UNLOCKING THE SECRETS OF THE HEART THROUGH MEDITATING ON THE SELF

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UNLOCKING THE SECRETS OF THE HEART

THROUGH MEDITATING ON THE SELF

by

Tina Lindhard

A Dissertation
Submitted in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy in Consciousness Studies

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DEDICATION

This dissertation is dedicated to Higher Nature. If it inspires further research into the metaphysical or electrical nature of the heart and the organism and ever-increasing levels of feeling-consciousness, I pray with all my heart that the people involved may always be inspired to do what is in their highest good and the highest good of all.

ACKNOWLEDGMENTS

This dissertation was written in a meditative state of consciousness under Higher Guidance and as such, it is not really "mine." It also relies on the prior inner investigations of Philosophers and Yogis throughout the ages and the investigations and contributions of numerous Western scientists. To all who have contributed to this knowledge, I give my heartfelt thanks. I give a special thanks to the embryologist Dr. Jaap van de Wal for introducing me into the "Goethean" way of doing science, which, when coupled with *Arka Dhyana* (Intuitive Meditation), brings awe, amazement, and delight to any avid student who wants to learn more about the wonders of Nature and her secrets. I also thank him for his excellent course into the nature of the embryo, for it provided me with the missing link between the metaphysical and physical world. The discoveries of Dr. Harold Saxon Burr concerning the electric fields of living organisms are also fundamental to the insights presented in this paper, as is unique way Dr. Francisco Torrent-Guasp unraveled the heart.

I also extend my thanks to my parents for everything they did for me. Without their insistence on giving me a good education, I would not have been able to undertake this work. To my uncle Niels who stood by me and encouraged me to return to university when I had dropped out, I too give my thanks. To all my pupils of *Arka Dhyana*, you taught me to see the beauty of the Intuitive Meditation method through multiple hearts and multiple eyes! To Dr. Art Kendal for his guidance on how *not* to make mistakes using statistics, how to construct a scale and also how to interpret the findings I extend my special heart-felt thanks. To my friend Carlos Nunez from Ponferrada who helped me

in numerous ways during this dissertation including giving me elementary physics lessons and helping with the construction of the scale and its presentation, I give my profound thanks. I give my thanks to Begoña Giraldes for teaching me how to do very pretty graphs and present the material in revealing ways. I also extend my thanks to Vima Guamasche for giving me permission to reveal her identity by publishing her sketches of her inner process; this added another "dimension" to this study. Although I name some scientists on Research Gate in this thesis, I thank all of them for inspiring me and making me contemplate many different problems, some of which are incorporated here. I also give my special thanks to my mentor Dr. Inula Martinkat of IUPS who trusted me enough to let me follow how I was being guided; sometimes it was not easy but I feel we learned to respect and love each other through the process. Also I thank her for her careful checking of the dissertation and her many suggestions. I give my heart-felt thanks to my husband, who suffered many burnt offerings as I happily forgot the meals I was cooking while becoming one pointedly absorbed in the work I was doing. Also for standing by me and encouraging me in my venture into science at this late stage of my life. I give my profound thanks to the non-profit organization CCASpain under whose auspices this study was conducted.

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insights I disclose in this PhD are scattered like exquisite pearls throughout his talks and books, but in philosophical and poetic ways, whereas here they are presented according to the requirements of science. If I have misrepresented his work in any way in these pages, the fault is entirely mine.

Abstract of Dissertation Presented to
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Requirements for the Degree of Doctor of Philosophy

UNLOCKING THE SECRETS OF THE HEART THROUGH MEDITATING ON THE SELF

By

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August, 2016

Chair: Dr. Inula Martinkat
Major Department: Consciousness Studies

Inspired by Max Planck to look for the Absolute, the universally valid, the invariant that is normally absent when only concentrating on relative, testable relationships, the present study set out to understand the nature and role of the heart using different procedures. In the literature review, this study includes the application of the comparative method of Goethe to the ontological development of the heart and the notochord based on primary observations of other scientists. This revealed that with the advent of the pulsating heart, the morphological ontology of the embryo mirrors the different broad phylogenetic stages of creation from worms to mammals and invertebrates to vertebrate forms. Reflecting on the origin of the heartbeat, this researcher concurs with Arka that pulsation is probably the underlying core principle and property of universal existence, cosmic existence, and local existence. This suggests that all matter originates and exists only by virtue of a force that brings all particles to pulsation; a *conscious Mind* that is expressing itself through ever-changing pulsating forms. This study also involved finding out what happens when

one meditates on the Self via the (pulsating) heart using the Intuitive Meditation (IM) method of inner investigation. Based on the Arka's theory of the six main levels of consciousness, this study predicted that people would show a trend towards a more feeling-based consciousness after being trained to go below their thinking mind. In order to test this, a scale was constructed under the name of the Feeling-Consciousness Scale (FCS). The scale items were based on Arka´s work and information derived from interviews with people who had practiced the IM method for more than 7 months. Using a repeated measures design, the FCS was filled in by 8 male and 23 female participants comprising of five different groups, before and after attending five IM training sessions spread over 6 weeks (a total of 13.5 hours). The second time the scale was administered, several open questions were added. A significant difference at the .001 level was found between both scores. No correlation was found between the number of times the method was practiced and the end scores. Due to the small sample size and that the scale is a project in development, these results are tentative. Statements from the open questions suggest there may be a relation between increased sentience and intuition, especially in females. The study ends with extensive suggestions for further research.

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CHAPTER 1

PROBLEM FORMULATION

Introduction

The human heart is like the heart of the universe, and hence it is sacred.

Unfolding the petals of one´s heart means gaining access to the secrets of the Universe.

(Arka, 2003, p. 114)

Background

The inspiration for this dissertation arose out of a question, an answer, and an assertion that arrived during 3 consecutive days of intense practice of *Arka Dhyana*, otherwise known as Intuitive Meditation (IM). The question was *why the heart?* The answer was because *it is the feeling center* and the assertion was that *the mind is to the brain what the Feeling Heart is to the heart; both the mind and the Feeling Heart are partly physical and partly metaphysical and both have their purpose; the mind gives rise to thoughts, the Feeling Heart gives rise to intuition.*

Although I had originally thought to do a study on meditation and changes in electromagnetic fields, I found the question "*why the heart"* provocative and it seemed to call for a more complete answer. Also, as I have been meditating specifically asking for *Higher Guidance* for over 3 months, I felt I had to honor these brief but very clear thoughts that had come in meditation. Many meditation practices throughout the ages have used the heart as a center of attention, but the reasons for this seemed unclear, at least to me. The answer that the heart is the *feeling center* seemed to be descriptive, whereas the assertion appeared to be a phenomenological statement about the structure of

human consciousness. Even if it is a phrase not actually used by the philosopher and yogi Srinivas Arka, it seemed to be directly related to his work and his method of investigating our inner world (Arka, 2003, 2006, 2009, 2010, 2013). It also appeared to be directly related to Arka´s (2013) theory of "The Six Main Levels of Consciousness." The third level he identifies involves "feeling-consciousness" which "generally prevails in the heart area and thus can be called Heart or Heart-Consciousness" (Arka, 2013, p. 37).

Based on this background, this dissertation developed into an exploratory study to clarify the question, answer, and assertion on which it was inspired and to discover more about the initial levels of consciousness outlined by Arka in his theory. The latter topic consolidated into a case study to find out if people would show a trend toward a more feeling-based conscious after receiving training in the heart-based Intuitive Meditation (IM) method developed by the above author. This method involves training people to go below their thinking minds so that they may connect with their Self via the heart. As I did not find any scale to measure feeling-consciousness, this study also involved the development of a scale to measure the changes in consciousness of people when they start meditating on the Self via the heart.

To understand more about the relevance of the heart to meditation methods, the literature review of this study centers around the question *why the heart?* Here I was inspired by Max Planck (1947) to look for the Absolute, "the universally valid, the invariant" (p. 47) that is normally absent when only concentrating on relative, testable relationships. To help achiever a broader perspective, I also included the use of the comparative method of Johann Wolfgang von Goethe.

I chose the investigation topic for several reasons. As Arka´s theory was inspired

by his inner explorations into his true nature or Self (Unfolding the Petals of the Heart, 2016), it lends itself to scientific investigation to see if, after learning his IM method, people would also show a trend toward a more feeling-based consciousness as predicted by his theory. I also felt his theory was worth investigating, as by proposing various levels of consciousness, it cuts through the dilemma (Chalmers, 2003; Grof, 1985) many Western scientists have with the term. In addition, it is a really unique theory. For the Nobel laureate Szent-Györgyi, scientific discovery itself "consists in seeing what everyone else has seen and thinking what no one else has thought" (as cited in Oschman, 2009, p. 19). In studies to do with human consciousness, it is argued here that discovery progresses through phenomenological experiencing. This, then, is presented in a way that no one else has thought, thereby throwing new light onto some aspects of human nature. This is consistent with a statement by La Tour and La Tour (2011) who claimed:

> Personal experience is of vital importance as it allows us to certify the complexity of our nature and surpass the knowledge that is available in physical reality. Without transcendent experiences, or those that surpass the physical senses and dimension, research will continue to promote misinterpretation, informational gaps, and remain trapped in theoretical conjecture (armchair research) failing to serve its central purpose as a practical instrument for self-orientation and guidance in the evolutionary process. (p. 66)

These phenomenological assertions may then to be researched using other modalities, including scientific investigation, particularly if they are to contribute to a growing body of scientific knowledge about some aspect of human nature. I therefore felt that by scientifically testing the above-mentioned aspect of Arka´s theory this study

would be contributing to the field of consciousness studies. The investigation topic was also a way to link a study about the heart with a practical and scientific example of what happens when one meditates on Self via the heart.

As I did not find any comparable research that deals specifically with feeling and different levels of consciousness in humans, and as the IM method had not been studied scientifically before, there was no data with which this study could be compared. I therefore decided to center the literature review on learning about the nature and role of the heart from various perspectives, including our ontogenetic development. I chose to do this as many methods of meditation throughout the ages have focused their attention on the heart (Louchakova, 2007a), but other than claiming it is the organ of incarnation, very little is known about what this really means or even entails.

I also felt that investigating the heart would help answer the opening question. In addition, I hoped that it would throw light on the *Feeling-Heart* especially, as the investigation topic involved a level of consciousness to do with feeling. Through this I also hoped to learn more about the topographical nature of the Self from the perspective of outside in. On the other hand, the research investigation was from the inside out, for it was directed at learning about the phenomenological experiences of others when they meditate on their inner Self via the heart using the IM method. By combining these approaches, it was hoped that this dissertation would contribute to a body of scientific knowledge about the heart, the initial levels of consciousness mentioned by Arka in his theory, and the topographical nature of the Self.

Beyond this, I hoped this thesis would awaken the world to the importance of keeping in touch with the Self via our Feeling Hearts. Not only is the Feeling Heart the

fountainhead through which we receive guidance and intuition, but also our personal wellbeing depends on our connection with our inner Self. Our educational system makes every effort to train children to develop their thinking and intellectual abilities. It seems to me as though this might be one of the causes of the lopsided view of life that is at the root of many of our modern-day problems. This is not only revealed through a loss of connection inside but also a loss of connection with nature and the universe outside (Arka, 2013). I therefore also hoped that this work would revive a new respect and even awe for nature and for life of which we are. And above all, I hoped this study would instill a new reverence for the embryo, that developing being from which we all began our journey on planet earth.

Brief Synopses of Proceeding Topics

As I opted to investigate the heart in the literature investigation, I have made this introduction longer than is normal. This is to cover various essential topics before embarking on other aspects of this dissertation. For ease of reading, I have identified these topics and outlined them in chronological order below. This also allows the reader to skip over topics and still not lose the thread. I have included definitions of various terms, like the Higher Self, Self, soul, emotions, and feeling in the text:

> It is very hard to describe metaphysical concepts and thoughts in local human vocabulary, which is very limited. However, we can try either coining a new word, or use compound words with hyphens or maybe draw some symbols and leave the rest for people to experience and understand it. (S. Arka, personal communication, May 4, 2016)

I therefore felt that reading about them in a broader context in the text itself might make

their meanings easier to grasp intuitively. In the section on definitions I have repeated the definitions of the various terms and refer to the page where they can be found.

The first topic centers on the various approaches and methods that were adopted in this dissertation. As I included the use of the comparative method of Goethe in the literature review, I give a brief synopsis of it, as I feel that many of our readers might not be familiar with his scientific approach. It is a very exciting way of conducting research, as it gives rise to the bigger picture. Although it normally relies on the primary observations of the researcher, I adapted it by comparing the primary observations of others. This generated many hypotheses, which are shared in the discussion.

As the research involved using a heart-based meditation method, in this introduction I describe the state of the art of heart-based meditation methods that meditate on the Self. I also share the reasons for selecting the IM method. I include a section about different meditation methods and their goals to help the reader understand why I have chosen not to compare the findings of this study with the results arising from research into other methods of meditation.

In the background section of this introduction, I begin with different definitions of consciousness, from both Eastern and Western perspectives. I also share how some of these definitions are linked to quantum physics. Arka´s definition of consciousness is also included, as is his theory of the six levels of consciousness. This section on consciousness is also to help the reader understand why a theory suggesting various levels may be considered as a real breakthrough in consciousness studies.

I also address the main aims of meditation methods and discuss the similarities between the aims of meditation and science. In addition, I discuss the differences

between the spiritual heart and Feeling Heart. Finally, I question what is mean by the *heart center*.

Approaches Adopted in this Study

This dissertation uses multiple approaches and methods, the main one being the intuitive inner voice of the researcher. Intuitive guidance was used in many sections of this dissertation, including the choice of its subject matter, its unfolding order, and the choice and order of articles presented in the literary review. It was discovered that the order of presenting information had an effect on the understanding of the researcher conducting the investigation. In this sense the study was heuristic. However, the research was also phenomenological, as it required learning about the inner experiences of others while constructing the scale and also during the actual research investigation itself.

This study required embracing various paradoxes, as it implied learning more about a level of consciousness that is ontologically prior to the development of our rational minds (Arka, 2013). It also implied applying the logical-thinking mind to develop a scale to measure a level of consciousness that essentially is related to a different inner way of being and perceiving the world. The requirements of the scale, moreover, were based on the rules of Newtonian and Cartesian science with all its rigor and statistical demands. It also involved applying the scale and performing preliminary psychometric techniques for validating it and analyzing the results.

This dissertation touches on different disciplines within science and different ways of doing science, as well as applying different schools within phenomenology, that of Goethe and that of Husserl. Although both have as their central aim, the study of "'the things themselves – in other words, how would the thing studied describe itself if it had

the ability to speak" (Husserl as cited in Seamon & Zajonc, 1998, p. 2), I used the method of Goethe, as applied by Steiner (1884–1885) and van der Wal (2014). According to van der Wal, it is by using the comparative approach, which involves the study and description of the juxtaposition of two isolated but polar objects, that one begins to see "more of the essence of the separate parts" (p. 2). At the same time, one starts discovering the "phenomena, which remain hidden whilst focusing on isolated parts . . . In other words one develops an eye for the total picture," (van der Wal, 2014, p. 2). This way of seeing is known as "dynamic perception" (p. 3). For example, if one looks at sperm and the egg cells, the huge size of the egg only becomes apparent when we compare it to the tiny size of the sperm. Likewise, it is full of cytoplasm, whereas the sperm has virtually no cytoplasm. She is almost immobile, but he is highly active. These differences are intimately related, and through this way of seeing, one realizes that each element adds a unique feature that the other one lacks, and therefore together form a unity that is more complete. The comparative approach enables one to look at the relationship between isolated polar elements, thus opening us to a broader reality. It is interesting that when this is done, the two poles are always in the visible realm; however, the middle "by its very nature exists in realm of the invisible. . . . This three-fold perception is an approach to nature and the human being which recognizes creation manifests the polarity of *spiritual principles* and *matter*"(van der Wal, 2014, p. 26). It is dynamic and gives us access to a bigger picture than when one only uses the analytical approach. In the Anthroposophic vision used by van der Wal, the spiritual dimension is primary.

In the literature review I applied the comparative method of Goethe to get a bigger picture of the dynamics of the developing embryo and the role of the heart in this

development. In this way I also hoped to learn more about the guiding forces that lie in the "invisible" or "metaphysical" realm.

State of the Art of Heart-Based Meditation Methods that Focus on the Self

Whereas major meditation studies have focused on mindfulness, very little is known about somatic focusing practices like Prayer of the Heart (Louchakova & Warner as cited in Louchakova, 2007a, p. 84). Even though the scientist and mystic Louchakova has done much to make these practices more known, especially Prayer of the Heart, her main focus has been centered around the mechanisms underlying consciousness, such as ontopoiesis (2005, 2006, 2007a, 2007b), ego transcendence (2007c) and the Self (1993, 2003, 2008, 2011; Louchakova & Luca, 2009; Louchakova-Schwartz, 2012, 2013). As science itself progresses in small steps, I felt that by centering the literature review on the nature and role of the heart, this study might add another dimension to the understanding of heart-based focusing practices.

Most people will agree that the mind is related to the brain and the mind gives rise to thoughts. However, not everybody has the same clarity through inner experiencing about the heart being the feeling center which gives rise to intuition. This knowledge is not unknown and different religions and traditions developed methods like Prayer of the Heart to tap into the heart´s intuitive and Gnostic aspect. This method takes years of training and is considered by seekers as "being complex" (Louchakova, 2007a, p. 82).

Arka has developed a heart-based method of meditation called IM which it is based on three pillars: touch, sound, and breath so that everybody who is interested may reconnect with their Feeling Heart and, therefore, open their intuitive capacity as part of an inner journey of Self-discovery. Here I used the definition of the term Self with a

capital as being almost synonymous with the term soul, which Arka describes in the following way:

> Soul is the unconscious master mind within every organic material in the body. It pervades inside and outside of every cell, a mother-like awareness of intelligence, which prompts everything that happens biologically, psychologically, emotionally, or in any other way. It can be bigger than our bodies and smaller than a photon. One's truest identity; cosmically spiritual in nature. (S. Arka, personal communication, May 4, 2016)

Plotkin (2003) sees soul as part of Spirit and describes it in the following way:

> By soul I mean the vital, mysterious, and wild core of our individual selves, an essence unique to each person, qualities found in layers of the self much deeper than personalities. By *spirit* I mean the single, great, and eternal mystery that permeates and animates everything in the universe and yet transcends all. Ultimately, each soul exists as an agent for spirit. (p. 25)

Arka uses the term Higher Self and from his definition included below, it seems to be very similar to Plotkin´s definition of Spirit.

> The Inner Self, Outer Self, means the Self of Nature, The Higher Self, is super-cosmic consciousness which is inside and outside of every particle even every subatomic particle, and omnipresently and eternally living entity throughout space, time, the cosmos and above and beyond, yet not interfering with individual will, mind/and consciousness as photons do not interfere with themselves. It leaves space for our ego, individuality, individual will, and

> spirit/soul, and gives us a certain freedom but if we master it reducing our conscious awareness to the subtlest form of being, we can take ourselves wherever we want to exist. (S. Arka, personal communication, June 5, 2016)

I have given slightly different definitions of similar concepts so readers can select the definition that resonates most with them.

The journey of Self-discovery is described as "a journey from the 'Rational Mind to the Emotional Heart to Pure Consciousness'" (Arka, 2013, p. 38). Arka (2013) claims that, if this journey is pursued, spiritual seekers will go through the six main levels of consciousness on their journey to pure consciousness. This outline is a theory as well as a description of a journey that involves rewinding our surface consciousness so as to reverse everything that has happened to us.

> To achieve enlightenment, we have to return to our hearts, or at least to keep in touch with the original point from which we began our journey in the world. After reaching the heart, we have to journey further into the innermost depth of our consciousness to experience the very essence of our being, the Self. (Arka, 2006, p. 180)

He also claims that although the levels one goes through are common, the content of each level is unique to each individual.

This dissertation involved learning more about the initial levels Arka (2013) mentioned in his theory of the Six Main Levels of Consciousness. Furthermore, to avoid confusion, I followed Arka´s suggestion that terminologies like inner Self, soul, and deeper consciousness are very close to each other in meanings. "Life force, on the other hand, is one of the properties of soul" (S. Arka, personal

communication, August 21, 2015).

Rationale for My Selection of the IM Method

Although the psychosomatic nature of religious practices is part of other methods that meditate on the heart (Louchakova, 2003), I concentrated on the IM method because, although it too is aimed at leading the practitioner to the discovering of the Self, it is so designed that people who want to connect with their feeling nature in their heart may do so. Arka developed the method nearly 40 years ago, and for over a quarter of a century it has been practiced in many countries, such as England, New Zealand, Canada, India, Spain, Mexico, and Fiji Islands. It is not a religious practice but a natural method of becoming aware of our feeling nature and also discovering or rediscovering our heart-based inner intuitive nature on our journey to Self-discovery. This guidance can then be used to investigate and discover our true nature or Self or to have clarity about something as basic as what the *body needs to bring it back in balance.* In other words, the first stage also involves getting in touch with the intelligence in our systems below the rational mind, referred to as the "subliminal mind" (Arka, 2013, p. 37).

Different Meditation Methods and Their Goals

Finally, in this introduction, I decided to draw the attention of readers to the fact that meditation methods differ in their aims, methods, and above all, supporting philosophies. For some people meditation is related purely to relaxation and stress release (Pfeiffer, 1966), meanwhile, for others different meditation methods can be divided into those based on philosophies that recognize the Self and those that do not recognize the Self (Arka, 2003). Pure Buddhist philosophy does not recognize the Self (Ruparell & Markham, 2001). In the following quote from the "Suñña Suta: Empty" translated from

Pali by Bhikkhu, (Buddha, n.d.) Buddha answers the following question in a very precise way:

> “It is said that the world is empty, lord. In what respect is it said that the world is empty?" The Buddha replied, "Insofar as it is empty of a self or of anything pertaining to a self: Thus it is said, Ānanda, that the world is empty. (Buddha, n.d.)

In spite of this, on reaching enlightenment after searching for truth for many years, Buddha "emphasized compassion to humanity in his messages" (Arka, 2003, p. 27).

Hindu philosophy and the Abrahamic traditions, on the other hand, do recognize the Self or soul.

Different methods of meditation can also be divided into thinking meditation or feeling meditation (Arka, 2003). This study looked at a feeling-based path that goes below the mind while meditating on our deeper essence or Self via the heart.

> Thinking meditation involves more complex thinking by asking us to follow specific steps, whereas feeling meditation deepens our feelings and places less emphasis on rationality. Feeling meditation soaks us in the tender experience of our hearts. In this state, the mind becomes an accepted, silent source of experience rather than a source of conflict within us. (Arka, 2003, p. 188)

Furthermore, Arka (2013) claims that feeling-based methods are easier than thinking based methods.

Just as the phenomenological experiences of traveling to Rome by sea and land is very different from that of traveling by air, it seems likely that different methods based on

different philosophies and/or different pathways give rise to different phenomenological experiences and also might lead to completely different destinations. Also within the same path, the specific inner experiences of each individual are also likely to be unique.

This dissertation was not aimed at comparing differences in meditation methods which are based on different philosophies, nor in comparing paths that are thinking-based with those that are feeling-based and go below the mind. However, I sometimes referred to other paths that also go below the mind and meditate on the deeper Self via the heart. Even though there are bound to be differences, I assumed they would be less than with those that do not meditate on the Self or even recognize the existence of the Self.

Some methods go below the mind but do not meditate on the Self. For Swami Mutananda (1994) this is similar to "heron meditation." He comments:

> The heron shuts his eyes and stands in a lake, pond or running stream, meditating for hours on end. He spends his whole life like this, standing in long periods every day. . . . He does not meditate for the peace of the Self but in order to kill fish to fill his stomach. . . . Meditating yogis, you won´t find paradise through heron meditation, because you find whatever you meditate on. (pp. 234–235)

Some methods focus on the heart but do not meditate on the Self, like the techniques used by the HeartMath Institute (HMI). "HeartMath techniques produce many benefits for the body, mind and emotions, (however) HMI does not consider them to be forms of meditation" (HeartMath Institute and HeartMath System FAQsfaqs, 2016c, question 9). I mention this here as in the literature review I refer to some of their research and finding. However, their aims are different from methods that meditate on the Self. This of course does not deny the physical, mental, and emotional benefits of their

techniques as demonstrated by their many research results.

Referring to the subject here is to alert the reader to these differences in meditation methods so that each method of meditation and the intention on which it is based is accepted according to its intrinsic purity. Arka (2016) likens the Arka Dhyana IM method to a "musical instrument" which people may utilize how they like. "Some people find happiness in just holding it, some want to apply it in a specific way, while others want to discover its full potential and take it to the heights of what can be achieved through practicing it." He explains that before one starts to meditate "one has to set one´s intention." Some people want to "improve their health or feel good, whereas others want to discover and connect with their true nature or inner Self." He (2016) also declares "the preliminary task of setting one's intention is the thrust of the IM method."

In my case study people were invited to connect with their deeper Self via their heart. Although I also touch on other methods that go below the mind with the intention of connecting with the Self via the heart in the literature review, the main focus of this dissertation is on the heart-based IM method.

Background of the Study

Definitions of Consciousness

In the East the study of consciousness has been undertaken for thousands of years. Compared to this, scientific research into the nature of consciousness is still in its infancy, with little agreement as yet on what is meant by consciousness (Block, Flanagan, & Guzeldere, 1997; Crick, 1994; Dennett, 1991; Pribram & Ramirez, 1980, 1995; Velmans, 2009). Chalmers (2002), a philosopher, outlines three materialist and reductionist models (models A, B, & C) and three immaterial and non-reductionist

models (models D, C, & F). All six models have their opponents and adherents. The first three consider consciousness as a product of physical matter, whereas the last three do not. Chalmers (2002) calls the first model "Type A Materialism" and it is based on the premise that everything is matter and that there "is no epistemic gap between physical and phenomenal truths" (p. 9). Model B centers around the argument that consciousness and processes in the brain are identical, whereas model C claims that consciousness cannot be reduced to brain functioning just yet but believes it will be in the future. Model D as identified by Chalmers (2002), is identified as "Type-D Dualism" or "interactionism"(p. 29) and is based on the notion that consciousness and the brain are radically different but yet somehow highly interactive. This model was developed by the neurophysiologist and Nobel laureate John Eccles and is supported by the philosopher of science, Karl Popper. It is also based on the radical dualism of Descartes. On the other hand, Chalmers describes model E as "weak dualism" or "epiphenomenalism" (p. 33), for although it proposes a difference between consciousness and the brain, it also claims that certain areas of the brain trigger certain experiences of consciousness. In this sense, it too has something in common with the first three models. Chalmers named the last model he addressed "Type-F Monism" (p. 36). Type F acknowledges "phenomenal or protophenomenal properties" (p. 37) and is characterized as a sort of "neutral monism" (p. 37), "panpsychism" (p. 37), and "idealism"(p. 37). According to model F at a basic level all of matter contains a form of subjective consciousness and all matter has phenomenological capacities. In this model not only is consciousness the intrinsic property of matter but that physical reality is also formed by consciousness (Chalmers, 2002, pp.1–42).

Disciplines that study consciousness, especially those disciplines which are still based "on the Newtonian-Cartesian paradigm of mechanistic science" (Grof, 1985, p. 65), are inclined to support a materialistic point of view. According to Grof, Western science stripped the original view of Newton and Darwin of their belief in divine intelligence underpinning all of creation and replaced it with one of radical philosophical materialism. This has given rise to the belief that consciousness is a product of the brain, which is understandable, as clinical and experimental neurology demonstrate there are close connections between various aspects of consciousness and physiological or pathological processes in the brain, such as traumas, tumors, and infections. "However, they do not necessarily prove that consciousness is produced by the brain" (Grof, 1985, pp. 21–22). Material science also considers individual organisms as "separate systems that can communicate with the external world and with each other only through their sensory organs" (p. 22). According to this approach, time is considered linear with memory somehow stored in memory banks of the central nervous system.

This model of reality is now being supplemented:

> By quantum-relativistic physics [which] has transcended the concept of solid, indestructible matter and separate objects and shows the universe as a complex web of events and relations . . . However, the physicist has very little to say about the variety of the different forms the cosmic dance takes on various other levels of reality. The experimental insights from unusual states of consciousness suggest the existence of intangible and unfathomable creative intelligence aware of itself that permeates all realms of reality. This approach indicates that it is pure consciousness without any specific content the represents the supreme principle of

existence and the ultimate reality. From it everything in the cosmos is derived. (Grof, 1985, p. 72)

This is remarkably similar to:

Classical Indian writings such as the Upanishads, [where] consciousness is thought to be the essence of Atman, a primal, immanent self that is ultimately identified with Brahman—a pure, transcendental, subject-object-less consciousness that underlies and provides the ground of being of both Man and Nature. (Sen as cited in Velmans, 2009, p. 1)

In talking about consciousness, Arka (2013) is consistent with the above view but clarifies it further. He says:

Consciousness manifests itself through physical matter. Similar to bacteria that are able to survive with a complete lack of oxygen and in high temperatures, consciousness lacks boundaries, can take any form or shape and can emerge under challenging life conditions. In spirituality, consciousness is mainly a non-physical yet powerful entity that is the pivotal point of all life and activates the senses in every living being. It is highly responsive and expressive and activates many levels, especially in humans. (Arka, 2013, p. 37)

In this definition, he proposes various things:

1) Consciousness manifests itself through all matter. This is similar to model F of Chalmers (2003), although Chalmers uses the preposition *in*, whereas Arka uses *through.*
2) In spirituality, consciousness is mainly a non-physical yet powerful entity. This

is consistent with the classical Indian definition of consciousness by Sen that it is outlined above.

3) Consciousness activates the senses in every living being. In this phrase, Arka talks about the senses but does not quality them further here. This implies a more material level or dimension to consciousness. Furthermore, as the mind in some eastern philosophies is seen as the “sense behind the senses" (S. Arka, personal communication, 2014), one might suppose that in this model, the mind, the senses that help us operate in the physical world, and the physical brain are related. However, as he also talks about the mystical senses in his writings, one supposes he is referring here not only the physical senses but also the senses below the senses. This aspect is touched on again later in this paper.
4) Consciousness is highly responsive and expressive. This has many implications as "consciousness" here is seen as not only expressive, but it is also as being responsive. This seems to indicate that physical reality is not only formed by consciousness but that consciousness itself can be acted on by the being through which it is expressing itself. In this sense the universe of Arka is not one that is determined but leaves plenty of space for free will. This aspect is considered again later in this paper when the different forces acting on the embryo are examined.
5) Consciousness activates many levels, especially in humans. Proposing different levels of consciousness eliminates the difficulty of choosing between a material and non-material world and a physical and nonphysical basis of consciousness. As "consciousness" as an entity activates different levels, especially in humans,

this implies that humans not only have access to these Six Main Levels of Consciousness, but also are an expression of these different levels. It also implies that different systems (material or physical and nonmaterial or non-physical) might be implicated in the different levels. The identification of six main levels of consciousness also eliminates many difficulties normally encountered when studying it. At the most fundamental level, however, Arka implies that the ground or Source of the universe is super-cosmic consciousness, which he also refers to as the Self or Higher Self. Thus from this perspective all creation including humans, are *One*.

Human consciousness and the Self are like honey and sweetness. They can be comprehended separately in our minds, but their oneness can be experienced deeply within us (S. Arka, personal communication, November 6, 2015)

Experiencing Consciousness

As some of the readers might not have meditated and therefore may not be clear what is meant by *experiencing consciousness*, I give an analogy here. If we take a strawberry, we can weigh and measure it, cut it up, find its chemical composition and compare it to other fruits. In this way we can find out about many of its properties. Science is normally involved in this type of inquiry. However, until we pop the strawberry into our mouths, we do not know what it tastes like. This is when we have the experience of "strawberry." When we do this, some people might suppose that others have the same experience as they, but really we cannot be sure of that. However, we can ask them about their experience, and although the words they give are not the experience, we might be able to get a general idea about the taste or "experience of strawberry" from

different people´s subjective points of view. When we talk of different meditation methods, they become the independent variable, like the strawberry, but in this case we want to know what happens to the person´s inner experiencing consciousness.

As I explained earlier, the results of different meditation methods also depend on the intention that one sets. The intention of the IM method is the realization or knowledge of the Self, a process that is said to lead to enlightenment (Arka, 2013). During the journey to Self-realization using the IM method, Arka (2013) claims the practitioner will pass through six main levels of consciousness.

Arka´s Theory of the Six Main Levels of Consciousness

Arka´s theory of the Six Main Levels of Consciousness is related to his definition of consciousness, as well as to his own experiences during his personal inner journey (Unfolding the Petals of the Heart, 2016). It is also based on his experiences while sharing the IM method with others.

The levels activated in humans are:

M (Mind) – Consciousness: Mind is the first layer, which manifests on the surface of the cerebral region. As it becomes sharpened by the cultivation of learning, it evolves into a faculty called intellect.

SM (Subliminal-Mind) – Consciousness: The second level, which is below the surface mind, is the subliminal or subconscious mind. We are unaware of its potential and capabilities, which may seem incredible to the surface mind. Many daily activities are governed by the subconscious mind.

F (Feeling-Mind) – Consciousness: The third level is the feeling mind. This feeling-consciousness generally prevails in the heart area and can thus be

called the Heart of Heart-Consciousness. It includes an emotional faculty called intuition. Almost all mothers have this faculty naturally available and readily accessible to help them understand the intense needs of their children and people they care about.

H (Emotional-Heart) – Consciousness: The fourth layer is the deeper heart where you feel emotions with even greater intensity. This can be called the spiritual heart, or your inner consciousness. The presence of the surface mind is reduced and the presence of subliminal or subconscious mind is enhanced. It is formed by impressions gathered through what you have learned and experienced along with the memory of your personality.

HS (Heart-Soul) – Consciousness: The fifth level is between the deeper heart and the ultimate essential being (Soul). Here you experience inner-space and the Mystical Universe, where the laws of physics start reversing and lead you to experience many alternative realities and possibilities that give access to your own soul. Here you become more connected with Nature and the forces of the Universe.

PS (Pure-Self) – Consciousness: The sixth layer is Core-Consciousness. This is the very essence of your whole presence and of everything that you feel, think and do. It is addressed as Soul or Self. (Arka, 2013, pp. 37–38)

Arka (2013) describes the journey of Self-discovery as "a journey from the 'Rational Mind to the Emotional Heart to Pure Consciousness'" (p. 3) and claims that, if perused, spiritual seekers will go through the six main levels of consciousness on their journey to pure consciousness. This outline is a theory as well as a description of a

journey that involves rewinding our surface consciousness so as to reverse the evolution of all that has happened to us.

> To achieve enlightenment, we have to return to our hearts, or at least to keep in touch with the original point from which we began our journey in the world. After reaching the heart, we have to journey further into the innermost depth of our consciousness to experience the very essence of our being, the Self. (Arka, 2006, p. 180)

He also claims that although the levels we go through are common, the content of each level is unique to each individual.

Similarities Between Science and Spirituality

Scientific inquiry is not so different from spirituality in that both want to know the nature of life or the nature of Nature. Nevertheless, the way they go about it is traditionally very different. Western scientists study the nature of the outside world, whereas the *inner scientists* of India, who later became known as yogis, philosophers, seers, and rishis, turned their attention inward so as to study, explore, and discover the nature of their inner Self. This is based on the premise that if they came to know their own nature, they would know the nature of the universe (Arka, 2003, 2013).

Self-Pondering and Meditation

Anybody who has tried to *turn their attention inward* will be aware this is no easy task, for often the first thing one notices is how prevalent one´s thoughts are and maybe one might be continually distracted by pains or discomforts in the body. So to help in this task, the yogis developed methods which lead to meditation. The methods are in themselves not meditation, but they certainly help give rise to different inner experiences

and states which, when coupled with contemplation, not only lead to an awareness of the deeper nature of the Self but also experiencing it.

The core of practices associated with ego transcendence and contemplation of the Self is the "experimental phenomenological introspection into the living topological construct of the Self " (Louchakova, 2007a, p. 82). For Arka, the term meditation entails "serious self-pondering [which involves] the process of making profound inquiry into the depth of the soul about . . . [our] existence or how the Universe was created or the laws that governed living and non-living matter (2013, p. 29). In traditions that meditate on the Self, inner inquiry leads to a vast transformation in the person undertaking the investigation and "*Sanatana dharma*, the spiritual philosophy of India, suggests that there is a perennial form of healing, which consists in the realization of the true, immortal, and limitless nature of the Self beyond the ego" (Sri Nisargadatta Maharaj as cited in Louchakova, 2007a, p. 81).

The Spiritual Heart and the Feeling Heart

In her paper on the "Spiritual Heart and Direct Knowing in the Prayer of the Heart," Louchakova (2007a) talks about the *Spiritual Heart* and ego transcendence. For her "the Spiritual Heart is a psychospiritual center of embodied consciousness in the interior space of the chest" (Louchakova & Warner; Spidlik as cited in Louchakova, 2007a, p. 4). Although this present study is talking about the same area, this study was concerned with learning about the type of consciousness that prevails in this location and the role it plays in our lives as *embodied beings*. Arka (2013) identifies this level of Consciousness as "Feeling-Mind Consciousness . . . This feeling-consciousness generally prevails in the heart area and can thus be called the Heart of Heart-Consciousness (p. 37).

Although it can also be called the "Feeling Heart of Heart-Consciousness," here I simply refer to it here as the Feeling Heart.

The terms feeling, sensation, and emotion also needed to be defined. Here the term sensation was used to "mean the perception and experience of stimuli and the term feelings to refer to the experience in the body of a configuration of sensations. Emotions are experiences that link feelings in the body with thoughts" (Lowenthal, 2004, p. 83). This definition was adopted because he stresses the experiential nature of the terms. When referring to the Feeling Heart I am alluding to an area in the center of the upper chest where feelings as a configuration of sensations can be experienced and which are linked to our thoughts through emotions and *vice versa*. According to Arka (2003) "feeling is like water, emotion is like waves in the lake of consciousness" (p. 18). Using the IM method of meditation, which involves coupling our breath and a mystical or vibratory sound with very light physical touch to the heart center and 18 other energetic centers of the body, is said to take us below our thinking mind and open us to our inner world of feeling and sensations. These inner experiences are essentially mystical in nature as the inner experiences obtained are not dependent on the use of our senses that we use to obtain information about the outside world but our mystical inner senses (Arka, 2013). As such, they can also be considered the senses below the senses. Ramirez uses "the term 'extra sensory perception' to refer to information that bypasses our normal sense receptors and that is not deducible to prior experience" (Ramirez as cited in Lindhard, 2015, p. 6). These feelings are said to be what gives rise to intuition or inner guidance. Gedlin (1981) talks about feeling and the *felt sense*, a term he coined, in the following way:

> A felt sense is not a mental experience, but a physical one. . . . A bodily awareness of a situation or person or event. An internal aura that encompasses everything you feel and know about the given subject at a given time – encompasses it and communicates it to you all at once rather than detail by detail. . . . A felt sense doesn't come to you in the form of thoughts or words or other separate units but as a . . . bodily feeling. (pp. 31–32)

The term *feeling-consciousness* is used here to refer to this inner world of experience. "Feeling is first, thinking is second, and proportionally varies according to individual's impetus and inspiration as well as inner content" (S. Arka, personal communication, May 2, 2015).

