “not only physical and systematic changes are needed, but also that humanity must transform its way of seeing itself and the world.”⁹⁸ This transformation, according to Merton, could happen through a more contemplative approach to nature that includes the heart. In a hymn that strongly reassemble St. Francis’ Canticle of the Sun, the trappiest Monk wrote:

⁹¹ Edwards D. Stephen, Edwards David (2017): 5

⁹² Carvahlo, António (2017): 12

⁹³ Bourgeault, Cynthia (2009): *Centering Prayer and Attention of the Heart*. In: Cross Currents, Vol. 59, No.1, 18

⁹⁴ Merton, Thomas (1966): *Conjectures of a guilty Bystander*. In: A Thomas Merton Reader. New York: Image Book, 158

⁹⁵ Merton, Thomas (1966): 158

⁹⁶ Bourgeault, Cynthia (2009): 19

⁹⁷ Bourgeault, Cynthia (2009): 19

⁹⁸ St. John, P. Donald (2002): *Technological culture and Contemplative Ecology in Thomas Merton’s Conjectures of a guilty Bystander*. In: Worldviews, 6,2, Leiden, p. 159-182

“Today, Father, this blue-sky land you. The delicate green and orange flowers of the tulip poplar tree praise you. The distant blue hills praise you, together with the sweet-smelling air that is full of brilliant light. The bickering flycatchers praise you with the lowing cattle and the quails that whistle over there. I too, Father praise you, with all these my brothers, and they give voice to my own heart and to my own silence. We are all one in silence, and a diversity of voices.”⁹⁹

Merton recognizes the Interconnectedness of all life describing creation as a family of “brothers”, an “earth community” which is united through a quality that he in earlier writings describes as pertaining to the heart namely, silence. In that silence, which we are all part of, the different “voices” arise. These “voices” of nature, these “brothers” give a “voice” to the human heart.

6.1 Franciscan Spirituality and the “Deep abiding” experiment

In 1979, Pope John Paul II. declared St. Francis the patron saint of ecologists.¹⁰⁰ St. Francis was known for preaching to animals and his exhortations to all creatures, including non-human beings like water, fire, the sun and the stars. He considered these equally beloved brothers and sisters under God. For St. Clare and St. Francis, creation was drenched with God’s spirit and love. For both of them, the heart was a central focal point of transformation. In her “Third Letter to Agnes of Prague” written in 1238, St. Clare explains:

“Place your mind before the mirror of eternity! Place your soul in the brilliance of glory! Place your heart in the figure of the divine substance and, through contemplation transform your entire being in the image of the Godhead Itself.”¹⁰¹

The transformative potential of such heart -contemplation lies in the shift of identification from a separate sense of self to a sense of self which is deeply connected to the Divine as one’s Deepest Self and as part of creation.¹⁰²

Similar to St. Clare, St. Francis spoke of the heart as our meeting place with the holy. In his Earlier Rule, he describes the heart as the dwelling place of the Lord.

To investigate how heart-focused meditation would increase awareness of inter-connective oneness, compassion and solidarity with others, Catherine Quehl-Engel, an Episcopal priest

⁹⁹ St. John, P. Donald (2002): 175

¹⁰⁰ <https://www.earthday.org/2016/10/06/patron-saint-animals-ecology/> (22.07.2018)

¹⁰¹ Quehl-Engel, Catherine Mary (2014): *Deep Abiding: Praying, Living, and Loving from the Inside Out*. Dissertation presented at Virginia Theological Seminary, 28

¹⁰² Quehl-Engel, Catherine Mary (2014): 29

serving as chaplain of Cornell College, designed an experiment with students and faculty from her university. The programme was named “Deep abiding” and although “neutral” in its design and open to members of all religious denominations, its theory was very much based on the Franciscan and, more generally, Christian concept of the heart as the indwelling of the Divine.¹⁰³ The 30 participants, aged between 18 and 69, showed a significant diversity in terms of spiritual/religious identity and perspectives. Ranging from atheists, agnostic to exclusively anchored and committed to one religion, some of them identified themselves as spiritual but not religious.¹⁰⁴ Over seven weeks for at least five times a week and a minimum of fifteen minutes, each time the participants were committed to a formal homework practice. This involved “inwardly surrendering, softening, re-tuning, and reidentifying with indwelling Spirit or life force as one’s Deeper Self.”¹⁰⁵ The participants were asked to focus on their heart and to breath in for five counts and exhale for five counts. The inhalations were taken as if from the front of the chest and the exhalations from the back. Optionally they could feel either as being “breathed in” or “prayed in” by Breath /Spirit /God or the Universe. The practice also involved concentrating on a feeling in the heart, like joy, happiness, gratitude or unconditional love. The participants were encouraged to fill the heart with healing light and to send this light to places or circumstances which, in their view, needed healing. “By sending healing, compassionate intention to all who have ever shared similar struggles, the intended outcome was that participants would develop a deeper solidarity, sense of oneness, and a communion of compassion with others...Perhaps this recognition of self in the other would be akin to the mystical experience Saint Francis of Assisi had of oneness with the leper and the crucifix of the wounded Christ”, Quehl-Engel wrote when describing the practice and its aim.¹⁰⁶

Participants took part in surveys in the form of questionnaires before the programme, immediately after it and one month later to quantitatively measure whether changes occurred over time and whether these changes were stable.

In the survey conducted one month after the program ended, some of the participants made the following statements:

Participant A: “I think a habit of self- and world awareness, plus a little basic love, helped me to first recognize and then forgive myself, my partner, my world, our struggles and flows.”

¹⁰³ Quehl-Engel, Catherine Mary (2014): *Deep Abiding: Praying, Living, and Loving from the Inside Out*. Dissertation presented at Virginia Theological Seminary

¹⁰⁴ Quehl-Engel, Catherine Mary (2014): 88

¹⁰⁵ Quehl-Engel, Catherine Mary (2014): 91

¹⁰⁶ Quehl-Engel, Catherine Mary (2014): 94

Participant B: “Heart-centered meditation allows me to feel the unity between myself and others resulting in compassion through that realisation”.

Participant C: “By showing tender mercy to myself, I can now try to do the same towards others. I feel kinder.”

Similar to the first study presented in this work, the “key-words” of the majority of participants were compassion, kindness and feeling of unity with others. These are all fundamental qualities for developing a wider sense of Self. A comparison of the survey before and after the program showed a decrease in the number of participants, from 29% to 8% saying they never experienced oneness with the Sacred amid ordinary daily activities.¹⁰⁷ There was an increase from 21% to 40% of participants reporting that they almost always experience a sense of “oneness with creation in a way words cannot convey.”¹⁰⁸ Quehl -Engel concludes her study by stating: “When taking into account the multiple forms of evidence from survey comparisons named above, it is safe to suggest that increased awareness of interconnective oneness with the indwelling Spirit and all living beings occurred as a result of this program.”¹⁰⁹ This conclusion is a strong indicator that heart-centred practices lead to an increased awareness of “interbeing” and of unity of life, therefore contributing to developing an increased sense of ecological Self and identification with all life forms.

This program was based on the Franciscan notions of “poverty” and “surrender”. Poverty is here the acceptance of one owns limitations. This acceptance happens through surrender or acknowledgment of an operative interdependent relationship with life. The interior prayer of the heart aims to put the practitioners in touch with these qualities as well as to show a “way of being, perceiving, loving and serving amid everyday life activities and encounters.”¹¹⁰

“Sufism and Christianity are joined at the heart”¹¹¹ as both are pathways of transfiguration through love. In the next section, I will investigate the Sufi practice known as Zikr and its implications for the “Ecological Self”.