The Heart as Center

When referring to the area in the center of the chest, I also wanted to know if this involves the physical heart, the fourth chakra, also known as the heart center or *Anahata,* or a space on either the left or right side of the heart center; the latter being a qualification referred to by Louchakova (2004, p. 38). In IM, on the other hand, pupils are instructed to bring their right hand in *jnana* mudra, which consists of bringing the index finger and the thumb together in a closed circuit, to the center of their upper chest and to become aware of their inner world of sensations and feelings. In this method students are invited to experiment where they feel more connection without specifying the exact location. However, as it was hoped that the study would cast more light on the relationship between the physical heart, the Feeling Heart and the spiritual heart, I decided to leave further clarifications until later.

Statement of the Problem

It appears that there is a scientific lacuna regarding knowledge about different methods of meditation that are feeling-based and focus their attention on the psycho-spiritual center of embodied consciousness in the center of the chest, or heart center. Furthermore, there seems to be an information gap regarding the nature, role, and importance of this center to us as embodied beings. In this thesis it was hoped that by centering the attention on the heart, it would be possible to learn more about the experiencing consciousness associated with this center and its relevance in our lives.

In asking what consciousness is, some scientists arrive at the conclusion that "consciousness is a name that simply refers to the state of being conscious of every being that is capable of being in such state " (Costa as cited in Brassard, 2016a) However, this is to say "absolutely nothing" (Brassard, 2016a). Furthermore, the plea:

> To stop searching for what “consciousness" is and start to investigate in what the state of being conscious consists in," is to fall into "the old as Spinoza, neutral monism, physiological parallelism, a strategy that is based on the hypothesis is that of an **isomorphism between certain neural excitations and certain 'aspect of consciousness', a *graal* search of the NCC, the “neural center of consciousness."** (Brassard, 2016a)

Brassard (2016a) then gives the example that:

> It has been said that there exists such an isomorphism between the firing of C–fibers and the awareness of pain. This has led philosophers to hold that pain is the firing of C–fibers, the awareness being a mere epiphenomenon.

All science can do is to tell us about what is happening from the third person perspective, it is not about "what is going on in me".

However, once phenomenology (Smith, 2013) is accepted as part of science, then these inner states can be studied. Looking at what happens when people are trained to go below their thinking minds and connect with their Self via the heart is the quest this researcher set herself in this study. Instead of looking at what the *state of being conscious* consists of by looking at what happens in the brain, this study looked at what happens to the inner experiencing conscious state of others when they follow a certain procedure by asking them indirectly through a scale and directly through open questions.

By doing this, the objective of this part of study was involved with learning about:

a) the inner conscious experiences of others after they had learnt the IM and

b) the initial levels of the topological nature of consciousness as outlined in Arka's theory, as science knows very little about consciousness from this perspective.

The other part of this study centered on learning more about the heart itself. I did not find information from an interdisciplinary perspective that throws light on the nature and role of the heart regarding the developing embryo nor the forces that govern this development. Furthermore, it seems little is known about how these forces are related to consciousness. But maybe what is more relevant, really very little is known about why specifically the heart has been selected in different meditational practices throughout the ages.

According to the following enigmatic quote often attributed to Einstein, "the world that we have made as a result of the level of thinking we have done thus far creates problems that we cannot solve at the same level as the level we created them" (Einstein as cited in ICARUSFALLING, 2009, para. 1). Generally, this is thought to imply the need to change the way we think and to *think outside the box*; but what does this really involve? Investigation into the different levels into which humans can tap, seems a good way of clarifying the deeper meaning of Einstein´s phrase. Maybe the humble heart has a role to play in guiding us in finding solutions to the many problems that exist in the world today if "the human heart is like the heart of the universe, and hence it is sacred. Unfolding the petals of one´s heart means gaining access to the secrets of the universe" (Arka, 2003, p. 114).

Purpose of the Study

In this dissertation the heart was the point of departure. The purpose was to increase our understanding about the development, nature, and role of the heart and how it is related to our ontogenetic development and to the initial levels of subjective inner experiencing consciousness in the journey of Self-Discovery.

To achieve this, I undertook a literature research into the nature and role of the heart from different perspectives by including information from different scientific disciplines. Among other areas, I included embryology and cardiac anatomy, electro-magnetic fields, torsion fields, extending insights from physical science to the functioning of the heart, the origin of the heartbeat, scientific applications of physical theories to living systems, scientific research into the heart, a closer look at Arka´s theory of the six main levels of consciousness and his thoughts on the nature of feeling-

consciousness.

This study also included a heuristic aspect that encompasses the learning process involved in constructing and validating a scale that taps into the consciousness of the subjects who meditate on their inner self via the heart using the IM method of inner investigation. The items of the scale, named as the *Feeling-Consciousness Scale* (FCS), were deduced from Arka´s theory and books (2003; 2006; 2010, 2013, 2015b) and derived from the reported phenomenological experiences of a group of people who have practiced the IM method for 7 months to 2 years.

The dissertation was also directed at finding out whether people would show a difference in trend toward a more feeling-based consciousness after receiving training in the IM method. This was addressed through an exploratory case study using a multi-method approach.

Participants signed up and paid a nominal fee to learn the IM method. They were from all walks of life and of both genders, although there were more women than men. Most of the subjects were Spanish.

By applying the scale in a pre- and post-test design, I hoped to find out if learning and practicing the IM method a minimum of five times over a 6-week period would bring about a trend toward a more feeling-based consciousness as measured by a paired samples test. A Pearson correlation was also performed to see if there was a connection between the number of times the method was practiced and the scale results. The second time the scale was presented I included several open questions.

Research Question and Hypothesis

If phenomenological assertions are to extend our knowledge about human nature,

then they need to also be researched and investigated scientifically. This dissertation, therefore, had three parts: a research question that was addressed in the literature review, the construction and the beginning steps in validating a scale to measure feeling-consciousness, and an investigation topic that was addressed by various hypotheses which rested on utilizing the scale as well as several open questions.

Research question. Why the heart and what is its nature and role with regards to our ontogenetic development and to the initial levels of our subjective inner experiencing consciousness in the journey of Self-Discovery? This is addressed through a literature review.

Investigation topic. Based on the theory of the six main levels of consciousness previously mentioned, experiencing different levels of feeling-consciousness is part of the journey in discovering the purity of our consciousness or Self. The investigation topic was concerned with the initial levels of this theory. More specifically, it was to ascertain if participants would show a trend toward a more feeling-based consciousness after being trained to go below their thinking mind using the heart-based method of meditation known as IM.

According to Arka (2003; 2006; 2010, 2013), the shift toward a more heart-level of consciousness involves various inner experiences, such as awareness of different configurations of sensations in the heart and elsewhere in the body, spontaneous emotional feelings arising during meditation, a move toward a feeling of unity and peace, connection with their Self, greater connection and empathy toward oneself, others, and nature, increased positivity and focus, a feeling of being centered, and an increased sense of receiving intuitive guidance.

Hypotheses.

A) The first hypothesis predicted that the experiencing consciousness of participants would show a trend toward a more feeling-based consciousness after learning the IM method and practicing it a minimum of five times over a 6-week period as measured by the same scale.

B) The second hypothesis predicted that participants who practiced the method more during the 6-week period would show a greater shift toward a more feeling-based consciousness, as measured by the scale.

Importance of the Study

As previously noted, not much is known about spiritual paths that are feeling-based and that meditate on the Self via the heart, nor about the different meditation methods that facilitate this journey (Louchakova, 2003, 2007a). The phenomenological accounts that do talk about this pathway also do not directly address the many benefits to us as embodied beings of the intermediate levels involving the Feeling Heart in the journey of the Self-discovery. It was assumed here that knowledge about these levels is not only important in fine-tuning our knowledge about the living topological construct of the Self and learning more about the manifestation of consciousness through physical matter, but also that there are intrinsic benefits to the people who can access these levels.

I therefore surmised that any scientific investigation into an easy non-sectarian method of investigating our inner nature or self would be of interest to many people who, in their desire for spiritual experiences, often have to resort to methods based on philosophies which are not consistent with their own. I also assumed that a non-sectarian method of inner investigation would be of interest to people, including skeptics, who

really want to discover their deeper nature. But above all, I also presumed that many people would be attracted to a meditation method that connects them with their inner Self, involves the heart, and embraces feeling. These arguments, therefore, led me to believe that an investigation into a method that focuses on the Self would be of interest to many people who are looking for alternative methods of meditation. I also felt it would be of interest to science, particularly the field of consciousness.

Research into the brain is vast, but research into the heart is limited when it is looked at from the perspective of its nature and role in somatogenesis and the different levels of consciousness associated with it.

Strawson (2016) claims that it is not consciousness that is the mystery, but matter. This study tries to clarify both. The research investigation, therefore, has potential importance to many fields of science, particularly those that are involved in understanding the human organism and how it works. Based on this it could also be of importance to people who work with curing diseases, from the medical profession to complementary healers. Even more, as the role of the heart on the physical development of living matter is similar in humans and animals, this study might also be of interest to the veterinary profession.

This study also has potential value to quantum physicists, as for some of them, the "way we think has a physical effect on what we perceive and this has brought about a revolution in physics as well in philosophy and in consciousness research" (van Lommel, 2007, p. 218). Therefore, any study based on phenomenological experiences that have an effect on our thinking and the way we perceive the world probably is relevant to the field of quantum physics.

As a distinction is made between spirit/soul and the human body in this study, it enters into the controversy of whether we are essentially spirit or whether we are matter. Here this researcher is not out to prove one position or the other, but hopes that this study might throw some light on what we are and what is our true nature.

This dissertation arose from a statement about the heart as a feeling center, and here too I hoped to cast some light not only on whether we have a mind that is associated with the brain and is partly physical and partly metaphysical, but whether we also have another semi-autonomous center inside of us, which is also partly physical and partly metaphysical. Here it is referred to as the Feeling Heart. I was not out to prove its existence, but to raise the possibility of its existence through investigating the nature of the heart and understanding more about the levels of consciousness associated with it. The proposition concerning the existence of a Feeling Heart was therefore addressed by the research question and by the investigation topic. Simply by bringing attention to the feeling aspect of the heart and to the inner world of feeling and its importance to human wellbeing could have many repercussions on multiple levels, especially those to do with education.

On a practical level, every effort in modern society is to make people more intelligent by developing our rational minds. In this endeavor Arka (2013) claims that we have lost touch with our Feeling Heart, which also leads to inner guidance and intuition. If this inquiry can help throw light on the nature of the heart below the mind, then a valid non-sectarian method that connects or reconnects us with our Feeling Heart and inner guiding voice could help on multiple levels, including designing educational systems so that children can maintain their connection with their hearts as well as developing their

rational minds.

The development of the feeling scale also makes the inner world more accessible and draws attention to the fact that among the vast number of possible inner experiences, there may be some that are common when a person starts meditating on the Self via the heart. Although this was an exploratory study, I hope that it will lead to a greater understanding and knowledge about how we experience the world from the inside out and also generate further research in this area.

Limitations of the Study

A major limitation to this study was that I did not find any information about the nature and role of the heart that coherently joins information gained from different scientific disciplines about which I have only a superficial knowledge. Obviously, a team of experts from different fields would add greater precision and richness to this way of working. The medical field of neurocardiology somewhat answers this interdisciplinary call but is mainly centered on cardiac disorders (Natelson, 1985).

As I did not find any scale in the literature that measures feeling-consciousness, I decided to construct one. Constructing a scale has several problems, which are outlined below along with other limitations of this study. As the inner world is as big, if not bigger, than the exterior world, any attempt to measure it is problematic. Also, to put words and numbers to inner experiences is enigmatic, as they are symbols. They can represent the experience, but they are not the experience itself, which is often so much richer and beyond words (I. Martinkat, personal communication, February 2, 2016). Nevertheless, by constructing a scale I hoped to draw attention to the inner world of feeling and its relevance to the overall wellbeing of human life. At the same time, I hoped

to find out if feeling-consciousness consists of certain inter-subjective elements that are common.

The actual IM method involves a transformative inner journey, which first involves a descent from the rational mind to the emotional heart to pure consciousness. Although the distance between the mind, which is associated with the brain, and the heart is very little, the actual inner journey in Self-discovery might take the student a long time, often many years or sometimes even a life time. Therefore, a study that only rests on 6 weeks of practice by naive subjects is somewhat superficial in nature. Someone who has just begun to meditate is not used to "serious self-pondering" (Arka, 2013) and relating to his or her own experiences in an inquiring manner; nevertheless, sometimes a method is able to give rise to experiences, which helps the person re-discover forgotten ways of being.

According to Arka (2013), although the levels through which the student will pass are common, the actual experiences are unique to each individual. Also, not all people begin from the starting point at the beginning of this inquiry. Many women are more connected with their feeling nature than men, "especially mothers" (p. 37). This makes it difficult to compare information obtained from different individuals. Furthermore, some people initially judge their capacity to feel as very high and it is only after practicing IM, that they realize that feeling involves deeper layers and other facets. Some of these people are those who are often identified as being “head orientated.” This can be due to trauma, sometimes at an early age, which caused them to dissociate from their bodies, and they live a life not even knowing they are not fully present in their bodies. However, after practicing IM for several weeks, they usually start experiencing different layers of

feeling, which gives them access to their body-based inner world. In this study it seems likely that some of the scores obtained that were in the reverse direction from expected, were due to this. This point is addressed again in the discussion.

Another limitation of the current study is the small sample size, which may result in a lower level of statistical power and hence increase the risk of a type II error. The findings should therefore be treated with caution until future studies will be able to replicate these findings with a larger sample size.

This work is about the subjects experiencing consciousness, so there is no other way to test this except through self-reporting, which is not always expressed accurately due to social reliability where people bend the truth to look good (McLeod, 2014).

The scale developed for this research may only include a limited number of statements due to the small sample (Byman & Cramer as cited in Rattrey & Jones, 2007, p. 239). I therefore included several open questions to overcome this limitation.

Constructing a new questionnaire in psychological studies has its difficulties (Clark & Watson, 1995) and the researcher had no prior experience in this field. As the construction of the questionnaire progressed, the term *feeling-consciousness* turned into a multifaceted state of being which involves different aspects that, in turn, needed to be teased out to grasp their deeper significance. It also became increasingly obvious that our consciousness, like "reality" is dynamic and an expansion of consciousness brings about an expansion in how we perceive the world. A scale, therefore, reflects "only a moment in time" and is an attempt to capture a certain level of understanding and way of being. The concept *feeling*, which our scale is said to measure, is also not static, for there are deeper levels of feeling still to explore if practitioners want to expand their consciousness

further. However, I still believe that constructing a scale of this nature is relevant, as it might help us to better understand the nature of consciousness.

The implication that consciousness is expansive brings with it problems regarding the choice of items selected to describe it. It also raises the possibility that certain items, including some of those used in this scale, might still hold even at deeper levels. This is implied by Arka (2015b) in a talk he gave in India, where he said in expansion, consciousness maintains "the same qualities yet its appearance its presence and its depth becomes expanded." However, this goes far beyond the exploratory nature of this study and requires further research, which would involve more participants who have practiced the method for longer than 6 weeks.

Another problem is that the meditation method concerns feeling, which is associated with the right hemisphere of the brain, whereas the language center and the use of words and analytical tasks are associated with the left hemisphere (Sperry, Nobel Prize, section 3). The second time the questionnaire was completed was straight after a meditation session, and some of the participants shared orally with the researcher that for them filling in the scale was difficult and even a "little absurd" as the pages seemed like a "jumble of words." Later it was noted that the statements that were in the reverse order were often answered in a way contrary to the expectation of the researcher. However, when we consider that answering these two statements would particularly require left-brain attention, it is not surprising that the results obtained from them were often contradictory. In fact, in the end I decided to not include these two items because of their ambiguous nature. This created another problem, because when all the statements are phrased in the same direction it makes it easier for the participant to guess the direction

that would show the greatest change and in order to look good they judge themselves accordingly.

Our interest here is not only about testing a theory, but also in finding out if there are certain common elements in the experiencing consciousness of the participants after learning the IM method. Although this may be seen as being only of *intellectual interest,* these states are related to the expansion of consciousness and personal enlightenment, which are the real goals of any avid pupil of the inner world. This consists of:

> A state of heightened consciousness, which brings clarity, inner peace and the ability not just to understand the deeper meaning of life, but also to feel it. As your heart blossoms, you experience streaming compassion, empathy and intuitive wisdom. (Arka, 2013, pp. 38–39)

As I had to limit the number of statements, due to the expected sample size, the statements chosen are inclined to reflect only the superficial layers of feeling-consciousness. Some of these are shared by body-based practices like chi kung, focusing, and physical yoga. Because of this overlap, it is expected that the ratings of subjects who are already familiar with other methods might not be sensitive enough to reflect the deeper changes that might be occurring when they meditate on the Self during IM.

Fundamental to this method is the awakening of the emotional layer, and the deepening of this is essential to the student´s progression through the various levels of consciousness outlined by Arka (2013) in his theory. This is difficult to measure, particularly as the limitation in the number of scale items does not allow for the inclusion of others that could tap into these deeper levels.

Given there was no control group, it is not clear if the results are a function of

time instead of changes brought about by the actual practice of the method.

In this study I tried to overcome the problems of the validity associated with having only one teacher of *Arka Dhyana* by inviting other qualified teachers to participate. A protocol on how to give the workshop and administer the scale was therefore created. (Appendix D). However, in the end only one other teacher with one subject participated in the study and her pupil did not complete the course for reasons of conflicting activities arising on the days of the course. This also opens the question whether our results are applicable to different teachers of the method and across cultures. As most of the participants were Spanish speaking and Spaniards are, in general, considered more emotional than other non-Latin nationalities (Ramirez, 2007), it could bias the results in a certain way. Generally, more women are attracted to these types of courses; and IM is no exception. This introduces a certain bias based on gender. This problem may be exacerbated further, as some men may be less attracted to this method because it is feeling-based and they need to go through the emotional layer to get to the deeper feeling layers below.

A further problem is that this study was conducted in two languages, English and Spanish. Translation is often more like interpretation and several people had to be consulted before an agreement on the translation of some of the terms could be reached, like *feeling-consciousness*. The same applied to the translation of the statements used in the actual scale. However, once again there was a positive side to this problem, as it led to an ever-finer understanding of the terms and statements used in the study.

Another limitation was that not everybody who filled in the scale completed the course and therefore filled in the scale 6 weeks later. The six people who did not

complete the course professed an interest in repeating it on another occasion. One had found a job that coincided with the times of the course. Two could not attend for health reasons, and two participants could not attend for personal reasons not related to the study. The other person was the subject from India. All people who filled in the second questionnaire completed the basic course, which consists of three sessions, but four participants did not attend all five sessions for reasons beyond their control, but they did meditate at home. I took this as unimportant, as the two extra sessions were practice sessions, which deepened the method rather than adding new elements.

Finally, another limitation might be that my extensive experience with the IM method might create a certain bias. Nevertheless, as my background also includes years of practicing other methods, the awareness of differences between methods might in the end help clarify the unique features of the IM method. I was also aware that bias could come from other sources, such as cognitive (Haselton, Nettle, & Andrews, 2005), aphelia or patternicity (Shermer, M. 2008) attribution bias (Heider, 1958), and confirmation bias (Nickerson, 1998). However, when these different types of biases are acknowledged, steps can be undertaken to eliminate them. In this study, where possible participants were also asked to share more about their inner experiences with this researcher rather than her relying purely on the words used by them. This was to eliminate the possibility that I would project my idea as to their meaning. This was also to eliminate the possibility that I would fall into the trap of linking together words that seemed to "hang together." This is why in the constructing the scale, the original eight participants were asked to organize the items. Also, in the results section of this study in identifying the different traits named in the open-ended answers, I also did not lump together words that from the outside

appear to describe similar inner experiences, like calm, thoughts are calmer and relaxed. It seemed appropriate that in an exploratory study these variations be acknowledged so future researchers are aware of the complexity of studying inner experiences of others.

Definitions

Below I give a list of the main concepts I have used in this study and alongside it I refer to the page where the definition can be found. I have also included the chosen definition to give the definition and the page number, as when definitions of these complicated metaphysical concepts are read out of context, they appear more confusing than when they are intuitively grasped within the broader text. These terms are more easily experienced than described by words.

I give definitions from different authors as different definitions might resonate more easily with different readers.

Self ..... p. 22

The theory of the 6 levels of Consciousness, identifies the sixth level as: "PS (Pure-Self)-Consciousness . . . this is the very essence of your presence and of everything that you feel, think and do. It is addressed as Soul or Self (Arka, 2013, p. 38).

Soul ..... p. 10

> Soul the unconscious mastermind within every organic material in the body that pervades inside and outside of every cell, a mother like awareness of intelligence which prompts everything that happens biologically, psychologically, emotionally, or in any other way. It can be bigger than our bodies and smaller than a photon. One's truest identity cosmically spiritual in nature. (S. Arka, personal communication, May 4, 2016)

Soul..... p. 10

By soul I mean the vital, mysterious, and wild core of our individual selves, an essence unique to each person, qualities found in layers of the self much deeper than personalities. By *spirit* I mean the single, great, and eternal mystery that permeates and animates everything in the universe and yet transcends all. Ultimately, each soul exists as an agent for spirit. (Plotkin, 2003, p. 25)

Higher Self..... p. 10–11

> The Inner Self, Outer Self, means the Self of Nature, The Higher Self, is super-cosmic consciousness which is inside and outside of every particle even every subatomic particle, and omnipresently and eternally living entity throughout space, time, the cosmos and above and beyond, yet not interfering with individual will, mind/and consciousness as photons do not interfere with themselves. It leaves space for our ego, individuality, individual will and spirit/soul, and gives us a certain freedom but if we master it reducing our conscious awareness to the subtlest form of being, we can take ourselves wherever we want to exist. (S. Arka, personal communication, June 5, 2016)

Higher Self and Spirit..... p. 10

This definition of Higher Self of Arka and the definition of Spirit of Plotkin are essentially the same: Their use depending largely on the preference of the individual author.

Soul, Inner Self, Deeper Consciousness..... p. 11

Arka (2016) suggests that terminologies like soul, inner self, and deeper consciousness are very close to each other in meanings (personal communication,

May 2, 2016).

Life force..... p. 11

"Life force is a one of the properties of soul" (S. Arka, personal communication, August 21, 2015).

Emotions..... p. 25

Emotions are experiences that link feelings in the body with thoughts" (Lowenthal, 2004, p. 83).

Sensation and Feeling..... p. 25

Here I follow Lowenthal (2004), as his definitions are experimental. He uses sensation to mean the perception and experience of stimuli. The term feeling he uses to refer to "the experience in the body of a configuration of sensations" (p. 83).

Feeling..... p. 25

"Feeling is like water, emotion is like waves in the lake of consciousness" (Arka, 2003, p. 18).

Feeling (Heart) Consciousness

In constructing the scale, I found feeling-consciousness consists of a more "physical" experience of a group of sensations like that suggested by Lowenthal. However, as practitioners increase their sensitivity to their inner world of feeling using the IM method, their experiences become more and more subtle. These experiences are more like "water." As practitioners begin to connect with their inner Self or soul, so the shades of these experiences changes.

To see the items included in the FCS, consult Appendix A.....p. 245

Note:

The Self with a capital S is used when referring to the Higher Self or the inner Self. However, the lower case s is used when referring to the self as personality.

CHAPTER 2

REVIEW OF THE LITERATURE

Aim and Overview

This literature review was an exploratory study where I intended to learn more about the nature and role of the heart from different perspectives, including our ontological development. Through this I hoped to throw some light on the question *why the heart* and generate new hypotheses that may then be explored more fully using the analytic scientific method. It was also to comprehend more about the various facets of our being, including the relation between the Self and the heart, and consciousness, particularly the initial levels of consciousness as outlined in Arka's theory.

This chapter is intrinsically a summary of the different topics that I was intuitively guided to investigate in order to answer the main research question. The order of the topics presented also follows the order in which I was directed from inside. Interestingly, each topic seemed to naturally give rise to the discovery of specific research previously done in the field with relevance to this investigation. Furthermore, the discoveries presented in each article seemed to lead naturally to another aspect, which in turn needed further clarification.

In order to reveal a fuller picture regarding the development, nature and role of the heart, this review includes information from different scientific disciplines, spiritual outlooks and approaches considered pseudoscience. Presenting the material this way also leads toward an exploratory point of view, which sometimes includes the research of scientists who are lesser known and whose work does not necessarily agree with conventional views. Nevertheless, to gain an overall picture of a precursory nature, I felt

these different perspectives needed to be presented, for only then can one decide which of them leads us to a greater understanding of the heart and its nature.

For this purpose, the following broad areas were included:

1. The development of the embryo and the heart from the perspective of the embryologist van de Wal (2014);

2. Further information about cardiac development and the heart including its unique folding and how this may be related to the heart´s particular character;

3. An excursion into the nature of electromagnetic fields, subtle energies, and the relationship between electrical fields and life, as well as the link of the discovery of these fields to the development of technologies to measure them;

4. The application of some basic tenets of physics to the heart and the consideration of the heart as a multifaceted center;

5. The presentation of origin of the heartbeat and its nature from the perspective of an Eastern philosopher and yogi and its similarity to statements made by some quantum physicists;

6. The comparative method of Goethe applied to the development of the heart and the notochord using the primary observations of other scientists to help understand more about the formative forces, which lie in the invisible realm (Goethe in van der Wal, 2014);

7. The examination of multifunctional roles of the heart, the possible role of sound in somatogenesis and the mechanisms involved;

8. The presentation of the electric character of living organisms from Eastern and Western perspectives;

9. The possible role electromagnetic fields might play in bio-communication and an exploration into the pineal gland and the possibility of the heart and the pineal forming part of a crystal oscillating system, which might not only play a role in intra- and inter-species communication, but communication between the organism and the higher cosmic guiding forces of nature;

10. The presentation of several theories about the heart as well, as reported experiences of heart transplant patients in order to understand more about the heart, subliminal mind, and memory,

11. The problem of how subliminal mind communicates with the conscious mind and the examination of possible ways as to how some transplant patients are able to retrieve memories about their donors;

12. The clarification of the difference between the self and the Self and also considerations into the ways and means one can go about looking for the Self;

13. The consideration in more detail of theory of the six main levels of consciousness, as well as several methods that support some of its initial levels. This section concludes with suggestions about the true nature of the incarnating Self or soul, the embryo, and the child.

Developmental Embryology and Cardiac Anatomy

The first topic addressed is what is meant by heart? Most of us automatically think of the heart as an organ, often graphically described as a "piston pump" (Burleson & Schwartz, 2005, p. 1109). However, not all scientists consider it in this way, one of them is the embryologist van der Wal (2014). He feels that one needs to see and listen to the story of the embryo in terms of "gesture" to understand the heart. According to him,

formative forces direct the dynamics of the developing embryo, which activity results in making the "different kingdoms" visible. In adopting this scheme, he follows in the footsteps of Hartmann (Hartmann in van der Wal, 2014, p. 32). Van der Wal uses the dynamics of the four main kingdoms of nature as recognized by anthroposophy. In this evolutionary approach each kingdom is distinct from the one prior to it; moreover, it is not just more of the same force that brings it about, but one that is opposite in direction. "So the dynamics of the plant are not brought about by the mineral; they are not a continuation of 'more of the same'. A new principle manifests in the plant, which stands in direct opposite to the mineral" (van der Wal, 2014, pp. 32–33). In a similar manner, the animal is different from the plant and the human is different from the animal. Each kingdom involves a new way of being from the one before. The human embryo is subject to these different developmental forces during its formation, which give rise to these different kingdoms. These forces can then be identified during the ontological development of the embryo. It is a constant dying out of the old that allows the manifestation of something new. The gesture involving the development of the heart is no different. The heart arises in the periphery and its first manifestation is blood.

The present review does not include the analysis of the different forces as outlined by van der Wal but it does recognize them without attaching specific names.

The Organism as a Living Being

In order to comprehend the lens applied by van der Wal, one has to first understand the way he views life. For him first of all there is the whole, and then it differentiates itself into different parts, and the embryo is a constant reminder to us of this fact. This is contrary to the prevalent way of thinking, which sees the organism as being

made up of separate parts where the whole is the sum of the parts. For him,

> It is the appearance which changes not the essence. . . . In the desert of modern day thought life, it is the embryo which cries out that wholeness comes first in living nature. . . [In the embryo] there is an endless series of differentiations, following one another in the course of time, creating the organs and the different parts of the body, it never happens the other way around! (van der Wal, 2014, p. 37).

From this perspective we are first and foremost a whole, an organism that then starts to differentiate and organizes itself in different ways. Therefore, during our development, we were never a cell or fertilized egg cell; as soon as the egg cell is fertilized, she stops being called a cell and becomes a body, a unicellular organism called a zygote" (p. 35).

Here I invite the reader to stop and reflect to understand fully what van der Wal is saying. From this perspective we, as organisms, are living beings from the moment of our conception and this implies that we, as such organisms, grow ourselves a body with all its different parts. In doing so we do not become *more of an organism*, we are whole from the outset of our lives and continue to be whole. This is consistent with Merriam Webster dictionary which defines the organism "as an individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent: a living being" (Merriam Webster.com, n.d.a).

The embryo goes through various phases and becomes increasingly more complex. An increase in complexity, however, does not imply an increase in what we are, *a living being*. Looking at the organism as a whole one can use many different lenses in an attempt to understand it and to see how it differentiates itself over time, basically all

life sciences have this as their subject matter. Here, in following van der Wal, the student is interested in learning more about how directional forces shape the organism in multiple ways during its early life.

Mineral phase. After conception, the living organism, which at this stage is known as a zygote, closes itself off by forming a protective outer shell. It then starts splitting up, first into two and then into ever-smaller segments to which the term "cleavage" is sometimes applied. This is not growth in the normal sense, as the organism does not increase in size or volume. Van der Wal sees it as being reminiscent of the mineral phase, where there is an identical reproduction of cells in a closed environment. At this point in time the organism is also free floating and "gives the impression of being like a spaceship floating in the Fallopian tube and the uterus without having any particular metabolic exchange with its environment . . . [and although we] are clearly dealing with a living entity . . . it displays more and more signs of death" (van der Wal, 2014 pp. 35–36). For van der Wal it is as though "'time is not yet.' Which time? Lifespan, lifetime so variable and specific for each organism" (p. 36). Interestingly, this phase lasts a week in all mammals, regardless of the duration of pregnancy, which is 21 days for a mouse, 21 months for an elephant, and 9 months for the human being. As the week when cleavage is taking place is not counted in the number of days or months of the duration of the pregnancy, it certainly seems that it is *outside of time.* As this phase advances a center or pole can be seen as forming. The inner cavity becomes filled with liquid produced as the cells finally start to die off. Some of the segmented parts cluster on the inside of the zygote near the basal end. The inner cell segments become known as the *embryoblast.* The other cells, which are gathered around the inner periphery wall, are referred to as the

trophoblast. This structure, which comes into being at the end of the first week, becomes known as a *blastula* or *blastocyst.* It can also now be considered as a duality, for it has an inside and an outside. Van der Wal refers to the inner lining as the central body and the outer cell lining as the peripheral body. This is an example of the process of differentiation that occurs during the development of all organisms. At this stage, if no new principle is introduced, the organism will die off, a clear example that more of the same does not produce growth. Many miscarriages occur at this point, often without the mother even knowing that she is pregnant.

Plant phase. For the organism to grow, a new phase needs to occur. This involves implantation, also known as *nidation*. If we are reading "this gesture correctly . . . [this] represents an interruption, a revolution" (van der Wal, 2014, p. 36).

During this new phase the periphery reaches out and extends its boundaries deep into the maternal blood vessels. Furthermore, by producing the hormone of pregnancy, it reaches into the pituitary gland of the mother, which facilitates her acceptance of the new organism. From being a cut off "space ship"(van der Wal, 2014, p. 36), the periphery of the organism now expands tremendously and reaches far beyond its physical borders. The organism can be seen as taking root, and, essentially, it lives in its outer body, also known as the ectocyst (outer egg). Meanwhile, the endocyst (inner egg), which is the core of the embryo and consists of the bilaminar germinal disk made up of ectoderm and endoderm, can be seen as the center around which everything revolves. Van der Wal likens it to the center of a wheel around which everything turns. The characteristic of the organism at this stage can be considered as being plantlike, for it too takes root and extends far beyond its borders and it too has a center around which life revolves but does not

participate by growing itself. This growth stage can be observed during the second week of the differentiating organism. Once again, however, eventually more of the same will not aid growth. When this does occur in humans, it is known as a "wind egg," an embryo with no center. This is, of course, very difficult for the mother who feels pregnant in every sense of the word.

Animal and human phase. In humans the developing organism is generally known as an embryo up to 8 weeks and from then it is referred to as a fetus. In the literature, I have found differences in the reported days on which the embryo stage is said to start; some saying 1 week and others saying 3 weeks (Schoenwolf, Bleyl, Brauer, & Francis-West, 2015). Regardless of the name, at the end of the second or the beginning of the 3rd week, "the chorionic cavity has come into being containing tissue of a kind that mediates, connects, but also creates space. This is the meso(-derm) which connects and mediates between the two dimensions by means of the body stalk" (van der Wal, 2014, p. 41). Van de Wal writes meso(-derm) like this to draw attention to the fact that, in keeping with Blechschmidt, the term mesoderm gives rise to a confusion in perception as derm means limiting skin and mesoderm is not a skin or border but "inner tissue. . . . with a third dimension" (van der Wal, 2014, p. 42)[1]. For van der Wal, the trophoblast also represents the embryo but for others, only the germinal disc is considered as the embryo, and they, therefore, talk of the activity in the trophoblast as being "extra-embryonic."

Now something new happens. At the beginning of the 3rd week the first blood islands and blood vessels (capillaries) originate within this extra-embryonic meso(-derm). The formation of blood vessels and blood is the very first functional differentiation of the

[1] As this qualification of van der Wal gives the idea of dimensionality, I continue to use it in this review.

meso(-derm). The blood then flows from the metabolic periphery of the trophoblast, or extra-embryonic meso(-derm), to the body stalk, which is at the caudal end of the germinal disc. It then proceeds toward the cranial end of the embryo, running alongside the “flanks” of the germinal disk, then dorsally along the amniotic cavity (only very little) and ventrally along the yolk sac (some more). At the central point, which van der Wal calls the "centripetal junction of blood vessels," it comes to a halt and then flows back to the periphery through other capillaries. "This point of reversal, where the flow comes to a standstill, turns about, and takes on a rhythmical character, is the first indication of the origin of the heart" (van der Wal, 2014, p. 44). This, moreover, is the first real center in the embryo for it is an actual anatomical center rather than just a center in space around which everything revolves. It must also be noted that "the movement of blood flow is primary, the emergence of the heart is secondary. First there is flow, and where this comes to a standstill, the form arises" (van der Wal, 2014, p. 44).

During the previous plant phase, growth was on the periphery with the roots extending outward into physical space. The animal phase is the reversal of this and requires a growth inward. Another differentiating factor is that life, up to the animal phase, is seen as being outside of the germinal disk. However, on about the 17th day, something radically different happens. According to Steiner, "whereas the incarnating soul-spirit was up to this point present *around* the physical kernel, the 'astral individuality' of the human being now incarnates into the physical kernel itself" (Steiner as cited in van der Wal, 2014, p. 45). In keeping with this, van der Wal claims that the human soul now "comes a step closer 'to earth,' with the heart being the organ of incarnation!" (p. 45).

This is a vital stage in the development as now:

> Innerness is created which can hold its own against the outside and emancipate from it. A different state of consciousness arises in the animal. An inner environment has now been established, leading a life independent of its surroundings. It is capable of moving of its own accord and of establishing a relationship to its environment. This inner space is not only somatic, but also psychic. (van der Wal, 2014, p. 46)

This, in terms of gesture, is a reality. However, before full emancipation can occur in the physical sense, van der Wal reminds us that more still has to happen to the developing embryo. First the flat germinal disc transforms itself into the trilaminar germinal disc. At the end of the 3rd week an intermediate layer appears between the ectoderm and the endoderm, namely the *intra-embryonic mesoderm*. The meso closest to the ectoderm is called *parietal* or *somatic meso(-derm)*, the layer closest to the endoderm is known as the *visceral* or *splanchnic meso(-derm)*. This mesoderm has made its way *into* the germinal disk, by growing inward, starting from the primitive groove. It now is a three-dimensional entity with "real inner content" from which the impulse to "forming organs arises" (van der Wal, 2014, p. 44).

The notochord. The 3rd week certainly brings about many changes in direction of growth of the developing embryo, including, if Steiner is correct, the incarnation of the soul/spirit. Later we will also hear how on day 17 (this is also the same day the heart *primordium* starts pulsating) the notochord starts to form (Moscoso, 2009). It is this that it said to have an effect on the formation of the neural plate, which starts to form on day 18/19, which in turn gives rise to the neural tube and thereafter the central nervous

system (CNS) and the brain.

Delamination or folding. During the 3rd, but primarily the 4th, week a process then starts to occur which is known as folding or delamination. The sides of the embryo, which up to now has been essentially a flat disc, now fold toward each other. At the same time there is a longitudinal folding, which together transforms the now three-dimensional embryo into the form of a cylinder. The longitudinal folding takes place toward the body stalk, which enables the developing embryo to still be connected to the placenta. The heart, at the top or cranial end of the embryo, begins its descent in the direction of the naval, where it later tucks the endocardinal tubes ventrally in the thoracic region at the base of the yolk sac (Richtsmeier, 1999, p. 1). This then allows the brain primordium to take its place at the top cranial end of the embryo. The caudal end also raises ventrally, which now truly gives rise to the umbilical cord. This curving process of the embryo creates an inner world, which is essentially cut off from the outside world. It is in this inner world that the organs develop. According to van der Wal (2014) the whole of this process is a growth phase, which needs to be completed physiologically at birth with the cutting of the umbilical cord.

Differences Between Humans and Animals

But this is not the end of the process. For van der Wal (2014) another phase needs to occur that differentiates the human from the animal. Although Darwinian science considers man as an extension of the animal, according to van der Wal the embryo tells a different story. This growth phase involves a fine-tuning of our capacity of awareness. With the creation of an inner and an outer world, "the outer world can be perceived. . . . The condition for having this awareness and perception is separation" (van der Wal,

2014, p. 49). Although this is shared with animals, the human being has an additional capacity. We can be aware that we are aware; "the new direction could be described as finding a standpoint towards our own inner world" (van der Wal, 2014, p. 49). Here he is playing with the term standpoint and inviting us to take it literally, for the next phase is the coming upright of the embryo. "We can experience a center in ourselves which is conscious of the fact that we are beings with self-consciousness" (van der Wal, 2014, p. 49).

Although humans share the upright position with penguins and kangaroos, van der Wal (2014) is talking about "a balance of the head on the trunk which in turn is balanced on the lower extremities" (p. 49). This allows the human to move in a unique way, which is not shared by other animals. The center of gravity in apes is slightly to the front and to the back in marsupials; essentially the center of gravity of animals is outside and draws the animal toward the environment and earth. It is only humans whose center of gravity draws us to ourselves. And again, of course, we need to find "this process of stretching in the course of somogenesis during embryonic development" (van der Wal, 2014, p. 49) if it really is another phase as he suggests. In the beginning in the fourth and extending into the 5th week, an impulse that starts with the elongation of the brain and not only "brings about the characteristic flexures of the different parts of the brain," but also "the head grows cranially away from the trunk, whereby the neck appears (van der Wal, 2014, p. 50). At the same time, "the pelvis 'turns' caudally 'away' from the trunk coming under it, resulting in the waist being formed" (van der Wal, 2014, p. 50). This process, according to him, is typical of the human being and it can be seen as an unfolding of the previous curled up embryo. This unfolding also brings about the growth of the extremities of the

stretching outward of the arms and hands and the stretching inward of the feet and legs. Van der Wal suggests that the brain and the extremities can be seen as forming a polarity whereby we need to arrive at a position of balance to maintain an upright position. This for him is one of the characteristics of the human being whereby the anatomical-morphological formation is also reflected in the organization of our self-concept, "I am."

Insights Gained from this Approach

I have outlined van der Wal's approach in some detail as, via it, we can begin to appreciate the dynamic forces behind the development of the embryo. It also suggests that each phase gives rise to a different way of *being in the world*. Moreover, it helps us understand the development of the heart in greater detail and opens us to seeing the "heart" as a system that starts at the periphery through blood. The heart is also the harbinger of creating an inner world, which we share with animals. We saw how on day 17, when pulsation starts, the plant phase is clearly over; instead of growing upward, the heart doubles and begins its decent toward the interior of the organism. Here pulsation can be seen as heralding a new phase. This also coincides with the entry of soul/spirit into the physical kernel itself with the heart being considered as the organ of incarnation.

I also found it interesting that the next phase identified by van der Wal is the coming upright of the human embryo. The elongation of the brain leads this development. Might not modern day man´s predilection for finding consciousness in the brain have something to do with this early anatomical-morphological formation as gesture have something to do with this? Moreover, might not the idea of the supremacy of mind, which is normally associated with the brain, have come about because of this gesture in man? The gesture of coming upright, is later repeated in the infant when, *with*

the maturation of the senses, it lifts its head. This too is interesting, as most of our senses, which inform us of the outside world, are found in the face. When one looks at the human head it seems to be separated from the rest of the body, in fact it seems to "float on a sea of consciousness" (Unfolding the Petals of the Heart, 2016). Rather like a periscope of a submarine, it is very involved with the outside world via the senses. The brain, however, is not only involved with the senses, but together with the mind, it is considered the thinking center, and this too is often concerned with information about the world outside and how we understand it. The mind, according to some Eastern philosophers, is the "sense behind the senses" (Arka as cited in Lindhard 2015, p. 5), which takes in information from our senses and processes it in certain ways. Western science has also traditionally been involved with understanding the world outside of us.

Mind is an Extended Entity of the Deeper Consciousness Within

Nevertheless, van der Wal reminds us that we are organisms, and as such, we are all of it, we are living beings. This is in spite of the fact we have differentiated ourselves into very complex beings. From this perspective, we are not our just our minds; yes, they are part of us, but they are not the whole of us. "Mind is an extended entity of the deeper consciousness within us. As the tail is to the comet, so the mind is to deeper consciousness in the sky of our spirit" (Arka, 2005, p. 15). In the identification of ourselves with our thinking minds we seem to have lost our true nature as humans, which van der Wal (2014) describes as man´s ability to become aware of his inner world and experience "a center in ourselves" (2014, p. 49). For Arka (2013), this has led to us losing touch with our hearts and our ability to connect with our deeper Self or soul.

In order to get in touch with our deeper Self, Arka (2013) claims we have to go

below our thinking minds.

Additional Facts about the Heart and Cardiac Development

As I have discussed above, "the cardiovascular system is the first system to function in the embryo. . . . [and] it is functioning by the end of the 3rd week of development" (Richtsmeier, 1999, p. 1). The heart too has its own nervous system, which is called the conduction system.

> Cells that make up the conduction system have a very highly developed power of spontaneous rhythmicity and conduction that is more highly developed than in the rest of the heart. However, the ventricles and the atria have innate powers of spontaneous contractility independent of any nervous influence. We know this because the fetal heart is beating before the conduction system or the nervous system is established, because isolated cardiac cells contract rhythmically when viewed in culture, and from the observation that the human heart continues to beat even when removed from the body (as in heart transplant operations). (Richtsmeier, 1999, p. 1)

From this, it seems as though the physiological heart is unique in many ways, particularly as it can continue beating even when removed from the body. As an organ too it is not without its controversies; I consider some of them here.

The Heart as a Double Helix

Although the heart is normally considered only as a four-chambered muscular organ, Torrent-Guasp´s (1973) helical model of the heart helps us look at the heart in a different way. Through blunt dissection he revealed that the un-scrolled heart consists of a ventricular band that:

> Extends between the points of origin of the right ventricle, at the pulmonary artery root, to termination at the aortic root, in the left ventricle. These components include a spiral horizontal basal loop that surrounds the right and left ventricular cavities, and changes direction to cause a second spiral, produced by almost vertically oriented fibers, giving rise to the helical configuration of the ventricular myocardial band. These anatomic structures are successively activated, as with a peristaltic wave, starting at the right ventricle (just below the pulmonary artery) and progressing toward the aorta to produce a sequence of narrowing, caused by the basal loop contraction, shortening (related predominantly to the descendant segment contraction), lengthening (produced by the ascendant segment contraction), and widening, as a consequence of several factors that act during ventricular myocardium relaxation. These sequences control the ventricular events responsible for ejection to empty and suction to fill. (Torrent-Guasp et al., 2001 p. 301)

Although the double helix model of DNA is well-known thanks to the discovery of Watson and Crick (1953), not many people including scientists are aware that the folding of the heart's muscular band is like a double helix[2]. The helical ventricular myocardial band of Torrent-Guasp should therefore raise "the fundamental question . . . 'what do we really know about normal and diseased heart structure and function' rather than becoming boxed-in by prior conceptions" (Konica et al., 2006, p. S38). It therefore seems appropriate to contemplate the implications of this and what it might mean.

[2] To watch the Spanish Cardiologist Torrent-Guasp dissect a cow heart revealing its helical nature, go to https://www.youtube.com/watch?v=NHl4DUu1bEI

The helix. The term helix itself is very interesting. It comes from the Greek word *ἕλιξ,* which means twisted or curved (Liddell & Scott, 1940). The helix in mathematics is considered a smooth space curve, i.e., a curve in three-dimensional space. It has the property that the tangent line at any point makes a constant angle with a fixed line called the *axis*. Helices can be either right-handed or left-handed, depending on the direction they spiral in space. It must be remembered that the descent of the rudimentary tube-like structure from its cranial position in the direction of the naval coincides when folding or delamination occurs in the embryo. At the same time there is a movement from the sides to the center. Prior to this development, the heart *primordium* was seen as an anatomical center that had begun to pulsate rhythmically and where an ascending blood vessel had changed direction and became a descending vessel. During embryonic development, this primary heart over the course of several days then not only descends, but if one considers the model of Torrent-Guasp (1973), folds or arranges itself in way so it resembles a double helix, or a *curve in three-dimensional space*.

Trilaminar disk. Before this happens, we will remember that the flat two-dimensional germinal disc has already formed itself into a flat three-dimensional entity with the formation of the *meso* layer between the endoderm and the ectoderm. Then on folding or delamination, the spatial arrangement of the entity changes again from being a flat tri-dimensional disc to become a cylinder. Does this mean that the organization of the organism now changes from being tri-dimensional to being four-dimensional? If this were so, the limits of space and time would be different to that of the third dimension. Delamination "means ‘coming out of the plane’, we can now speak of a real, spatial outside and inside in the anatomical sense" (van der Wal, 2014, p. 46)

Another interesting aspect regarding the function of the heart is that as it "contracts in systole, [it] also rotates and produces torsion due to the structure of the myocardium" (Burleson & Schwartz, 2005, p. 1109). Later some of the implications of this are considered.

Vortices of the heart. Torrsent-Guasp and Burleson and Schwartz were not the only people taken with the unique structure of the myocardium. Working from an entirely different perspective through form itself, Chester (2014) discovered that the shape of the heart conformed to a geometric pattern, which he had discovered and named a *Chestahedron*. From this form he deduced that unique structure of the myocardium forms two vortexes where:

> Blood streams into the left ventricle in a clockwise direction and then vortexes around itself, finally emerging from the left ventricle in the opposite, counter-clockwise direction. At the moment when the blood flow reverses, there is no movement; absolute stillness reigns. However, this is a dynamic rest. This is the exact moment, simultaneous in time and space that for Frank Chester represents the eternally present heart-centered state in each human being. (Morgenthaler, n.d., para. 2)

The importance of this will also be touched on later.

From Worms to Mammals: The Evolution of Cardiac Morphology

"The human heart seems to repeat within the first few weeks of fetal life the evolution of the cardiac morphology which occurred in millions of years from worms to mammals" (Corno, Kocica, & Torrent-Guasp, 2006, p. 562). In 20-day-old embryos, the heart is first a single vascular tubular structure "like a worm." The next stage occurs at 28

days and is fish-like in that it develops "into a sequential pulsatile pump including the atrium, ventricle, bulbos cordis (conus), and truncos arteriosus." At 30 days there is a further change with the heart resembling that of reptiles and amphibians in that it has two-chambers with atrial and ventricular septal defects. And finally, between 35–50 days, a four-chambered structure appears which is what is found in birds and mammals.

For Corno, Kocica, and Torrent-Guasp (2006) the primary heart tube must carry distinct axial information to assist the twisting and repositioning of the segment in order to avoid any misstep in interpreting the left-right axial information, which might lead to congenital heart defects.

It also seems interesting that worms, reptiles, and amphibians are cold blooded, which means that the regulation of their body temperature largely depends on the outside temperature (Rohrig, 2013). These animals, however, do have the capacity of regulating their own bodily temperature through contact and the selection of microclimates most appropriate for their survival under ever-changing outer environmental conditions. For example, worms will come to the surface when the ground gets very wet or they will drown. Birds and mammals, on the other hand, do have an inside temperature regulatory system which requires they have a higher basic metabolism rate. Interestingly, during the embryonic development the rudimentary heart finally tucks itself at the base of the yolk sac, the zone of the embryo involved with metabolism. Mammals, however, are also dependent on the exterior environment for food and also for warmth and need to seek or be provided with microclimates most appropriate for their survival. The migratory patterns of birds to warmer climates might have something to do with this (Rohrig, 2013), and the newborn human baby, being hairless, also requires the warmth of its mother or

caregiver to survive.

The formation of the muscular heart into an elliptical form coincides with the shaping space and the coming into being of a cylindrical organism. In addition, this process seems to recapitulate the evolutionary history of worms to mammals in which contact with the outside world seems to play an important role. Sills (2012), in fact, reminds us that the heart originates outside the main body of the embryo and "it is the only organ to originate outside body. . . . The heart seems to bring with it a relational awareness of what is beyond our physical boundaries, to connect with the other" (p. 38).

When one lets primary reality as description of the embryo and heart *speak* for itself, one becomes aware of a truly remarkable process. But this is not all; the heart is remarkable in many other ways as well.

Electromagnetic Fields

The heart is also notable because it radiates an electromagnetic field. When one takes into account the model of Torrent-Guasp, it is easier to understand the relative size of its field. From physics it is known that a wire through which a current is passed produces an electromagnetic field. However, when a current is passed through a coil or a helix it is so much greater. Although the muscular band of the heart is not a wire, it is shaped like a helix and it does emit an electromagnetic field. Baule and McFee (1963) were the first scientists who created a way to measure it, but the results they obtained were “noisy.” The next to develop an instrument was Cohen, who in 1967 used a smaller coil and a magnetically shielded room to reduce the noise. Because all charged wires and the earth itself produce electromagnetic fields, it is difficult to exclusively measure the electromagnetic field produced by the heart. In 1970 Zimmerman designed a very

sensitive detector, which is known as the SQUID (superconducting quantum interference device) that when it is used in a room such as that developed by Cohen (1968), leads to results that are as clear as an electrocardiogram (Cohen, Edelsack, & Zimmerman, 1970). This technique is now used in many clinics, hospitals, and laboratories, both for research and diagnosis.

McCraty, Bradley, and Tomasino (2005) of the HeartMath Institute have made claims about the strength of the heart's electromagnetic field such as that:

> When compared to the electromagnetic field of the brain, it is 60 times greater in amplitude, and permeates every cell in the body. The magnetic component is approximately 5000 times stronger than the brain's magnetic field and can be detected several feet away from the body with sensitive magnetometers. (p. 15)

However, this statement implies that these fields are static, whereas other researchers point out that magnetic fields vary between subjects and also within the same subject at different times (Ben-Amar Baranga, 2010). For facts to be accepted by other scientists all factors relating to the phenomenon that is being measured have to be present when publishing articles so that others can verify them. What is known from other research is that the heart does emit an electromagnetic field greater than the brain and that it, like other magnetic fields, extends beyond the body and also permeates the body, which of course includes all cells (Ben-Amar Baranga, 2010). Ben-Amar Baranga shows that the heart´s magnetic field is between 10–20 pico-teslas and the brain´s magnetic field between 50–100 femto-teslas. Fishbine, on the other hand states, "typically the heart's electromagnetic field above the chest is 100 to 1,000 times stronger than brain fields above the head" (Fishbine, 2003, p. 6). Their statements vary slightly, so there is a real

need for more to be known about the condition of the subject at the time of measurement and the measuring instrument used. Investigations into the electromagnetic field of the heart and the brain are still in their infancy and each step needs to be made carefully giving all the factors involved if this new field of science is to be taken seriously by other scientists.

Subtle Energies

These considerations are particularly important, as mainstream science is still not open to the notion of *subtle energies*. Anderson (2010) gives several reasons for this:

- There is no agreed-upon scientific definition of subtle energy, and hence no reliable methodology for detecting or measuring the energies so defined.
- There is no broadly accepted scientific theory of such energies.
- The very notion of subtle energy originates in pre-scientific esoteric traditions, which have been systematically marginalized by the scientific enterprise for more than a century.
- The notion is thus considered far too subjective, or worse, a point of religious belief, or worse yet, a mere superstition. (p. 1)

I also feel there are many other reasons, but probably the main one is that to understand the subtle energy fields one also has to have more than a rudimentary knowledge of physical science, including electricity, quantum physics, and how holograms work (Pribam & Ramirez, 1980). At the moment, most researchers and workers in the life sciences are trained to understand organisms from an organic point of view, which either involves chemical reactions or nerve impulses. However, a new field known as "electronic biology or solid state biochemistry" (Oschman, 2009, p. 18) has

been created. It is largely based on the pioneering work of Szent-Györgyi and hopefully this will fill this lacuna in science. Furthermore, although organic models typically stress the interdependence of the component parts as well as their differentiation, they do not address the meta-level of non-physical forces which might be not only holding but guiding the system to develop in a certain way.

The Relationship Between Electrical Fields and Life

Harold Saxon Burr was one of the earliest scientists who were interested in the relationship between electric fields and life. Matthews (2007) sums up Burr´s fundamental questions about the electromagnetics of living systems in the following way:

1. Do living organisms possess steady state (i.e., direct current) voltage levels?
2. Can these voltage levels be assessed in a manner that is free from the usual ambiguities of electrical measurement such as random variations in the electrical resistance and flow in the specimen being measured?
3. Are voltage level fluctuations random or are they related in such a way as to produce definable electrodynamic fields?
4. If such fields are present, are they merely by-products of biochemical processes, or do they exert an influence on those biochemical processes and on the patterns of organization found in living entities? (Matthews, 2007, p. 56)

The first requirement was to develop an instrument to measure "the infinitesimal variations in voltage (physicists refer to these as potential differences)" (Matthews, 2007, p. 55) "without upsetting significantly a very sensitive electro-chemical balance" (Burr & Hovland, 1937, p. 248). This eventually resulted in an instrument known as the Burr-Lane Vacuum Tube Microvoltmeter. With this Burr made his first measure and was able

to ascertain that an unfertilized salamander egg showed several points of differing voltage around the "equator of the egg relative to the vegetal or south pole of the egg" (Mathews, 2007, p. 58) with one specific point being greater than any of the others. Furthermore, he obtained an increase in voltage up to distance of ½ mm away from the egg. This voltage increased steadily after fertilization and throughout the development of the embryo.

Head tail relationship. Later with the help of microsurgical instruments, Burr was also able to demonstrate that the point of maximum voltage in the unfertilized egg would after fertilization correspond with the salamander´s head and the place of minimum voltage would develop into the salamander´s tail. He repeated this amazing discovery on embryos of frogs and chicks and all demonstrated that the point of maximum voltage seemed to dictate the alignment of the grown systems head tail alignment" (Matthews, 2007, p. 59). Working with chicks, Burr and Hovland (1937) came to the conclusion that electro-dynamic fields provide the missing irreducible relational factor required to account for the organization of the physical chemical constituents of living organisms. Chick studies also "seem to indicate that the potential gradients also are associated with the development and differentiation of the nervous system" (Burr & Hovland, 1937, p. 255).

Voltage and the vascular system. Although Burr observed an increase in voltage with the development of the vascular system and a sharp drop in voltage when the heart stopped beating, he did not feel that the increase in gradient was directly related to this additional organ system. However, he did not discount it either (Burr & Hovland, 1937). Following van der Wal´s focus of the heart system being related to blood and circulation with the actual organ only developing later, it would be interesting to see how the initial

development of blood, the circulation of blood and the beating of the rudimentary heart are related to the increase in gradient that Burr found. From Burr´s results it seems that the bioelectric field found in the unfertilized egg can be seen as a blueprint for a future location *in space* of a polar relationship between the cranial and caudal end of the physical body of the future organism.

Bioelectric fields and disease. Burr was also interested in disease. He felt just as "normal biologic growth and development was accompanied by a bioelectric field that appeared antecedent to the beginning . . . abnormal growth would likely be preceded by the appearance of an abnormal bioelectric signature" (Matthews, 2007, p. 59). Burr too was able to verify his hypothesis and although this not of interest to us specifically, it is related.

Holding that Burr´s findings are applicable to the human embryo, and that bioelectric fields appears to accompany or even precede an organism's biochemistry and patterns of organization, we must also ask ourselves if our bodies are determined by this field or to what extent they are determined? Burr´s investigation into disease indicates that these fields can be altered in some sort of way, giving rise to disease. Equally it seems that we can interact with the field in certain ways to correct any imbalance that has been created. According "to Asian medicine there aren´t any diseases – there are only energetic imbalances that can be detected and corrected to prevent health problems and restore optimal functioning" (Oschman, 2009, pp. 13–14).

A New Way of Looking

This work of Burr obviously opens many new ways of looking at how bodies of living organisms are arranged in space and also what occurs over time. In living

organisms, it seems as though there are different systems which are involved in the "arrangement" of our physical bodies, one of which is the invisible force discovered by Burr. Science up to now has mostly concerned itself with the chemical and neural system and, as yet, not much is known about the electrical system. Burr´s contribution seems to be a remarkable step forward in this respect. He was also way ahead of his time, for it is only in recent years that once again scientists are interesting themselves in his work and pursuing this line of research (Oschman, 2009).

The bioelectric field of the organism is very small in the beginning and increases with time as the organism develops (Burr & Hovland, 1937). This seems to imply that other electric and electromagnetic fields might start interacting with the organism as it develops which may swell or increase the bioelectric field. However, this researcher does not discount that the initial bioelectrical field might not contain certain information about the future development of the physical organism; after all a salamander egg does not grow into a human being. On the other hand, it might just guide the one-dimensional arrangement in space that Burr discovered.

Extrapolating from Burr's Findings

As already stated, the heart radiates an electromagnetic field, as does the brain, although much smaller in size. From the work of Burr, it seems probable that unseen forces guide the development of the heart in much the same way that the bioelectric field anteceded and guided the initial physical growth of the embryo, at least in the head-tail location in space. If this is so, then this may also apply to the other organs in the body, including the brain. In fact, based on Burr´s work, it seems probable that *unseen or metaphysical forces guide the formation of all parts of the body.* It also opens the

possibility that the heart, which as we have seen, is the first organ to develop and radiates the greatest electric magnetic field in the body, could be involved as an inner guiding force or metaphysical force that is involved in or even responsible for the further development of the organism including the other organs. Magnetic fields are vector quantities characterized by both strength and direction. Vector spaces, in the geometric sense, are spaces formed by vectors representing displacements in the plane or in three-dimensional space. Voltage, on other hand, measures a change of potential between two points. If this does not exist, electrons do not flow, rather like water flowing from a dam (C. Nuñez, personal communication, November, 2015). Later in this review, I touch on how the bioelectrical force discovered by Burr, the electromagnetic force of the heart, and even more subtle forces may interact. However, it appears to me that it might be fruitful to first continue our investigation into the bio-magnetic field of the heart to see where that can lead us. But first let us look at the relationship between physical science, energy, and subtle energetic fields.

Physical Science, Energy and Subtle Energy Fields

When we look at parts of the living organism using the lens of Goethe, the question *what for* springs to mind (van der Wal, 2014). This, therefore, shifts our interest into contemplating the purpose of the electromagnetic field of the heart, and for this we need to understand how electromagnetic fields work in greater detail. I, therefore, also need to elucidate the main assumption I shall be making regarding the organism and how it functions.

Assumptions

It would be convenient to assume that the electric and electromagnetic fields

found in the body function in a similar way to the electro and electromagnetic fields discovered by physics. It seems to be a question of scale. Those found in the body are referred to as subtle because they are difficult to perceive, especially as scientists have not yet developed instruments that are sufficiently sensitive to measure them, although this is slowly changing. According to Arka (personal communication, 1998) we cannot invent anything, which is not in our image. This implies that our bodies may function in a similar way to physicists' discoveries about the physical universe and how it functions. In support of this, Rubrik (2008) points out that the modern view of the biofield is "at least in part, based on the electromagnetic field theory of modern physics. . . . [and] rests on physical principles that can be measured" (Rubik, 2008, p. 555). However, she also draws our attention to the fact that these fields "might also include acoustic and possibly other subtler energy fields not yet known to science" (Rubik, 2008, p. 555).

Some Basic Tenets Regarding Electromagnetic Fields and Torsion Waves

A resume is given here about some of the basic tenets of physics concerning electromagnetic fields and torsion waves. Man´s knowledge regarding these tenets have led to numerous discoveries that in turn have resulted in practical applications of a technological nature:

1. Passing an electric current through a wire that is a helix produces an electromagnetic field, which is greater than if the wire was straight.
2. Placing a ferromagnetic material like iron in the center of a helix through which a current is passed, increases the size of the magnetic field (Laplante, 2005, p. 143).
3. Passing a current through a coil magnetizes the iron, and the field of the

magnetized material adds to the field produced by the wire. In science this is referred to as a ferromagnetic-core or iron-core coil.

4. Magnetic lines of force can pass through iron more easily than air.
5. Magnetic lines of force contract longitudinally and expand laterally.
6. A permanent magnet creates its own persistent magnetic field and is made from a material that is magnetized. Magnets are considered either hard or soft depending on the capacity of material from which they are made to retain a magnetic field under different conditions.
7. Magnets produce invisible electric fields and their most prevalent property is that they are a force that pulls on other ferromagnetic materials, such as iron, and attracts or repels other magnets.
8. Electric and magnetic fields travel through space as waves moving at the speed of light (Maxwell, 1865).
9. The unification of light and electrical phenomena resulted in the discovery of radio waves. A radio, in essence, involves the emission and reception of information.
10. Torsion waves are produced through alternating currents in exact opposite phase, which makes the net result a nil electromagnetic field, the zero field and is the fundamental wave within the electromagnetic waves (Quanten, 2009). "Torsion essentially means 'twisting' or 'spiraling'. Thus, this is the action of torsion waves as they propagate through space—and it is also the action of static torsion fields. Torsion fields are generated by spin and/or by angular momentum; any object or particle that spins produces torsion waves

and possesses its own unique torsion field." (Murphy, 2012, para. 3)

The proven existence of torsion waves by the Russian scientist Nikolai Kozyrev made him one of the most controversial figures in the history of the Russian scientific community. Torsion waves appear to play a role in explaining our physical reality (Quanten, 2009). This is the fundamental wave within the electromagnetic waves. "Electrostatic or electromagnetic fields without a torsion component do not exist" (Nachalov, n.d., para 18).

Let us now look at what we can learn when we apply these basic scientific tenets to the heart.

Extending tenets about electromagnetic fields and torsion to the heart. The heart has held a prevalent role in many spiritual traditions, especially in those that meditate on it directly. In the Christian tradition, the *Sacred Heart of Jesus* is an object of deep veneration. Furthermore, the *blood of Christ* is also venerated with wine being used in representation of it (Rebillard, 2015). The reason for the latter has always puzzled me. Van der Wal´s (2014) comment that the heart system starts from the "advent" of blood in the developing embryo of mammals, added to my conundrum.

So let us now turn again to the heart and see what happens when these basic tenets about electromagnetic fields discovered by physical science are applied to the heart.

1. Passing an electric current through a wire that is a helix produces an electromagnetic field, which is greater than if the wire was straight. The heart has an electrical system called the cardiac conduction system and although it is not a wire, it produces an electromagnetic field. The electrocardiogram (ECG) gives us a graphical representation of heart's electrical activity. As

detailed earlier in this review, the conduction system of the heart is independent of any nervous influence (Richtsmeier, 1999, p. 1). Magnetocardiography (MCG) is the technique to measure the electromagnetic field around the heart using very sensitive devices, like the SQUID. What is generally not known is that Torrent-Guasp´s (1973) method of dissecting the heart reveals that the ventricular myocardial band of the heart has a helical configuration. The electromagnetic field of the heart has been recorded as being the organ that produces largest electromagnetic field in the body (Fishbine, 2003).

2. Placing a ferromagnetic material like iron in the center of a helix through which a current is passed, increases the size of the magnetic field (Laplante, 2005). When one considers that iron is one of the chief chemical components of blood and that in the heart, blood is found on the inside of the myocardial helical band, according to the tenets of physical science this will also increase the heart´s electromagnetic field. However, as oxyhemoglobin does not contain unpaired electrons, it has "zero magnetic moment;" on the other hand, the "magnetic susceptibility of hemoglobin itself (ferrohemoglobin) corresponds to an effective magnetic moment of 5.46 Bohr magnetons per heme, calculated for independent hemes" (Pauling & Coryell, 1936, p. 216). The characteristic of hemoglobin in the embryo and the fetus is different from adults (Abraham & Taylor, 1975; Al-Mufti, Hambley, Farzaneh, & Nicolaides, 2000). During pregnancy the mother has to deliver oxygen to the baby and extract CO_2. This occurs across the placenta, where the two systems

come very close together. Oxygen transfer could not occur is both systems used the same transporter, so according to Lean (2016) mammals "have evolved a unique form of hemoglobin for fetuses, known as fetal hemoglobin (Hb F) consisting of two alpha and two gamma subunits (α2 γ2)" (Lean,2016 Adult vs Fetal Haemoglobin section, para. 3). In addition, as higher affinity for oxygen inhibits oxygen dissociation, other mechanisms are also in place. The one that is of interest to us here is that in the fetus one finds an "increased hematocrit (Hct) – higher number of red blood cells per blood volume. This is a common reaction to reduced oxygen availability." (Lean, 2016 Overcoming Higher Oxygen Affinity section point 1)

3. This implies that in the fetus and even in the adult, iron in venous blood in its passage through the heart, may become magnetized in the process, leading to a further increase in the size of the magnetic field of the heart. From this it seems that the heart may act like a *ferromagnetic-core coil* or an *organic iron-core coil*, which is organic in nature. As fetal blood has a higher number of red blood cells and as the lungs are not yet activated, this leads one to suppose that the heart with its potential to be an organic ferromagnetic-core coil, might play a very precise role in the development of the organism during certain critical phases of its development. However, as this area has not yet been researched, any suggestions by this researcher would be purely speculative. Nevertheless, this is touched on again in point no. 7.
4. As magnetic lines of force can pass through iron more easily than air, it seems probable that iron in the blood might act as a way of passing magnetic lines of

force throughout the body. Nordenstrom (1983) has hypothesized the existence of intrinsic electrical pathways in the body, the most prominent being the low-resistance vascular network. In the 4th century Galen believed that the heart made "vital blood" and carried vital spirit through the arteries. “Nutritive blood,” on the other hand, was made by the liver (Galen as cited in Rosch, 2014, p. 1).

5. Magnetic lines of force contract longitudinally and expand laterally. This vision is consistent with the elliptical human aura or bio-field that one can see in pictures and painting from different spiritual traditions. Although many psychics can see the aura or bio-field directly, with the development of new technical means we can all now see this field. Semyon Kirlian and his wife Valentina Kirlian (1939) were the first to discover that when an object is placed on a photographic plate that is connected to a high voltage and a high frequency power supply, an image is produced on the plate. From this, he developed the Kirlian Camera. At present the best-known modern day version of this camera is the GVD or Gas Discharge Visualization Camera developed by Korotkov (2013). Harry Oldfield became fascinated with Kirlian´s discovery, and he set himself the task of developing a camera, which could take the field in three dimensions instead of the flat two-dimensional photos obtained using the Kirlian camera. In the late 1980s, this resulted in the PIP (Polycontrast Interference Photography). Using microchip technology, Harry Oldfield has also developed a scanner, which could provide a real time, moving image of the energy field. He believed that the future of analysis lay

in finding an effective scanner, which can “see” imbalances in the energy field rather than disease in the physical body (Oldfield Systems, 2012). Like any technology, one has to be trained to interpret what one is seeing, just like when reading an x-ray.

6. It seems as the heart could act like a magnet. As venous blood is passing continuously through the heart, iron in the blood would need to be magnetized continuously for it to be considered a magnet that is permanent. God, in the Hindu tradition, is described as *Krsna*, meaning *all-attractive* (Rosen, 1989). Great spiritual leaders are considered to be like *Krsna*, and when this is taken literally, it seems to indicate they have mastered the art of affecting their magnetic fields and becoming all-attractive or God-like. This supposition goes beyond extending the tenets of physical science to the heart.
7. Magnets produce invisible electric fields, and their most prevalent property is that they are a force that pulls on other ferromagnetic materials, such as iron, and attracts or repels other magnets. Babies, when they are born, are highly attractive or magnetic (Arka, 2006). Interestingly, just prior to birth, the baby receives a tremendous amount of iron from the mother (Iron Disorder Institute, 2009). Abraham and Taylor (1975) point out that compared to adult blood, "the blood of newborn infants contain 10 to 30% more hemoglobin A" (p. 3929). According to the Iron Disorder Institute (2009), this is to prepare the new born "for a spectacular period of rapid growth and will assure adequate iron is available for the first 6 months of life. For this reason, newborns and infants have exceedingly high serum ferritin and transferrin-

iron saturation percentage (TS%.)" (Iron Disorder Institute, 2009, para. 2). The unborn embryo also has a high hemoglobin count during the first trimester (Abraham & Taylor, 1975). The purpose of sharing this information here is not to take a reductionist point to view, but to stress there might be many reasons why nature has blessed the newborn with a high level of transferrin-iron during these two periods of its early existence. When one considers Burr´s hypothesis that bioelectric fields appears to accompany or even precede an organism's biochemistry and patterns of organization, it could be that these two phases in the life of the embryo are also when the heart needs to become more magnetic so it can influence the future development of the organism in a specific way or in specific ways. Certainly it is during both these phases that tremendous changes occur in the developing organism. During the first trimester the embryo is still "growing itself" a body (van der Wal, 2014), after birth it is enlarging this body and also "growing itself" a way to relate to the exterior world.

8. Electric and magnetic fields travel through space as waves moving at the speed of light (Maxwell 1865). On observing his cat react to the sight of a snake, the Nobel prize winner Albert Szent-Györgyi came to the conclusion that "life was too rapid and subtle to be explained by slow moving chemical reactions and nerve impulses" (as cited in Oschman, 2009, p. 18). This led him to investigate submolecular nature of collagen. Collagen is shaped like a triple helix, whereas DNA and the heart are double helices. As electric and magnetic fields travel through space at the speed of light, maybe this too has

something to do with how information within the system is communicated. As the heart radiates the greatest magnetic field, maybe it can be seen as a nonverbal communication or guidance center, which, through resonance, acts as a force on other components of the organism, like the triple helix found in collagen. This could help to explain the instantaneous reaction of Szent-Györgyi´s cat. However, this relationship may work in both directions and, therefore, further investigation is needed. Obviously there are many more implications of this tenet of physics, particularly when one considers the possibility of the heart communicating with other systems in the outside world. I discuss this again in the next point.

9. The unification of light and electrical phenomena resulted in the discovery of radio waves. A radio, in essence, involves the emission and reception of information. In the embryo, as we have seen, the heart system developed originally outside the main body of the embryo and as we have seen earlier, brings with it a relational awareness of what is beyond our physical boundaries and which enables us to connect with the other. The implication of this is that the heart may also continue to play a role later in our development as a sending and receiving station both within the system and beyond its borders. Certainly we know that the heart communicates with the brain through neural and other ways affecting perception, amygdala, and stress response (McCraty & Tomasino, 2002). It also seems that more information is sent from the heart to the brain than vice versa (McCraty, 2009). The possible role of the heart as a sending and receiving system is looked at in a little more

detail later in this review.

10. Torsion waves are produced through alternating currents in exact opposite phase, which makes the net result a nil electromagnetic field; the zero field. It is the fundamental wave within the electromagnetic waves. They appear to play a role in explaining our physical reality (Quanten, 2009). As we have seen earlier, the heart can be seen as consisting of two vortexes spinning in opposite directions. It also seems relevant that as the heart first "contracts in systole (it) also rotates producing torsion, which was recognized by both Aristotle and Harvey" (Burleson & Swartz, 2005, p. 1109).

In spite of this being a complex and somewhat controversial subject, I touch on it again briefly later in this dissertation. It also seems worthwhile noting here that Kozyrev discovered that human thoughts and feelings also generated torsion waves. He found that emotional thoughts produced a much greater effect on his equipment than intellectual thought (Murphy, 2012). If one thinks "of torsion waves as connections not through space, but in the realm of *time* (or time-space), then real-time (instantaneous) telepathic communication between people separated by thousands of miles may become slightly more comprehensible—and less 'unusual'"(Murphy, 2012, Torsion, Psi, and the Brain section, para. 1).

The heart as a multifaceted center. When applying these tenets of physics to the heart, we can begin to understand that the heart certainly seems to be more than a pump. Through its unique structure and electrical and chemical makeup, it seems Nature has supplied the organism with a highly sophistical multifaceted center. Generally, this center is below our level of awareness. Nevertheless, the heart seems to be important in how

information is transmitted within the organism and between organisms, and even between organisms separated by distances, both in time and in space. The heart or the heart center also seems as though it could be involved in the formation of different dimensions. It might even be implicated in the delamination process of the developing embryo when the flat trilaminar disk is transformed into a cylinder. Furthermore, the unseen bioelectrical forces of the heart might play a role in the continuing development of the embryo and to the overall wellbeing of the mature organism.

The Origin of the Heartbeat and the Primary Nature of the Heart

Pointing to the conduction system as responsible for the pacemaker activity of the heart is also not going very far back in our inquiry. Richtsmeier (1999), as we have already seen, claims: "the ventricles and the atria have innate powers of spontaneous contractility independent of any nervous influence" (p. 1). The intrepid explorer, therefore, wants to know the origin of the human heartbeat. On asking the philosopher Srinivas Arka the origin of the human heartbeat, the audience was given an answer that leads us to the very origin of the universe itself. For him it is a link in a chain that stretches far beyond the pulsations observed (Arka, 2015a). However, before considering this, let us once again contemplate what we know about the nature of the heart and how it might function.

Mechanical Physics and Beyond

Blood is the first manifestation of the heart system. At the beginning of the 3rd week the first blood islands and blood vessels (capillaries) originate within the extra embryonic meso(-derm). In the developing embryo blood then flows from the metabolic periphery of the *trophoblast* through the capillaries to the body stalk then to the cranial

end of the germinal disc, where it turns around and flows back through other capillaries.

During metabolism, organic compounds are broken down to form heat and energy; a process called catabolism. Heat energy is known as thermal energy, and through a process known as diffusion blood probably plays a role in embryo in transferring this internal energy to the cooler or more distant parts of the organism. Initially this energy is kinetic and potential energy. Blood is also responsible for transporting oxygen from the mother via the placenta to the developing embryo and this too creates heat as it loses its oxygen molecules to the cells through which it passes.

The interesting thing is that blood is flowing in the embryo even prior to the development of the heart as an organ (Chester, 2014).

> If the heart were a pump, the paper-thin tissue at the apex of the left ventricle could never withstand the developing pressure. . . . In the developing human embryo, blood is already streaming rhythmically through its blood vessels before the heart has even formed. Something other than the heart, therefore, must be responsible for this movement of the blood. (The Event Chronicle, 2014, para. 5 & 6)

These comments suggest that science needs to look for another model of how blood to moves around the body. Interestingly Descartes did not consider the heart as a pump, but as a furnace. (Descartes as cited in Rosch, 2014)

The change in pressure due to the difference in diameter between arteries and veins might help explain flow, but it does not explain the *buckling* the blood capillary or tube-like structure undergoes to form the helical heart. For if it did, all blood vessels would buckle when they change from arterial blood to venous blood. So we have to look

for the cause of this phenomenon elsewhere. However, before doing this, let us consider the origin of the human heartbeat.

The Origin of the Heartbeat

On recently being asked the origin of the human heartbeat, Arka answered in the following way: “the complete truth is not there, that is the truth. The truth is there, but the complete truth is somewhere else.” This answer was in reference to the place where the heartbeat is first recorded. However, he also clarified that the little tube-like structure is not flat, but "it is like a cap forming, it is arch shaped, it is like a rainbow. . . . [it] has pulsation" (Arka, 2015a). The importance of this qualification becomes more apparent later in this review. He then invited us to go back and look for "the origin of the heartbeat beyond our existence, to our ancestors and keep on traveling backwards” (Arka, 2015a). This way of thinking leads us somewhere beyond human existence. “There was existence, but there was no human existence, there was existence and definitely that existence must be higher than the human level of existence.” On arriving at this point he suggested that we had reached a dead end in our investigation. In spite of this, he claimed that we had established that “human existence has a beginning—existence has a beginning. But what then is the core of human existence?” (Arka, 2015a). To his own question, he answered:

> At the core is pulsation; it could be both physical and spiritual. You do not have to say it is purely spiritual; no, it is also tangible. So intangible pulsation becomes tangible. It is also tangible. We feel the pulsation, not only thinking about it as being present in others . . . we also feel the pulsation . . . pulsation is underlying some other pulsation (Arka, 2015a).