7. Heart and Zikr: A Sufi Perspective

¹⁰⁷ Quehl-Engel, Catherine Mary (2014): 140

¹⁰⁸ Quehl-Engel, Catherine Mary (2014): 141

¹⁰⁹ Quehl-Engel, Catherine Mary (2014): 144

¹¹⁰ Quehl-Engel, Catherine Mary (2014): 148

¹¹¹ Vaughan-Lee, Llewellyn (2012): *Prayer of the Heart in Christian & Sufi Mysticism*. California: The Golden Sufi Center, XV

Llewellyn Vaughan -Lee, a modern Sufi teacher from the Naqschbandiyya-Mudschaddidiyya Sufi tradition, once stated, “as we silently work upon ourselves, the energy of our devotion becomes a point of light within the world. At the present time, a map is being unfolded made of the lights of the lovers of God. The purpose of this map is to change the inner *energy structure of the planet*. In previous ages, this energy structure was held by the sacred places, stone circles, temples, and cathedrals. In the next stage of our collective evolution, it is the *heart of individuals* who will hold the cosmic note of the planet.”¹¹² This statement is relevant to our purpose here for two reasons. First Llewellyn brings ecology and spirituality together by implying that spiritual practice has an impact on the planet. Second, he stresses the importance of the individual heart as a focal point of evolution and spiritual betterment. In doing so Llewellyn Vaughan -Lee is consistent with an old school of thought, Sufism. In the Sufi tradition, in fact the heart plays a crucial rule.

But what is Sufism, first of all? Even if in reality it is far more complex, for the sake of this paper Sufism is defined as the mystical branch of Islam. A prominent scholar of Islamic theology, Annemarie Schimmel, defines Sufism as:

“the mystical Islamic belief and practice in which Muslims seek to find the truth of divine love and knowledge through direct personal experience of God. It consists of a variety of mystical paths that are designed to ascertain the nature of humanity and of God and to facilitate the experience of the presence of divine love and wisdom in the world.”¹¹³

Sufism, which is often treated as a single phenomenon, is made up of numerous and different strands, styles, and traditions called *Tariqa* or Order.¹¹⁴ This is an important point as the practices and focus can vary according to the *Tariqa*. A common feature of all Sufi orders is the importance given to the heart. Sufism is sometimes described as “the path of love” and the Sufi as a “traveller on the path of love, journeying back to God through the mysteries of the heart.”¹¹⁵ The heart is believed to be the seat of God, Allah or the Beloved, as Sufis often call the Divine. The goal, as in every mystical tradition, is the return to the divine source. In Sufism, this return to the primordial source or reality is achieved through the practice of heart meditations or through *murāqaba*¹¹⁶, the Sufi word for meditation which, in Arabic means “to watch over” or “to take care”. *Murāqaba* implies that during meditation, the practitioner takes care or watches over the

¹¹² Vaughan-Lee, Llewellyn (2012): XVIII

¹¹³ Schimmel, Annemarie (2014): *Sufismus. Einführung in die Islamische Mystik*. München: C.H. Beck

¹¹⁴ Bowker John (Ed.) (1997): 924

¹¹⁵ Vaughan-Lee, Llewellyn (2006): *The Sufi Meditation of the Heart*. In: Shear, Jonathan (Ed.): *The Experience of Meditation*. USA: Paragon House

¹¹⁶ Vaughan-Lee, Llewellyn (2012): 3

spiritual heart at the same time acquiring knowledge over it and its creator.¹¹⁷ What differentiates Sufism from Islamic philosophy and dogma, is mainly “that Sufi authors rely on *ma’rifah* – the direct knowledge of Self and God that flows freely in the purified heart.”¹¹⁸

In Islam the heart (*qalb*) is the connecting point between matter and spirit, earth and heaven and stands for contemplation and spiritual life.¹¹⁹ *Qalb* or heart is related to the verb *qabil*, meaning “to receive.” The heart is seen in Islam as the receptacle of the universe, able to receive the Divine in whatever form it manifests. Sufism sees itself as the “religion of the heart”, according to the Indian Sufi master Hazrat Inayat Khan, and the heart as the seat of eternity, light, and divinity. Adam became human through the breath God gave him. According to Sufism’s interpretation of Genesis, through the breath of God, Adam was given a heart.¹²⁰ The importance of the heart is stated also in the Koran and the Hadiths, the stories attributed to the Prophet Mohammed and not contained in the main koranic body. According to the Hadith Qudsee, Allah states: “Heaven and earth cannot hold me but I am contained in the heart of my servant.”¹²¹ It is here, within the heart, that the devotee meets God.

Some of the most important Sufi treaties on the heart were written by the 9th century AD Sufi scholar al-Hakim al- Tirmidhi from Khurasan.¹²² He divides the heart (*qalb*) in four concentric arranged parts or stations called *maqâmat*. These stations are the breast (*sadr*), being the outermost sphere, followed by the proper heart (*qalb*), the inner heart (*fu’ad*) and the intellect (*lubb*). The *qalb* is considered to be the seat of the “light of faith” or “acceptance by the heart of the truth of God.”¹²³ The inner heart is the seat of the agnostic light, where visions of reality are gained. The innermost sphere of the heart, the intellect, is the abode of the light of unification, the recipient of God’s grace and wealth.

The Self in Sufism is not considered to be part of the heart, but rather a separate entity seated in the stomach and the source of passions and evil desires. This Self needs to be kept under control through spiritual discipline and practices such as meditation, so the Self does not escape from the stomach and enter the heart, obscuring its light. But according to al-Tirmidhi, the Self doesn’t

¹¹⁷ Khwaja Shamsuddin, Azeemi (2005): *Murâqaba: The Art and Science of Sufi Meditation*. Huston: Plato

¹¹⁸ Baker Rob, Henry Gary (Eds.) (2005): *Merton & Sufism: The untold Story. The complete Compendium*. Louisville: Fons vitae, 23

¹¹⁹ Richo, David (2007): *The Sacred Heart of the World. Restoring Mystical Devotion to our Spiritual Life*. New York: Paulist Press, 14

¹²⁰ Richo, David (2007): 14

¹²¹ <https://www.bakkah.net/en/hadeeth-qudsee-neither-my-earth-nor-my-heavens-could-contain-me.htm> (16.09.2018)

¹²² Baker Rob, Henry Gary (Eds.) (2005): 79-88

¹²³ Baker Rob, Henry Gary (Eds.) (2005): 80

possess any authority or real power. The “real king is the heart and the self is its kingdom.”¹²⁴ For Sufis, therefore, the heart is both earthly and heavenly, the connecting point of earth and heaven.