Having arrived here he invited us to consider our position again.

> Our investigation into the beginning of human existence arrived at a dead end. This then requires a further cosmic tour . . . where we land up in an ocean of non-human or non-living entities. Just particles . . . and what are they doing? They do not have life like us, but they are doing the same thing at the core. . . . Pulsation is happening at the core. On the elementary particle level they are pulsating . . . We came to non-human existence but we landed up seeing pulsation. The core is the same. At the core of the universe and human existence, we landed up seeing only pulsation. (Arka, 2015a)

He furthermore invited us to think of non-pulsation and although in our thoughts we can do it, he assured us that in reality it does not exist and anyone who wanted to argue this standpoint, would have to prove it.

> There is no non-pulsation, pulsation is internal to every fabric for there is pulsation deep inside; that means the heart pulsates because it wants to manifest emanate and move on. It is moving somewhere else; the heart is a wave emerging; it finally does not stop; it transfers the pulsation to another form of existence. Relatively we think the wave ends here, but the wave never ends. (Arka, 2015a)

Quantum Physics and Pulsating Particles

Quantum physicists have also come to the conclusion that matter is not solid. Through the use of mathematical equations, they too view particles as having pulsation. By multiplying the mass of the particle by the square of the speed of light, and then divide this by Planck´s constant, one finds its frequency. From this they have "created a picture of a particle with a definite rate of pulsation"(Hofmann, 1959, p. 75). Hoffman

then invites us to concentrate on pure pulsation, which we can interpret "as a bottled up heartbeat or else as a spread out pulsation" (Hofmann, 1959, p. 75). Broglie used both interpretations at once and thus assumed that:

> A particle at rest not only possessed a localized heartbeat but was also accompanied by a widespread pulsation forever in step with it and extending all over the universe. This pulsation was as if a whole ocean were rising and falling like some vast elevator; there were no waves in the ordinary sense, just a rise and fall. (as cited in Hoffman, 1959, p. 75)

We are not going to go into the argument of relativity here only to say that Broglie brought it round in a full circle by suggesting that "matter, long thought to consist of particles, must be accompanied by waves and thus partake in their nature" (Broglie as cited in Hofmann, 1959, p. 80).

Combining Perspectives

Arka and quantum physicists therefore share a common view in considering particles as having pulsation. In our cosmic tour guided by Arka, we landed up in an:

> Ocean of materials, non-human or non-living entities; just particles, material particles. But what are they doing? They do not have life like us, but they are doing the same thing at the core. That is so amazing. Pulsation is happening at the core. (Arka, 2015a)

However, whereas physicists concentrated on the wave-like aspect of matter, he stresses pulsation as the core property of all existence. "Pulsation is the underlying core principle and property of universal existence, cosmic existence and local existence" (Arka, 2015a). At the core of our existence as humans, we find pulsation, which "is not only spiritual but

also tangible" (Arka, 2015a). At the core of particles we find pulsation, which is like "a bottled up heart beat" (Hoffman, 1959, p. 75).

> Pulsation is like a wave emerging, the heart pulsates because it wants to manifest, emanate and then move on . . . it does not stop, the heart is like a wave emerging . . . transfers the pulsation to another form of existence . . . relatively we think the wave has ended here—but the wave will never end. (Arka, 2015a)

This means that no morphological structure is behind the heartbeat. This too is what Christoffels and Moorman (2009) insinuate:

> The configuration of the distinct components of the embryonic heart, or the "cardiac building plan," is sufficient to maintain an activation cycle, with the derived ECG resembling the adult pattern. These observations imply that the function provided by a conduction system is present already in the early embryonic heart, and that, like in lower vertebrates, this function *does not require the formation of morphologically defined components* [emphasis added]. (p. 196).

The Manifest World as an Expression of Invisible Intelligence or Mind

The origin of the manifest world seems therefore to be *Creative Intelligence* that is expressing itself in ever-changing pulsating forms from *elementary particles* found in the primordial ocean to every other manifestation in existence; it extends itself from stars, to man, and beyond (Arka, 2015a). Scientists too, recognize the pulsating nature of stars even though it cannot always be measured directly (Bhatnagar, 1944).

In studying the atom, Max Planck (1944) came to a similar conclusion:

> As a man who has devoted his whole life to the most clear-headed science, to the study of matter, I can tell you as a result of my research about atoms this much:

> There is no matter as such. All matter originates and exists only by virtue of a force which brings the particle of an atom to vibration and holds this most minute solar system of the atom together . . . We must assume behind this force the existence of a conscious and intelligent mind. This mind is the matrix of all matter. (Planck, 1944)

The Three in One

At this level of analysis, it also becomes very difficult to separate the force that creates, the intelligence behind this force, and the universe itself. The tenet of non-duality behind Vedic philosophy becomes increasingly manifest when we look at creation in this this way.

> Thus the essential nature of the Lord is perpetual *spanda* (creative pulsation). He is never without *spanda.* Some hold that the Highest Reality is without any activity whatsoever. But in such a case the Highest Reality being devoid of activity, all this (i.e. the universe) will be without a lord or Creative Power. (Singh, 1992, p. 10)

When this aspect of *spanda,* which continuously subsides into infinity, is perceived by awareness, Singh (1992) claims it will lead the practitioner "inwards until the most delicate and powerful tendrils of individuality merge with the infinitely rapid vibration of the ultimate consciousness"(outside back cover).

Through modern science we have become accustomed to thinking of "physical reality as waves of energy – the matter-energy continuum" (Singh, 1992, outside back cover). However, as physical reality is considered only a part of creation, we need to go beyond this and the superficial perception of the senses to discover other realities or

dimensions (outside back cover).

The Paradox of the Heart

Resuming what has been said so far, the primordial heart in the embryo starts to express itself as pulsations on the 17th day. Moreover, these pulsations are tangible. Scientists like Christoffels and Moorman (2009) agree that the origin of the heartbeat does not have a morphological component. Steiner (1884–1885) claims that on about the 17th day the incarnating soul-spirit that was previously present around the physical pith, now incarnates into the physical kernel itself via the "astral individuality" (Steiner as cited in van der Wal, 2014, p. 45). As the heart tube also begins to pulsate at the same time, it seems there is a relationship between the incarnating spirit/soul and the primary expression of the emanating wave of creation revealing itself through matter as pulsation. Through the expression of *It Self as pulsation*, the incarnating spirit/soul, the fundamental creative Intelligence of the Universe and the entity that is created, are in essence *One.*

However, as it also has been said earlier, the heart system is also connected with that of our mother through the development of blood. This implies that through pulsation we are incarnated spirit/soul and yet on the other hand, as the heart system is the only organ in the body that physically starts to develop outside of the germinal disc itself, we are related via the development of blood to our mother and through this, the wider environment. This seems to point to a fascinating paradox of our being and the role the heart as blood and as pulsation plays in our lives and in our identity. Obviously, both influences effect and are affected by us on many levels in our ongoing development. Later in this review I consider the role the pulsating heart might have on our further physical development and maintenance of the physical body.

The Heart, the Environment, and the Midline

In addition to Spirit as the never-ending impulse to create expressing itself as pulsation through the heart and the force expressed by the environment through the mother, we also have another invisible force; that which Burr discovered. This seems to be similar to what Sills (1997) refers to it as the "embryological ordering system" (The Midline Function section, para. 2). We could ask ourselves which force is the most important or which force is primary, but I feel it will lead us further in our inquiry if we look first at how these different forces interact in the development of the body. This researcher has not found descriptions or studies that simultaneously look at the roles the midline and the cardiac system play in the further development of the physical body. This includes that of the CNS and the brain, which develop after the heart has started beating. By comparing the developing heart with the developing midline, I hoped to learn the forces that reveal themselves when one undertakes a comparative analysis of this nature.

The Influence of the Environment

Although we also know through mishaps in the development of the physical body of the embryo that the environment plays an important role, primarily through the mother, we will not specifically be looking at this force. It is recognized by science. "What mothers eat, drink, and feel—the environments which they themselves experience—affect daily the neural development of their unborn child" (Scheibel, 1997, para. 1).

The Function of the Midline

However, before looking at the interaction of the heart and the midline as represented by the notochord, let us first look a little closer at the role the midline plays

as an ordering principle in regard to physical matter.

Burr discovered a metaphysical head-tail or north-south axis, which can be measured prior to fertilization and the actual physical development of chicks, salamanders, and frogs, and is present even before fertilization takes place. He surmised this ordering principle is also applicable to other mammals. Sills (1997), and Jealous too, talk about an ordering principle, which Jealous describes in the following way:

> The mid-line around which the human body develops, is the first function to appear in the organization of our existence. The spatial dynamics of the human body, in all of its ramifications, are orientated to this mid-line. This includes the molecular, cellular, tissue and organ physiology. The functioning midline must, of necessity, be present throughout the life of the organism. The continuous reorientation of the organism, both in time, space and function, requires that the organism have a place of orientation to which all structure and function can refer in order for it to maintain its shape, and physiological motion. (Jealous as cited in Sills, 1997, The Midline Function section, para. 2)

The midline is recognized in other traditions as well, and in the yogic tradition the midline that orients us to the universal design of life "is called the *sushumna* . . . and the *thrusting channel* in the tradition of the Taoists" (Sills, 1997, The Midline Function section, para. 9).

Sills (1997) carries the importance of the midline further when he talks about health:

> It is not a function of any system of the body. Nor is it a function of genetics or of any cellular structure. Health is an expression of a universal principle. It is

> unconditional and is an expression of the essence of who we are as incarnate human beings. Health permeates and animates. It is ever present and is never lost, no matter what the state of the body or mind. (Sills, 1997, Health section, para. 1)

In the same vein, Sutherland refers to it as "the blueprint around which the cellular world organises embryologically and maintains this intention throughout life. It is a constant, unceasing, moment-to-moment creation. It is always available and is the inherent Health of the system" (as cited in Sills, 1997, Health section, para. 3). Sutherland also refers to this organizing principle to as "an expression of the Universal Intelligence at work within the human system" (as cited in Sills, 1997, Health section, para. 3).

The presence of the metaphysical midline is first observed as a structure that forms during the blastula phase of the developing embryo and determines bilateral symmetry. It is named the primal streak and it later extends through the midline and creates the left–right and cranial–caudal body axes (Downs, 2009).

As physical reality is only a part of creation (Singh, 1992) maybe we can best conceive the midline as a principle around which the physical body is organized in space.

The Development of the Heart and the CNS from a Dynamic Perspective

A full discussion of the development of the central nervous system (CNS) and the brain is beyond the scope of this dissertation. Nevertheless, as they are part of the story of the organism and its manifestation in physical form, I shall point out several interesting features about their development, especially when we consider these in relation to the influence of the midline and the possible influence the heart system has on their physical unfolding. Here I continue to take a comparative approach to understand more about the dynamic nature of the embryo and the underlying organizing forces involved in its

development. Again, I rely on the accurate description of primary reality as seen by others, even though I recognize that the lens of the observing embryologist might influence the description of primary reality.

Further Developments of the embryo

Before I compare the developing heart together with that of the developing CNS, which includes the notochord, the term gastrulation needs to be understood. Other factors pertaining to the notochord also need to be clarified.

Gastrulation. This is a phase in the early embryo and in most animals that follows the blastula phase and corresponds with the "formation of the three primary germ layers – ectoderm, endoderm and mesoderm" (Lim & Thiery, 2012, p. 3472) Here we must also bear in mind the previous comments of van der Wal (2014) that meso-(derm) is not a derm but an inner layer which "creates space and connects at the same time" (p. 42).

> Ectoderm includes all of the packaging elements of the organism, i.e., skin, hair, nails and, interestingly enough, the nervous system. Mesoderm makes up the major structural components of the body including the great muscle masses, both the voluntary muscles which underlie all of our work, actions and behavior, and the involuntary muscles which make up the walls of all of our organs such as heart and blood vessels, respiratory and gastrointestinal systems, and our bones. Finally the endoderm includes all of the cell systems which line our organs and vessels. (Scheibel, 1997, The Primitive Cell Layers section, para. 1)

Gastrulation is followed by organogenesis when individual organs develop within the newly formed germ layers.

The notochord in greater depth. On day 17 of post-fertilization the notochord

can be observed and by the 25th day the notochord is already fully formed (Moscoso, 2009). The notochord is the extension of the primal streak and its appearance coincides with the pulsating of the heart at the top of the germinal disc, which also occurs on the 17th day. The notochord arises out of mesoderm tissue, which although it was already present in the ectocyst or peripheral body (van der Wal, 2014), essentially comes into being in the germinal disc or central body during the formation of the flat trilaminar disc. According to Scheibel (1997) the first task of primitive mesoderm is:

> To come together to form a long cylindrical structure. In doing this, they are recapitulating the earliest event in the transition from invertebrates to vertebrate forms, a transition which occurred at least six hundred million years ago. This rod-like structure is the notochord, the progenitor of the backbone or vertebral column. . . . In the case of the developing embryo, the notochord seems to have a highly specific "organizing influence" on the primitive ectoderm layer just above it. Through the release of special chemicals, the overlying ectoderm is induced to divide more rapidly, forming a thickened mass called the neural plate. A crease or fold soon appears in this plate. The crease rapidly deepens and becomes known as the neural groove. The entire embryo is lengthening as this happens. The neural groove continues to deepen until its sides, the neural folds, arch over and fuse with each other forming a short segment of completely enclosed tube. This newly formed "neural tube" will give rise to the nervous system. (Scheibel, 1997, Appearance of the Notochord section, para. 1)

Essentially, it seems as though in the notochord, the invisible midline becomes visible. It extends throughout the entire length of the vertebral column and forms the

longitudinal axis. Also as we see above, it is said to play an "organizing influence" in the formation first of the neural plate, which then in turn folds to form the neural groove, which then closes to form the neural tube. The notochord lies dorsal to the neural tube, and in the human adult, the rod-like notochord found in embryo is just a remnant that exists between the discs of the vertebra as the nucleus pulposus (Scheibel, 1997).

Composition of the notochord. It is interesting that the primary composition of the notochord is a core of glycoproteins that are encased in a sheath of collagen fibers, which are wound into two opposing helices. According to Koehi, Quillin, and Pell (2000) “the notochord can play an important mechanical role in shape changes during early morphogenesis of vertebrates” (p. 28), for it is the angle between these fibers via increased pressure at the core that determine the "shortening" (p. 33) and "widening" (p. 36) versus "lengthening" (p. 36) or "elongating"(p. 33) and " narrowing "(p. 36).

Some proteins are also helical in structure and collagen, which is the basic building block of the human body, is a triple helix (Oschman, 2009, p. 14). Collagen as we have just seen, is the major component of the notochord, which in itself is primarily composed of a core of glycoproteins that are encased in a sheath of collagen fibers, which are wound into two opposing helices. We will also remember meso(-derm), using van der Wal´s (2014) qualification of the term, is an inner tissue with a third dimension (p. 42). Meso(-derm), as we have just seen, supplies the proteins and collagen which are the basic building blocks of the structural components of the embryo´s physical body.

Comparison Between the Developing Heart and the Notochord Including the CNS

Following the rational of Burr and van der Wal that non-physical forces or metaphysical forces are behind the arrangement of physical matter, I decided to find out

if we could learn more about the forces behind the developing heart and the notochord, including developing CNS, by comparing their development. I, therefore, drew up a list of comparisons based on the primary observations of other researches. This can be seen in the table below. By doing this I hoped to learn more about the forces, which, according to Goethe, lie in the invisible realm (van der Wal, 2014).

Table 1

Comparison Between the Developing Heart and the Developing Notochord Including the CNS

Day	Heart	Notochord, and CNS
<17	Formation of blood in the meso(-derm) of the trophoblast (extra-embryonic) and its circulation toward the cranial end of the germinal disc, which is two dimensional in appearance (van der Wal, 2014)	
	At this stage mesoderm exists in the trophoblast, which van der Wal considers as part of the embryo, whereas other embryologists consider it as "extra-embryonic." The germinal disk still consists of two layers: ectoderm and endoderm. The body stalk joins the trophoblast and germinal disk.	
17	The astral part of the soul/spirit is said to incarnate (Steiner in van der Wal, 2014). The heart tube at	The nota cord—an extension of the primal streak begins to form (Moscoso, 2009). The notochord is formed from cells derived

	the cranial end begins to pulsate (Arka, 2015a) or take of a rhythmical character (van der Wal, 2014). The heart tube is not straight but formed like a 'little cap' (Arka, 2015a). Blood capillaries are formed from mesoderm (Scheibel, 1997, The Primitive Cell Layers section, para. 1)	from mesoderm (Scheibel, 1997, Appearance of The Notochord section, para. 1)
	The germinal disk has changed from a bi-laminar to a tri-laminar disk	
	"The human heart seems to repeat within the first few weeks of fetal life the evolution of the cardiac morphology which occurred in millions of years from worms to mammals" (Corno, Kocica, & Torrent-Guasp, 2006, p. 562).	
17–20	The heart is first a single vascular tubular structure "like a worm."	The notocord is a rod-like structure and is the progenitor of the backbone or vertebral column.
	With the appearance of meso(-derm) the germinal dice changes from being a flat bi-laminar disc to a flat tri-laminar disc (van der Wal, 2014). Gastrulation takes place over several days (Schoenwolf, 2015).	
18/19		"The first task of primitive mesoderm is to come together to form a long cylindrical structure. In doing this, they are recapitulating

		the earliest event in the transition from invertebrates to vertebrate forms, a transition which occurred at least 600 million years ago. This rod-like structure is the notochord, the progenitor of the backbone or vertebral column" (Scheibel, 1997, Appearance of the Notochord section, para. 1)
18/19		During a process known at neurulation, the notochord influences the ectoderm to first form the neural plate, which then folds in on itself to form the neural tube (Ladher & Schoenwolf, 2005). This process takes place over several days starting day 18/19 (Moscoso, 2009). The embryo at this stage is straight but "tubular"(p. 14). The neural plate, neural tube, nervous system and the brain are formed from ectoderm cells (Scheibel, 1997).
20		The three main divisions of the brain, which are not cerebral vesicles, can be distinguished while the neural groove is still completely open. (The Virtual Human Embryo, 2011a) [3]

[3] "Carnegie stages are named after the famous US Institute which began collecting and classifying embryos in the early 1900's. Stages are based on the external and/or internal morphological development of the embryo, and are not

20–28	Delamination or folding occurs over several days. The flat tri-laminar disk is slowly changed into a three-dimensional cylinder. There are two main stages, longitudinal folding and transverse folding.	
21		During longitudinal folding the "forebrain grows cranially beyond the oropharyngeal membrane and overhangs the primitive heart" (LifeMap Discovery, n.d., 26. Embyonic Folding and Flexion of the Embryo section, para. 1)
22	During delamination or longitudinal folding, the enlarging brain moves the primitive heart and the pericardial cavity first to the cervical region and then into the chest (LifeMap Discovery, n.d.)	The straight "tubular" embryo begins to curve (Moscoso, 2009).
23	The heart tube continues stretching and cardiac looping begins.	
25	The cardiac loop is larger than the head and consists of a transverse	The notocord is fully formed (Moscoso, 2009). "Closing of the neural tube proceeds in a zip-

directly dependent on either age or size. The human embryonic period proper is divided into 23 Carnegie stages covering the first 8 weeks post-ovulation" (Hill, 2016).

	and ascending section (Moscoso, 2009). (The Virtual Human Embryo, 2011b)	up action from day 20 to day 25 when the anterior neuropore closes" (p. 13).
25		Folding: The tail fold takes place later than the head fold and results from the dorsal and caudal growth of the neural tube (LifeMap Discovery, 26 Embyonic Folding and Flexion of the Embryo section, para. 2).
26–28		The caudal neural tube now closes at the level of somite 31 or where the second sacral segment will differentiate (Moscoso, 2009, p. 13).
28	The form of the heart is fish like in that it develops "into a sequential pulsatile pump including the atrium, ventricle, bulbos cordis (conus), and truncos arteriosus" (Corno, Kocica & Torrent-Guasp, 2006, p. 562).	Five pair of branchial or pharyngeal arches are transiently present in the period of 20–35 days of embryonic development. (LifeMap Discovery, n.d.)
29		"Three brain vesicles or neuromeres can be clearly identified on close examination: the prosencephalon, the mesencephalon and the

		rhomboenc- ephalon" (Moscoso, 2009, p. 15).
29	The head is now larger than the cardiac loop.	
30	The heart has two-chambers with atrial and ventricular septal defects and resembling that of reptiles and amphibians (Corno, Kocica, & Torrent-Guasp, 2006).	
30–32		The embryo has more than 30 somites which end in the embryonic tail (The Virtual Human Embryo, 2011c),
35		35 days post-fertilization when, on external examination, a midbrain flexure and the pontine flexure can be observed (Moscoso, 2009).
41–44		The embryonic tail begins to atrophy. Interdigital zones form into hand plates with visible finger radiations and footplate with toe primordium become visible (The Virtual Human Embryo, 2011d & e).
35-–50	A four-chambered structure appears, which is what is found in	

	birds and mammals (Corno, Kocica, & Torrent-Guasp, 2006).	

Contemplating this Comparison

From this comparison it seems that the early morphology of the embryo seems to mirror *cardiac morphology* in that it repeats a pattern of development that "occurred in millions of years from worms to mammals" (Corno, Kocica, & Torrent-Guasp, 2006, p. 562). As the morphology of the heart resembles that of a worm, so the body of the embryo forms the notochord. Later, as the morphology of the heart comes to resemble that of the fish, branchial or pharyngeal arches are found to be transiently present in the embryo. A few days later, the heart resembles that of reptiles and amphibians, and at this stage the embryo has more than 30 somites, which end in the embryonic tail (The Virtual Human Embryo, 2011c). Finally, as the a four-chambered structure which is found in birds and mammals becomes manifest, so the embryonic tail atrophies and inter-digital zones form into hand plates with visible finger radiations, and foot plates with toe *primordium* become visible (The Virtual Human Embryo, 2011d & e).

This researcher also noticed that there is a certain overlapping in number of days, and the comparisons are not exact. But this comparison has been made from data that was not looking specifically at these changes in the same embryo. Also, although Corno, Kocica, andTorrent-Guasp (2006) mention a specific day when the heart, for example, resembles that of reptiles and amphibians, the manifestation to this shape has probably taken place over several days in much the same way as the next stage requires that this shape is replaced by that of birds and mammals and this too probably takes place over

several days.

The descent of the heart probably also reflects in the change from cold to warm blooded mammals, but this researcher was not able to find data which illustrated where the developing heart is physically situated in the embryo during the different animal stages. What we do know is that when the embryo is "worm like," the heart *primordium* is at the cranial end, and when the embryo is fully formed in mammals and birds, the heart is nearer the yolk sac.

The developing heart and the developing notochord are both made of cells from the meso(-derm) layer, whereas the CNS, including the brain, is formed from ectoderm cells. The notochord is seen as the organizing force behind the neural tube, which in turn is seen as putting in motion the development of nervous tissue from ectoderm as soon as the neural tube is formed (Scheibel, 1997).

The slight differences in number of days between the morphology of the heart and the morphology of the developing notochord and the CNS in different embryos might also be explained as the information regarding the age of the human embryo are always calculated from the last menstruation date and observation of the embryo through ultrasonography. Knowledge of form and structure has also been gained through "miscarried or aborted embryos and of animal embryos of a known gestational age" (Collins as cited in Rodeck & Whittle 2009, p. 24). A more accurate comparison would require that the morphology of the heart and the morphology of the development of the CNS be looked at in parallel in the same developing embryo.

This comparison reveals that from day 17 to approximately 50 days post-ovulation, the overall form of the developing embryo seems to reflect the phylogenetic

history of worms to mammals and invertebrates to vertebrates. This is observed in the morphological development of the heart and the notochord, which it the primary longitudinal skeletal axis and is “the structure (that) is replaced by vertebrae” (Mosby's Medical Dictionary, 2009). The parallel development of these key aspects of the embryo, are also reflected in its overall changing appearance during this development.

In the human adult the only remnant of the flexible notochord as found in worms, as mentioned earlier, is the nucleus pulposus, which is found between the discs of the vertebrae (Scheibel, 1997).

The notochord is also seen as being implicated in brain development in that it forms the neural tube, which then gives rise to the CNS. “At organ level, brain development starts with the formation of the neural tube or neurulation, followed by formation of the neuronal migration and neuritic differentiation, with synapse formation and controlled neural ‘pruning’” (Bourgeois as cited in Moscoso, 2009, p. 13).

A fuller exploration into the comparison between the morphological development of the notochord and CNS including the brain in conjunction with the morphological development of the heart is beyond the precursory nature of this literature review. Nevertheless, is seems as though this would be a useful avenue of research in the future.

Implications Based on this Comparison

In spite of slight difference in days that has already been referred to above, it seems the morphological development of the heart and the notochord, including the CNS, parallel each other in development. Even if the notochord may direct certain activities, it is synchronized with what is happening in the developing of the heart and vice versa. This seems to indicate that there is one overriding creative force behind the development

of the embryo. It also seems this force consists of different *components*, as the different phases through which the human embryo passes indicate that there is a continuous dying out or transformation of the old that then heralds a new phase. This is "maintained" for a short time and then once again, the form is transformed. In the philosophy of India they talk of the three primary aspects of one overall force of Nature: creation, organization, and destruction or transformation. In Indian philosophy this is known as Trimurti, or the three faces or forms of the one Godhead (Matchett, 2003). The coordinated way the embryo evolves also seems to indicate there might be a primary Intelligence or Mind either behind or involved with this development.

This leads us to suggest a variety of possibilities:

1) There is one overriding nonphysical intelligence that is directing the development of the material or physical body of the organism including that of the heart and notochord CNS.

2) The force behind the development of CNS, including the notochord, also influences the development of the heart. This is unlikely as the formation of the heart, including blood, predates the development of the notochord. In addition, the force Burr discovered seems to be linked to head caudal positioning in space but not the development of three-dimensional space. So another force would have to be added which directs not only the three dimensionality but also cylindrical development, which has a component of time or changes in development over time.

3) A force behind the morphological development of the heart also influences the development of the CNS. This is also unlikely as the force directing head caudal development is prior to the development of the heart.

4) There is an overriding intelligence, which manifests completely or partially through the heart, which then directs and/or influences the development of the CNS cum notochord and maybe the rest of the body. This force could be linked to sound and/or electric and electromagnetic forces.

5) There is an overriding force which manifests completely or partially through the heart which then interacts with the head tail force found by Burr and also directs and/or influences the further development of the CNS and maybe the rest of the body. This force could be linked to sound and/or electric and electromagnetic forces.

6) There is also another force, which is linked to environmental factors, that also plays a part in the overall development to the physical body. (We know this is true from the study of defects in form.)

7) The heart, including blood, capillaries, and the heart as an organ is entangled with primitive streak or the force behind it and changes in one produces changes in the other. (This explanation is from quantum physics. However, it does not preclude there being a force directing this entanglement.)

8) The material body itself creates and arranges its own development through genes. (This seems unlikely as the parallel development of the heart and the notochord including the CNS seems to indicate that there is some "higher force" which is directing and coordinating the different phases that the organism undergoes.)

9) A combination of some of these possibilities.

10) There is one overriding Higher Intelligence that organizes itself into different forces to govern its creation. It is these forces that are behind the development of the material or physical body of the organism, including that of the

heart and notochord and the CNS. In this view the soul, which is connected to Higher Nature and is part of the Higher Self, probably via a series of hierarchically descending radiations, enters the organism by way of the heart primordium and thus enables the "heart" to act as a manifesting and emanating agent itself. This incarnating intelligence then mirrors the way the Highest Source operates and, still under the guidance of Higher Nature, probably combines many different ways in organizing its creation, which includes a variety of invisible forces. Among others, these forces could be sound, electric, electromagnetic forces, and torsion waves. In this way soul would enter "within every organic material in the body [and] pervade[s itself] inside and outside of every cell, a mother like awareness of intelligence which prompts everything that happens biologically, psychologically, emotionally, or in any other way (S. Arka, personal communication, May 4, 2016). However, as creation is not determined, environmental factors including thoughts, especially those of an emotional nature, could play a role in the ongoing "creating" of the body. Matter, in this view, may be seen as slow and similar to "vibrating sound." Soul or spirit, on the other hand, may be seen as quick like light.

Although I did not address these assumptions directly in this dissertation, I continued to look at different aspects of the heart from a variety of perspectives.

Multifunctional Role of the Heart

Looking at the multifunctional role of the adult heart, Burleson and Swartz (2004) hypothesize that the heart functions as a generator of bio-information that is central to normative functioning of body. The source of this bio information is based on:

(1) vortex blood flow in the left ventricle;

(2) a cardiac electromagnetic field and both;

(3) heart sounds; and

(4) pulse pressure which produce frequency and amplitude information. Thus, there is a multidimensional role for the heart in physiology and biopsychosocial dynamics. (Burleson & Swartz, 2004, p. 1109)

Their hypothesis, which is based on the four criteria mentioned above, looks at the role of the heart in maintaining normal body function. Nevertheless, some of these criteria could also play a part in the role of the heart during the somatogensis. Below I consider the possible role of sound in not only maintaining normal body function but also the creation of form.

Sound

In the adult, the ubiquitous sound of the heartbeat is achieved via the sequential closing of the mitral and aortic valves. These sounds are "almost ignored when, in fact, they provide a continuum of sound and vibrational energy for the whole body throughout the entire lifespan" (Burleson & Swartz, 2004, p. 1112). Burleson and Swartz (2004) point out that when measured by a seismograph:

The biggest vibration occurs with the ejection of blood from the left ventricle. The pulse pressure wave of blood traveling down the aorta with each heartbeat is reflected back from the aortic bifurcation at the iliac junction. This reflected wavefront forms an interference pattern. (p. 1112)

The rhythm the heart emits can also be changed through changing our respiratory rate as in meditation (Peng et al., 1999). In addition, when the:

Heart beat coincides with the wave pattern of blood being reflected back from the

> iliac bifurcation creates a resonance at about seven times a second with an amplitude almost three times the normal signal. An important characteristic of resonant systems is that they are sustained with a minimum amount of energy. (Burleson & Swartz, 2004, p. 1112)

This is also connected to cardiac coherence, which is addressed later in this review. However, first let us look at how sound is related to the generation of form.

Cymatics. The science of the study of sound creating form is called *cymatics*, a word that comes from the Greek meaning *wave*. When the surface of a plate, diaphragm, or membrane is vibrated, the regions of maximum and minimum displacement are made visible in a thin coating of particles, paste, or liquid. In this way different patterns are formed depending on the frequencies of the emitted sounds (Jenny, 2001). The experiments done are all done on a flat two-dimensional surface, and although there is a certain height to the forms found as the sand or dust that accumulates to make the forms, it is possibly that the forms formed by sound in three-dimensional space could be different from the forms created on a flat two-dimensional surface.

The effect of sound and thoughts on water. In the same vein, but using a different medium, Emoto (1943–2014) experimented first with natural water and then the effect of sound and thoughts on water. He did this by projecting music or thoughts onto a bottle of distilled water and then freezing droplets of it. As these began to thaw, he found that the droplets formed into unique geometrical patters or crystals and these he photographed. His findings were not done as scientific experiments and his work is probably better known to the general public than to scientists. In Emoto's books there are many photos of the various crystals he photographed. He discovered that words that are

negative do not form crystals but ugly blobs with no definite structure. On the other hand, the words *love* and *thanks* formed hexagonal crystals of exquisite beauty. He also found that just by pasting a piece of paper with a certain word of an emotional nature written on a bottle containing distilled water, was sufficient in generating a crystal of a specific nature when the water was frozen (Emoto, 2004). These experiments with water took place in a three-dimensional environment, as the container for the water has height, width, and depth.

His work has often been highly criticized by the scientific community on several grounds, mostly methodological, and has therefore been referred to as "pseudoscience″ (Reville, 2011). The skeptical way Emoto's work has been received by the scientific community might also be related to the fact that science does not yet understand how consciousness may affect water or the mechanisms involved. Emoto´s work may well be related to Kozyrev´s findings that feelings, especially those of an emotional content, generate torsion waves. These waves are seen "as being able to impose a new 'structure' to a substance where there were none before" (Swanson, 2008, p. 69). Under controlled experimental conditions, if the emotional component is not present, it seems as though the results obtained by Emoto would also be different. In a study by Radin, Hayssen, Emoto, and Kizu (2006) in a double-blind test, distant intention on water crystal formation of a group of over 2,000 people in Japan had a significant effect on the shapes of ice crystals formed from water samples situated in California as rated by "higher scores for aesthetic appeal than those from the control water ($P = .001$, one-tailed), lending support to the hypothesis" (abstract). This experiment seems to indicate that our words and thoughts do affect physical reality.

Sound and creation. We may recall that the same time the notochord is coming into being in the germinal disc, the primary heart has started pulsating. We therefore need to ask ourselves how are these two events related? As described earlier, for Arka (2015) the beating heart is a tangible expression of non-physical pulsation that is the underlying core, principle, and the property of universal existence, cosmic existence and local existence. The heart is like a wave emerging and it function is to manifest and move on. It is part of the never-ending wave of creation.

As we have seen above, the sound of the adult heart is achieved via the sequential closing of the mitral and aortic valves. Furthermore, if vibrational heart sounds play a role in maintaining bodily function, as suggested by Burleson & Swartz (2004), one can also speculate about the effect the various different heart sounds of the developing heart have on the developing embryo, including the developing notochord. What we do know is that there are changes in the appearance of the embryo during this process. We also have to remember that matter/material is not solid, but also vibrating. Sound could also be linked to cylindrical development, which has a component of time or changes in development over time. In this case it is therefore possible we are talking of four dimensions: length, breadth, depth, and time.

These ideas are purely speculative, but as science increases its interest in the effect of sound on particles in space and how forms are generated, maybe some of the lacunas in our knowledge will be filled.

Thoughts as Invisible Waves or Invisible Sound

In talking about thoughts, Arka (2005) says:

Though thoughts are invisible, they are as effective as visible matter. They have

> their own shape, size, color and carry a certain quantum of energy. Regardless of their nature, thoughts will affect the source first before they reach the atmosphere (Arka, 2005, p. 23).

This possibility seems to be related to the research conducted by Nummenmaa, Glerean, Hari, and Hietanen (2013). This study suggests each emotion affects our body in a specific topographical way, depending on the emotional word pronounced. They also "propose that consciously felt emotions are associated with culturally universal, topographically distinct bodily sensations that may support the categorical experience of different emotions" (p. 646). Based on their research, Lindhard (2015) also pointed out that just the thought of an emotion also may affect the body in a specific topographical way.

This also could be related to how the thoughts of the pregnant mother as an *external force* might affect the developing embryo. "In a more positive vein, Japanese mothers think happy thoughts (*taikyo*) during pregnancy to ensure the health and well-being of their infant" (Scheibel, 1997, Determinants of Growth and Development section, para. 2).

It also opens the possibility that all creation is a Divine thought, or maybe a song sung by the highest creating forces of Nature.

Possible Mechanisms Involved

This researcher has not found any convincing explanations regarding the mechanisms involved if either sound affects matter or thoughts affect living organisms. However, it seems as though this could tie in the work of Kozyrev (as cited in Murphy, 2012), which as mentioned earlier, demonstrated how our thoughts and feelings,

especially those with an emotional content, generate torsion waves. How these interact with the torsion waves produced by the heart or even how the “emotional” heart might affect the shape of our thoughts is beyond this introductory exploration into the nature of the heart. Again, these suggested relationships are in the form of hypotheses that need further research to understand these relationships. As torsion waves too are said to be involved in time-space relationships (Murphy, 2012) and the heart produces torsion waves, it seems, as suggested earlier, that the "heart" could be involved in time-space dynamics.

Moscoso (2009) talking about the spatial distribution during neurogenesis, comments: "the exact temporal and spatial distribution of differentiating cells during neurogenesis has been difficult to establish so far, and how organs are assembled in complex three dimensions has escaped plausible explanations" (Moscoso, 2009, p. 20).

There is certainly much to explore and much yet to discover and the possible role the heart, heart sounds, and torsion waves have in the creation of form is still a mystery which needs to be unraveled. However, what is increasingly clear is that our bodies are not as "solid" as was formally supposed.

Electrical Character of Living Organisms

In the past 50 years, Western science has revealed that there is "a remarkable endogenous electric character to organisms" (Liboff, 2004, p. 44). However, this knowledge is not new and in the East this relationship is well known. In India it is known by the Sanskrit word *prana*, meaning "vital principle" (Dictionary.com, 2015), whereas in China it is known as *chi* or *qi* (Frantzis, 2007, p. 4). Terms like *prana* and *chi* literally mean "breath," but figuratively mean "material energy," "life force," or "energy flow"

(Hockney, 2015, The Energy section, para. 3). Other traditions and cultures have a similar concept but use different names. In the Hebrew tradition it is known as *ruah*, whereas in the in the Bible it says: "God formed man out of dust, and he breathed into his nostrils the breath of life; and man became a living soul" (Frantzis, 2007, p. 4).

Replacing Terms: Life Force with Electrical System

When we replace some of the words that are used in ancient texts with words used in physics, with which scientists are more familiar, then things become somewhat clearer. For example, replacing *life force,* or *breath of life* with *electrical system* resonates more easily with the modern ear and makes it easier for people of today to understand more fully to what the masters of old were referring. However, to reduce Self/soul to life force or *prana* is to fall into a trap of modern science in thinking of "physical reality as waves of energy – the matter-energy continuum" (Singh, 1992, outside back cover). In doing this we miss our true identity as evolving souls. This type of reductionism can be observed in some of the Western theories I introduce below.

Equally, I feel that to reduce life force or *prana* to only one of the radiations which science has discovered is to fall into another type of reductionism. "In a wider context, everything is consciousness and consciousness is everything. Neither non-physical conscious life forces, nor energy, nor the physical body alone can sum up the totality of a living entity that thinks, imagines, perceives and understands" (Arka, 2003, p. 67). In talking about life force and the physical body he also comments:

> Whether the physical body sustains life force or whether the life force sustains the physical body, is a mystery . . . Receptacles normally do not interact with their contents, but this nature-made body receptacle can respond, think, feel and grow

with the grace of the life-force in itself. (Arka, 2003, p. 68)

The Relationship Between Soul and Electrical Radiations

The idea that soul and electromagnetic radiations are related is not a novel idea. With the ultimate goal of amalgamating science and spirituality, Pereira (2015) looks at the continual interactions that exist between electromagnetic radiations and those propagated within the biological cell by a pathway known as Cell-Soul Pathway. He hypothesizes soul as "being an indefinite, non-structured, massless energy make up of electromagnetic radiations" (Pereira, 2015, p. 426). It is the equivalent of a "scientific entity" that he says should not be confused with spirit (p. 426). But this is easier said than done and raises another problem in how to distinguish soul from spirit without reducing all life to only interacting electromagnetic fields. In addition, we create a new type of duality with spirit being separate from interacting electromagnetic fields. Limiting soul to only electromagnetic fields also means that as other fields (like torsion waves) of an electrical nature are recognized, the definition would have to be changed. Arka´s (personal communication, August 21, 2015) statement that "life force is part of soul" cuts through this rather thorny problem. However, one attractive element of Pereira´s approach is the proposed dynamic interaction between electromagnetic radiations and the living cell.

Eastern and Western Theories about Living Systems

This section is dedicated to a brief look at an Eastern and a Western theory about living systems from an energetic or electrical perspective.

The energetic character of the organism from the Indian point of view. The first system considered is the Indian system of *chakras* and *nadis*. Information by a

Western scientist who links this system with the embryo is also included.

Chakras. *Chakras,* meaning wheel in Sanskrit, "are commonly considered to be centers of concentrated metaphysical energy" (Maxwell, 2009, p. 807). Simply put, they are "swirling intersections of vital life forces" making up the "subtle energy system" of the body which animates each person´s physical, mental, emotional, and spiritual body. Each chakra reflects an aspect of consciousness essential to our lives. They "are organizing centers for the reception, assimilation, and transmission of life energies" (Judith, 2006, p. 4).

The idea of the *chakra* system entered India´s sacred texts between 1800 and 800 B.C. (Beshara, 2013) and has been increasingly used or adapted in the West by various theorists, such as Jung, Judith, Avalon, Wilber, Myss, Ruumet, and Brennen (Marconi, 2003). In spite of this, Maxwell feels that science has a certain difficulty with the chakra system because of the difficulty of demonstrating how something "nonphysical could interact with the physical" (Maxwell, 2009, p. 809). He, therefore, set out to find a physiological underpinning to of this metaphysical system that is sufficiently subtle and also explains some of the experiences reported by yogis.

The five major *chakras* are seen as being situated along the vertebral column and the other two in the head; one between the eyebrows and the other at the crown of the head. Together the seven *chakras* form a profound formula for wholeness that integrates mind, body, and spirit. "When quite underdeveloped they appear as small circles about two inches in diameter, glowing dully in the ordinary man; but when awakened and vivified they are seen as blazing, coruscating whirlpools, much increased in size, and resembling miniature suns" (Leadbeater, 1997, p. 3).

Nadis. "The word *nadi* is derived from *nad* meaning a hollow stalk, sound, vibration, and resonance. *Nadis* are tubes, ducts, or channels which carry air, water, blood, nutrients, and other substances throughout the body" (Iyengar, 1983, p. 32).

Although they are veins, arteries, capillaries, bronchioles and so on, they are also considered as channels or tubular organs of the subtle body through which energy, life force, or *prana* flows. *Prana* is seen as the energy that permeates the universe on all levels as well as being all vibrational energy. Physical energies such as heat, light, gravity, magnetism and electricity are also *prana*. It is also the hidden or potential energy in all beings (Iyengar, 1983).

There are several thousand *nadis* in the body and "all nadis originate from one of two centers, the kandasthāna – a little below the navel – and the heart" (Iyengar, 1983, p. 32). Thus, in this system, the heart is seen as having a prominent role. However, as the chakras are related to the *nadis* and often arise where the *nadis* cross, by implication the heart is also related to the chakra system.

It must also be remembered that the *chakra* system is not only related to the physical body, but also the mental, emotional, and spiritual body (Beshara, 2013). Here I have considered the *chakra* system from a more *physical point* of view, as I have been considering the relation between forces and form.

Gap junctions: Western understanding of the chakra system. In an attempt to find a relationship between reported experiences of people who practice yoga, Maxwell (2009) builds on Shang´s (2001) theory and links the chakra system to embryonic development and *gap junctions*.

It is proposed that the effect of advanced meditation is accomplished by restoring

> greater strength to the more primitive electrical circuits, particularly at locations capable of exerting broader control, that is, those which are proposed to be the physical bases of chakras. (Maxwell, 2009, p. 816)

Gap junctions allow for electric and metabolic coupling between cells and also form an electrical network with endocrine effects. He also proposes that "meditation functions to increase the prevalence of gap junctions . . . ultimately allowing a full electrical unification of the spine and brain" (Maxwell, 2009, p. 817).

However, gap junctions are not only restricted to the spine and brain. They have an essential role in embryonic processes. The density of gap junctions is greatest during embryological development . . . and many developmental processes are affected by gap junctions, including left right patterning . . . the development of limb buds, the migration and survival of neural crest cells . . . heart development . . . the development of the nervous system. (Maxwell, 2009, p. 812) Gap junctions are so named because of the *gap* shown to be present at special junctions between cells (Revel & Karnovsky, 1967). From the comparison between the developing heart and the developing notochord, we have seen that there is also a time dimension to the physical manifestation of the developing embryo with *gaps* not only in ontological time but also phylogenetic time as expressed by the developing heart and midline. This conundrum might throw some more light on the chakra system, the nadis, and gap junctions.

The electrical character of the organism from a Western scientific point of view. In contrast to seeing parts of the organism as having electromagnetic properties, "it is possible to view the living system as an electromagnetic entity, with the response of the system to a given electric or magnetic signal as an outcome expected on the basis of

physical law" (Liboff, 2004, p. 44).

Liboff (2004) suggests that the field reflects the changes in the developing embryo and grows as each organism develops from birth to maturity. He postulates "the existence of an electromagnetic field that is distinctly representative for each and every organism" (Liboff, 2004, p. 45) and which includes wounding and traumatic events. Moreover, he relates the individual's electromagnetic field to the individual's genome, which he then calls the "electrogenomic field" (Liboff, 2004, p. 44). It is this that is said to directs the physical development of the organism. In addition, in line with "Athenstaedt (1969) and Becker (1974) . . . the changed field acts as the template for restoring the system to its normal state" (Liboff, 2004, p. 44).

Although Liboff (2004) acknowledges a hypothetical field, which can be mathematically described in terms of a vector P that is a function of space and both ontogenetic and phylogenetic history, he makes no mention of the heart in his model or the role the heart plays in ontogenetic development of the individual and its effect on the overall electric field that he proposes. This links it with theories we have considered earlier in the review, like that put forward by Burr.

Many Western scientists involved in theorizing about the electrical nature of the organism are involved in health care and their main goal is to restore the organism to health. However, when theories do not include other aspects like the mental, emotional, and spiritual bodies, I feel they are not complete. It is also easy to slip into reductionism by seeing the organism as only an electromagnetic entity.

Moving Toward an Understanding of Bio-communication

One very interesting aspect of Liboff theory is that he postulates interactions of a

dynamic nature between electromagnetic radiations arises from different sources. This makes the potential for bio-communication possible. The SQUID routinely picks up signals from the brain, the heart, and other endogenous sources that are "magnetically coherent, reflecting that fact that the currents in each source are in phase, with changes occurring simultaneously. Because of this we find the potential for bio-communication, more specifically intersystem electromagnetic bio-communication " (Liboff, 2004, p. 46). HeartMath have built on this knowledge to help create harmony between the heart and the brain. They have shown how "self-induced positive emotions increase coherence in bodily processes, which is reflected in the patterns of the heart rhythms" (McCraty & Zayas, 2014, Abstract). This is not the coherence I am referring to here. Liboff (2004) as we have seen above, uses this term when referring to in phase systems where a change in one aspect brings a corresponding change throughout the system simultaneously. HeartMath on the other hand, uses the term coherence in three different ways: "clarity of thought, speech and emotional composure . . . synchronization or entrainment between multiple waveform . . . (and) order within a single oscillatory waveform" (HeartMath Institute, 2016a, Definitions of Coherence section, para. 1). Liboff´s (2004) usage of the term gives rise to many interesting possibilities, such as bio-communication between systems as well as the attraction between different people or different groups could be based on similarities in oscillating rates and, of course, vice versa. We all know the expression: I don´t like her or his vibes.

When referring to the possibility of communication between different individuals, Liboff says: "the electromagnetic characteristics of living things may therefore allow for direct communication between individuals other than by means of the relatively recently

evolutionary development of speech" (Liboff, 2004, p. 46). This has far-reaching implications that are also related to our interest in feeling-consciousness. It implies we may have *senses below the senses* or *mystical senses* that are capable of picking up information about the fields of others around us, whether they are people, other living organisms, or even nature herself. When the 2004 Indian Ocean tsunami occurred, the animals had already moved to high ground, whereas the people were still on the beach. This implies that the animals were able to pick up this information, although scientists are not sure yet of the mechanism. Liboff points out that much of the work on electromagnetic fields is based on "the likelihood that biological systems have probably evolved to use the earth´s magnetic field to their advantage" (Liboff, 2004, p. 43). This also raises the possibility that animals may be highly sensitive to changes in these fields, even though the fields themselves are relatively small. Brown´s (1962) research showed that planaria and other organisms are sensitive to changes in the geomagnetic field.

> In spite of the seeming complexity of the subject, Liboff claims that:
>
> Biologic structures that are biochemically complex need not be electromagnetically complex. . . . there is a far greater simplicity in using an electromagnetic field to describe living things compared to the widely disparate distribution of enzymes and other biochemical factors that are normally used. (Liboff, 2004, p. 46)

For this to be possible, the primary factor required would be "signal intensity, not in the form of thermal radiation, but more frequency specific. The oscillator serving as the basis for the underlying time-varying electromagnetic field must be coherent in order for information to be transmitted" (Liboff, 2004, p. 46). Resting of the finding of Singer

(1999), "there are components of our brains that produce g-oscillations reflecting millions, perhaps billions, of neuronal elements all oscillating in phase" (Liboff, 2004, p. 46). However, we must also remember that the heart is the most prominent oscillating system in our body. However, a good communication system also needs a crystal. The pineal gland is made of from "piezoelectric material" (Lang, Marino, Berkovic, Fowler, & Abreo,1996). However, before we consider the implications of this, we first looked at the pineal gland in a little more detail, particularly its relation to the heart.

The Heart and the Pineal Gland

We now have to backtrack a little to understand more about the pineal gland and its relation to the heart. Descartes, like many philosophers before him, was interested in the pineal gland and considered it “the seat of the soul.” This points to another enigma. The first concern is to establish which *heart center* are we talking about and the relation between this and the pineal gland. We also need to look at *blood and the brain*, because to eventually understand heart consciousness, we also have to understand other parts and aspects of the organism to which the heart is intimately related.

Blood and the Brain

Although the role of neurons in the heart are beginning to attract a lot of attention, mainly due to heart disorders (Pauza, Skripka, Pauziene, & Stropus, 2000), it might be beneficial to consider the blood/brain relationship in an attempt to understand the relationship of heart system to brain. The heart system, as pointed out earlier, arises before the brain. Nevertheless, as we have already seen in the developing embryo, blood vessels are present in the place where the brain will form. Later, when the neurons form, the blood system is separated from them by what is known as the blood-brain barrier.

"The neurons of the central nervous system (CNS) require precise control of their bathing microenvironment for optimal function, and an important element in this control is the blood-brain barrier (BBB)" (Abbott, 2013, p. 437). The interface between blood and the CNS is the endothelium, and this is the main controller of traffic across the barrier layer. It allows the passage of water, ions, some gases, and lipid-soluble molecules by passive diffusion, as well as the selective transport of molecules such as glucose and amino acids that are crucial to neural function. On the other hand, it limits the entry of plasma components, red blood cells, and leukocytes into the brain. The brain receives up to 20% of cardiac output. If cerebral blood flow (CBF) stops, brain functions stop in seconds and damage to neurons may occur in minutes. "The normal neuronal-vascular relationship is critical for normal brain functioning. It has been estimated that nearly every neuron in human brain has its own capillary . . . The total length of capillaries in human brain is about 400 miles" (Zlokovic, 2005, p. 178). We may also recall that blood vessels arise from mesoderm and neurons arise from ectoderm (Scheibel, 1997).

Some parts of the brain do not have a blood brain barrier: the area postrema, the median eminence, the pineal gland, the neurohypophysis of the posterior pituitary gland, and the choroid plexus. Whereas the postrema encourages vomiting when toxic substances have been ingested and, therefore, inhibits further harm being done by eliminating them from the stomach, the other mentioned sites secrete hormones. The pineal secretes melatonin, responsible for circadian rhythms; the neurohypophysis of the posterior pituitary gland is responsible for the release of the neurohormone oxytocin and vasopressin: The median eminence regulates the anterior pituitary through the release of neurohormones (Leslie, 2011, p. 64); and the choroid plexis produces cerebrospinal fluid

(CSF) and forms the blood-CSF barrier.

What Heart Center Are We Talking About?

In the section on the paradox of the heart, it was pointed out that through blood, the heart gives a relational awareness what is beyond our physical boundaries (Sills 2012). Through the development of blood we are related to our mother and the wider environment, and through pulsation we are related to the Creative Principle of the Universe, which, according to Arka, is both tangible and intangible. In other words, the heart has a horizontal and a vertical component. The vertical component would imply that through its expression as pulsation, the Creative Principle of the Universe is taking up abode in matter through this anatomical center, described as a little tube like structure that is like a cap forming, “it is like a rainbow. . . . [it] has pulsation" (Arka, 2015a).

For van der Wal the primordial heart at the center of the cranial end of the germinal disc is not only the first anatomical center, but also a psychic center. Steiner too claims that this is the center where on about the 17th day the incarnating soul-spirit that was previously present around the physical pith, now incarnates into the physical kernel itself as the “astral individuality” of the human being. However, as the primordial heart now folds to form the physical organ, which tucks itself into a space just above the yolk sac to the left of center in the thoracic region, we must ask which heart we are talking about when we talk about the *heart center*.

The energetic heart center. Although the heart tube that forms that anatomical helical heart folds over and descends, the co-ordinate of our embryological past still stays at the cranial end of our being where the brain forms. This can be considered as a metaphysical energetic center rather like the metaphysical midline we talked about

earlier.

But in spite of this center being metaphysical, the heart *primordium* leaves traces of its passing, as “an embryonic blood vessels never disappears completely unless its territory does” (Lasjunias, Berenstein, & Brugge as cited in Saikia, Handique, Phukan, Lynser, & Sarma 2014, p. 345). At the base of the brain there is an anastomotic ring known as the circle of Willis, which unites the internal carotid and the vertebrobasilar systems. "The circle of Willis encircles the stalk of the pituitary gland and provides important communications between the blood supply of the forebrain and hindbrain (i.e., between the internal carotid and vertebrobasilar systems following obliteration of primitive embryonic connections)" (Tubbs & Hankinson, 2013, para. 2). Although the numerous variants in the form of this ring “can be correlated to their phylogeny and embryology” (Saikia et al., 2014, p. 344) what interests us here is that they are related to the embryonic vessels, which gave rise to the heart *primodium*. Interestingly enough, they are also related to the capillary network, which supplies the pituitary gland and pineal organ. The internal carotid (inferior hypophyseal artery) and the arterial circle of the brain (Circle of Willis) supply the section of the pituitary, known as the neurohypophysis. “One of the most outstanding features of the pineal, noted even by the early anatomists, is the obvious, conspicuous capillary network within the pineal gland. The blood supply is profuse even though the pineal is small relative to the total body mass. The fetal pineal also receives a copious blood supply” (Møller as cited in Luke, 1997, p. 31) supplied by the choroidal branches of the posterior cerebral artery (PCA) (Arendt, 1995). The PCA in the fetal brain develops relatively late and arises from the fetal internal carotid artery, which regresses as the vertebral and basilar arteries develop (Osborne, 1998). These form

part of the Circle of Willis, which supplies blood to the brain and the surrounding structures. The pineal gland lies within the subarachnoid space and is bathed by subarachnoid cerebral spinal fluid (CSF) at its outer aspect. It is surrounded by a thick fibrous capsule and is formed from the ectoderm tissue (Luke, 1997; Scheibel, 1997). As mentioned earlier, both the pineal and the neurohypophysis of the pituitary are outside the blood brain barrier. Both the pituitary and the pineal gland are formed from ectoderm, but each part of the pituitary gland arises from different ectoderm layers.

Primordium of the pineal organ. It seems to this researcher that the little cap-like structure talked about by Arka could also be the *primordium* of the pineal gland. The heart *primordium* is in the center of the cranial section of the germinal disk, and the future pineal gland is in the center between the left and right hemispheres of the brain.

In looking for research to support the hypothesis that the future pineal gland might coincide with the place where the heart *primordium* develops, I discovered that the human fetal pineal gland develops in the 2nd month of gestation as an evagination of the ependyma covering the third ventricle at the diencephalic mesencephalic border (O'Rahilly & Møller as cited in Møller, Phansuwan-Pujito & Badiu, 2014, p. 3). But this does not in fact contradict the proposition that the little cap mentioned by Arka (2015a). might be the primordium of the pineal gland because, according to van der Wal, flow is first and "where this comes to a standstill, the form arises" (van der Wal, 2014, p. 44). We must remember that at this early stage, the germinal disc is considered flat, as neither the meso layer nor the cylindrical nature of the embryo has formed. Certainly, if the little cap coincides with the *primordium* of the pineal gland it would have to flow or change its position across the various changes in layers that the head of the developing embryo

undergoes, not only in space but also in time if we take this to include phylogenetic development. The fact that it ends up as a little cone-shaped pea that sits on the roof of the third ventricle of the brain in the center between the left and right hemispheres, does not necessarily tell us about its origin.

According to Oksche, in its "phylogenetically ancient form the pinealocyte resembles a cerebrospinal fluid-contacting neuron endowed with sensory and secretory properties" (Oksche, 1982, p. 30). As in the embryo the morphology of the heart and of the vertebral column repeat a pattern from worms to mammals and invertebrate to vertebrate forms, it is possible that the morphological development of the pineal organ does the same. Morphologists have "repeatedly commented on the marked structural diversity of the pineal" (Gladstone & Walker as cited in Reiter, 1981, p. 162). The pineal organ is:

> The only a portion of a diencephalic region, the epithalamus, which has existed and continues to evolve over eons . . . In extinct vertebrates, it has been theorized that the pineal gland and pariental eye probably functioned as a sensory system which monitored environmental thermal extremes. (Roth & Roth as cited in Reiter, 1981, p. 162)

These findings suggest an intimate link between the pineal organ and the blood system and by extension the heart, and this link might have been present from very early on in the ontogenetic history of the embryo. In the same way it is present in the phylogenetic history of organisms that possess blood.

Pineal organ from a physiological point of view. From the physiological view, the mammalian pineal is:

> An endocrine organ which acts an intermediary between the environment and the endocrine system. It functions as a neuroendocrine transducer. It accepts environmental sensory information (especially the photoperiod from the retinae) and converts this neural message into hormonal products, notably melatonin. (Luke, 1997, p. 20)

In the pineal gland the level of melatonin, the precursor of serotonin, is high during the daytime and low during the night (Axelrod, 1982).

"In evolutionary terms the pineal organ displays features of photoreceptor, biological clock, and endocrine gland" (Oksche, 1982, p. 15). The pineal is sometimes referred to as a *gland, organ*, or *body* although the correct anatomical name is "pineal organ" (Reiter, 1981, p. 162). It seems that the multifunctional role of the pineal organ mentioned above could explains the different terms as each researcher uses the term most applicable to their field of interest. Another term for the pineal is *epiphysis cerebri*, which literally means beyond the physical cerebrum or brain. I explore this aspect of the pineal in the next section. "The concentration of sensory and neuroendocrine properties in one cell line or in one cell may offer functional advantages" (Oksche, 1982, p. 29)

The pineal body also is interesting because it is connected by three systems: the heart system through blood, the neural fold, which arises from the neural plate, and the brain through CNS. Rephrasing this, the pineal body may be seen as connecting three systems.

Linkage to the heart system through blood. We have seen earlier how the pineal body is linked to early embryonic blood vessels and is outside the blood-brain barrier. This allows for hormonal products to be either transported to the rest of the body by

blood or CSF in which the pineal is bathed. It also allows the pineal gland to receive chemicals and hormonal products through the blood. According to Oksche (1982), the vascular patterns of the pineal organ have not been examined in great detail. Even though this statement was made many years ago, the pineal still seems under researched, especially if we consider blood as being part of the heart as a communication system, also on the subtle electrical level. As pointed out earlier, Nordenstrom (1983, 1992) hypothesized that the vascular system might be part of an intrinsic electric network in the body. "Biologically closed electric circuits *(BCEC)* are the key mechanisms permitting energy to flow and biological matter to differentiate and to perform various functions" (Nordenstrom, 1992, p. 285). At this level, maybe the relationship between this network and pineal body may yield new discoveries. Also as the pineal is an endocrine organ which acts an "intermediary between the environment and the endocrine system" (Luke, 1997), maybe blood plays a role in communicating to this central gland certain aspects regarding the outer and even inner environment.

Linkage to the neural fold. Reiter (1981) comments:

> Although the pineal is definitely an azygous midline structure, in the strictest sense there are actually two pineal anlagen, one on either side of the neural fold of the developing neural tube. Both folds possess prospective pineal cells. But when they fuse a single pineal rudiment normally results. (p. 287)

As mentioned earlier, brain development starts with the formation of neural tube. Ontogenetically the neural tube arose from the neural plate, which in turn arose from the notochord, which is connected to the metaphysical midline.

Linkage to the Brain and the CNS. The sympathetic innervation of the pineal

organ is from the superior cervical ganglion, and the parasympathetic innervation is via the pterygopalatine and otic ganglia. In addition, some nerve fibers penetrate into the pineal gland via the pineal stalk (Møller & Baeres, 2014).

Blood, neural tube, and CNS represent ontologically different stages in the developing embryo. However, it seems that the pineal might also belong to a higher order of functioning, particularly as the pineal gland is made from piezoelectric material. This suggests that it could be part of an electronic oscillator circuit.

The pineal as epiphysis cerebri, or beyond the physical. Descartes considered the pineal gland as "the seat of the soul." But what did he mean by *seat* and what did he mean by *soul*? In Augustine's and Aquinas' thesis soul is regarded as the principle of life. The principle of life may well be held to be completely present in each living part of the body (just as biologists nowadays say that the complete genome is present in each living cell). However, Descartes did not regard the soul as the principle of life. He regarded it as the principle of thought (Lokhorst, 2015, The Passion of the Soul section, para. 6).

St. Augustine conceived of the soul as being present in each part of the entire body: "In each body the whole soul is in the whole body, and whole in each part of it" (St. Augustine, 2007, p. 381). St. Thomas Aquinas also accepted this view. Nevertheless, "in deference to Aristotle, he added that this does not exclude that some organs (the heart, for example) are more important with respect to some of the faculties of the soul than others are" (Lokhorst, 2015, The Passion of the Soul section, para. 5). The position of Descartes created a problem for himself for although he too recognized soul as being present in all parts of the body, it is difficult to see soul as *thought* being present in our big toe and of course every other part of the body (Lokhorst, 2015).

Arka (2013) cuts through the above problem in his theory of the Six Main Levels of Consciousness. His position is similar to that of Augustine and Aquinas, for when answering the question "where is the soul found in the human body," Arka answers with a question: "soul, electrically, tell me where there is no soul . . . soul is not the word, it is the meaning that is important—self spirit, atman, how can you separate yourself from soul?" (Unfolding the Petals of the Heart, 2016). From this statement, he is clearly referring to an electrical system. This can also be considered as life force, which he claims is a property of soul. We also saw in the introduction that he, coinciding with Descartes, recognizes the thinking mind, but as being one of the levels of consciousness. Rephrasing this, we can say that in the human being, the thinking mind is one of the properties of soul in humans.

However, on a more subtle level, as all matter seems to originate and exist only by virtue of a force that brings all particles to pulsation, the existence of a *conscious Mind* expressing itself through ever-changing pulsating forms becomes a possibility. In this sense it seems as though consciousness or conscious Mind is present throughout the body. Another possibility is that the organism continues to be connected to this Higher Entity even though a part of it has incarnated via the heart system. Certainly it appears that the material body of the embryo is under the guidance not only the developing heart but also a higher force or forces either present in the body or outside of it. This also does not exclude that both possibilities at the same time. And here we get back to the definitions of the Higher Self as permeating all creation and the inner Self or soul being the part of the Higher Self that incarnates. If this is so, then we need to discover how this functions and how the different elements are guided and communicate with each other.

Crystal Oscillators

In physics a *crystal oscillator* refers to an electronic oscillator circuit that uses mechanical resonance of a vibrating crystal of piezoelectric material. It is used to create an electronic signal with a precise frequency. These frequencies keep track of time, provide a stable clock signal for digital integrated circuits, and stabilize frequencies such as in radio transmitters. The most commonly used piezoelectric resonator is quart crystal; hence the circuits incorporating them become known as *crystal oscillators* (Graf, 1999). In the human body the pineal gland is made from "piezoelectric material" (Lang et al., 1996, p. 191).

Electronic Oscillating Systems

As pointed out, the pineal gland is linked to heart via blood, the neural tube and CNS. However, the piezoelectric nature of pineal also enables it to be part of an electronic oscillator circuit system, which together with the heart creates a possible way messages could be communicated on a more subtle level throughout the body. In addition, as we have already observed that during embryonic development, the developing heart and the developing notochord seem to be coordinated by an outside force or forces. The piezoelectric nature of pineal and the oscillating nature of the heart could play a very special role in communicating with these outside forces. From this point of view the whole system might be considered as an electronic oscillating system, which is under the guidance of higher forces in Nature, where information is circulated throughout the system instantly and also in a step-down process. This could be considered the highest form of *communication.* However, we are normally oblivious of it, in the same way as of the processes that go on below our thinking minds and involve the

manifested form of this Higher Intelligence or inner Self, which is accessible via the heart. It is also probable that this process continues throughout our lives. This distinction is the difference between meditation methods that go below the mind and above the mind. In methods that go below the mind, one connects first with the inner Self via the heart. "It is very healthy and safe to go beneath the mind and journey to the center of your conscious Self, which is very close and accessible to you" (Arka, 2000, p. 28). Whereas methods that go above the mind connect with Higher Nature directly, this is much more difficult than methods that are feeling-based and go below the mind.

> If you go beneath the mind, you find the same thing as when you go beyond it. When you go beyond the mind, you ascend on a macrocosmic scale. Then you go beneath the mind, you descend towards the heart into the deeper levels of your microcosmic existence. (Arka, 2000, p. 28)

In the IM method investigated in this study, practitioners are trained to first go below the mind and connect with the inner Self via the heart. Later, as their practice intensifies, the practitioners who want can then connect with the Higher Nature to experience the more cosmic aspect of their Self (Unfolding the Petals of the Heart, 2016). This excursion into the relation between the pineal gland, the heart, and higher guiding cosmic forces is to give the reader an idea how the system might function. Mostly, the systems we have been talking about are below our level of awareness.

Subliminal Mind

For bio-communication to be really effective, the recipient also needs to be aware of what is being communicated. As we have suggested, animals still seem to have this avenue open to them. Humans, on the other hand, seem to a large extent to have lost this

capacity, although more than likely information is being passed on a non-conscious level all the time. In his theory, Arka (2013) refers to this level of functioning as *SM (Subliminal-Mind)- Consciousness.* This is in harmony with Freud´s idea of the unconscious and with Oschman's (2009) model of sub-threshold information going into what he terms the living matrix, although he suggests that it is the senses split information into two pathways, the living matrix and the neuromatrix. It is possible that organism has different ways of functioning: the thinking mind, which is linked to the brain and the *Feeling Heart*, which is linked to the Higher Self via the inner Self. Largely what goes on in the area of our Feeling Heart is below our awareness. Nevertheless, the heart has been found to send more signals to the brain than vice versa (McCraty, 2009). HeartMath have done extensive research into the different ways the heart communicates with the brain. According to them, there are four communication pathways: neurological, chemical, biophysical, and energetic (HeartMath Institute, 2016b, Heart Brain Communication section, para. 1).

The heart has been found to have an intrinsic nervous system of its own, containing around 40,000 neurons called sensory neurites. This extensive and complex neural network has been characterized as a *brain on the heart* or *heart-brain* (Armour, 1991, 2007, 2008). This allows the heart to act independently of the brain, sending and receiving meaningful messages of its own through the autonomic nervous system.

The Heart and Memory

Although the neural connections between heart and brain may be a way of communication under normal circumstances, the autonomic nervous system is an unlikely root for transmitting information in the case of heart transplant patients, as in

transplant operations, the nerves of the heart of the recipient are severed.

Some of the unusual findings concerning heart-transplant patients, therefore, raise questions for which science still needs to find answers. For me, there are essentially two problems. One is to establish how memory is stored and the role of the heart or heart field in storage. The other is the problem to do with retrieval of these memories. This might also throw some light on the mechanism involved in methods of meditation that meditate on the Self via the heart with the intention of rewinding our surface consciousness so as to reverse the evolution of all that has happened to us (Arka, 2013, p. 180).

Research into Heart Transplant Patients

Studies done and books written about transplanted hearts, both by researchers and by people who receive a heart transplant, reveal that between 5 and 10 percent of the people who receive a transplanted heart report changes in their tastes, personalities, and most extraordinary, in their memories (Skofield, 2012). The fact that some heart-transplant recipients undergo changes in food and lifestyle preferences and experience fears and memories of their donors, has made scientists contemplate the role and function of the heart in more detail.

Pearsall (1998) has informally observed that patients who receive other organ transplants, such as kidney and liver, also manifest changes in sense of smell, food preference, and emotional factors. Nevertheless, these changes were usually transitory and could be associated with medications and other factors of transplantation. However, in the case of heart transplants, the findings seem to be more robust and were more strongly associated with the donor's history. "If this is verified by future research, the implications for basic physiology as well as clinical medicine could be substantial"

(Pearsall, Schwartz, & Russek, 2005, Discussion section, para. 6).

In a retrospective study concerning heart transplant patients, 79 percent claimed that their personality had not changed post operatively but showed "massive defense and denial reactions," 15 percent report changes in their personalities but claim theses are due to having faced a life-challenging event, and six percent reported "a distinct change of personality due to their new hearts" (Bunzel, Schmidl-Mohl, Grundbock, & Wollenek, 1992, p. 251).

The Role of Heart in Memory Storage

As heart donors and their histories are kept anonymous, the cases reported indicate that some recipients are able to access information about their donors via their new hearts. This raises the question concerning the role of the heart in memory storage. It seems that electromagnetic fields are not the only fields which science is applying to living systems. Below some of the "newer" theories and their relation to the heart are considered.

Dynamic energy systems approach. Russek and Schwartz (1994) suggested that the heart can be viewed as a dynamic energy-generating system and they coined the word "energy cardiology" (Russek & Schwartz, 1994, p. 186). The global bioenergy field inside the body is now thought to include electromagnetic fields, potential fields, and quantum fields, all embedded inside of each other. These endogenous fields regulate biochemical processes and precede the physical and chemical changes, which manifest as disease (Rein, 1998, p. 16). For Oschman (2000) the heart plays a modulating, perhaps even coordinating, role in the body's electromagnetic, potential and quantum fields acting through the living matrix. For Maret (n.d.) biological systems, including the heart, exhibit

non-local, global properties, which are consistent with their ability to function at the quantum level (Maret, n.d., para. 3). Living systems are dynamic organizations of intelligent information expressed in energy and matter (Schwartz, 1996). When modern systems theory is applied to biophysical energy, known as the "dynamical energy systems approach," the biophysical consequences of organized energy have far-reaching implications for the role of the heart. Whereas living systems theory posits that all living cells possess "memory" and "decide" functional subsystems within them (Miller, 1978), the dynamical energy systems approach posits that all dynamic systems store information and energy to various degrees (Swartz & Russek, 1997, 1998).

> The systemic memory mechanism provides a plausible explanation for the evolution of emergent (novel) systemic properties through recurrent feedback interactions (i.e., the nonlinear circulation of information and energy that reflects the ongoing interactions of the components in a complex, dynamic network).
>
> Recurrent feedback loops exist in all atomic, molecular and cellular systems. Hence, evidence for atomic systemic memory, molecular systemic memory and cellular systemic memory should be found in these systems. (Pearsall, Swartz, & Russek, 2005, para. 2)

One of the predictions of this theory is that sensitive recipients of transplanted organs can experience aspects of the donor's personal history stored in the transplanted tissues. But although this theory postulates that memory could exist at the atomic, molecular, and cellular systemic levels, it does not really tell us how the heart recipient retrieves the information, although sensitivity of the person seems to be a needed quality.

Torsion waves. Although torsion is not excluded from the dynamic energy

systems approach, it is not specifically included either. However, quantum fields are sometimes used as an all-embracing term that refers to experimental anomalies involving "free energy" research that go beyond classical energy fields (Rein, 1998, p. 1).

Swanson (2008) comes from a slightly different perspective and also proposes a new paradigm based on the work of the Russian astrophysicist Kozyrev, who claimed he had discovered another force to the four forces recognized by Western physical scientists that he named the “density of time” (Kosyrev as cited in Swanson, 2008, p. 44). As "every elementary particle, such as electrons and protons, have spin, this means that torsion is a universal force" (Swanson, 2008). Swanson (2008) feels torsion waves can be seen as a breakthrough in our understanding of the nature of "subtle energy" and may be "the missing element in understanding the aura and other aspects of subtle energy" (Swanson, 2008, p. 44).

Torsion fields and the encoding of information. Torsion waves are the fundamental wave within the electromagnetic waves, and they have several properties, some of which were discussed earlier. They are seen "as being able to impose a new 'structure' to a substance where there were none before . . . (and whose) pattern of spins can encode information . . . (which) can later be detected by the torsion field of another individual" (Swanson, 2008, p. 69). Although in this article Swanson is referring to the imprinting of objects, if this would also apply to biological system there would be far reaching implications, particularly if it applies to the heart. The heart, as we have seen earlier, produces a torsion field as it consists of two vortexes spinning in opposite directions. This implies that through torsion, we may be encoding our history, including that of our thoughts, onto the heart´s torsion field. Linking Kozyrev´s discovery that

human thoughts and feelings also generated torsion waves, it seems possible that through them, we can imprint our own heart´s torsion field, all of us in their own specific way. Emotional thoughts, as pointed out earlier, produced a much greater effect on Kozyrev´s equipment than intellectual thought (Kozyrev in Murphy, 2012, Time and Torsion section, para. 1). In the same vein, Arka (2005) claims that although "thoughts are invisible, they are as effective as visible matter. They have their own shape, size color and carry a certain quantum of energy. Regardless of their nature, thoughts will affect the source first before they reach the atmosphere" (p. 23).

Bio-fields. Based on experimental evidence, Rein (1998) introduces the concept of a bio-field composed of layers comprising force fields, potential fields, and quantum fields embedded within one another. This is reminiscent of Bohm´s model (Bohm & Hiley, 1975) of an implicate order which is embedded within the explicate order. In this case classical electromagnetic fields "would be at the level of the explicate order which has embedded within it the potential field, which in turn has embedded within it the quantum field." Each level would also be increasingly more "subtle and fundamental" (Rein, 1998, p. 2). The relation of these fields to the heart still has to be established.

The helical nature of the heart. It seems, as suggested earlier, the unique way the heart is enfolded could have something to do with subtle fields. A recent article by Oschman and Oschman (2015) published after I had started this dissertation, points out how the helical nature of the heart discovered by Torrent-Guasp (1973) later led him to regard the three-dimensional ventricular architecture as a geometrically non-orientable surface similar to a triple-twisted Möbius strip.

This is one of several geometric arrangements used to document the Aharonov-

> Bohm effects, involving electromagnetic vortical potential or scalar fields. Extraordinary yet compelling evidence has also indicated that the heart's energy fields, generated by vortical electrical flows through the heart and aortic arch, are coupled to fields of information that are not bound by the limits of time and space. (Oschman & Oschman, 2015, p. 1)

This led the Oschmans to suggest that the heart is a bi-directional scaler field antenna. This suggestion is based on some of the missing equations of Maxwell dealing with potential fields, which by the end of 1800 had been thought of as arbitrary and unnecessary. I also outlined earlier in this review that the heart might be connected with fields of information that are not bound by the limits of times and space. I based the analysis in this study on Kozyrev's findings regarding torsion waves and torsion fields, whereas the Oschmans (2015) talk of scaler waves and scaler fields. The fascinating thing is that regardless of the names used, the field around the heart seems to be linked to fields of information not bound by the limits of time and space. This implies that these fields might be related to memory and memory storage.

Retrieval of Memory

In the case of heart transplant recipients, this researcher has not found specific research that contemplates how information is retrieved. However, in listening to several heart recipient patients talking about their experiences (Skofield, 2012). I noticed several things. First, in most cases, even though the recipients acquired new memories and tastes, they maintained personal identities apart from these new acquisitions. Several people claim that now they are living for the "two of us" or there is the "presence of another within me," it is like "two people in one body." Memories (of the donor) are referred to as

coming " through me." However, this does not seem that clear in all cases. A man who had received the heart of a man who had committed suicide, married his donor´s widow. Twelve years after marrying her, he committed suicide by shooting himself. His widow's first husband had also committed suicide in "strikingly similar circumstances" (Thompson, 2008, para. 3).

For instance, as said earlier, heart transplant recipients suddenly feel urges for foods that they did not usually consume prior to receiving their new heart. Another recipient changed from being a "couch potato" to being a sports person with the same sporting preferences as the donor. In another two cases, one recipient started writing poetry, which he had not done previously, and the other acquired a preference for classical music. In the latter case the donor had been a violinist. But even stranger, a little girl who had acquired the heart of another little girl who had been murdered, received through nightmare like dreams, accurate information, such as a description and even the clothes the murder was wearing. Her psychiatrist handed over the information to the police and this then led to the capture of the man who had murdered the donor. Another donor had been killed after being shot in the face and the recipient of his heart kept experiencing flashes of light to his face (Pearsall, Schwartz, & Russek, 2005). Obviously, there are various mechanisms of how the recipient receives information, which seems to include feelings, dreams, and experiences like the ones just mentioned. This warrants investigation, as it can tell us more, not only about how memory is stored, but also about how it can be retrieved. It seems as though at least some of heart transplant patients are able to retrieve memories from their new hearts. Interestingly, all but two of the cases Pearsall reported, were women (Joshi, 2011).

Torsion, originally named “density of time” by Kosyrev, might be another vital link in our understanding of how fields are impregnated with information (Kosyrev as cited in Swanson, 2009). If the memory is encoded on the heart´s torsion field, maybe by increasing our sensitivity, we can slowly travel backward in time to when we incarnated in this life or even beyond. Through this we can then let go of memories, especially those that have an unresolved emotional component. This is not a bizarre proposition, as many therapeutic methods in psychology are based on the ability to retrieve memories from the "unconscious."