7.1 Zikr- the Heart-centered meditation of Sufism

The term *Zikr* is derived from the Arabic word “*dhakara*” meaning “remembering”. It refers to the remembrance of God, the annihilation of one’s self in the presence of God or the forgetting of everything other than God.¹²⁵ This can be achieved through recitation of Allah’s names or though silent meditation. Through this remembrance of God, according to sure al-Zumar “their skins and their hearts soften” (39:23). This softening of the heart is considered in the Koran to be a quality of the pious whose “bodies follow what is in their hearts by sharing this calmness and rest.”¹²⁶

Zikr is considered to be the most rewarding performance of Muslims toward God. In the Surah Ar Ra’d, one of the most repeated Koranic verses, it is stated: “Those who have believed and whose hearts are assured by the remembrance of Allah. Unquestionably, by the remembrance of Allah hearts are assured” (13:28).¹²⁷

The outer form of the Zikr practice can vary but, in essence, the attention of the practitioner revolves toward the heart. It is here that the Divine Presence is invoked. The invocation is achieved through repetition of a phrase, typically “*La Ilaha illa ‘Llah Hu*”, from Arabic meaning “There is no God other than God” or “Nothing exists, which is not God” or the repetition of God’s name and his attributes. The phrase is repeated in coordination with the breath, sometimes with specific movements, as explained in the following example of a Zikr practice:

“The practitioner says out loud the word Allah while moving the head from the centre down and left in a straight line toward the heart. The energy is directed into the heart centre. Silently the practitioner breathes in as he/she moves the head back up and looking forward.”¹²⁸

Technically speaking, Sufis believe that focusing on the heart activates the heart centre itself, the psychic energy centre in the chest, and this engenders love.¹²⁹ The spiritual heart then begins to spin. This generates more love and, ultimately, helps the mind become still. As the mind becomes

¹²⁴ Baker Rob, Henry Gary (Eds.) (2005): 85-86

¹²⁵ Saritoprak, Zeki (2018): *Islamic Spirituality. Theology and Practice for the Modern World*. London: Bloomsbury, 36

¹²⁶ Saritoprak, Zeki (2018): 36

¹²⁷ <https://quran.com/13/28> (06.08.2018)

¹²⁸ <https://risingtideinternational.org/allah-heart-zikr/>

¹²⁹ Vaughan-Lee, Llewellyn (2006): 6

still, the heart spins faster, creating a chain reaction leading to more stillness of the mind and more presence within the heart. The first effect of this quietening of the mind is a “sense of being, not an ego identity because this *being* is not separate, but contains everything within it.”¹³⁰

Abdul Qahar Sarawari from the University of Afghanistan and Mohammad Nubli Abdul Wahab from the University of Malaysia Pahang recently conducted research to investigate the relationship between heart coherence and the practice of Zikr.¹³¹ “Heart coherence” is here defined as a specific assessment of the heart’s rhythms that appear ordered and in a sine wave-like pattern. In a state of coherence, the physiological system doesn’t need extra energy to perform to its optimum as in this state there is a synchronisation between heart rhythms, the respiratory system and the blood-pressure rhythm, leading to a synergetic effect. Heart coherence and its effects are “measurable through the use of heart rate variability (HRV) biofeedback technology and HVR techniques.”¹³² Heart Variability Rate is defined as the changes in the time intervals between nearby heartbeats and it can be seen as indicator of how the body deals with physiological and environmental challenges.¹³³

The method used by Sarwari and Wahab is a combination of HRV-biofeedback technology and interviews with the participants of the study. Prior to heart measurements during the Sufi Practice of Zikr, the Heart Rate Variability of the practitioners was assessed using the so called “Quick Coherence Technique” (QTC). This previous measurement enabled the researchers to compare the results from HRV with results from the Zikr. The QTC includes three data collections and coherence technique stages: heart focus, heart breathing, and heart feeling. Collecting the HRV data was done in eight sessions: baseline 1 (2 Minutes), heart focus (2 minutes), heart breathing (2 minutes), heart feeling (2 minutes), baseline 2 (2 minutes) and three sessions performing the Zikr. The holy words chosen to be mentally repeated for two minutes in synchronisation with the breath were: *Subahanallah*, the Glory of God, *Astaghfirullah*, I beg Allah for forgiveness, and *Alhamdullilah*, Thanks be to Allah. During each stage, the HRV of the participants was measured with help of a technical device and subsequently analysed through a statistical computer programme called SPSS.

¹³⁰ Vaughan-Lee, Llewellyn (2006): 7

¹³¹ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): *The relationship between Zikr (Remembrance of Allah), Heart Coherence and Intrapersonal Communication among Muslim Postgraduate Students from different Countries*. In: Journal of Language and Communication, 5(1), 110-123

¹³² Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 110

¹³³ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 114

After the measurements of the HRV, participants were asked to undergo an interview which included a package of five open-ended questions about their personal feelings and experiences of the practice of Zikr and their heart coherence.¹³⁴

The 20 participants were all male Muslim international students from the University of Malaysia Pahang. The advantage of such a selection was that all participants shared a common religious background and were familiar with the practice of Zikr. As students aged between 22 and 39, they also shared a similar social life. The disadvantage of selecting a narrow pool of participants with the same religious background is that the results may be partially representative and cannot be extrapolated to a broader population.

The results of the data analysis showed that both the Quick Coherence Technique of focusing on the heart and the Zikr positively affected the increase of heart coherence of the participants while the Zikr demonstrated a significantly higher positive effect on increasing the level of heart coherence.¹³⁵

The interview results showed that through the practice of Zikr, the practitioners gained “stronger control over their hearts and emotions”¹³⁶ and an increased heart coherence. They could better deal with the challenges from their environment and develop positive emotions and higher self-esteem. Here are some statements from the interviews:

Practitioner 1: “Prayer and Zikr performance are among the main strategies for me to control my negative emotions and to deal with the challenging life in a completely different environment.”

Practitioner 2:” When I am out of my home country and stay with different people, daily strange things cause me to be depressed and experience emotional disorder and I try different ways to overcome such personal problems...Mostly, I overcome the mentioned challenges and repair my emotional mood when I perform Zikr”

Practitioner 3: “When I perform Zikr or pray, I feel more comfortable and happier. After prayer and performance of Zikr I feel more energetic and think positively”

Practitioner 4: “Prayer and Zikr performance recharge my body and my soul. Actually, when I am tired of my busy life, my daily prayers and remembrance of Allah helps me to recover easily and be prepared for different parts of my personal and social lives.”

¹³⁴ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 116

¹³⁵ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 117

¹³⁶ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 118

The common traits found in the answers of the practitioners of Zikr are an increase of positive emotions, decrease of depression, and other emotional disorders, and more successful interactions with others. In other words, the Zikr -a heart -based meditation- has the potential to help individuals make behavioural changes.¹³⁷

Although nature and subjects' identification with nature were not addressed, the described overall increase of wellbeing and happiness due to the Zikr -practice could reflect an increased sensitivity towards the environment. This study is quite new (2018) and more research is needed using different methods and a bigger number of participants. Nevertheless, this investigation sheds some light over the positive correlation between Zikr, heart action and reactions, and the social lives of individuals.¹³⁸ These results could encourage Muslims and non-Muslim to consider heart -based meditations like the Zikr to improve their interaction and sensitivity towards human and non-human environments all leading to the development of an ecological self.

7.2 Ecology and Islam

The essence of Islamic theology lies in the belief that the entire universe is God's creation. Within this creation, humans play the role of a *khalifa* or trustee of God on earth. This is explained in sura al-*An'am*, 6:166: "It is He who has made you khalif over the earth." Man is not the ruler of nature, but the steward of it, responsible for its safekeeping¹³⁹. This is the actual meaning of *khalif*. This relationship of humanity to creation is derived from a second central concept of Islam, namely *tawbeed* or "Unity of God". *Tawbeed* means, that God is the owner and creator of the Universe as stated in the al-Nisa sura: "To God belongs all that is in the heavens and on earth." The universe is seen as interdependent. This "interbeingness" of all creation is reflected also in the unity of humanity with nature which is not seen as separated from humankind. Humans have to render account toward God, on how they treat nature. This accountability is the third central concept of Islam called *akbrah*. "So, unity, trusteeship and accountability, that is *tawbeed*, *khalifa* and *akbroh*, the three central concepts of Islam, are also the pillars of the environmental ethics of Islam."¹⁴⁰