As we go beyond our personal histories, it is equally possible that we can either tune into other fields to learn more about them or transmit information to another being who would then need to decipher this information. Telepathy is probably based on this possibility. Being open to dreams and through visions in meditation, it is also possible that we can touch on information not only of a personal nature but that of a more archetypal nature as suggested by Jung. Bio-communication between organisms seems to be happening all the times. Also, as suggested earlier, it seems that communication between higher cosmic forces might also be going on all the time; increasing levels of sentience or feeling might be the door that opens the individual to having access to these deeper levels of communication. One of the first steps might, therefore, be coming consciously aware of one´s own deeper layers.

Senses below the Senses

Along with our classical physical senses, we cannot forget the world of synesthesia: We have other senses that can see, touch, smell, and hear (for instance, people hear colors, feel sounds, taste shapes…), claimed for over 300 years and

confirmed recently by additional evidence (Cytowic, 2002). In addition, according to Arka (2000) and Zukov (1989) we have mystical or multisensorial perception that does not come through the five physical senses. Zukov feels this perception is "heart-based." For Arka, the heart is the mother of all the senses, and it is only later that the mind forms. Science has shown that more information flows from the heart to the brain than from the brain to the heart (McCraty, 2009). However, this does not clarify what information the heart is transmitting to the brain.

Arka (2000) suggests that memory is converted into subtle impressions and stored somewhere deep within the body and individual consciousness. However, he also qualifies that "we do not have to willfully remember anything as information and impressions are externally stored in the universe. We just have to access the desired information outside with the synchronicity of our emotional impression stored deep within" (Arka, 2000, p. 20). In the case of some heart transplant cases we observed that some people were able to retrieve not only the preferences of their donor, but also information about what happened to them. This subject has yet to be investigated in any depth. As the neural pathways have been cut in heart transplant patients, it seems they could help unlock the doors of how memory is stored. Sensitivity has been mentioned as a possible quality "in retrieving information" (Pearsall, Swartz, & Russek, 2005, para. 2).

For people who want to discover the true nature of Self, they have to reverse all that has happened to them. Sarris (1997) talks of this as healing one´s past. In Western scientific language the Self might be seen as being made up of increasing subtle levels which would include the "explicate order which has embedded within it the potential field, which in turn has embedded within it the quantum field" (Rein, 1998). However,

when we work from the outside in, we have no idea what these different layers represent to the experiencing consciousness of the person.

Tapping Into the Layers Below the Mind

Science, as we have seen, recognizes the organism as a being embedded in a bio-field of ever-increasing subtle fields. Spiritual traditions too talk of an aura where different bodies or sheaths are each embedded in the other (Sarris, 1997, p. 8). These bodies go from the inner subtlest body to the denser physical body. The different bodies that make up the Self are generally thought to be the causal body, mental body, emotional body, etheric body (made of ether or life-energy), and physical body (Besant, 1911), but there are also variations to these names and in the number of sheaths. They are said to extend both outside the body and penetrate into the body itself (Arka, 2003). However, when information is expressed like this, whether it is from a scientific or spiritual point of view, it only gives us information about the different layers. It does not tell us about the experiencing consciousness of the person when they contact these different layers.

The Self and the self

Studying the development of the embryo brings new clarity to the self or Self, for it depends on the perspective from which one is looking. As developing embryos, life is beginning; the person is starting out. As individuals start to mature, they grow away from their cosmic origin in their heart. As the spirit consciousness or Self recedes, a new thinking entity develops, which is later recognized as mind and along with this the ego is created. The growing individual develops the senses, which are tools to help understand the physical world in which he or she lives. Later, using the rational mind, the person often affirms that he or she is a purely physical being (Arka, 2003).

Looking for the Self

However, there often comes a time when the individual wants to discover his or her true nature, soul, or Self: the Self that is beyond the personality or ego identity. Often the person does not quite know what he or she is looking for, but the person does know he or she does not feel complete. "In about one third of my cases the patients are suffering from no clinically definable neurosis, but from the senselessness and emptiness of their lives" (Jung, 1933, p. 62). Many methods have been created to put the person in touch with what is going on beyond their thinking minds. In the West, Freud was the first to develop a method to help his patients tap into their unconscious. Later, Jung (1933) and Adler (1964), to name only a few, followed. However, not all methods were aimed at putting clients in touch with their souls. Jung and Maslow identified a personal self and a spiritual self and the aim of therapy was considered a drive to wholeness, to express the true Self. Assagioli's (1965) synthesis model is similar in that he too recognized a higher consciousness or Self. In his model he identified the lower unconsciousness consisting of repressed and past events, the middle unconsciousness consisting of the past and present events, and the higher unconsciousness, which is made up of our potential: wisdom, joy, love, and intuition.

However, predating modern psychology, methods were developed to put people in touch with their soul or Self. These methods were known as meditation and, as pointed out in the introduction, they involved "the experimental phenomenological introspection into the living topological construct of the Self" (Louchakova, 2007a, p. 82) or "serious self-pondering into the depth of the soul about . . . [our] existence (Arka, 2013, p. 29).

This researcher is not here to argue about whether meditation or

psychotherapeutic methods are more effective, but to point out their commonality. Both broad approaches recognize that the person needs to go beyond or below their rational thinking mind and tap into levels that are not normally available to consciousness.

What Happens When We Go Below the Mind?

Arka (2009, 2013) identifies the part of the individual who undertakes the inner journey as the "I awareness," "I ego conscious awareness," or "I ego awareness" (2009). The "I awareness" is the pivot of the memories which form into a personality. We recognize this as a consistent personality from the day we become aware of our presence. "With the development of 'I ego awareness' a time arises when we want to touch the origin of consciousness expressing itself through the human body" (S. Arka, personal communication, August 10, 2016). In the journey to self-realization, as stated earlier, he talks about the need of the person to reverse all that has happened to him or her (2013). Other meditation approaches that meditate on the Self talk of *ego transcendence* (Louchakova, 2006, 2007; Louchakova & Warner, 2003; Louchakova-Schwarz, 2014).

It is natural that different people and approaches use different words; however, the meaning of both perspectives seems to be similar. In the IM method the objective is to put practitioners in touch with their Self, awaking their inner guiding voice or intuition. In IM, it is recognized that this process may be different for different people. Some might be guided to combine a more psychological approach with meditation, whereas others might choose a totally different combination. What is important is that people learn to tap into their Self so they can receive inner guidance.

However, to discover their true Self, practitioners have to become consciously aware of the deeper layers. These layers include different aspects of the self. This is

similar to the Prayer of the Heart (Louchakova, 2007a). To go "behind the veils" requires that "the interior contents of consciousness become visible, from the way one sees things, to relationships, decision making, life choices and finally one´s understanding of oneself" (Louchakova, 2004, p. 42).

Intuitive Meditation

The IM method of meditation is said to help people connect with their inner Self and go through the various layers or veils that have been described above. In IM practitioners not only meditates on the Self via the heart but also activate 19 energetic points or chakras which are situated throughout the body using their own touch, breath, and a vibratory sound. In IM you do not meditate "on some object or person, instead you meditate upon your own deeper Self because that is where your highest wisdom unfolds" (Arka, 2013, p. 46). Through touch IM practitioners first contact the physical level. However as, the intention is to open all the layers so as to touch the "touchless Spirit," practitioners are slowly taken beyond this to experience other levels. Becoming increasingly involved with their own touch combined with a vibratory sound and breath enables practitioners to become consciously aware of these more subtle layers. The IM method encourages individuals to experience and explore their inner selves at their own pace, in their own time and space. Each session involves various aspects, connection with the Self via the heart, conscious touch, conscious breathing at each touch point, intonating a vibratory sound, and also lying down for a period of relaxation at the end of the practice. As the IM method involves various aspects, it is difficult to tease out what aspect of the method produces the results or whether it is the unique combination of the various aspects. Below we look at several of the issues involved with breath, emotions,

and touch and some of the research that has been undertaken on breathing and on touch.

Breath work. Although the connection between breathing and emotions was recognized as far back as the 16th century (Pfeffer, 1978), there is scant interest in medical literature in the connection between the breath and emotions (Jassy, 1985). However, the connection between breath and health is slowly being recognized and "yogic breathing, defined as a manipulation of breath movement, has been shown to positively affect immune function, autonomic nervous system imbalances, and psychological or stress-related disorders" (Zope & Zope, 2013, p. 4). In the East the breath is recognized as a contributing factor in health and different states of consciousness. Breath work in Eastern yoga systems is known as *pranayama*. In the yogic system, it is claimed that the rhythm, depth, and form of breathing can be used to alter consciousness, promote healing, and increase physical capacity (Khalsa & Khalsa, 1976). Grof, although formally known for his early studies into LSD, later became intrigued with the therapeutic aspects of the breath. His approach, subsumed under the name of Holotropic Breathwork, as the name suggests stresses a movement toward wholeness. In breath work Grof and Grof (2010) identify four specific stages involved in the healing process: 1) the sensation phase 2) the biographical stage 3) the perinatal stage, and 4) the transpersonal stage.

The doctoral thesis of Jassy (1985) investigated participants through a process that involved breathing deeply in a prescribed way while directing the breath to the center in the mid-chest. He observed in the participants a feeling of being in touch with self; willingness to see life as it is; a feeling of spaciousness and relaxation. This seems to indicate the breath work, coupled with focusing on the chest, is a way of transforming

certain patterns and in achieving a more feeling-based consciousness.

Emotions. In nearly all meditation methods the importance of working with emotions is recognized. It has also been observed that breathing and emotions are linked and that by controlling our breathing we control our emotions and vice versa (Arka, 2013). That is why in traditions that stress ego transcendence, it is considered very important to work with emotions. In the IM method, emotions are negotiated through expansion into them as feelings. Allowing the feelings, instead of trying to change them, helps free blocked emotions. The idea of staying with a self-limiting emotion until a breakthrough to a higher level occurs is also found in other traditions such as *Tantra.*

> You feel the energy [e.g. anger], you contain the energy, consciously and deliberately choosing not to express it in the customary way. When it attempts to move through its habitual channel, toward its usual goal . . . you wait. It boils. It rattles its cage and gets furious. Finally, it explodes upwards to find another outlet. (Ballantine, 1999, p. 443)

When practitioners are able to be with their own emotions, they can then also be with the emotions of others in a non-judgmental way. However, not all the emotions that boil up are negative; many are an expression of the deeper self within, particularly when the person is expressing him or herself with another or with others. When the person allows these emotions to surface, often both parties feel a great tenderness (Arka, 2003). This indicates that a certain amount of mirroring goes on between communicating individuals.

Touch. Touch is an important aspect of many healing methods. This suggests that some sort of energy exchange takes place between people. In assessing a sampling of

results McCraty, Atkinson, Dana Tomasino, and Tiller (1998) suggest that there is evidence that there is an exchange of electromagnetic energy produced by the heart when people touch or are in close proximity of each other (p. 359). However, this does not explain why self-touch might be healing. However, touch is a natural reaction when we hurt ourselves: Our hands go to the injured spot. This ability to affect ourselves though our own healing touch might suggest we can also redirect our heart`s magnetic energies to ourselves and not only to others.

Arka`s Theory of the Six Main Levels of Consciousness Revisited

Arka theory is novel in the sense that he suggests that practitioners of the IM method will go through different levels of experiencing consciousness on their journey to discover their true nature or Self. In this way he can be seen as drawing attention to the possibility that the experiencing consciousness of individuals may change when they bring their attention down from the mind (which is normally associated with the brain) to the heart with the intention of connecting with their deeper Self or soul. Arka (2013) also points out that during this journey from the mind to the heart, the contents of each level will be unique for each individual although the levels will be common.

It is probable that other methods that meditate on the Self via the heart share some of these experiences. The main levels Arka identifies are: 1) M (Mind) – Consciousness, 2) SM (Subliminal-Mind) – Consciousness, 3) F (Feeling-Mind) – Consciousness, 4) H (Emotional-Heart) – Consciousness, 5) HS (Heart-Soul) – Consciousness and 6) PS (Pure-Self) – Consciousness. As we have indicated already in this review, the first two levels are consistent with what science already knows about consciousness. It is the next levels that are not specifically identified by science already. The results of Jassy (1985)

imply that breathing consciously in the center of the chest brings a change toward a more feeling-based consciousness. However, the research is brief in that it consists of a single session. Jassy's (1985) research also does not indicate whether there might be different levels of consciousness nor if people can maintain these experiences over time.

Prayer of the Heart

Prayer of the heart is a meditation method, which centers on the Self via the heart center. In its initial stages it begins "by associating the repetition of Divine Names . . . with the somatic sense of self in the chest" (Louchakova, 2005, p. 295). However, in the "contemporary 'accelerated' form the beginning attention is fixed in the chest to access the Gnostic 'mind of the heart' . . . Whence, the phenomenological analysis of the Prayer of the Heart uncovers the inner structure of consciousness within this 'mind of the Heart' as opposed to 'mind of the head'" (Louchakova, 2005, p. 295). Here we see a distinction between the thinking mind and the mind of the heart. Furthermore, she points out how "data from the focus groups show that intentional consciousness associated with the head usually consists of self-reflective, analytic/synthetic, logic based constructs as opposed to the lived experience in the chest" (Louchakova, 2005, p. 295). In this, Prayer of the Heart is consistent with the initial levels outlined by Arka (2013) in his theory.

F (Feeling-Mind) - Consciousness

The third level Arka recognizes has to do with feeling, and he called this level F (Feeling-Mind) – Consciousness. The next level is also to do with emotions, but they are felt with greater intensity. This he identifies as level H (Emotional-Heart) – Consciousness. For Arka (2013), to get back to the core of our consciousness we again need to get in touch with our Feeling Heart, and this requires opening ourselves to

increasing levels of emotional experience. The difference between levels three and four is difficult to distinguish from outside. However, for the practitioner it is easier to identify because of the intensity of the inner experiences. In the course of allowing hidden feelings to surface, the practitioner often is taken to memories of what happened. In this way the memory of one´s personality is slowly unveiled. When we consider Kozyrev´s findings that feelings, especially those of an emotional content, generate torsion waves and that torsion waves are linked to time, the need to open oneself to ever-increasing levels of emotional experience is consistent if we want to recover memory and work through old patterns of being. As we pointed out earlier Sarris (1997) talks of healing one´s past.

Feeling-consciousness and expansion of consciousness. Feeling-consciousness, for Arka (2015b) is something one can develop. It is like any muscle, the more you practice certain movements the more the muscle develops. During the practice of IM method, one´s capacity to feel increases. The more one involves oneself with this task, the more it develops. However, it is not just a repetitive discipline, it also requires a heartfelt involvement. He also talks about expansion of consciousness. However, this expansion does not mean it gets bigger and bigger, but an expansion where the same qualities are maintained, "yet its appearance, its presence and its depth become expanded" (Arka, 2015b). An example may be living in the same house with others where there is no communication and they do not understand your needs and necessities although you are all living together in close contact. In this example we are not talking of physical distance but an experienced emotional distance which in the above example, is felt as vast.

> So in the end of the day everything is grasped by feelings, experienced by feelings, feelings are like the first element the first tool, like your inner tool. Without that you cannot welcome anything. You cannot experience anything and interestingly through feeling you really grasp everything—and that feeling where is it—that feeling is heart—connected element—totally heart-related element. We live with our feeling, but even then with that feeling there are levels of feelings levels, and you cannot categorize there are so many levels. When it comes to feeling there are no number—there are so many levels only the person who feels it–they know the level. It is indescribable but they know. It is interesting you know but you can never describe. (Arka, 2015b)

The exploration into our inner consciousness is personal. It is also mystical. It is also about searching for one´s reflection.

> When we meet somebody we cannot connect with that person unless you see part of yourself in that person. Part of your being must reflect back to you. That person must already have something that you have—otherwise it cannot be reflected—it is like a mirror effect–it all happens in seconds, in microseconds. (Arka, 2015b)

Feeling and thinking. For Arka thinking is an "immediate form of feeling." It is first but this does not clarify where the feeling is coming from. Like feeling pain or pleasure, the thought of them is immediate, but it is not deep. In this sense thoughts are definitely parts of feeling. "Surface feeling could be called thinking." Like feeling, thinking is also internal and is a faculty of consciousness (Arka, 2015b).

Using a method known as "body mapping" research done by Nummenmaa, Glerean, Hari, and Hietanem found mental awareness of the different emotions

corresponded with topographically specific bodily sensations that are culturally universal. Rather like what Arka is suggesting, it seems that the wording or "the naming thought" given to these deeper sensations is a short hand way of referring to them. The findings of Nummenmaa et al., suggest that sensations could "underlie our conscious emotional experience" (Nummenmaa et al., 2013, p. 646). As our definition of feeling refers to the experience in the body of a configuration of sensations, this implies that feelings might underlie our conscious emotional experience.

Deeper Levels of Consciousness

Although exploring the other levels of consciousness are beyond the scope of this thesis, here I just mention them briefly.

During the fifth level, identified as HS (Heart-Soul) – Consciousness, the practitioner is said to experience a greater connection with nature and the laws of physics start reversing. The sixth level involves the awareness of one's essence, of one's whole presence and of everything that one feels, thinks, and does. It is addressed as Soul or Self and is named as PS (Pure-Self) – Consciousness (Arka, 2013).

Sentience and Consciousness as Properties of the Soul

Science generally concerns itself with the physical and chemical properties of matter, but does not study that which animates matter. Although the soul or *atma* cannot be seen, we can infer its existence in much the same way science infers the existence of the force of gravity when an apple falls from a tree (Sri Chaitanya Saraswat, 2015, p. 8). The main problem is that "physical analysis can only elucidate the structure and function of a system as characterized from an external viewpoint. However, living organisms are conscious systems and their subjective experiences are within" (Sri Chaitanya Saraswat,

2015, p. 6). In Vedanta, consciousness and sentience are properties of the soul. Traditionally in both Eastern and Western philosophy, "life is understood as a cognitive or sentient principle" (Sri Chaitanya Saraswat, 2015, p. 2)

There is also ample empirical evidence that establishes cell sentience from the perspective of cell functions. "Cells can cognitively read their environment, analyze the received information and then execute the necessary action to continue their survival" (Sri Chaitanya Saraswat, 2015, p. 3). Modern biology is also coming to the conclusion that not only "unicellular organisms display cognitive behavior, but that even individual cells in the multicellular organisms exhibit individual cognitive behavior" (Sri Chaitanya Saraswat, 2015, p. 3; Pereira, 2016). "External forces are the unifying principle in an artifact, but, in the case of a living organism, the unifying principle is sentience" (Sri Chaitanya Saraswat, 2015, p. 6).

Louchakova-Schwartz (2014) also states that "sentience is not a property of the human brain, but rather, is borrowed from the cosmos and appropriated as the self in the human condition; inter-subjectivity is a derivative of sentience, and subjectivity is an instance of inter-subjectivity" (Louchakova-Schwartz, 2014, p. 1)

First and Foremost We Are Sentient Beings

Arka (2013) talks of rewinding our surface consciousness to reconnect with our deeper Self. The beginning is metaphysical then physical; this leads to the mind, which is mystical, then concludes in the spiritual heart. This journey leads to self-discovery and realization and can result in personal enlightenment. This is a state of heightened consciousness, brings "clarity, inner peace and the ability to not just understand the deeper meaning of life but to feel it too. As your heart blossoms, you experience

increased compassion and empathy with awakened yet unconditional love and intuitive wisdom" (S. Arka, personal communication, May, 2005).

During this process we also regain a lost part of ourselves, which he calls *innocence,* pointing out that in very young children and in many adults approaching the end of their lives, there is innocence. In this state, he implies, the heart has taken over from the mind again and now the heart uses "the mind as an instrument to express its guidance" (Arka, 2003, p. 61). As practitioners of IM lets go of past debilitating experiences and also learn to humble their ego, so they too become guided by higher forces of nature or higher self that is expressing itself through the heart. Arka recognizes this level of experiencing consciousness as living in the heart (p. 61). Here the person lives "with depth, with emotion, with feeling, with creativity" (Arka, 2003, p. 81). It is not the end of the journey, but it is the initial step.

Other people also recognize the importance of innocence. Returning to the embryo, Sills (2012) points out that "the little ones are representative of the unknown, of the mystery. They are sensitive, vulnerable, aware, sentient beings. We all have this within us. We have the intelligence of the embryo to return to" (p. 40).

The embryo is guided directly by nature; in this sense it is innocent. As the practitioner starts to regain this innocence, so he or she is again directly guided by nature and an intuitive wisdom about life arises. Jesus also acknowledged the importance of innocence. The New Testament says:

> But Jesus called the children to Him and said, "Let the little children come to Me and do not hinder them. For the kingdom of God belongs to such as these. Truly I tell you, if anyone does not receive the kingdom of God like a little child, he will

never enter it." (Mark 10:13–16)

SatChitAnanada

In Indian philosophy the nature of pure consciousness is referred to as *SatChitAnanda*, pure Being, pure Knowing, and pure Bliss (Ramabrahmam, 2007). The IM method is said to be a journey from the rational mind, to the emotional heart, to pure consciousness. As we have seen, it involves a return to our innocence where we learn to listen to Nature's guiding wisdom through our Feeling Hearts. The source of this guiding voice is referred to differently in different traditions: Self, soul, atman, voice of God and inner voice. It is, however, not the name that is important, but the capacity of people to connect with their inner intuitive guidance that is whispered silently through their heart. Feeling is "like 'mother sense', the mother of mother sense . . . without its involvement . . . [we] cannot grasp anything" (Arka, 2015a).

CHAPTER 3

RESEARCH METHODS

Research Approach

This dissertation was an exploratory study to understand a) why the heart? and b) what happens when one meditates on the Self via the heart? The research topic was concerned with Arka´s theory of the six main levels of consciousness. The initial levels of this theory lend themselves to comparing measurements of the "experiencing consciousness" of subjects prior to receiving training in the IM method and then again after learning the method. This measurement could be done in various ways: through interviews, questionnaires, or measuring changes in the participants' electromagnetic fields as measured by a SQUID or a GVD image. I discounted the latter two methods, as I felt that a basic exploratory study was needed before using expensive and less accessible techniques like the SQUID. Also, electromagnetic technologies work from the outside in and do not address the experiences of the person.

As measures have been designed and developed to investigate other methods of meditation, like mindfulness (Lau et al., 2006, p. 1447), I was inspired to use a similar approach. These measures involve self-reporting through rating subjective experiences after training in the mindfulness meditation technique. Likert type measures were used in these scales, such as the Cognitive and Affective Mindfulness Scale (Feldman, Hayes, Kumar, & Greeson, 2004), the Freiburg Mindfulness Inventory (Buchheld, Grossman, & Walach, 2001), the Kentucky Inventory of Mindfulness Skills (Baer, Smith, & Allen, 2004), the Mindful Attention Awareness Scale (Brown & Ryan, 2003), the Mindfulness

Questionnaire (Chadwick, Hember, Mead, Lilley, & Dagnan, 2005) and the Applied Mindfulness Process Scale (Michael, Black, & Garland, 2016). I also decided to use a Likert type measure in this study.

However, as I was unable to find any scale that measures feeling-consciousness, I decided to develop a scale to be applied twice, prior to learning the method and again 6 weeks later. The scale was named the *Feeling-Consciousness Scale* (FCS).

Questionnaires or scales have their pros and their cons. They are relatively quick to complete, economical, and usually easy to analyze (Rattrey & Jones, 2007, p. 235). But closed questions or statements may restrict the depth of the participant´s response, resulting in the quality of the data collected being incomplete or diminished (Bowling, 1997; Rattrey & Jones, 2007). Another problem is that questionnaires or scales assume that the researcher and the respondents share underlying assumptions about language and interpret statement wording in a similar manner (Rattrey & Jones, 2007, p. 235).

I therefore chose to use both closed and open response formats, since "all methods of data collection have limitations, (and) the use of multiple methods can neutralize or cancel out some of the disadvantages of certain methods" (Creswell, Plano, Gutmann, & Hanson, 2003, p. 164). I also chose a multiple method approach, in the belief that this was the most appropriate way of learning about feeling-consciousness and what is involved in the initial stages of Arka´s theory.

The construction of the scale involved a series of steps, for the scale items were not only deduced from theory but also derived from interviewing eight people who had practiced the IM method for between 7 months and 2 years. I asked them to tell me about their experiences related to the practice of IM. I chose to do this, as my interest was not

only in testing a theory, but to find out if certain subjective experiences are common to practitioners when they start meditating on their deeper Self using the IM method. Based on intuition and on Arka's work, I felt that "feeling-consciousness" is a single construct involving multiple facets.

Later, the same eight people ordered and arranged the statements regarding their experiences in different groups based on common elements. In the draft of the scale used in the pilot study, I had to reduce the number of scale items as when testing the reliability of a scale the rule of thumb is about five respondents per item (Byman & Cramer as cited in Rattrey & Jones, 2007).

I am also aware that everybody has a rich inner world with his or her own unique individual experiences. In applying the scale the second time I therefore also included some open-ended questions in order to learn more about the experiencing consciousness of the participants after learning IM and to see if there were some emerging elements or factors that may have been overlooked while constructing the scale. The choice of a mixed method design was therefore not to validate or corroborate the findings of both methods (often known as triangulation), but as a way of combining the results leading to greater elaboration and expansion of information (Brannen, 2005). In addition, keeping open about the results of the two methods allows for discovery where they might complement or enhance one another or where they might even contradict one another (Brannen, 2005, p. 12). In the discussion I give actual examples from the open answers that support the need for keeping open about results.

This study also included a boon as one of the participants did some sketches regarding her inner experiences after each IM session. They provided qualitative data on

the internal process from another perspective. She presented us with them on the last day of the study. I include them in the results as a visual representation is often worth more than a thousand words and is an approach that could be considered when doing future research into meditation methods. The sketches also give a visual representation of IM as a process or journey, rather than something fixed and static. Furthermore, including the micro level in this way gives "voice" to the individual as well as the larger macro patterns that I hoped would be revealed through the quantitative research (Brannen, 2005. p. 8).

As so little is known about how our inner world is affected when we meditate on the Self via the heart, multiple methods were also seen as a practical solution, for that approach opens the door to different views and to different forms of data collection and analysis (Creswell, Plano, Gutmann, & Hanson, 2003). I felt that using multiple methods of data collection might not only help in learning more about the phenomenon I wanted to measure, but also assist future researches to construct a more sensitive instrument.

During Phase 1, I conducted a pilot test to refine the wording and format of the scale. In Phase 2, I administered the scale and conducted the initial procedures to validate the scale and assess its reliability. I see the construction of the scale as the start of a research program where future researchers can refine it further. More about the constructing of the scale is given in Appendix C.

Research Design

Research Procedures

The following table gives a visual representation of the research procedures embraced in this study. Basically, it consisted of two phases: The first involved the drawing up the scale items and the initial testing of them during a pilot study; the second

concerned the actual procedures adopted in the study.

Figure 1: Research Procedures: Phase 1

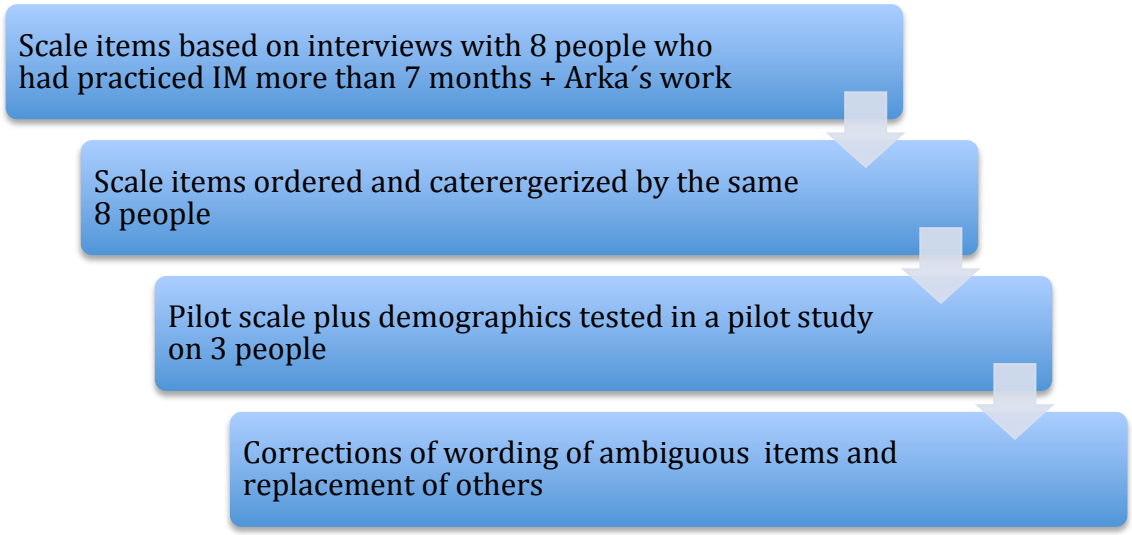
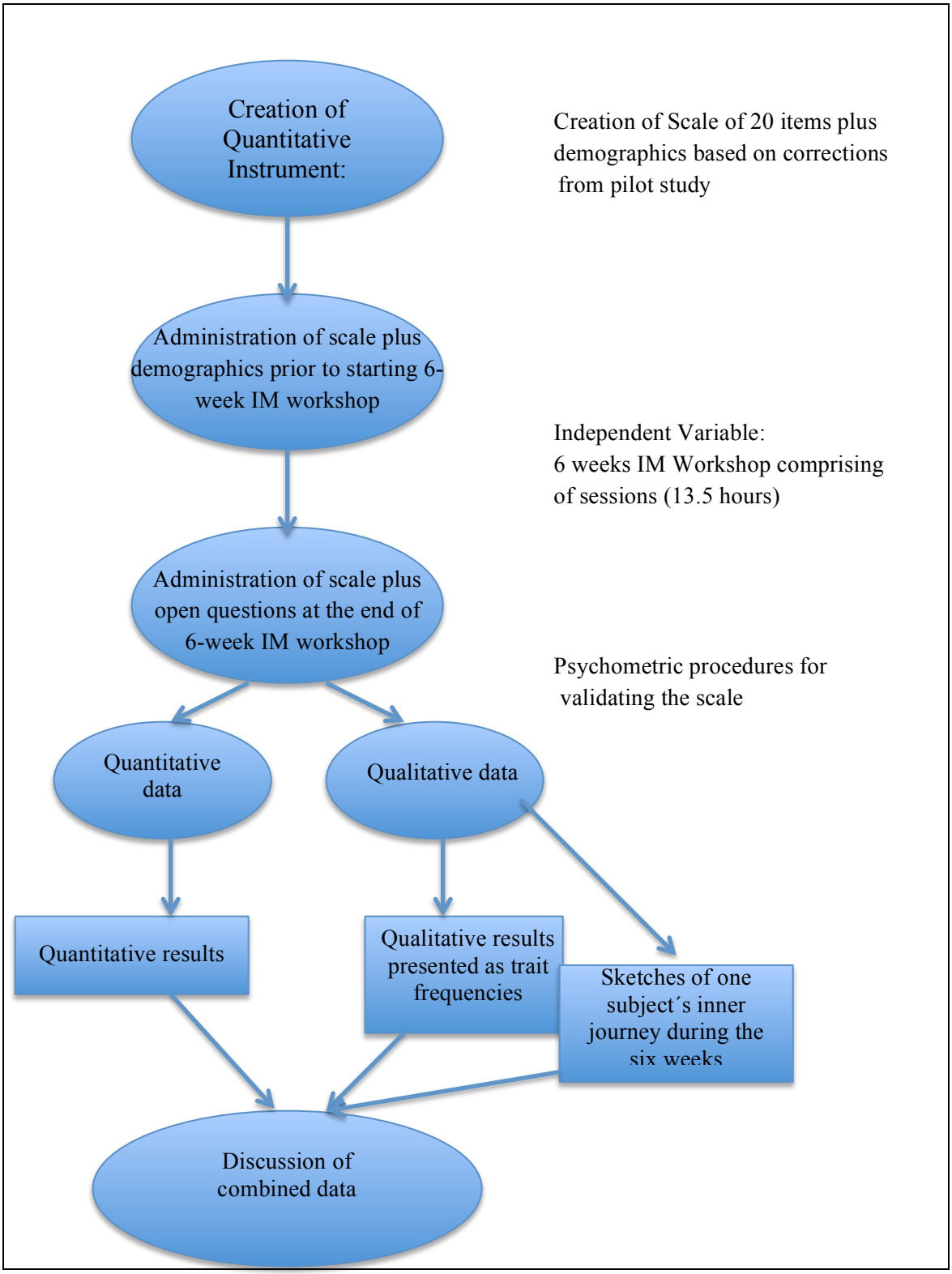


Figure 2: Research Procedures: Phase 2



Statistical Assessment

This section considers the hypotheses in their null form, the procedures adopted in assessing the qualitative data, the question of validity and reliability, and gives a brief account of the way I approached the assessment of the qualitative answers.

Research Hypotheses: Null Form

A) The first hypothesis predicted that the experiencing consciousness of people will not show a trend toward a more feeling-based consciousness after learning the IM method and practicing it a minimum of five times over a 6-week period as measured by the same scale.

B) The second hypothesis predicted that participants who practice the IM method more during the 6-week period will not show a greater shift toward a more feeling-based consciousness.

Test procedures adopted. A repeated measures t-test (paired sample test) was performed on the results to see if there was a quantitative difference between the pre- and post-test scores. A Pearson correlation was also performed to see if there was a relation between number of times practiced and the change in consciousness scores.

Validity and reliability. The specific validation processes used were: face validity, reliability as internal consistency using test-retest reliability, and Cronbach's alpha correlation coefficient.

In science validity refers to the degree to which a measure measures the construct it represents. In spirituality the term validity is used differently. In spirituality a teacher of the inner world is not interested in verifying a theory, but training his or her pupils in a certain way, which will put them in touch with their own inner world and guidance so

they may reach higher conscious states and obtain enlightenment. Their success in reaching higher states is considered proof of the validity of the method. Of course, this requires great dedication and perseverance by the student as well (Arka, 2013).

Assessment of Responses to Open-Ended Questions

I assessed the answers to the open-ended questions to learn more about the inner experiences of others and also to see if there were items that could inform future scale development through inclusion of new items (Rattray & Jones, 2007, p. 237). I also assessed them to see if we could learn more about the process involved when learning IM.

I coded the data by turning the qualitative data into quantifiable data to see if certain experiences were mentioned more than others. Finally, I looked at the qualitative answers to see if the coded data was different for males and females and where the answers supported our results and where they indicated that our scale was not picking up the whole picture.

Description of Participants

To obtain participants for this study, information about the workshops in the form of a flyer was sent to a mailing list of people who had learned the method previously. They were requested to share the information with those friends who they felt might also be interested in learning the method. Information about the workshops was also diffused on Facebook. In addition, I gave a conference about the method in one of the vegetarian restaurants in Madrid.

Prior to attending the workshop, the subjects were briefed that the workshop would form part of a study and that participation in the study was voluntary. During the workshop the subjects who agreed to participate in the study completed the questionnaire

in the beginning of the workshop and then again at the end of the last session. All subjects also signed a form consenting to their participation in the study (Appendix B).

The participants for this study were self-selected in the sense they were people who voluntarily signed up to learn the IM method and participate in the study. As long-term changes in inner consciousness normally require that people actually practice the method on a regular basis, I decided to use only people interested in learning it. All participants paid a nominal sum for attending the workshops. People who were not earning were given a discount. They came from all walks of life, were of both genders and a variety of ages.

Thirty-seven participants started the course, of which 31 completed it. Six could not complete the course for a variety of reasons already discussed in the section concerned with limitation. Twenty-three were females and 8 were males.

Instrumentation

The FCS was administered to 31 participants. As the same IM workshop was offered on different days, times, and places the participants joined whatever workshop was most convenient to them. All workshops were conducted in spacious halls, which permitted the participants to lie down during the relaxation phase of the meditation. In the end there were five groups consisting of between three and nine subjects. All the participants filled in the FCS prior to beginning the workshop. The same scale, but reordered was again applied 6 weeks later at the end of the last class after practicing IM. The first time the scale was applied it also included demographic questions regarding age, gender, and experience with other meditation methods. The scale also included several open questions the second time it was applied (Appendix A). The assertions were the same

as in the first scale, although the order of presentation was changed. A Likert-type scale ranging from 1 to 7 was used, with 1 representing never or almost never and 7 representing very often or always. All participants filled in the scale items the second time it was applied but one male did not fill in the open questions.

Pilot Study

A pilot study consisting of three participants was conducted. Two participants moved in the direction predicted by the hypotheses, but one did not. Two weeks after starting the workshop the person whose results moved in the contrary direction stated that he had overestimated himself on the scale in the beginning, as he had not realized that feeling had so many facets. He was told to fill in the scale the second time in a way that was consistent with his new inner experiences. This, for me, explained the reverse order of the shift found in his results. It also alerted me to a problem concerning some of the statements, as it seemed that they did not stipulate sufficiently clearly the level of feeling that was being addressing in this study. For example, *I am aware of my feelings*, can be taken to mean I am aware of my feelings in my mind, but it could also refer to feelings as bodily sensations. As this study is interested in the latter, I corrected this statement and all the others where I felt a finer distinction was needed to prevent this confusion. For example, *I am aware of my feeling* now became *I am aware of my feelings as an inner experience in my body*. I also added some new statements based on Arka´s work and changed some statements that I thought were ambiguous. The scale increased from the 17 statements that we used in the pilot study to 20 in the final study. Twelve of the statements were essentially the same as the pilot study, although nine of these were made more specific. Three new statements involved clarification of some of the statements that

arose during the pilot study. Two more of the new statements added, previously formed part of the open questions, and by including them in the scale, the need for so many open questions was reduced. The three remaining new statements were based on the talks on feeling-consciousness that Arka gave in India (2015b).

Description of Final Scale

The final scale consisted of 20 items. I dropped two during the analysis phase because both of these were worded negatively and when the participants were filling them out, many asked which way they should go. This indicated an ambiguity in their wording, so I decided to not include them.

As this study is a start in a field in which scientific psychological evaluation is new, future work in evaluating this treatment approach will need to refine the measurement instrument and try to develop a shorter version so that the field can add constructs to the evaluation instrument (A. Kendall, personal communication, January 31, 2016).

Description of Open Questions

The qualitative questionnaire consisted of five reflective questions and an additional question asking whether the participants thought they would continue to practice IM if time, situation, and the need arose. There were two completely open questions in which the participants were invited to add more comments if they wanted to. The list of open questions can be seen in Appendix A.

Data Collection Procedures

The data collection involved two phases. The first phase was described earlier. The next phase involved the giving of the workshop on which the data for this dissertation

is based. As it was originally proposed that other qualified IM teachers from various countries participate in giving the workshop and administer the scale, a protocol of procedures was established in order to standardize teaching methods and the agenda in the presentation of the measuring instrument used (Appendix D).