¹³⁷ Senik Mohd Rozali, Nubli Wahab Mohammad (2013): *A pilot study of the effect of Zikr on the Performance Psychology using heart Rate Variability (HRV)*. In: <https://www.heartmath.org/research/research-library/relevant/pilot-study-of-the-effect-of-zikir-on-the-performance-psychology-using-hrv/> (07.09.2018)

¹³⁸ Sarwari Abdul Qahar, Wahab Mohammad Nubli (2018): 120

¹³⁹ Nasseef, Abdullah Omar (1986): *The Muslim Declaration on Nature*. In: <http://www.arcworld.org/faiths.asp?pageID=132> (16.09.2018)

¹⁴⁰ Nasseef, Abdullah Omar (1986): *The Muslim Declaration on Nature*. In: <http://www.arcworld.org/faiths.asp?pageID=132> (16.09.2018)

Another relevant aspect that derives from the Koran is the idea that the whole of creation is constantly praising God. This is illustrated by a story about Yunus Emre, an eminent Turkish poet and mystic from the 14th century. One day, Tapduk Emre, the spiritual teacher of Yunus Emre, wanted to appoint a successor from among his disciples. He asked each of them to go to a field and collect a bouquet of flowers. Everyone came back with the requested flowers, everyone but Yunus Emre, who returned empty handed. After being questioned about his behaviour, Yunus responded. “Master, whenever I tried to cut them, I heard them praising God. That is why I could not cut them.”¹⁴¹ This answer showed to the master that Yunus had realized what is written in sura al- Rahman (55:7): “And the herbs and the trees both bow in adoration.” Because of his realisation Yunus Emre became the successor of his master.

In Islamic theology, in fact, nature is a mirror reflecting God, in particular his attributes and names which are recited, for example, during the Zikr and other prayers. Nature’s elements are considered to be godly signs, so called *ayat*. According to the Koran, the signs of God are infinite and limitless and every aspect of nature can be viewed as a divine sign: “The water that God sends down from the sky, the ordinance of the winds and clouds are signs.” (2:164)¹⁴² In a further sura, it is stated: “In the heavens and the earth are signs for believers and in your creation...there are signs for people who understand the alternation of night and day and the sustenance that God sends from Heaven and thereby revives the earth and in the directing of the wind.” (45:3-5).

From the Islamic perspective, similar as humans, also the elements fire, air, earth, and water are servants of God and are accordingly quoted in the Koran and the Hadiths: “And the Earth shall shine with the light of its Lord” (az-Zumar sure 39:69), “Of water >we< fashioned every living being” (al-Anbiya sure 21:30), “He has made for you , out of the green tree, fire” (Ya Sin, sura 36:80) and “Do not curse the wind, for it derives from the breath of the All-Merciful” (Hadith). These are just a few examples of how the elements are described in the Koran and the Hadiths. Elements don’t exist for the sake of themselves but for the sake of their Creator.¹⁴³ According to the Koran, the elements are not mere dead matter but living entities. From the ecological point of view, this is of immense importance. “At the dark heart of the >environmental crisis<” so Pir Zia Inayat Khan, a modern Sufi teacher, “lurks the privileged dogma that matter, the raw stuff of physical existence, is essentially inanimate- a euphemism of dead.”¹⁴⁴ A spiritual tradition able to tackle the present ecological crisis has to be able to see the liveliness of all aspects of nature,

¹⁴¹ Saritoprak, Zeki (2018): *Islamic Spirituality. Theology and Practice for the Modern World*. London: Bloomsbury, 182

¹⁴² Saritoprak, Zeki (2018): 183

¹⁴³ Saritoprak, Zeki (2018): 184

¹⁴⁴ Inayat Khan, Pir Zia (2008): *The Holy Mysteries of the Five Elements. An Eco-Sufi Vade mecum*. New Lebanon: Sufi Order International Publications, 1

including the elements. In the Koran, the planet earth is treated as a living being. Sura 44:29 for example states that heaven and earth did not cry for the Pharaoh and his people drowning in the sea. Nature is treated as a living organism “that has feelings and is even conscious, aware of what is happening, whether good or bad.”¹⁴⁵

In Islamic spirituality, nature is considered a place of brotherhood since all living beings, including elements and matter, share the same source of existence, the same Creator. Also, animals are regarded as equal to humans and as equally entitled members of the living community. The al-An‘ām sura (sura 6:39), in fact, states: “There is neither an animal on earth nor a bird flying on two wings that is not part of a community like you.” Several sura in the Koran are named after animals, such as “The Cow” (sura 2 al-Baqarah), “The Cattle” (sura 6 al-An‘ām) or “The Bees” (sura al-Nahl). Macrocosm and microcosm are equally important, each reflecting divine qualities according to their capacities.

By considering all of the above beliefs, one can conclude that Islamic spirituality and ecology are closely linked. The contemplation of nature is an essential practice for Muslims, and all humans, in general, to realize the essence of God and the role humans play in creation. But differently than other religions or doctrines, Islam does not see nature as part of God, but rather as “God’s art that reflects His beautiful names and attributes, which can be seen through spiritual experiences.”¹⁴⁶

8. Heart and Heart Meditation from the Buddhist Perspective

“Buddhism” - a Western term - covers a vast variety of schools and lineages based on the teachings of Gautama Siddharta in the 5th or 6th century B.C. The core teachings valid for all Buddhist schools are the “Four Noble Truths” (the truth of suffering or *dukkha*, and how to avoid the cycle of sufferings), the “Eightfold path” (the route to Enlightenment) and the “*paticca-samuppāda*” (the study of the causes of existence).¹⁴⁷

In Buddhism, the heart as spiritual centre, as known in Christian or Sufi teachings, does not exist. However, central to Buddhist teachings is the idea of compassion. This can be seen as a quality of the heart.

¹⁴⁵ Saritoprak, Zeki (2018): 189

¹⁴⁶ Saritoprak, Zeki (2018): 194

¹⁴⁷ Bowker John (1997): 171-172

The “Heart Sutra”, a short Buddhist text encapsulating the essential teachings on emptiness, was probably written in 350 C.E.¹⁴⁸ It is one of the best known and most popular Buddhist scriptures from Mahayana Buddhism. Here, Buddha chose the Bodhisattva of Compassion to illustrate his core teachings on emptiness:

“From the deepest of prajna wisdom
The Bodhisattva of Compassion saw into the emptiness
Of every construct
And so, passed beyond all suffering.”¹⁴⁹

In China and Japan, the early Indian principles of compassion and mercy became embodied in the bodhisattvas called Quan-Yin. The concept of compassion becomes along with its bodhisattva, the central principle in order to reach dispassion and, through dispassion, the supreme enlightenment.¹⁵⁰ At first glance, it seems a paradox that compassion would lead to dispassion. What is meant here is a selfless state, devoid of selfish passions. From a Buddhist understanding, supreme enlightenment is the state in which there is no more distinction between “self” and “other”. The whole of existence is perceived as “One” and the “once isolated human being >can finally enter< into the ultimate human equation...Once compassion issues from this ground level of being, the whole person becomes free to relate, ecologically, to the entire environment. Where is the old Ego-centricity? It has turned inside out. Eco-centricity prevails”¹⁵¹ states James Austin, author of “Zen and the Brain”. Without our ability to identify with other life forms, to extend our sense of Self to our environment, we will not be able to overcome our selfishness and the sense of separation from our environment. Albert Einstein described this state as a prison, restricting us to our personal needs: “Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole nature in its beauty.”¹⁵²

8.1 Loving Kindness Meditation

¹⁴⁸ Bowker John (1997): 417

¹⁴⁹ Austin, James (1998): *Zen and the Brain. Toward an Understanding of Meditation and Consciousness*. Cambridge: MIT Press, 698

¹⁵⁰ Austin, James (1998): 652

¹⁵¹ Austin, James (1998): 652

¹⁵² Popova, Maria (2017): *Einstein’s remarkable Letter to a Grief Stricken Father Who had just lost His Son*. In: <https://www.brainpickings.org/2017/03/14/einstein-grieving-father-letter/> (03.10.2018)

The question about the role of the “heart” in Buddhism is not easy to answer. In the “Satipatthana Sutta”, a major Buddhist scripture, the heart is seen as merely one of the thirty-one parts of the body and falls into the form of an aggregate that, according to Buddha’s noble truths, are the cause of suffering through attachment.

Another difficulty in the assessment of the role of the “heart” in Buddhism lies in the sometimes-ambiguous translation of specific terms from the original Pali and Sanskrit scriptures into modern languages. In the *Sutta-pitaka* and other Buddhist texts for example, there are three different words that interchangeably can be translated as “mind” or “heart”. These words are “manas”, “vijñana” and “citta”. “Citta”, the most widely used term in the scriptures, is often translated as “heart-mind” because it contains both thoughts and emotions.¹⁵³ According to the different traditions, the term “citta” can be understood in various ways. In Mahayana Buddhism, for example, “citta” is associated with “alaya vijñana” the “storehouse of consciousness” which contains the impressions of past experiences and, thus, becomes the seed of karma. In other Tibetan schools “citta” is simply the mind of dualistic, discriminative thinking and opposite to “rigpa” or “pure awareness”. However, in Mahayana Buddhism, “citta” is not only awareness, but refers to “bodhicitta”, the enlightened “heart-mind”. In this case, “citta” is seen as the compassionate wish to help all living beings to reach the state of enlightenment. Without compassion, according to Mahayana Buddhism, the pursuit of enlightenment becomes selfish and an interchangeable object of desire.¹⁵⁴ Because of the close relationship of mind-heart and compassion within Buddhism, compassion will here be regarded as a quality related to the heart and central to Buddhist teachings. Traditional Buddhist literature emphasizes the importance of connectedness based on compassion and describes techniques for enhancing it.¹⁵⁵ One such meditation practice or technique to enhance the heart-based faculty of compassion and empathy is the so-called “loving-kindness meditation”. The loving-kindness-meditation can be defined as a type of mindfulness meditation that incorporates cognitive and emotional aspects. The goal of this practice is to develop and increase the feeling of love, warmth and caring towards oneself and then expand these feelings to all other living beings, human and non-human.¹⁵⁶ The primary purpose of loving-kindness meditations is to cultivate unconditional kindness towards all living beings¹⁵⁷ and to foster positive emotions rather than to modify cognitive or behavioural

¹⁵³ O’Brien, Barbara (2018): *What is Citta in Buddhism?* In: www.thoughtco.com/citta (04.10.2018)

¹⁵⁴ O’Brien, Barbara (2018): 2

¹⁵⁵ Davidson R.J., Harrington A. (2002): *A Vision of Compassion: Western Scientists and Tibetan Buddhists examine human nature*. New York: Oxford University Press

¹⁵⁶ Leppma Monica, Young Mark (2016): *Loving-Kindness Meditation and Empathy: A Wellness Group Intervention for the Counselling Students*. In: *Journal of Counselling & Development*, Vol. 94, 297

¹⁵⁷ Gyatso, Tenzin (2001): *The compassionate life*. Boston: Wisdom Publications

factors.¹⁵⁸ The loving-kindness meditation typically involves repeating sentences like “may I be happy” while thinking of the self. This phrase gradually extends to a close friend, a neutral acquaintance, a difficult person, an enemy and finally, all living things, including plants and animals.¹⁵⁹ Loving-kindness meditation in Buddhist scriptures is referred as “metta”, meditation on universal love. One of the main scriptures on *metta* is the “Visuddhimagga” (The Way of Purity), a 5th century Pali text, that exposes the teachings of Theravada Buddhism.¹⁶⁰

According to Wilson, from whom the term “biophilia” originates, humans have an inborn and evolutionarily acquired tendency to focus on and affiliate with, other living things.¹⁶¹ This is why, in modern societies where most people are physically and emotionally disconnected from their environments, connecting to nature can enhance a sense of happiness and wellbeing.

Denholm Aspy and Michael Proeve from the University of Adelaide investigated what effect loving kindness meditation has on the feeling of connectedness to nature.¹⁶² Their hypothesis, based on previous studies, was that “having a subjective sense of interconnectedness to nature, or the natural world, is...an important predictor of well-being.”¹⁶³ A series of studies, like the meta-analysis conducted by Capaldi, Dopoko, and Zelenski¹⁶⁴, showed that nature connectedness was a significant predictor of vitality, positive affect, and satisfaction with life. Subjective nature connectedness has also proven to be a very strong predictor of pro-environmental attitudes and behaviours, and is associated with a greater willingness to engage in sustainable actions and concern about the negative impact of human behaviour on the environment.¹⁶⁵ In fact “individuals who incorporate nature into their sense of self may view harm done to nature as harm done to themselves.”¹⁶⁶

The experiment designed by Aspy and Proeve involved 115 undergraduate psychology students from the University of Adelaide. The students were provided with a recording of a guided loving kindness meditation. The study involved only a single meditation session. A recording instructed

¹⁵⁸ Carson J.K., Keefe F.J., Lynch T.R. (2005): *Loving-kindness meditation for chronic low back pain: Results from a pilot trial*. In: Journal of Holistic Nursing, 23, 287-304.

¹⁵⁹ Buddhharakkhita, Acharya (1995): *Metta: The philosophy and practice of universal love*. Sri Lanka: Buddhist Publication Society

¹⁶⁰ Bowker, John (1997): 170

¹⁶¹ Capaldi C.A., Dopoko R.L., Zelenski J.M. (2014): 978

¹⁶² Aspy, Denholm J. and Proeve Michael (2017): *Mindfulness and Loving Kindness: Effects on Connectedness to humanity and to the Natural World*. In: Psychology Reports, Vol 120(1), 102-117

¹⁶³ Aspy, Denholm J. and Proeve Michael (2017): 103

¹⁶⁴ Capaldi C.A., Dopoko R.L., Zelenski J.M. (2014): *The relationship between nature connectedness and happiness: a meta-analysis*. In: Frontiers in Psychology, 5, 976.

¹⁶⁵ Mayer F.S., Frantz C.M. (2004): *The connectedness to nature scale: a measure of individuals' feeling in community with nature*. In: Journal of Environmental Psychology, 24, 503-515

¹⁶⁶ Mayer F.S., Frantz C.M. (2004): 503

the participants “to first recall a happy childhood memory, then to repeat the phrases *may I be happy, may I be safe and secure, may I be healthy and strong, and may I be fulfilled.*”¹⁶⁷ The same words were then directed to a friend, an acquaintance, a difficult person and finally, all living things. At the end of the meditations, the participants were asked to answer a questionnaire titled “Positive and Negative Affect Schedule (PANAS)” a validated questionnaire to measure the positive and negative effects of a meditation practice. The connection to nature was measured through a “Connectedness to Nature Scale” consisting of 14 statements ¹⁶⁸ which measured on a 1-10 scale from 1 (strongly disagree) to 5 (strongly agree) the following statements:

1. I often feel a sense of oneness with the natural world around me
2. I think of the natural world as a community to which I belong
3. I recognize and appreciate the intelligence of other living organisms
4. I often feel disconnected from nature
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living
6. I often feel a kinship with animals and plants
7. I feel as though I belong to the Earth as equally as it belongs to me
8. I have a deep understanding of how my actions affect the natural world
9. I often feel part of the web of life
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common “life force”
11. Like a tree can be part of a forest, I feel embedded within the broader natural world
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature
13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass of the ground or the birds in the trees
14. My personal welfare is independent of the welfare of the natural world

The statistical evaluation of the questionnaires showed that after practising loving kindness meditation, the participants felt a stronger social connectedness as well as stronger connection to nature.¹⁶⁹ The study also provided strong evidence that loving-kindness meditation could be a viable intervention for enhancing well-being through enhanced connectedness.¹⁷⁰ At the same time well-being has the potential to enhance both social and nature connectedness.