Data Analysis Procedures

Quantitative Data Analysis Procedures

The whole field of cognitive interviewing in question development has grown from the awareness that it is difficult to develop questions that reflect the construct under consideration without mixing in other constructs that confuse the respondents and the analysis. The eliciting of information is not as simple as it may appear. This explains why psychology uses standardized tests as part of evaluations (A. Kendal, personal communication, January 31, 2016).

A repeated measures t-test (paired samples test) with a significance level is 5% was performed to see if there was a significant difference between the pre- and post-test scores.

Face validity. Face validity was not directly addressed in this thesis, as the field is so new there is no panel of experts to consult. However, the way I derived the scale items from actual experiences of other practitioners of IM may be seen as giving certain validity to the choice of scale items.

Internal consistency of scale items. Cronbach´s alpha uses inter-item correlations to determine whether constituent items are measuring the same construct (Bowling, 1997). If the items show good internal consistency this statistic should exceed 0.70 for a developing scale or 0.80 for a more established scale (Rattrey & Jones, 2007, p. 237). In

the present study, Cronbach's Alpha coefficient was .908.

Summary item statistics. The mean correlation between pairs of items was .35. The lowest correlation was .20. The highest was .74. The negative correlations indicate that with a more sensitive (larger) set of respondents there may be more than one underlying dimension (construct)

Procedures Used for Open-Ended Questions

In this section only 30 participants responded; one of the participants who had filled in the scale online did not complete this section. The answers to the open questions were not very elaborate, but, in turn, were descriptive in terms of certain traits. This permitted the answers to be coded in terms of frequency. Seventeen traits were identified, of which several coincided with the scale items used. A frequency count was conducted. I looked at the frequency of naming a trait in terms of gender. I also calculated the frequency scores based on gender into percentages. Although some traits were similar to each other, I initially left them as separate traits, for sometimes both were mentioned together by the same person, indicating that at least for them, the internal experience of each trait was slightly different. Two people responded in English. One of the traits, "sensitivity" (*sensibilidad* in Spanish) has multiple shades of meanings (Merriam-Webster.com, n.d.b), and this led to interesting reflections, which I go into in the discussion. As some people claimed that prior to learning IM they were already sentient, I identified it as the same trait with part "a" and part "b," with part "a" reflecting more "sensitivity" after learning IM and part "b" reflecting recognition of sensitivity prior to learning IM. I did the same for intuition, as people also claimed they were already intuitive prior to learning IM. I also looked at the data to see if one could recognize

phrases that identified the learning of IM as a process. Unfortunately, open questions did not address the question of process directly. However, the sketches of the one participant do indicate that learning the IM method is a process.

CHAPTER 4

RESULTS

Summary

This chapter presents some of the demographic information of the participants, the null version of the hypotheses, the tests undertaken and the statistical results of these tests. A visual representation of the results of the first hypothesis as a scatter plot and a ladder graph is included. With regard to the second hypothesis, I present a scatter graph showing the lack of relationship found between number of practices and the feeling-consciousness scores. Another table shows the frequencies of the traits extracted from the open-ended questions, which incorporates the number of times each gender mentioned each trait. Another table shows the frequency of naming a trait in percentages based on gender differences. I represent both these tables as bar graphs. Finally, the sketches by one of the participants as a qualitative testimonial of her inner journey over the 6-week period are included.

Participants

Eight of the 31 participants were males and 23 were females. The age ranged from 27 to 72 years, with an average age of 48 years. Twenty-five were Spanish, two Argentinian, and one from Colombia, Brazil, and Italy respectively. At the time of the study, they all were living in Madrid, where I conducted this research. Although all subjects filled in the scale items, only 7 males and 23 females filled in answers to the open questions.

Results Based on the Scale and the Open-ended Questions

Hypotheses

A) The experiencing consciousness of people showed a significant difference in a trend toward a more feeling-based consciousness after learning the IM method and practicing it a minimum of five times over a 6-week period as measured by the same scale.

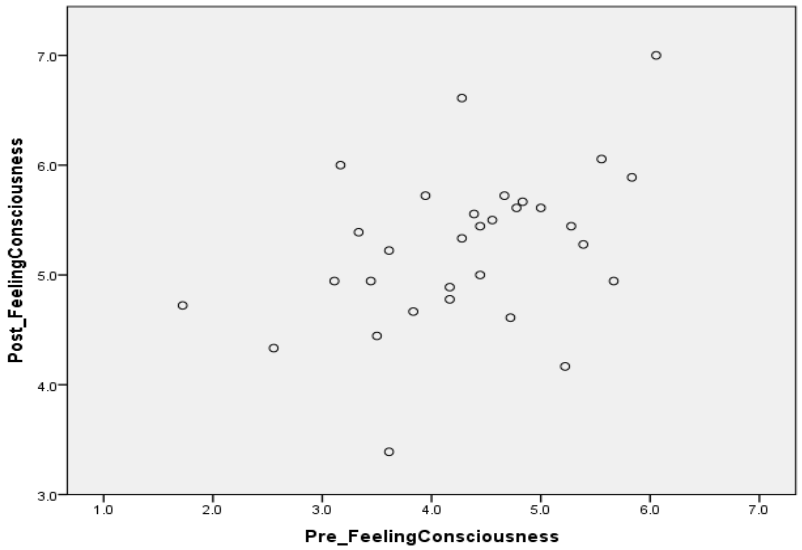
B) Participants who practiced the method more during the 6-week period did not show a greater shift toward a more feeling-based consciousness as measured by the same scale.

Paired Sample t-Test: Pre- and Post-Feeling-Consciousness

A paired-samples t-test was conducted to compare feeling-consciousness on the pre-test and post-test. There was a statistically significant difference between the pre-test score (M= 4.3, SD= .99) and the post-test score (M= 5.3, SD= .72); $t = 5.4$ (30), $p < .001$. The mean post-test score was .9 scale points higher than the mean pre-test scale score. The 95 % confidence interval is from .6 scale points to 1.3 scale points with a statistically significance at the .001 level[4].

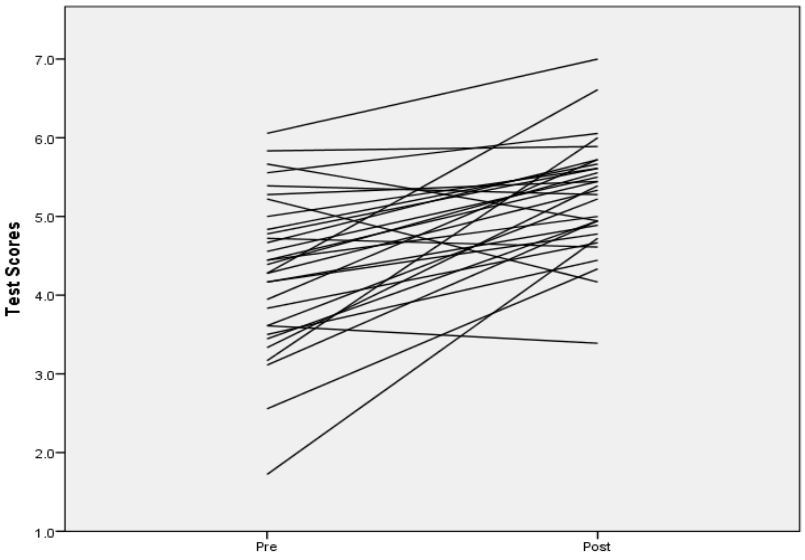
[4] Statistically significant means that taking into account the amount of variability the observed result is not readily attributed to mere chance variation. Statistical significance does not necessarily imply that the observed difference is meaningful.

Figure 3: Scatter Plot of Results



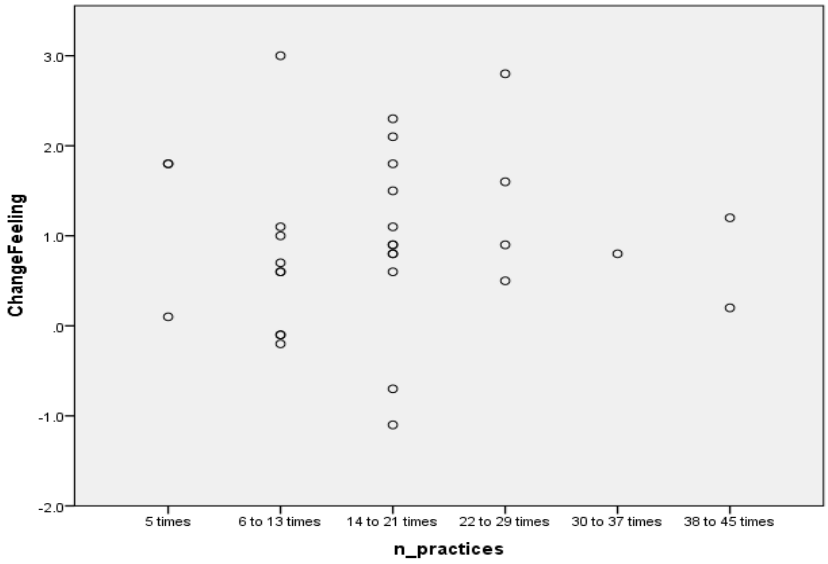
Notice that although there is somewhat of a lower left to upper right pattern, the points are far from being along a line.

Figure 4: Ladder Graph



a. Rotation converged in 3 iterations.

Figure 5: Changes (shifts) in Feeling-Consciousness and Number of Practices



The vertical axis shows how much score changed (shifted) from pre-test to post-test. The horizontal axis shows how often participants practiced the IM method. Notice that there is not an observable pattern to the positions of the point. This is borne out by the tiny Pearson correlation; r (29) = .01, ns.

Results Based on Open-ended Questions

Table 2: Frequency Table Based on Coded Data from Open-ended Questions

(30 Respondents)

Item	Males	Females	Total
1 a) More Intuitive after learning IM	3	19	22
b) Intuitive prior learning IM	3	4	7
2 a) More Sensitivity after learning IM	1	20	21

b) Sentient/Sensitive prior learning IM	1	15	16
3) Can work with emotions/not judge	2	15	17
4) Tranquil	4	10	14
5) Present/centered	1	11	12
6) Peace	3	8	11
7) Connected/ know or aware of myself	3	7	10
8) Clarity/lucid	3	5	8
9) Happy/blissful	2	6	8
10) Present in my body	3	4	7
11) Awareness of breath/emotions	1	1	7
12) Relaxed	1	5	6
13) Confidence in life/like a child		5	5
14) Energy feeling (tingling)	1	3	4
15) Thoughts are calmer	1	2	3
16) Calm		3	3
17) Listen to the body	1	1	2

Figure 6: Bar Frequency Graph Based on Coded Data from Open-ended Questions

(30 Respondents)

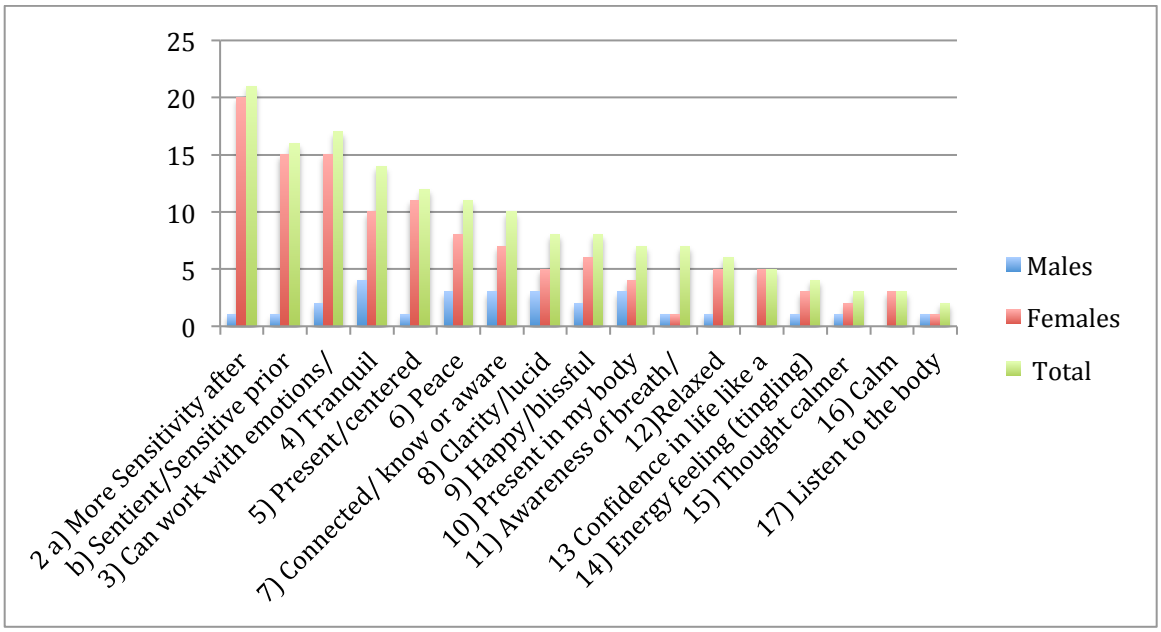


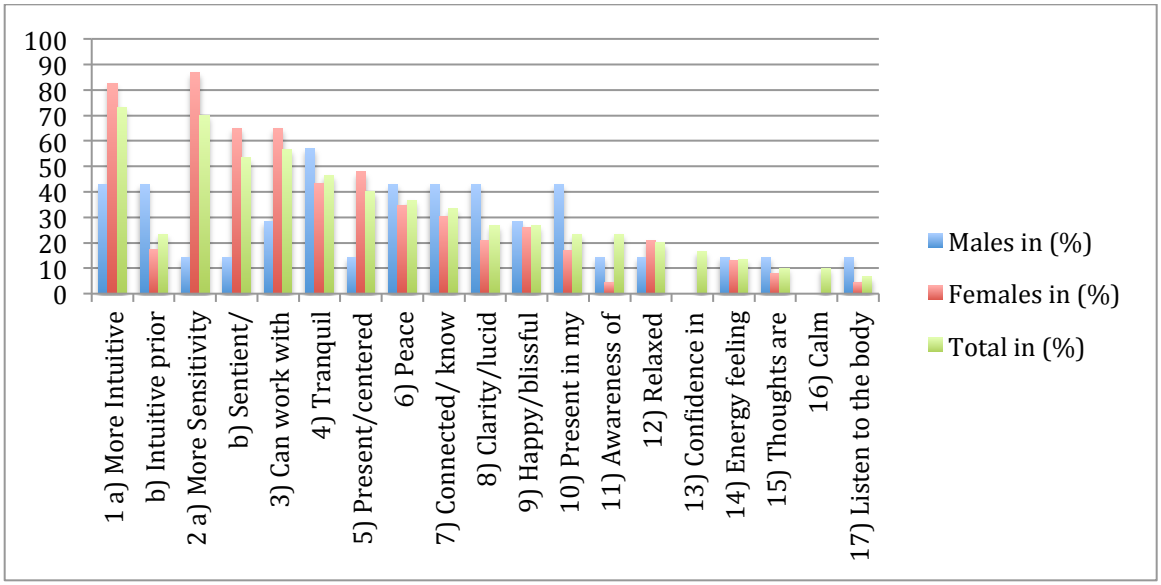
Table 3: Percentage Table based on Coded Data from Open-ended Questions

(30 Respondents)

Item	Males in (%)	Females in (%)	Total in (%)
1 a) More Intuitive after learning IM	42.8	82.6	73.3
b) Intuitive prior learning IM	42.8	17.3	23.3
2 a) More Sensitivity after learning IM	14.2	86.9	70
b) Sentient/Sensitive prior learning IM	14.2	65	53,3
3) Can work with emotions/not judge	28.5	65	56,6
4) Tranquil	57.1	43.4	46.6
5) Present/centered	14.2	47.8	40
6) Peace	42.8	34.7	36.6
7) Connected/ know or aware of myself	42.8	30.4	33.3
8) Clarity/lucid	42.8	21	26,6
9) Happy/blissful	28.5	26	26,6
10) Present in my body	42.8	17	23,3
11) Awareness of breath/emotions	14.2	4.3	23.3
12) Relaxed	14.2	21	20
13) Confidence in life/like a child		21	16.6
14) Energy feeling (tingling)	14.2	13	13.3
15) Thoughts are calmer	14.2	8	10
16) Calm		0.13	10
17) Listen to the body	14.3	4.3	6.6

Figure 7: Bar Frequency Graph in Percentages based on Coded Data from Open-ended Questions

(30 respondents)



Practice of IM

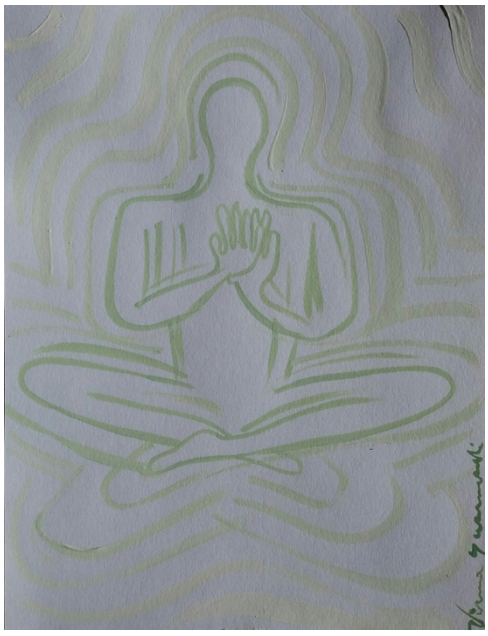
Twenty-six out of 30 people said they would continue to practice IM. Four said they might practice it if time and the occasion arose.

Qualitative Results

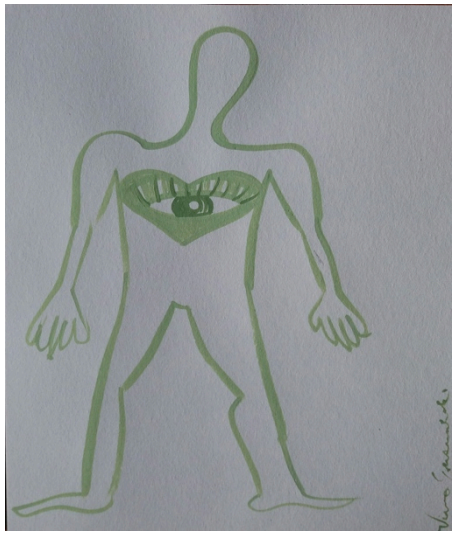
Here I present the seven sketches one participant made to show her personal journey as the training went on.

Figure 8: Seven Sketches as a Testimonial of One Participant´s Inner Journey

A) **B)**

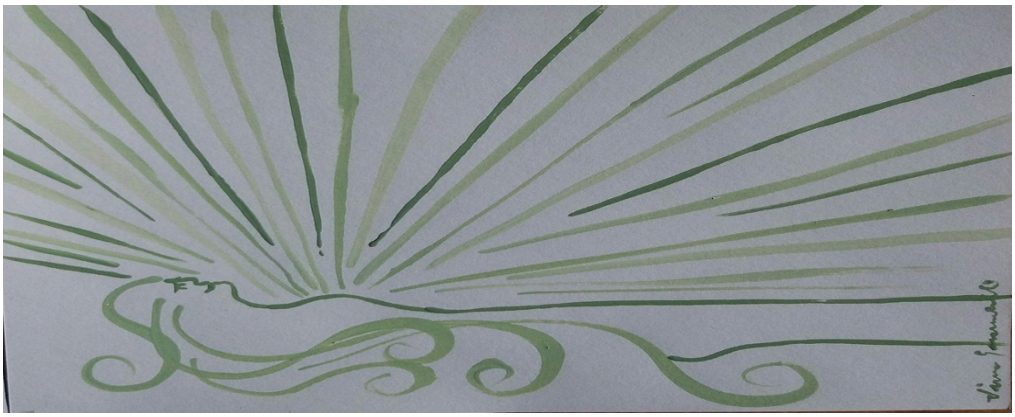


C)

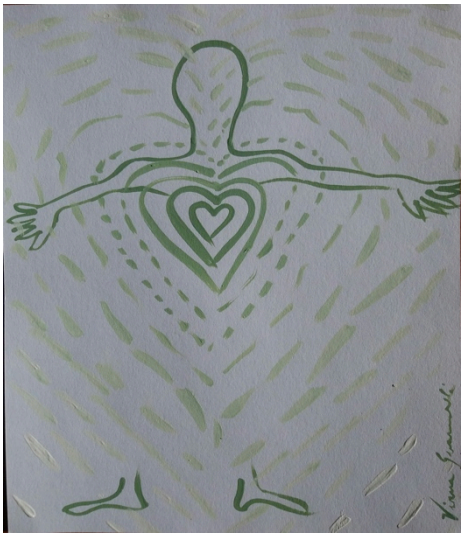


D)

E)



F)

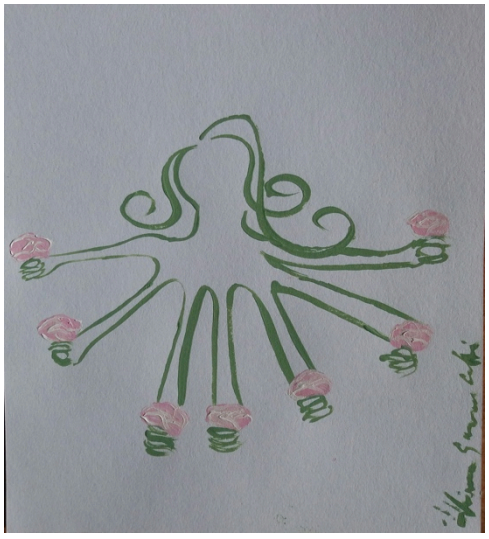


F

F

F

G)



CHAPTER 5

SUMMARY, DISCUSSION, AND RECOMMENDATIONS

Summary

The central question of this dissertation was "why the heart?" To answer it, I incorporated two different but complementary approaches; research of the literature into the nature and role of the heart and an exploratory case study to find out what happens when one meditates on the deeper Self via the heart using IM. Both aspects were included, because I also wanted to understand why many meditation methods like the IM method use the "heart" rather than for example the "liver," as the focus of attention as part of their practice. In addition, I also hoped that the case study would throw some light on the nature of consciousness. Like La Tour and La Tour (2011) suggest, I feel that only information derived from subjective inner experiencing of people who have gone further than their thinking minds can really inform us about the nature of consciousness and its possible levels.

In this study I used additional ways of doing science. In the literature review the comparative method of Goethe was applied to understand more about the invisible or metaphysical forces that might be behind the physical development of the embryo, including the heart. The review generated many insights and propositions where the "heart" plays a fundamental role. Among others, these insights involve the ontological development of the embryo, evolution, pulsation, and creation, the application of physical principles to the heart, sentience, and consciousness as properties of the soul and the nature of thinking and mind.

The multi-methods case study showed that the IM method produced a significant

shift toward a more feeling-based consciousness as measured by the FCS. This scale includes items such as unity, peace, intuition, positivity, awareness of emotions, and connection to one's inner Self, sometimes expressed as soul, inner being, or atman. The investigation involved a repeated measures design conducted over 6 weeks. Preliminary psychometric procedures in validating the scale were also performed. Answers to several open questions also indicate there is a possible link between increased sensitivity and intuition, particularly in women. The men remarked that the method brought about an increase in intuition, tranquility, peace, clarity, and presence in their bodies. The results suggest that the consciousness has more than one level and that participants can change their inner experiencing consciousness through using the IM method. These results are tentative due to the small sample size, especially those concerning gender.

Discussion

For ease of reading, I have divided the discussion into two sections; one involving insights, reflections, and/or propositions derived from the literature review and the other concerning the case study. The two sections are related through the "heart," but as they have been approached differently in this dissertation initially, I maintain this distinction here. However, as they overlap, I conclude with a brief discussion on how the two sections embrace one another.

In this discussion I justify presenting my thoughts as insights, reflections, and/or propositions on the grounds that the nature of the literature review and the case study was essentially exploratory.

Insights, Reflections and Propositions Based on our Literature Review

I have divided this section into the main areas that were contemplated in the

literature review.

Insights Related to the Embryo

Many people are fascinated about what happens during near-death experiences in the hope to learn more about our true nature and what happens when we die. However, few people seem interested in learning about our true identity by studying the embryo, the "relation" between the embryo and the heart and the very beginnings of life itself. Looking at the developing embryo through the eyes of van der Wal is exciting and truly illuminating. Goethe's comparative method of doing science also helps us to go beyond the physical and to get a feel for the actual forces that shape the embryo, including its appearance. The more one looks at the embryo, the more one realizes that even the so-called solid, is not so solid with the human embryo going through different stages reminiscent of the four main kingdoms of nature. This is redolent of the work of Haeckel (2001), and I recognize his contribution to a "sequence based phylogentic embryology" (Richardson & Keuck, 2002, Abstract). However, here I also put an emphasis on the different kingdoms as recognized by Anthroposophy.

Based on primary observations of others, I propose that not only does individual human development (*ontogenesis)* mirror the four large phases of development of humanity as a whole (*phylogenesis)* in terms of dynamics as presented by van der Wal, but that the varying forms the human organism takes during its embryonic development can be seen as mirroring that of the various kingdoms. First the fertilized egg is round and like “a cut off space ship” (van der Wal, 2014, p. 36). During this phase the organism is like a mineral ball where growth takes place on the inside. During the plant phase, if we accept the trophoblast as being part of the embryo as suggested by van der Wal, it is

easy to see how the embryo grows and puts down its roots first, like any plant. Plants too do not have an anatomical center, with growth taking place through their growing tips; roots first and then the outside of its stem and finally the leaves (van der Wal, 2014). This can be observed in the germinal disc of the developing embryo with blood flowing up the outside of the disk to its cranial end.

Then on day 17, when the heart *primordium* starts pulsating, one can behold how the plant phase is clearly over, for instead of growing upward, the heart doubles and moves toward the interior of the organism. Here, tangible pulsation can be seen as heralding a new phase. During this new animal phase, we discovered how the structural development of the organism as represented by cardio morphology and the formation of the vertebral column, recapitulates the evolutionary history from worms to fish to reptiles to mammals, and invertebrate to vertebrate forms; an evolution that occurred over millions of years (Corno, Kocica, & Torrent-Guasp, 2006; Scheibel, 1997). Curiously the embryo first resembles that of a worm with its flexible notochord; then it grows pharyngeal arches, which later disappear. This is followed by a tail, which is also later reabsorbed. Then when the four-chambered structure found in birds and mammals slowly starts appearing, one can observe interdigital zones that form into hand plates with visible finger radiations and footplates where the toe primordium become visible (The Virtual Human Embryo, 2011d & e). Then at Carnegie stage 20 when the embryo has a length of between 18 to 22 mm and an estimated post-fertilization age of approximately 49 days, one can observe that the upper limb has become longer and slightly bent at the elbow. "The hands are still far apart and the fingers are short, stubby and slightly curved over the cardiac prominence. The interorbital groove is conspicuous" (The Virtual Human

Embryo, 2011f). The embryo now truly has a more human like appearance. Finally, the anatomical-morphological development of the human embryo permits the embryo to unfold. Coming upright permits the center of gravity in man to be inside the body. In contrast to animals and primates, this allows humans to experience a center inside of themselves. This is also reflected in the concept of self (van der Wal, 2014).

It is not only the heart and the backbone that recapitulate evolutionary morphological development, but, as we have seen, the whole embryo takes on certain aspects of the different stages of mammalian development. This remarkable occurrence is visible and can be seen by everyone who really looks at the changing shapes of the embryo. Pictures of the different stages of embryonic development are available from a great variety of sources, based on the Carnegie stages. It does not need testing, only recognition through observation.

The following comment from Brassard also points to the link between time and structural evolution. He states:

> There is a very interesting parallel between this notion of time and the notion of structure evolution. I found this relation in the evolution of the structures of images, image of all living forms, objects that grew during an ontogenic process. If you consider an image as a 2D scalar field, the mathematical optimal way to remove its structure (i.e., the critical points) it is to Guassian filter it. This corresponds to the heat diffusion of the image where diffusion time correspond to spatial scale as variance of the Guaussian convolution kernel. Now if you consider that the structures of this image had to be created in the inverse direction of its optimal structure destruction. I have empirically observed this process for

> image of all kind of natural organism, human bodies, trees, animals etc. What you observe is that the sequence of image structure creations of each of these objects from coarse to fine spatial scale recapitulate the sequence of structure creation of the surface of these objects during their ontogeny, their morphogenesis. There many mathematical reasons why it is so, all the axis of growth correspond to ridge and river created at the symmetry breaking point of the structural evolution of the image in scale space. The classification of all image structure according to their sequence of formation become like a tree of life and visual perception has to proceed along the ontogenic sequence which is built-in in the visual system. (Brassard, 2016b)

Brassard points to possible mathematical reasons for axis of growth, which is somewhat similar to the spatial axis discovered by Burr and which deals, as we have seen, with the possible arrangement of form in space. However, he does not consider the origin of the images themselves, or the possible role pulsation has in linking these images. In addition, he does not speculate on the possible role heart dynamics have on "creating" the apparent form of the entity, which is then arranged along the axis of growth, as least in organisms that possess a pulsating heart. Brassard is talking of arrangement of form and not the origin of form. In the comparison in the literature review we discover how the structural development of the organism, as represented by cardio morphology and the formation of the vertebral column, recapitulates the evolutionary history of worms to mammals. It would also be interesting to see if the filtered images of the human form that Brassard refers to, also reflect the other kingdoms that van der Wal identifies in his vision to see if they are consistent with the evolutionary perspective

described in this dissertation.

From this overview some scientists might argue that a worm does not have a heart, as we normally know it. Worms, however, do have various "pseudo hearts," depending on the species (Edwards & Bohlen, 1996, p. 17). I do not feel this distracts from my argument, as the worm is an organism that has a system based on blood. The various "pseudo hearts" might well be precursors for different energy centers found along the spine and which are acknowledged in the *chakra* system. Certainly the *chakra* system recognizes the "curled up snake" at the base of the spine, often referred to in the Indian theory as the *kundalini;* the potential energy of this *curled up snake* is what is seen as rising and fully opening the chakra system (Jung, 1996). When the embryonic development is scrutinized, the basis of this consideration becomes clear, for during the reptile phase (days 30 to 40) the human embryo manifests a tail, which later is reabsorbed between days 41 and 44. I also propose that along with the considerations of van der Wal this is probably one of the clear differences between the human species and primates. The rising of this energy is said to occur thanks to spiritual practices, but it can also happen spontaneously. It is this system that allows for personal and spiritual growth, right up to the highest level of understanding and experience (Johari, 2000).

Insights Related to Homo Sapiens: A kingdom In Its Own Right?

Like van der Wal I do not hold that man is just another type of primate. Certainly the human being is the only species capable of not only discovering its own true nature or Self through inner reflection, but also of experiencing it (Arka, 2013). In this sense human beings are the only species that that can undertake the spiritual journey and transcend their past and limiting beliefs thereby changing the experience of all that has

happened to in their lives. In this way they can recover their innocence and connect with Higher Nature again. Ironically, maybe the human being is the only species that loses this connection and then has to consciously find it again.

As this study has previously suggested, we are linked horizontally to our personal past through blood, whereas we are linked to our ontological and phylogenetic past through pulsation. Pulsation also links us vertically to a conscious Mind expressing itself through a creative force that manifests It Self as different pulsating forms. During development, the human being is related to primates, but it is also related to all mammals, birds, reptiles, fishes, worms, and the vegetable and the mineral kingdom. This, however, does not preclude Homo sapiens forming a unique kingdom in its own right.

We may remember van der Wal´s words that an increase in complexity does not bring about an increase in being. Humans are the only being that can realize there is only one being or Self, manifesting in different forms. The embryo passes through all the kingdoms during its ontogenetic development, as has been shown here. Even though the mineral phase can be seen as being more "dead than alive" (van der Wal, 2014) and as being "outside of time," in mammals this time is always 7 days, regardless whether we are talking of an elephant, mouse, or human being.

This leads me to speculate if the 7 days mentioned in Genesis has something to do with this. In the introduction I shared how yogis meditate on their own nature so that they may generalize about the nature of Nature outside. In the Old Testament, God is seen as creating the world in 6 days and then on the 7th day He rests; His work is done. In the developing organism, it is on the 7th day that *nidation* takes place. The developing organism "rests" on the walls of the uterus of its mother. A more miraculous process one

cannot contemplate or behold. A soul, the Self, is coming closer to material reality. Scientists really know very little about what goes on during those 7 days. Visually, of course, they can observe how cleavage takes place, but what the process means is still a mystery. It could mean that higher forces are laying down some sort of ground plan for the developing organism. Maybe the "world" is being created in 7 days?

Insights Regarding Evolution

The way of looking of van de Wal (2014) gives one a new perspective on the term *evolution*, where the human embryo goes through the four principle stages or kingdoms of Nature, to then incarnate into human form. It seems that to evolve and grow one has to "die" to the stage before. This suggests that "nature is not only evolutionary but also revolutionary" (Arka, 2005, p. 64), and it also implies that to arrive at the next evolutionary stage we too have to "die" to evolve, either physically or though spiritual practices in life. This is probably related to traditions that talk about ego transcendence or rewinding of one´s personal evolution.

The considerations outlined suggest evolution involves the *evolution of consciousness* where we pass from mineral to plant to animal to human beings to finally attain the highest potential a human can attain while still maintaining a body. Many spiritual traditions talk of this latter stage as "illumination" (Saint Teresa of Avila, 1915; Louchakova-Schwartz, 2013) and it involves the ability of humans to transform themselves into "light beings" or "beings of light." This involves uniting mind, heart, and soul and rewinding one´s past (Arka, 2013) or transcending one´s ego (Louchakova, 2007c). It also involves the discovery of one's true nature or Self. It is this that then paves the way in uniting the exterior universe through respect and love (Arka, 2003).

These reflections might also give clues on what happens when human beings "give up" their body on death.

Insights Relating to Applying Physical Principles to the Heart

In this dissertation I uphold the idea that physical principles as applied to the cosmos cannot be fundamentally different to principles applied to physiological systems. However, I do not think that physicists have necessarily discovered all the laws or principles of nature. I feel that the application of physical principles to physiological systems might be still in its infancy. In this dissertation I suggested that the subtle energy system probably works according to some of the physical principles found so far, and probably others still to be discovered. It seems to me that when technology develops further and/or technologies already developed, like the PIP and GDV, are accepted by mainstream scientists, then there will be an expansion in our understanding of the human body.

In the section on the heart this researcher showed the possibility of applying some of the principles of physics to the developing heart. Based on the findings of Torrent-Guasp (1973) regarding the helical way the heart is folded, I proposed that the heart might act as an electric coil and therefore the magnetic field that it produced is greater than if it was not folded in this unique way. I also suggested that the iron in blood under certain conditions could be involved in amplifying this field, as well as the idea that blood might be charged in this process and play a specific role or roles during embryonic development. These suggestions now need to be verified by other researchers

Insights Regarding Pulsation and Creation

Arka´s view of the origin of the human heartbeat led us to a cosmic sea of

pulsating particles. When one combines this with the image of *pure pulsation as* a "bottled up heart beat" or else as "a spread out pulsation" (Hofmann, 1959, p. 75), we arrive at an image of the cosmic sea consisting of "bottled up" heartbeats, including our own pulsating heart. Pulsation is also found at our core, "it is not only spiritual but also tangible" (Arka, 2015a). "Matter, long thought to consist of particles, must be accompanied by waves and thus partake in their nature" (Broglie as cited in Hofmann, 1959, p. 80). This is similar to the image one hears from spiritual teachers that if the ocean is Divine, how can the waves be any different.

Combining pulsation being the core property of particles and the pulsing heart as being the core of our existence, Arka comes to the conclusion that "*Pulsation is the underlying core principle and property of universal existence, cosmic existence and local existence"* [emphasis added] (Arka, 2015a). In contemplating the source of pulsation, one is led to the conclusion that all matter originates and exists only by virtue of a force that brings all particles to pulsation and behind this force is a *conscious Mind.* This is consistent with Planck, for he assumed that there was "a conscious and intelligent mind" behind the force that brings "an atom to vibration and holds this most minute solar system of the atom together" (Planck, 1944).

In resume, through our pulsating heart we are not only linked to the very origin of the universe, but also via a creating force to an *intelligent conscious Mind,* the matrix of all matter. A Creative Intelligence that is expressing It Self through ever-changing pulsating forms, from elementary particles in the primordial ocean to the solar system to man and beyond (Arka, 2015a,).

Insights Regarding Sound

From the literature review the role of sound in creation, including the creation of the body, human or otherwise, is largely an area that has not been fully explored by science. In the comparison between the developing heart and the developing notochord, including the CNS, it was found that with the advent of the pulsating heart, the morphological ontology of the embryo mirrors the different broad phylogenetic stages of creation from worms to mammals and invertebrates to vertebrate forms. I suggest that sound might play a key role in these changing forms. And again one gets back to the essential nature of the Universe as pulsation. However, like in Vedic non-duel philosophy, this researcher also recognizes it is really impossible to separate the force that creates, the intelligence behind this force, and the universe itself. To highlight this, I repeat the following quote:

> Thus the essential nature of the Lord is perpetual *spanda* (creative pulsation). He is never without *spanda.* Some hold that the Highest Reality is without any activity whatsoever. But in such a case the Highest Reality being devoid of activity, all this (i.e. the universe) will be without a lord or Creative Power. (Singh, J. 1992, p. 10)

His view suggests that through the pulsating heart, "bottled up" or tangible, the Highest Intelligent Mind or Consciousness is present in us as well as beyond us. It is also present in all forms, as consciousness.

Insights Regarding the Pineal Organ and the Heart as a Possible Oscillating System

I have touched on the pineal organ and suggested that together with the heart, it may act like a *crystal oscillator* system. In this way I feel that messages could be

communicated in a more subtle way throughout the body. I suggested this could be related to somatogenesis and also to overall body functioning. I also hinted this could be how information from outside the system is communicated to the system. Obviously, this might work both ways and be a way the organism communicates with the outside world. This level of communication would go on below our level of consciousness. However, I feel that one can become conscious of this system and use it consciously as a way of communicating with others through focusing our thoughts and projecting them through the third eye. This is talked about in different spiritual traditions. Anybody who cares to try, just remember whatever we send out, we are the first to receive.

Insights Regarding Heart Transplant Patients

With the recognition as the heart being the organ of incarnation, the debate of the ethical implications of heart transplants is opened. Although I am not about to jump on this wagon here, I do feel that this debate should not be avoided either. Here I take a practical point to view. As heart transplant patients already exist, and some of them are having experiences that defy scientific understanding, they can tell us not only about how memory is stored but also how it can be accessed or retrieved. This type of research may also be beneficial to people who are "living for the two of us" (Skofield, 2012). Experiences of these patients also points to the possibility of other levels of consciousness, which are not normally acknowledged from the "outside in" position. Nevertheless, these experiences are a reality to many people and include dreams and visions, which contain messages from the subconscious.

In methods where the practitioner is seen as rewinding their evolution of all that has happened to them, what occurs in the case of heart transplant patients? Whose history

would they be rewinding? Avoiding these questions will not make them just go away, I feel they need to be asked.