¹⁶⁷ Aspy, Denholm J. and Proeve Michael (2017): 107

¹⁶⁸ Frantz Cynthia, Mayer Stephan, Norton Chelsey, Rock Mindi (2005): *There is no “I” in nature: The influence of self-awareness on connectedness to nature.* In: Journal of Environmental Psychology 25, 427-436

¹⁶⁹ Aspy, Denholm J. and Proeve Michael (2017): 111

¹⁷⁰ Aspy, Denholm J. and Proeve Michael (2017): 111

Practicing kindness and compassion regarding environmental problems, climate change, and the destruction of nature requires a strong motivation and a caring heart. By enhancing our connectedness with nature, the loving kindness meditation has the potential to strengthen active compassion when applied deeply and sincerely.

As already mentioned, in Buddhist scriptures the heart is referred as “citta”, i.e. “the centre and focus of man’s emotional nature as well as that intellectual element which inheres in and accompanies its manifestations, i.e. thoughts.”¹⁷¹ According to Buddhist teachings, the mind is the heart. *Citta* is here best understood through expressions familiar to our everyday language like “with all my heart; heart and soul; I have no heart to do it; blessed are the pure in heart; singleness of heart.”¹⁷² All these idioms emphasize that “thoughts” have a cognitive and an emotional dimension. The mind is therefore not only rational. It is emotional too. This is why “citta”, which often is translated as mind, can be located within the heart or even seen as the heart itself.

Because of this mind-heart concept in Buddhism, in the following section mindfulness meditation will be considered as a form of heart-based meditation even if the focus of attention is not specifically on the physical heart. In fact, in the *mettā-sutta*, perhaps the most famous Southern Buddhist text of all, the practice of loving-kindness (*mettā*) towards all beings is considered as a “mindfulness” practice and according to *Adhidamma*¹⁷³, mindfulness can only be present in wholesome states of consciousness, which are characterized by wholesome qualities such as loving-kindness.¹⁷⁴

Mindfulness, or undivided attention to the present moment, is not very different from the remembrance of God as practiced in the Sufi’s *Zikr* or from the remembrance of God as described by St. Augustine and the early Christian fathers: “early texts and Christians may not have used any term that has been recently translated as mindfulness, but their encouragement of this ever present awareness suggests that is exactly what they are describing.”¹⁷⁵

From an historical and textual point of view, “mindfulness” in Buddhist tradition is considered just one, though crucially important, element within the eightfold path as thought by the Buddha.

¹⁷¹ In: The Pali Text Society’s Pali -English Dictionary http://lirs.ru/lib/dict/Pali-English_Dictionary,1921-25.v1.pdf (09.10.2018)

¹⁷² In: The Pali Text Society’s Pali -English Dictionary http://lirs.ru/lib/dict/Pali-English_Dictionary,1921-25.v1.pdf (09.10.2018)

¹⁷³ The *Abhidhamma* is the third and final section of the Buddhist canon. In: Bowker, John (Ed.)(1997): *The Oxford Dictionary of World Religions*. Oxford: Oxford University Press, 6

¹⁷⁴ Virtbauer Gerald, Shaw Sarah (2017): *Understanding mindfulness: Current epistemological, methodological, and ethical issues*. In: SFU Forschungsbulletin 5/2, 22-49

¹⁷⁵ Virtbauer Gerald, Shaw Sarah (2017): 31

The eightfold path includes beside “right mindfulness” (sammā -satī) also “right view” (sammā-ditthi), “right intention” (sammā- sankappa), “right speech” (sammā- vācā), “right action” (sammā- kammanta), “right livelihood” (sammā- ājīva), right effort (sammā- vāyāma) and “right concentration” (sammā- samādhi).¹⁷⁶ Today mindfulness is one of the most used terms to characterize Buddhist practice. A USA Today article, for example, entitled “Buddhism: Religion of the moment...and called mindfulness the heart of Buddhist meditation...the ability to live completely in the present, deeply aware and appreciative of life.”¹⁷⁷ Mindfulness is a process of non-judgmental awareness into the present moment, including sensations, thoughts and emotions.¹⁷⁸ But mindfulness is more than just living in the present. It exercises a form of intuitive discrimination, guiding the mind-heart towards what is good, and taking it away from what is bad or destructive.¹⁷⁹

In a study using a qualitative approach based on semi-structured interviews of mindfulness meditators, Carvalho investigated how and if mindfulness meditation challenges the paradigm of modern Self as a separate, autonomous identity and supports a more decentred and symmetrical paradigm of selfhood.¹⁸⁰ His research relied on data from participant observation and interviews with twenty-seven participants on mindfulness meditation and Vipassana meditation¹⁸¹. The weakness of this study is that only selected interviews were quoted. This makes Carvalho’s publication too selective to rely on as a primary resource. One section of his research explored how the practice of meditation “progressively implements new forms of affect, characterized by the slowing down of the flow of thoughts, increasing the awareness of the body and fostering a deeper sense of connection with others.”¹⁸² The attunement of the practitioner’s attention towards bodily sensations as practiced in Vipassana and mindfulness meditations leads, in many cases, to the development of a “porous” body awareness, in which boundaries between the Self and the environment are less solid. It is an explicit aim of both forms meditation to make the concept of “Interbeing” and “Interconnectedness” a perceptible experience and to “prompt an ecological or decentred form of selfhood which translates into a deepened sense of connection

¹⁷⁶ Virtbauer Gerald, Shaw Sarah (2017): 28

¹⁷⁷ Kraft, Kenneth (1997): *Nuclear Ecology and Engaged Buddhism*. In: Tucker, Mary Evelyn and Williams, Duncan Ryūken (Eds.): *Buddhism and Ecology. The Interconnection of Dharma and Deeds*. Cambridge: Harvard University Press, 273.

¹⁷⁸ Kabat-Zinn (1991): *Full Catastrophe Living*. New York: Delta Trade Paperback

¹⁷⁹ Virtbauer Gerald, Shaw Sarah (2017): 29

¹⁸⁰ Carvalho, António (2017): 1

¹⁸¹ Vipassana: „form of meditation which has the personal apprehension of the specific truths of Buddhism as its object. Together with tranquillity it represents the twofold dimension to Buddhist meditational practice.” In: Bowker, John (Ed.) (1997): *The Oxford Dictionary of World Religions*. Oxford: Oxford University Press, 1025

¹⁸² Carvalho, António (2017): 7

with other humans and nonhumans.”¹⁸³ The experience of non-separateness through mindfulness meditation and the consequences for ecological awareness are described by a long-time mindfulness practitioner as follows:

“I have seen many people with ecological concerns start a meditation practice, but I also see it the other way around, people who have experiences with meditation becoming interested in environmental and ecological issues, in a more encompassing ethic, including not only humans but also the environment, animals, the world...I believe that the experience of meditation makes us realize that we are not separate, we are not separate from anything or anyone, we are not separate from any form of life, whether animate or inanimate, the meditative experience allows us to feel the non-separateness between what we call the self and the world.”¹⁸⁴

Another mindfulness practitioner and environmentalist reported a similar experience of how meditation changed his perception of self and its relation to the world:

“mindfulness affects everything- in terms of perception, in terms of how I connect with nature – it makes us much humbler and much more respectful and to value deeply the contact with nature and with other people. I suppose on a general level it’s a kind of deepening experience, you feel more connected with other things in your environment and through practice you see more deeply and you feel more deeply that connection.”¹⁸⁵

For both practitioners mindfulness, meditation had a relevant impact on their perception of the self and its interconnectedness with the world and with nature in particular.

Carvalho concludes from his observations that mindfulness meditations lead to a suspension of a stable sense of self, enhancing a sense of presence and, in some cases, of body dissolution and fragmentation of the self. At the same time, mindfulness practices seem to increase a sense of connectedness with humans and nonhumans. This supports environmental actions and “allows the practitioners to re-imagine ecology as a relational attempt to break away from individuation, supported by technologies of the self which lead to a greater appreciation of the more-than-human dimensions of affect.”¹⁸⁶

Carvalho’s findings are supported by other studies. Barbaro and Pickett ¹⁸⁷ synthesized a number of researches already studied mindfulness and connectedness to nature. Their aim was to

¹⁸³ Carvalho, António (2017): 8

¹⁸⁴ Carvalho, António (2017): 10

¹⁸⁵ Carvalho, António (2017): 10

¹⁸⁶ Carvalho, António (2017): 12

¹⁸⁷ Barbaro Nicole, Pickett Scott (2016): *Mindfully green: Examining the effect of connectedness to nature on the relationship between mindfulness and engagement*. In: *Personality and Individual Differences* 93, 137-142

understand the psychological processes that encourage pro-environmental behaviour. They also worked with students from the psychological department of Oakland University. The study's participants were asked to fill out a so-called "five facets of mindfulness questionnaire". This questionnaire assessed scores for five facets of mindfulness: nonreactivity to inner experience, observing, acting with awareness, describing, and nonjudging of experience. The participants also completed the previously mentioned "connectedness to nature scale" to assess their perceived oneness with the natural environment. All data were statistically evaluated, showing a strong correlation between mindfulness, and pro-environmental behaviours. As previously hypothesized by the researchers, connectedness to nature mediates the relationship between mindfulness and pro-environmental behaviour.¹⁸⁸ It has been argued that the reason for this correlation lies in the potential of mindfulness to intensify specific experiences. This may lead to better behavioural regulation. Mindfulness meditation can lead to an enhancement of sensory perception, and thus impact experiences in nature. This enhanced perception may, in turn, strengthen nature connectedness amongst mindful individuals.¹⁸⁹ Based on a study conducted by Brown, Ryan, and Creswell¹⁹⁰ showing that mindfulness sensitizes individuals for their intrinsic needs, Kellert argues that intrinsic needs can be met through affiliation with nature. "Therefore, if mindfulness fosters the meeting of important needs, and if these needs can be met, in part, through experiences in nature, mindfulness and nature connectedness should be positively associated"¹⁹¹ so the argument of Howell and Raellyne.

Mindfulness can lead to more awareness towards automatically carried every-day behaviours and solicits pro-environmental behaviour concerning diet, transportation, and housing. This correlation might be also positively enhanced by a feeling of greater self-world/self-nature connection, as argued by Howell, Dopko and Passmore.¹⁹² Most relevant for pro-environmental behaviour is the extent to which one feels part of the natural world, in other words how developed the ecological self is. Individuals with a strong sense of an ecological sense and thus a strong connection with nature are less likely to harm the environment as nature is seen as part of one own's self.

¹⁸⁸ Barbaro Nicole, Pickett Scott (2016): 140

¹⁸⁹ Howell Andrew, Dopko Realyne, Passmore Holli-Anne, Buro Karen (2011): *Nature Connectedness: Association with well-being and mindfulness*. In: *Personality and Individual Differences* 51, 167

¹⁹⁰ Brown Kirk Warren, Ryan Richard, Creswell David (2007): *Theoretical foundations and evidence for its salutary effects*. In: *Psychological Inquiry* 18, 211-237.

¹⁹¹ Howell Andrew, Dopko Realyne, Passmore Holli-Anne, Buro Karen: 167

¹⁹² Howell Andrew, Dopko Realyne, Passmore Holli-Anne, Buro Karen (2011): 166-171

9. Discussion and conclusion

One central hypothesis in my dissertation is the assumption that one of the core causes behind the present environmental crisis is found in the alienation of humans from nature due to the separation of the individual self and the natural world. Over time this separation and loss of nature- connectedness has led to the destructive behaviours of men towards the environment. It has been argued, that to overcome this nature-alienation nature should again become part of human identity. This identification with nature as part of the self has been named by Arne Naess, “ecological self”. It could be critically argued, that the deep ecological assumption, identification with nature would automatically lead to a more responsible treatment of the environment, is an erroneous one. Considering how many people despite their identification with body and mind, continue to harm themselves through substance abuse or other self-destructive behaviours, one could doubt that identification with nature could lead to more concern for nature. As a counter argument David Chang stresses that the notion of an expanding circle of identification “serves to redress the bifurcation between self and ecological alterity, a dichotomy that facilitates an attitude of indifference toward ecological destruction.”¹⁹³ The ecological self, as a product of expanded identification might be compared to an “enlightened self” which is able to recognise the ecological decline as our own decline.

It has been further argued on the basis of studies conducted by Elisabeth Bragg that in order to maintain an “ecological self” people have to engage in some form of practices.

I hypothesise that the key qualities for developing an “ecological self” are empathy, gratitude, a sense for the interconnectedness of life, and the ability to identify with nature. A meditation practice can be assessed as helpful in developing the “ecological self” if it helps to develop one or more of the above-mentioned qualities.

Based on this assumption I looked at different heart-based meditations from the Christian, Buddhist and Sufi tradition, using structured and semi-structured interviews with practitioners of these different heart-based meditations. I then attempted to evaluate whether heart-meditation do support the development of qualities like empathy, connectedness and gratitude and therefore can be seen as a tool to develop an ecological self. I also looked at the neurobiological and cardiological insights to shed some light on the actual function of the physical heart in connection with consciousness and nature -connectedness.

¹⁹³ Chang, David (2013): *Mindscares and Landscapes: Exploring the Educational Intersections of Neuroscience Ecology and Meditation*. Master Thesis at the University of Columbia, Faculty of Graduate Studies, Vancouver, 38

The aims of the dissertation were to discuss the subjective correlation between the effects of heart-based meditations from the Christian, Sufi and Buddhist traditions on the individual perception of nature and to evaluate the potential role of heart-based meditations on developing an ecological self.

Biochemical studies of the physical heart strongly suggest that the heart, as synthesiser of the neurotransmitter Oxytocin, might play a key role in how we feel about nature. Beside the hormonal aspect, through its neuronal pathway, the heart seems to influence the way we perceive the environment, for example, the way we perceive time.

It has further been shown that the physical heart is co-responsible for our ability to feel compassion and to empathize with the surrounding. This is mainly due to the electromagnetic field produced by the heart and functioning as conductor for information from and towards the environment as well as inside the body. At this point it could be carefully postulated that practitioners of heart-meditations might become over time more sensitive towards this inbuilt system of communication and thus develop a higher sensibility for their own bodies as well as a higher sense of connectedness with the environment. In fact, it has been scientifically proven that biomagnetic communication, i.e. the exchange of information between living beings, is possible and that it happens through synchronisation of the heart rhythms between the communicating subjects. Science has also demonstrated the existence of the connection between breathing patterns, heart's rhythmic activity, and emotions. As shown in the section about heart-meditations in the different traditions, the awareness of the practitioners is mostly not only on the physical or spiritual heart, but on the breathing as well. The combination of the two has an effect on the practitioner's emotions, often leading to a sense of peace and connection. Based on the feeling of interconnectedness, heart-meditation seems to reinforce the feeling of gratitude, which is a basic quality of the ecological self. Gratitude, especially when extended to nonhuman beings as well, has the potential to change our ideas about the role of humans within creation, questioning the position of dominion and control of men over nature. Further scientific research is needed in order shed more light on the connection of the heart, heart-meditations and the ecological self.

The next step was to look at a heart-meditation from the Christian tradition called "Jesus Prayer" or "Prayer of the Heart". I evaluated two sets of interviews with practitioners of this technique. Both studies showed very similar results. Many practitioners of both surveys described feelings of gratitude, peace, happiness, state of oneness with creation, a sense for the sacredness of nature, and increased awareness of the interconnective oneness as outcome of the heart-meditation.

Next, I looked at the Sufi practice called Zikr, a form of heart meditation. I then evaluated a study on the relationship of heart coherence and Zikr practice, where practitioners were asked to answer five open questions regarding their practice. Some practitioners reported an improvement of their well-being in form of higher control of emotions and heart, better ability to cope with a new environment, higher self-esteem and happiness. The presented study and its results are not sufficient to make general statements on the effect of the Zikr on the ecological self.

Nevertheless, we can carefully assume, that the positive impact of the Zikr on the well-being of the practitioners might have a positive impact also on their sensitivity towards the environment in a broader sense. In a following section I describe the importance of nature in Islamic theology. The two combined, i.e. the practice of Zikr and the believe in the Koran might facilitate the development of an ecological self. However, further research is still needed.

The last example for a heart-meditation is from the Buddhist tradition. As for the previous two traditions, also here I evaluated three studies done on practitioners of loving-kindness meditation and respectively of mindfulness-meditation, both considered as forms of heart-meditation. The statistical evaluation for the loving-kindness meditation showed that practitioners felt stronger social- and nature- connectedness after the practice. The result of this study has been interpreted as strong evidence that loving-kindness meditation could be an effective intervention to enhance both social- and nature- connectedness and therefore help to motivate practitioners to engage in pro-environmental behaviours. The second study focused on mindfulness – meditation, participant observation and semi-structured interviews of the mindfulness practitioners. Some practitioners reported a strong correlation between mindfulness practice and an increased sense of interconnectedness with nature. A second study conducted on mindfulness showed, according to the researchers, a strong correlation between mindfulness and pro-environmental behaviour due to an increased sensitivity of the practitioners towards the surrounding and their own conduct. In summary mindfulness meditation seems to show a strong correlation to nature-connectedness and is positively evaluated as intervention for pro-environmental actions.

The main difficulties I faced, was to find appropriate literature and interviews to use as a primary source. Due to ethical regulations set by the university, it was not possible for me to conduct my own interviews. This limitation is also the reason, why I choose only three traditions, although heart-based meditations and practices can be found in many other spiritual and religious lineages.

For all three traditions I could evaluate only from an already pre-selected pool of answers. This is probably the biggest weakness of this study, as the negative examples, of practitioners who didn't feel any increase for example in nature-connectedness, do not appear in the used sources.

Another difficulty resides in the fact, that meditative experiences often escape verbal descriptions,

which is the cause for various methodological problems in meditation research.¹⁹⁴ One of the biggest hurdles of meditation studies are unintentional biases of the researcher. Personal beliefs on meditation can potentially influence the outcome of the study, even if the results of interviews are statistically evaluated.¹⁹⁵ It is not possible for me to assess how far researcher's biases played a role in the outcome of the evaluated studies. For most of the cited cases double blinded studies have not been conducted and the quoted interviews are characterized by strong positive statements suggesting the correlation between meditation and nature-connectedness. For this reason, further investigations would be required.

When we research an object, we implicitly assume, that we investigate something outside ourselves.¹⁹⁶ In reality not only are researchers connected with the object of research, but they interpret the reality and outcomes of their observations based on own experiences, memories, and possible biases. This problem has been addressed and described by reflexivity theories. And of course, the concern regarding objectivity in research applies also for my thesis. As a long-term meditation practitioner in loving-kindness meditation as well as in the Sufi Zikr technique, I am aware of my own biases in favour of meditation as transformational tool, and of my wish to find a positive correlation between heart-meditations and the ecological self. Nevertheless, I will conclude asserting that the question, whether heart-based meditation can help developing an ecological self remains an open one.

One first difficulty resides in the challenge of defining “self” and “identity”, two concepts that point to large, amorphous, and changing phenomena.

Some authors suggest that the individual differences in nature-connectedness are trait-like qualities and cannot be changed through meditation practices¹⁹⁷ and that feelings about nature are more likely to be shaped during childhood and have to be seen as a cultural product.

On the other hand, there is a wide consensus amongst researchers that subjective nature connectedness is a strong predictor of pro -environmental attitude. Even if it is not possible to proof a causal relationship, meditation and in particular heart-meditation seems to facilitate the feeling of connectedness in general and in specific cases of connection with nature as well. Many practitioners from the quoted studies have reported increased sense of peace, well-being, gratitude after their meditation practices. This are all indicators that heart-meditation may have a positive impact on the ecological self.

¹⁹⁴ Carvahlo, António (2017): 7

¹⁹⁵ Kreplin Ute, Farias Miguel, Brazil Inti (2017): *The limited prosocial effects of meditation: A systematic review and meta-analysis*. In: www.nature.com/scientificreports (15.11.2018)

¹⁹⁶ Aull Davies, Charlotte (1999): *Reflexive Ethnography. A guide to researching selves and others*. London: Routledge

¹⁹⁷ Capaldi Colin A., Dopoko R.L., Zelenski J.M. (2014): 3

Research in the field of cardiology and neurobiology has proven the central role of the heart as a receptor and as a communication organ. As the functioning of the brain is affected by meditation due its neuroplasticity, in a similar way, it can be hypothesised that heart-meditations may have an impact on the functioning of the physical heart und thus affect the behaviour of practitioners.

The present dissertation has been a first attempt to show the relationship between heart, heart meditation, ecology and ecological self. Initial studies concerning heart-meditations in general and mindfulness in connection with nature connectedness seems to suggest the existence of a positive correlation between heart- meditations and the development of an ecological self. I believe that there is a big potential for further research. Indeed, the main contribution of the present work does not lie in providing answers but rather in arising a new question – the role heart meditation in shaping an ecological self- which has so far escaped wider academic discussion. A more systematic approach and a more rigorous data collection could shed more light on this relationship, maybe providing a useful tool in tackling the present environmental crisis.

One big advantage of heart-meditations is the religious and spiritual relevance of the “spiritual heart” for reaching a state of “oneness - consciousness” that can be founded in many religious traditions worldwide. Independently of religious beliefs, heart-meditations can easily be used by practitioners from different cultural and spiritual background, who can inbuild such practices within their personal religious beliefs.

The connection of neuroscience, heart-meditations and ecology might seem unusual. However, I believe that we need to develop a more holistic understanding of human consciousness and behaviours which will hopefully provide us with new insights on how to find solutions for the ecological crisis. A holistic approach to ecology which beside social and political activism includes spirituality and its technologies as well, requires the integration of insights from disparate fields of knowledge and our willingness to employ a wide range of methodological and theoretical tools.

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