Insights into How Memory Might Be Stored

This is another field that was addressed in the present dissertation. Memory might be linked with torsion fields. How torsion fields are related to the heart is, however, an area that still needs exploring. However, it seems as though our personal history might influence this field and filter right down to the more material level. The benefits of rewinding our history have not been investigated yet by science. We suggest that the shape of the helical nature of the heart might be influenced ever so slightly by our history. In this way our habits and history might have an overall repercussion on heart functioning. There also might be a link through entanglement between other helical shapes in the body and maybe even beyond. In fact, it seems that everything is "entangled," both the individual and all that goes on in him or her, and the Universal itself. If I change one habit in me, my whole system changes. Why? Well, although this is a tautology, it is because it is whole. This is why spiritual traditions put an emphasis on changing ourselves, rather than on changing others.

It has been shown that techniques that involve thinking positively and creating positive scenes (HeartMath Institute, 2016d, The Quick Coherence Technique) have a positive effect on the heart-brain relationship (McCraty & Zayas, 2014). However, this is not the same as rewinding one´s history, which is seen as leading to discovery of one's true Self or soul. But this also needs testing.

Insights into Sentience and Consciousness as Properties of the Soul

Science does not generally talk of the soul but it is beginning to feel more

comfortable with the term electric fields. However, reducing soul to electric fields is a mistake, which gives rise to a new type of reductionism, rather like seeing consciousness as only being a property of brain. I feel that consciousness is an area that does not require armchair speculation (La Tour & La Tour, 2011), but information based on phenomenological experiences of people who have gone further than their thinking mind.

Arka´s theory acknowledges different levels of consciousness and this cuts through many problems regarding conscious for it acknowledges both a thinking mind and a Feeling Heart. I also think that the etymology of the English verb "feel" might be one of the reasons why some people might have a problem with relating the verb *feel* to the heart. In late Old English the verb "to feel" is "to have a mental perception," from Proto-Germanic **foljan* (source also of Old Saxon *gifolian*, Old Frisian *fela*, Dutch *voelen*, Old High German *vuolen*, German *fühlen* 'to feel,' Old Norse *falma* 'to grope')" (Online Etymology Dictionary, n.d.a., Feel, para. 1). The translation of the verb to *feel* into Spanish as *sentir* avoids this difficulty for Spanish speaking participants as the etymology of this Spanish verb comes through the Latin root *sentire* which originally meant to listen, but later came to represent all the senses (Etimología de Sentir, n.d., Sentir, translation of para. 1). This later acceptance is related to the etymology of the English verb to "sense": "'to perceive by the senses,' . . .Meaning 'perceive (a fact or situation) not by direct perception' is from 1872" (Online Etymology Dictionary, n.d.b, Sense, para 2).

Arka also talks about the senses below the senses, or mystical senses, which are not reliant on our physical senses but can be awakened through meditation and are inner experiences. It is basically that level that I am talking of in this study. After the pilot

study, to highlight this difference I changed the wording of some of the scale items by including the phrase "as an inner experience." I did this, as it is the ability to feel or to sense as an inner experience that the IM method is said to awaken. I touch on this topic again in my concluding remarks. As this is also related to emotional based thinking, I also touch on it below.

Insights Regarding Emotional-Based Thinking

Inner experiences of thinking link it to the mind, which is often also associated with the brain. Interestingly, when one looks at the evolution of embryo we discovered that the blood system was formed prior to the neural system, and was already in place in the cranial end of the embryo. I also discovered that the neural system "parallels" the blood system. "It has been estimated that nearly every neuron in human brain has its own capillary. . . . The total length of capillaries in human brain is about 400 miles" (Zlokovic, 2005, p. 178). Coupling this with Descartes idea of seeing "the heart as a furnace" (Descartes as cited in Rosch, 2014, Where do Emotions Originate section, para. 1), gives rise to some intriguing speculations. What comes to mind is that when blood is heated in specific ways specific types of "thoughts" may be given off. According to the laws of physics heated molecules rise; we only have to thinking of heating a house where the heat rises to the ceiling. If blood is excited or heated excessively, for example when a person is angry, the blood rises in the body and the person becomes red in the face. Looking at the body maps of Nummenmaa et al. (2013) it is easy to see how different emotions affect different parts of the body, including the head area.

This is a largely unexplored area, which could reveal how emotions, experienced initially through the heart system as feelings (groups of sensations), could also be

reflected in the neural system of the brain, which then gives rise to thinking. The naming of the sensations could be learned. In this sense words might be a short hand for inner experiences of an emotional nature, and thoughts could be inner use of words tied to groups of sensations. The sensations, as represented by specific topographical areas, behind the word linked to an emotion would be more or less specific, like Nummenmaa et al. (2013) demonstrated in their study. In this sense the excitation of a certain part of the neural system could be seen as the "radiance" of a part of the blood system, and thoughts to do with emotions, which are associated with mind, could be an even more subtle radiation of the blood and neural system. This could be the origin of *mind*. In this sense mind would be all over the body even though it would be principally associated with the brain.

This gives a new take on thinking, especially thoughts that arise from emotional activity as groups of sensations and then are named through the use of words. It also gives a new take on meditation methods that concentrate on the heart and are feeling-based, like the IM method.

Insights Regarding "Yoga" or Conscious Awareness

The mystical branches of the different religions involve union with the source of creation, sometimes referred to as God, Higher Nature, Allah or the Beloved. This is the true meaning of *yoga,* which means union or *to yoke.* We have discussed here how the source of creation from the Eastern perspective is Consciousness, which, according to Arka's definition, is expressing It Self through all creation. Arka also defines the part of the person who undertakes the journey as "I ego awareness," and he maintains that to find our true identity, we have to look beyond or below our surface mind to discover our true

Self. To find their way back “home” and union between “I ego awareness” and Consciousness, the practitioner has to begin a journey, and the way we have considered here, is the way below the rational mind; a journey from mind to Feeling Heart to pure Consciousness. During this journey to union, Arka’s theory suggests practitioners who go below their mind will go through six main levels. However, in the introduction, it was also suggested that there might be intrinsic benefits to participants who start the journey and connect with their Feeling Heart. So let us now turn to find out what happened in the case study.

Insights and Reflections Based on the Case Study

This study revealed a significant difference in trend toward a more feeling-based consciousness after participants learned to go below their thinking minds using the IM method and practicing it a minimum of five times over a 6-week period, as measured by the FCS. This indicates there is a different type of consciousness available to us that is characterized by certain common traits. This change is consistent with the 3rd level of consciousness talked about by Arka in his theory, as well as the aim of the IM method, for it invites the thinking mind to come down to heart area in the center of the upper chest while using the *Jñana* mudra.

These results do not prove Arka's theory, as the scale used is still being developed and as yet little is known about the factor "feeling" which it is said to be measuring. The results are also tentative, as the sample size was small and the developed scale needs to be refined further. There are also no results from other studies into the IM method with which these can be compared. This study is also concerned with the initial levels of Arka´s theory, not the theory as a whole.

Nevertheless, the significant difference found indicates that the IM method does bring about a change in the experiencing consciousness of the people who practice it. However, the scatter plot of the results does not show a straight line but variability in the results. The answers to the open questions confirmed many of the scale items, such as feeling of peace, being centered, aware of oneself, present in one's body, thoughts are calmer, and feeling of energy. The answers to the open questions also make one aware that some concepts like calm, tranquil, thoughts are calmer, are inner experiences of a slightly different order, as sometimes the same respondent mentioned all three variations. This also demonstrates one of the problems of reducing inner experiences to a limited number of scale items.

Answers to the open questions also indicated a possible link between increased sensitivity and intuition, particularly in women. In men their answers suggest an increase in intuition, tranquility, peace, clarity, and presence in their bodies. These gender differences have to be taken with extreme caution, as only seven males answered the open questions and this is too small a sample from which to generalize. Women are generally more present in their bodies, as physiologically with menstruation, their attention is often drawn to sensations in the body. So, in this sense, men and women start from slightly different inner bodily experiences. However, presence in one´s body seems to be only one aspect of feeling-consciousness.

I did not find a correlation between the numbers of times the method was practiced over the 6-week period and the change in feeling-consciousness scores. This indicates that something else might have been going on. For this researcher there is another factor that is probably vital to the outcome, and that is a deep desire of

participants to connect with their Self, soul, or inner being. In a previous workshop one person who really had a desire to connect, had a deep emotional experience in the initial stages when introduced to the gesture from mind to heart, and for him this helped established a connection with his inner being on a very deep level. Furthermore, Arka (2013) suggests that one meditates when one feels the urge. It is not purely a physical discipline where inner spiritual experiences depend only on the number of times one practices the method.

These results indicate that training in IM can increase one´s ability to access one´s inner feeling layers of consciousness. However, as words and numbers are only symbols for reality and the fact that the scale was only filled in twice, the results do not reveal this training as a process. On the other hand, the sketches produced by one of the participants do indicate the process that went on in her over the 6-week period, but in a non-quantifiable way. She described each sketch in her own words, which I include here. In sketch A, she had "an expansion of consciousness from the heart beyond her material body." This was during the first meditation session. In the second session (sketch B), her hands opened her sight "to see the whole cosmos," to see the "stars and beyond." At the same time, she lost her "experience of body weight." Sketch C does not correspond to a session of meditation, but represents a state of consciousness, which had become permanent. She described it as if "my vision now comes from the heart." The next two sketches D and E come from the third meditation session and came "out of" the music that was played during yoga *nidra*, the stage of lying down and relaxing. From her breasts she saw "branches coming out and also other branches reaching down" to her. "Everything formed one network." At the same time, it was as though my heart "was

opening and emitting rays of incorporeal light expanding in all direction." In the fourth session, there was now "permanent love through the heart, very simple, only love." And in the last session, there were just arms sharing her gifts. She is offering, "pink flowers to all." Her energy "was transformed," it was "transparent." She also shared with this researcher that "this meditation is different from others, as it permits one to live from this state permanently. It is not divorced from daily living." Training in the IM method in essence is an introduction to the practice of phenomenology where contemplation of one´s true nature also rests on self-pondering about one´s inner states and experiences. Filling in the scale for this study had an unexpected spinoff, as it required that the participants assess their inner conscious states right from the start of the course. As normally inner states and experiences seem to be rather like dreams, taking them out of the right hemisphere and writing them down with the left hemisphere helped the students to become consciously aware of them. When inner experiences are acknowledged, it also seems to open the person to further experiences. One of the participant's drawings of her inner experiences is another way of expressing them. This researcher does not feel it has to be only written. Dance, drawing, and poetic writing are other ways of expressing these deeper levels of experience.

The results of five participants went in the opposite direction than expected. There could be various reasons for this. Some people are primarily "head orientated," and for them it is difficult to connect with other levels of consciousness. For others it is challenging to express their feelings in words and numbers like that required by the scale. Also, there are people who have undergone various degrees of trauma and have dissociated from their bodies. For them to return to their bodies is considered unsafe (I.

Martinkat, personal communication, November 6, 2015), and although the IM method is aimed at Self-discovery, the initial layer one encounters is the physical body. In the people whose results went in the opposite direction than expected, we also looked at their answers to the open-ended questions. In descending order (difference of -1) the person who showed the greatest change in the opposite direction shared that he felt "slightly more tranquil since practicing the method, but it is not yet significant" and that his "thoughts were somewhat calmer." He also declared that his emotions were "somewhat more controllable and less extreme." The second (difference – .7) shared that the method brought her peace and commented that she believed that "something had changed in her vibrations, like before it was hidden and now was able to come to her in a flash and completely clear" even if "this was difficult to explain." Although she did not answer most of the other questions as she felt "she did not know the method well enough," this participant shared with the researcher that on leaving the hall after the forth IM session she had had a mystical experience of union with the Cosmos where all boundaries disappeared. The third participant (difference -.2) declared that the method had increased her awareness of her inner self and her emotions and that she was now able to control them better. She also commented that on most days "she had arrived to the session in a very emotional state and when she left she had felt more tranquil and in peace." The fourth and fifth participants showed a difference of only -.1 on the scale. The forth shared she had "really liked the course, especially learning not to evaluate her emotions" and that learning about "letting her emotions flow or to just quietly observe them, helped her to make better decisions." She was also one of the participants who commented on experiencing energy. In her case this was experienced as a "buzz between thumb and

index finger." She also declared that she considered herself a being sensitive before learning IM. The fifth person felt that after the course she was "more conscious of herself, her presence in her body but above all, connected to her inner part." The IM method had given her "awareness of emotions, more tranquility, calmness, and happiness." In addition, after practicing, she felt "more peace, renewed, and at the same time more energetic and grateful to life for giving her these experiences." She also added that she felt her sensitivity had increased that this made her more "aware of the reactions of others and how a practice like this could help them feel better."

These comments are not consistent with their scale scores. This could be due to an over evaluation the first time the person filled in the first scale. Another subject commented: "When I filled in the scale the first time, I felt I was very aware of my inner sensations, but now I realize that my ability (on starting) really was weak." This is a comment this researcher often hears when she imparts the method. People are surprised at the how much they are able to feel, perceive, and experience as they progress with the method. Maybe giving the scale several times could overcome this problem.

The statements generated by the open-ended questions indicate that the IM method permitted just over 56% of the participants to get in touch with their emotional layer. I was surprised how many times the word "control" was used in Spanish to indicate they had learned something positive regarding their emotions during the course. So I asked them what they meant by it and they shared that before the course they had been controlled by their emotions, whereas now, by letting the underlying sensations flow and not seeing them as good or bad, they were in control of them. Learning this ability could possibly be the key to accessing further inner experiences like peace and tranquility.

Another comment by some of the participants to this researcher was that although they felt peace, calmness, and unity during and after the practice, they were not yet able to maintain it during the whole day. This is normal. Although this study measured the frequency of certain experiences occurring more often, the IM is not an immediate quick fix for changing one's inner conscious state permanently. The IM method puts the practitioner in touch with the vibrating life force in their hearts, which leads to ever-new experiences and insights (Arka, 2000). Living from a state of Feeling Heart consciousness requires not only practice, but also learning how to not lose it. It requires going with the flow and also tuning into Self via the heart for guidance. This is an art that is an ongoing practice over the years. It does not happen in 6 weeks. It is also not about eradicating the use of the thinking mind, but rather it is about accessing the plane the individual wants when one wants. Arka (2003) identifies three planes, living from the mind, living from the heart, and living in the core being (p. 61). This dissertation has directed our attention to understanding more about living from the heart. Basically, this involves living with depth, with feelings, with emotions, and with creativity. Here the "heart" uses the mind to express its guidance (Arka, 2003, p. 61). In the literature review I also discussed how "innocence" is the prime factor in accessing this level of consciousness. This also suggests that this state of consciousness might be similar to that which is principally found in the very young and the very old, near to leaving their bodies. In this state Higher Nature directly guides the person, such as one finds in the development of the material body in the embryo.

The IM method cannot be directly compared to other methods of meditations that meditate on the heart, like Prayer of the Heart and the method used by HeartMath, as

neither of them are based on increasing feelings and sensitivity through the combination of touch, sound, and breath. In addition, as I said in the introduction, the Heart Math method does not meditate on the Self but concentrates on creating harmony or coherence between the mind and heart. This is done by making a "sincere attempt to experience a regenerative feeling, such as appreciation or care for someone or something in your life" (HeartMath Institute, 2016d, The Quick Coherence Technique, Step 2). On the other hand, Prayer of the Heart and the IM method are directly involved in ego transcendence or rewinding our evolution and the discovery of the Self. The IM method is said to bypass the mind by creating vibrations in the different energy stations through the use of sound and experienced through touch. The use of a vibrational sound is directed at 19 stations or energy centers in the body, including the heart. In this way, as described earlier, the practitioner is put in touch with the vibrating life force in their hearts, which leads to ever-new experiences and insights (Arka, 2000). But, in spite of these differences, research has shown that Prayer of the Heart also increases intuition and is said to open practitioners to their emotional layer and feeling level of experience where silence leading to insights starts prevailing (Louchakova, 2005, 2007a). HeartMath has also investigated the role of physiological coherence and intuition and found the heart is involved in the processing and decoding of intuitive information (McCraty, Atkinson, & Bradley (2004)

There is no doubt that other methods of meditation often tap into some of the same levels and have their merits. As I suggested in the introduction, each method should be investigated according to its intention on which it is based and according to its intrinsic purity. Different methods and different intentions make it difficult to compare

results directly.

Another interesting finding regarding the open-ended questions is the relationship found between "sensitivity" and intuition. The word used in Spanish is *sensiblidad* and this brings up a problem not only of translation but also of meaning. I have already mentioned the differences in the etymologies of the verbs "to feel" and "to sense." The Spanish dictionary points to five different possible translations of the word *sensiblidad* with one of them being: "information that comes through the five senses" (Diccionario Manual de la Lengua Española Vox, 2007, Sensibilidad). But as I stated earlier, I feel that there is another perception at work here that does not necessarily coincide with the five senses. Zukov (1989) claims *multisensorial perception* is heart-based and does not come through the five physical senses. He also describes it as an understanding that comes through the heart rather than the intellect. For Zukov, intuition and multisensory perception are the same, with the latter being a more accurate term, as many people use intuition as having hunches. For him "multisensory perception is the voice of the nonphysical world;" it is "an awareness from the soul level" (Zukov, n.d. What is a multisensory human section, para. 2). This is consistent with Arka´s comments that the heart is the Mother of the senses and that there are senses below the senses. The Spanish word *sensibilidad*, like English word sensibility, also has an emotional component that includes "the capacity to feel and understand emotions" (Merriam-Webster, (n.d.b)., Sensibility) This is also probably involved in the capacity of people to tap into the deeper layers that Arka (2013) identifies in his theory. The next level Arka identifies is "Emotional Heart Consciousness," where you "feel emotions with even greater intensity. This can be called the spiritual heart, or your inner consciousness" (Arka, 2013, p. 37).

Concluding Remarks

Arka's theory into the six main levels of consciousness rests on a gifted power of analysis into the nature of the inner conscious states one encounters as one descends from the "thinking mind to the emotional heart to pure consciousness." The theory suggests there is a clear metaphysical road map for anybody undertaking the journey in Self-discovery using the IM method and offers a way through the "hard problem of consciousness" mentioned by Chalmers (1995). By recognizing different levels, it includes levels of consciousness to do with the brain and with the heart, thereby including thinking and feeling through the heart. At the same time, it acknowledges the unique inner experiences of each person. However, it also opens the possibility that each level might have certain distinguishing characteristics.

This study demonstrated that meditating on the Self via the heart using the IM method gave rise to a level of consciousness characterized by certain traits such as unity, peace, intuition, positivity, awareness of emotions, and connection to one's inner Self, sometimes expressed as soul, inner being, or atman. The results indicate that using the IM method one can go below *thinking mind consciousness* and experience another level of consciousness, which is related to the "heart." This level of consciousness appears not to be new, but the recuperation of a level of consciousness experienced by the very young and the very old. In this sense it seems as though the human being is equipped with different semi-autonomous systems of a metaphysical nature for operating in the world: One is the thinking mind and the other is the *Feeling Heart.* This investigation also reveals that IM is a safe, easy, and drug-free method for anyone who wishes to explore

their inner world where the heart is the “gateway” to deeper levels (I. Martinkat, personal communication, July 6, 2016).

This study gives some support for the initial levels Arka mentions in his theory. However, as this study was an exploratory study, we have only touched on the nature of *Feeling Heart consciousness*.

The literature review has revealed many reasons why the "heart" has been chosen as the focus of attention throughout the ages. It seems that through *blood* we are related to our personal history and through the heartbeat, through pulsation, we are related to our own core and the core of the universe. And beyond this, it seems as though our bodies are a manifestation of a force that brings all particles to pulsation and is expressing itself through ever-changing pulsation forms. The embryo showed us that during the first 49 days of our lives, we went through many changing forms, from the mineral kingdom to the plant kingdom to the animal kingdom where pulsation is no longer just metaphysical but also tangible. Here we are taken to the realization that not only do we live in a physical universe but the Universe is inside of us. The embryo also showed us that to grow, we have to die to a previous stage. This brought with it the realization that the chief force in the universe seems to be composed of a creating, maintaining, and transforming or destroying aspect. There is no new growth without death of a previous stage. This leads me to suggest that to live, to evolve, the embryo has to negotiate these forces; it has to "listen" to Higher Nature. In this, it too becomes part of the beautiful never-ending cosmic dance of creation. In essence, we are still that "embryo," that innocent being is inside all of us. A return to this state is always open to us for in our hearts; we are innocent. We can always opt to listening once again to Higher Nature expressing it Self

through our hearts.

> All babies are born with no "mind" but full of heart, which totally connects them to Nature and the universe. They can, therefore, sense changes in the weather, people, and surroundings. During that stage they mainly communicate with the world in two ways by either smiling or crying. As they grow their universal awareness subsides receding deep into their hearts and souls. They become more aware of themselves as individuals with their ego as its nucleus. (Arka, 2016, personal communication, 18 June, 2016)

I also concur with Arka and with Planck that behind the creating force is a Mind, a conscious, and intelligent mind: the Self, our true Self. It does not matter what one calls IT; the Rigveda is oldest of all the Vedas and it states: *Ekam Sat-Viprah Bahudha Vadanti.* "The ONE BEING, the wise diversely speak of" (Rigveda Book 1, hymn 164). This Self is outside and beyond but it is also our inner Self, that which is manifesting It Self through pulsation through our hearts. There is only one Being of which we are.

Inner contemplation, or meditating on the Self via the heart brings us to these realizations. However, the researcher of the inner world also wants to experience this truth. One of the participants had the experience of an expanded state of consciousness where all visual boundaries disappeared, a state known as Cosmic Consciousness. Another participant observed that she was easily able to enter states where she lost the "notion of her physical limits of her body." A third participant has also left us a testimony of her process in her drawings.

Commenting on the expanded state of consciousness experienced by some of our participants, Arka says:

> When you reach the very core of your consciousness (deepest inner self), you lose your body identity, memory identity, psychological identity, since you stay at the border of higher consciousness. Which is the consciousness of the nature outside, it is where nature (you may call it even higher nature) operates or functions for the world of matter, body and mind.
>
> A consistent practice of Dhyana can lead one to have this most enlightening mystical and spiritual experience. (S. Arka, personal communication, May 7, 2016)

When people start to meditate they sometimes have what is known in some traditions as "beginner's mind" and it may happen that they have illuminating experiences, often without realizing their importance or the grace they have received. Saint Teresa of Avila (1515–1582) expresses this in the following way:

> It is one grace that our Lord gives grace; it is another grace to understand what grace and what a gift it is; and it is another and further grace to the power to describe and explain it to others (Saint Teresa of Avila, 1915, p. 116).

Recommendations

The results of this study indicate that it would be worthwhile for scientists to continue investigating Arka´s theory, the IM method, and the nature of feeling-consciousness. Feeling consciousness is particularly important as it opens the way to learning about another level of consciousness below our thinking mind. However, this study does not reveal if this consciousness can be maintained, accessed at will, nor the long-term benefits to people who can access it. In order to understand more about feeling-consciousness, I recommend that the investigation be repeated, but that the time

period is extended to a year. I also recommend that other tests be included that measure other parameters, so that the different results may be compared and give us a bigger picture regarding the nature of feeling-consciousness.

I also recommend a change of the name of the scale to Feeling-Heart-Consciousness Scale (FHCS) because it might alert the people filling in the scale that we are measuring changes in *body-based* or *inner experiences,* not the naming of the sensations by the mind. I also suggest the convenience of administering the scale at least three times during in any future long-term research.

In the present research I did not investigate the first level of Mind Consciousness although I inferred its presence. Future researchers might be interested in knowing more about this level so they can compare it with other levels Arka mentions in his theory. Research from this perspective could also include physiological parameters, such as changes in stress levels, blood pressure, and changes in heart rate variability (HRV).

As very little is known about the deeper levels of consciousness associated with the heart mentioned in his theory, I propose that additional research be undertaken using more seasoned meditators of this method. In this way we would not only learn more about the changes in the inner experiencing consciousness that takes place as one goes though the levels, but also we could understand more about the underlying common elements involved in the different levels. These deeper levels could be explored through phenomenology, heuristic techniques, or using a method similar to what was chosen in this study.

Arka´s theory may also not be tied to the meditation method he developed. It could also be a general theory about the nature of human consciousness when one

explores one's nature from the microcosmic perspective. It might also be interesting to find if the levels Arka identifies coincide with the experiences of people who practice other heart-based methods and meditate on the Self. This would be a way of assessing if this theory has a more universal application.

Most of the participants of this study were Spanish speaking. I suggest it would be interesting to conduct this research with participants from different countries and cultures. Being a natural method of meditation, it would be interesting to see scientifically how different cultures respond to the IM method. This would also be a way of ascertaining the universality of the inner conscious experiences expressed by the scale items.

The scale designed also needs further refining. Other items should be included to make it a more sensitive instrument. The open-ended questions from this study indicate that it might be viable to include items involving sensitivity and tranquility. It is therefore recommended that future research use more subjects, so the contents of the scale can be extended. This would also lead to more information about the underlying common elements involved in the feeling as a construct. A larger population would also permit one to run a factor analysis on the results to ascertain if feeling-consciousness consists of more than one underlying dimension.

Even though this dissertation is a living example of the intuition of the heart in action, the FCS did not specifically focus on intuition, but feeling. Although I did find a significant increase in feeling-consciousness as measured by the scale, including an item about intuition, further studies are required to learn more about intuition per se and how it is related to the Feeling Heart. I also suggest that it might be worthwhile to investigate

how intuition is related to sensitivity, which seems to also be related to retrieval of memory. Answers to the open-ended questions also indicate it would be interesting to understand more about the differences in named traits mentioned by the different genders. Ideally, this would require an equal number of male and female participants. It might also be interesting to explore if "increased sensitivity" is a trait experienced mostly by females, as indicated by this study; or perhaps it is a trait that is difficult for many men to acknowledge.

Based on this study I suggest we are equipped with different semi-autonomous systems of a metaphysical nature for operating in the world, one is the thinking mind and the other is the Feeling Heart, the first gives rise to thoughts, the other gives rise to intuition. However, this does not reveal the mechanisms behind intuition. It is possible that an increase in sensitivity enables the person to become aware of subtle changes in their own electromagnetic field brought about through either contact with another person's field or the field of the environment itself. This could help explain how animals are aware of impending disasters in nature, as it would enable them to acquire information that by passes the normal senses. This topic needs a deeper research so we can understand more fully some of the dynamics behind what is happening. However, intuition regarding one’s own true nature or the nature of the universe seems to be of a different order.

As young children are more connected to their Feeling Hearts, it would also be interesting to see if combing training in meditation methods like IM with standard teaching methods that involve the development of the intellectual mind could help children to keep their intuitive heart connection open. This might help to create a society

that is more sensitive to their inner nature and to outer nature. It would also be a way of helping children cope with emotional experiences based on working with inner sensations. Simply having the first half hour of daily teaching open to listening to the inner experiences of children could help them with the difficulties they might be facing at home or elsewhere. I am not suggesting that the teacher changes the circumstances of "little Johnny." However, empathically listening to little Johnny's problem and encouraging him to relate it to his inner experiences could help him integrate what is happening through acceptance, not through denial. Also, encouraging the rest of the class to listen through their bodies, could not only help change the way little Johnny faces the ups and down of his life but help all the class work with their inner world of feeling and sensations. We often project onto others what we do not like or accept about ourselves. Once we have accepted that aspect, there is no problem. However, if it is an aspect we have denied and it has become part of our shadow, we will probably react in a negative way to others who we see as having this trait. These traits often include unresolved feeling-based emotions, which are linked to certain experiences. The IM method involves listening to one's deeper layers and past, through acceptance, which then allows one to listen to the deeper layers in others.

I also recommend that research into meditation methods in general include qualitative representations of inner experiences, such as the sketches presented in this study. In training children in IM, allowing them to sketch or dance their experiences would be a way they could give voice to their inner world that does not involve words. Encouraging different forms of expression permits practitioners to connect with the creative source, which is the real essence of meditation methods like IM. The

effectiveness of combining the practice of IM with creative expression could also then be researched.

Studies should be conducted on seasoned meditators who meditate on the deeper Self via the heart (like the IM method) using technologies like the MCG, ECG, EMG, EEG, and the SQUID. This would give us information about these states from the perspective of outside in. In addition, combing some of these techniques with GVD imaging (Gas Discharge Visualization Camera), or the PIP (Polycontrast Interference Photography) could also be undertaken so we may understand more about changes in the relationship between electric fields, the aura, the meridian, the chakra system, and brain waves of seasoned meditators when they are absorbed in meditating on the deeper Self via the heart.

Pertaining to the field of epigenetics, Guimaraes (2016) suggests that RNA predates DNA and that "nuclear acids are memories, not instructions" (Guimaraes, 2016). He concurs that nuclear acids might be "memories and instructions," but not in the sense that "they were instructions from the beginning." This has implications for meditators who practice methods where they are said to rewind the experience of all that has happened to them. It would be fascinating and highly instructive to find out what happens to their RNA.

And finally, to really unlock the secrets of the heart I suggest a team of experts from different scientific fields working together. Such a team could include seasoned meditators who meditate on the Self via the heart, embryologists, cardiologists, physical scientists, including quantum physicists, anatomists, biologists, osteopaths who work with the midline, and also anthropologists. This would help clarify many of the

propositions regarding the heart that were raised during this investigation.

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APPENDIXES

APPENDIX A

FEELING-CONSCIOUSNESS SCALE

Scale Including Open Questions

Escala de la Consciencia-Sentiente

Test #02

Name or pseudo name (*)
Nombre o pseudónimo

En las páginas siguientes encontrarás una colección de declaraciones relacionadas con tu experiencia cotidiana de la conciencia. Por favor, valora cada una de ellas de acuerdo con tu experiencia interior durante las últimas tres semanas.

Next pages you will find a collection of statements related to your every day experiencing consciousness. Please evaluate each statement according to your inner experience during the last three weeks.

Cada afirmación tiene 7 opciones, desde "nunca o casi nunca" hasta "muy a menudo o siempre". Por favor, contéstalas de forma que refleje tu experiencia, no tanto como lo que pienses que tu experiencia debería haber sido.

Each statement is graded in seven different ways from "never or almost never" to "very often or always". Please fill it in so that it reflects your experience rather than what you think your experience should be.

Por favor, trata cada ítem de forma separada y responde todas estas cuestiones. Si nunca has sentido esa experiencia, valórala con 1 que también representa "nunca".

Please treat each item separately from every other item and please fill in an answer to each question. If you have never had an experienced, rate the statement with a 1 representing "never".

Date /Fecha:

(*) Nota: No necesitamos tu identidad, pues esta encuesta es totalmente anónima, pero sí que necesitamos que indiques la misma manera de identificarte que utilizaste en la anterior encuesta.
We do not need your identity because the investigation is anonymous; but we need that you use the same name or pseudo name that you used in the previous questionnaire.

Please, use the scale below: Por favor, recuerda la escala

never or almost never nunca o casi nunca	1	2	3	4	5	6	7	very often or always muy a menudo o siempre

M3) I feel peace inside	1 2 3 4 5 6 7	M3) Siento paz interior
G6) When I bring my attention to the heart area, my thoughts become slower or disappear altogether	1 2 3 4 5 6 7	G6) Cuando llevo mi atención al área del corazón, mis pensamientos se ralentizan o desaparecen totalmente
H4) I feel energy inside of me	1 2 3 4 5 6 7	H4) Siento energía dentro de mí
C5) I override or do not pay attention to my emotional layer of experience	1 2 3 4 5 6 7	C5) Ignoro o no presto atención a mi capa emocional de la experiencia
T1) I am sensitive to the feelings of others	1 2 3 4 5 6 7	T1) Soy sensible a los sentimientos de los demás
O8) I have a feeling of unity inside	1 2 3 4 5 6 7	O8) Tengo un sentimiento de unidad interior
B9) I am aware of my emotions as they are happening	1 2 3 4 5 6 7	B9) Soy consciente de mis emociones cuando se producen
J6) I feel connected with my innermost being (some describe this as soul, self, atman)	1 2 3 4 5 6 7	J6) Me siento conectado/a con mi ser más íntimo (algunos lo llaman alma, ser, atman)

I2) I feel the centre of my being is in the area of the heart

1 2 3 4 5 6 7

I2) Siento que el centro de mi ser está en el área del corazón

N4) I am aware of my feelings as an inner experience in my body

1 2 3 4 5 6 7

N4) Soy consciente de mis sentimientos como una experiencia interna en mi cuerpo

Please, use the scale below:

Por favor, recuerda

never or almost never
nunca o casi nunca

1 2 3 4 5 6 7

very often or always
muy a menudo o siempre

Please, use the scale below:

Por favor, recuerda la escala

never or almost never
nunca o casi nunca

1 2 3 4 5 6 7

very often or always
muy a menudo o siempre

P3) I am centred

1 2 3 4 5 6 7

P3) Estoy centrado/a

S3) I am guided by my intuition

1 2 3 4 5 6 7

S3) Me guío por mi intuición

D2) I feel that space also exists inside of me

1 2 3 4 5 6 7

D2) Siento que el espacio también existe dentro de mí

F5) I classify/judge some of my inner bodily feelings as good or bad and I consider I should not be feeling them

1 2 3 4 5 6 7

F5) Clasifico/juzgo alguno de mis sentimientos interiores, que experimento a través de mi cuerpo, como buenos o malos y considero que no debería sentirlos

E6) I feel sensations of various kinds in the centre of my chest or in the heart area

1 2 3 4 5 6 7

E6) Siento sensaciones de varias clases en el centro de mi pecho o en el área del corazón

K2) My sense of time inside is much slower than time measured externally	1 2 3 4 5 6 7	K2) Mi sentido del tiempo interno va mucho más lento que el tiempo que se mide externamente
L4) I can feel pulsations (like heart beats) in different areas of my body	1 2 3 4 5 6 7	L4) Puedo sentir pulsaciones (como latidos) en diferentes áreas de mi cuerpo
R8) I feel positive	1 2 3 4 5 6 7	R8) Me siento positivo/a
Q9) I notice vibrations in my body	1 2 3 4 5 6 7	Q9) Me doy cuenta de vibraciones en mi cuerpo
A7) I am aware of my own heart beat as an inner experience	1 2 3 4 5 6 7	A7) Soy consciente del latido de mi corazón como una experiencia interior

Please, use the scale below: Por favor, recuerda

never or almost never
nunca o casi nunca

1 2 3 4 5 6 7

very often or always
muy a menudo o siempre

Is there anything you would like to comment or add regarding the questionnaire itself or how you filled it in the first time you did it?

¿Hay algo que te gustaría comentar o añadir en relación con el cuestionario en sí o con tus contestaciones previas, en la primera vez que lo respondiste?

Including the 5 Arka Dhyana sessions you have received, how many times have you practiced Arka Dhyana during the last 6 weeks (42 days). If you cannot remember, just do a rough calculation.

¿Cuántas veces has practicado Arka Dhyana durante las últimas 6 semanas (42 días), incluyendo los 5 talleres? Si no puedes recordarlo exactamente, haz un cálculo aproximado.

Veces / Times ☐ 5 ☐ 6 - 13 ☐ 14 - 21 ☐ 22 -29 ☐ 30 -37 ☐ 38-45 ☐ >45

Reflective Questions / Preguntas para la reflexión

1. In what way or how do you feel Arka Dhyana has complemented to your well being?

   ¿En qué forma y cómo sientes que Arka Dhyana haya contribuido con tu bienestar?

2. Please add something about your experiences while practicing the method Arka Dhyana and how you feel afterwards.

   ¿Hay algo que te gustaría añadir acerca de tus experiencias mientras has practicado el método Arka Dhyana y cómo te sientes después?

3. In what way is Arka Dhyana helping you with your emotions?

   ¿De qué modo está Arka Dhyana ayudándote con tus emociones?

4. Since experiencing the method Arka Dhyana do you feel that you have tapped into intuition more? Please expand your answer if possible.

   ¿Desde que experimentas el método Arka Dhyana sientes que estás sacando más partido a tu intuición? Por favor, detalla ampliamente tu respuesta, si es posible.

5. Do you feel that Arka Dhyana has increased your sensitivity? For example, how do you react to violent scenes in films or the TV? Do you have to turn away your head and close the eyes? Has it always been like this or have you noticed a change since taking this course? Please also give more details in how your sensitivity might be increasing.

¿Crees que practicar Arka Dhyana ha aumentado tu sensibilidad? Por ejemplo, cómo te resulta ver escenas de violencia en películas o en la tele, ¿tienes que apartar la mirada? ¿Ha sido siempre así, o has notado algún efecto después del curso? Puedes, por favor, también dar detalles de cómo tu sensibilidad ha podido ser incrementada.

6. Do you feel you will continue to practice the method after finishing the course if time, situation and the need arises? Yes / No / Maybe

   ¿Sientes que continuarás practicando el método después de terminar el curso según el tiempo, las circunstancias o si fuera necesario? Sí / No / quizás

7. If there is anything more you would like to share or comment on, please do so below.

   ¿Hay algo más que te gustaría compartir o comentar? Por favor, adelante.

APPENDIX B

CONSENT FORM

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Irv Katz, Ph.D.
Chancellor

Inula Martinkat, Ph.D.
Academic Dean

Consent to Participate in Approved Research Form

Dissertation Title: UNLOCKING THE SECRETS OF THE HEART THROUGH MEDITATING ON THE SELF

Name of Participator or Pseudo name:

Name of Investigator: *Tina Lindhard*

Description: This research requires that each participant fill in the same questionnaire twice, prior to starting the *Arka Dhyana* workshop and then again 6 weeks later after attending the last *Arka Dhyana* session. The first time the questionnaire was presented it included demographic data. The second time it was presented in included several open questions.

Time Commitment: *The time commitment is the length of the Arka Dhyana workshop, which is 42 days.*

Payment: *Subjects are not paid to participate in this study.*

Risks: *I, Tina Lindhard, do not anticipate any risk to you participating in this study other than those encountered in day-to-day life*

Benefits: *You will be helping in the construction of a feeling-consciousness scale to aid this and later research into this topic.*

Disclosure: *This inquiry involves two self-assessment inventories. There is no treatment except for the Arka Dhyana workshop,*

Special Populations: *N/A*

Confidentiality: *Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. All data can be filled in using a pseudo name if the participant desires. The anonymous information will be used for a PhD project and for later publications of the study.*

Right to Withdraw: Your participation is voluntary and refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled and you may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

IUPS Approval: "This research proposal has been reviewed and approved by the ***Academic Committee of International University of Professional Studies,*** and it has been determined that this study meets the ethical obligations required by Federal Law and University policies."

Questions and Contact Information: *admin@ccaspain.org, consol.tina@gmail.com*

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,

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Mentor: Inula Martinkat, Ph.D.
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Statement of Consent: *By completing the following survey (or other document as appropriate) you agree to participate in the project entitled,* UNLOCKING THE SECRETS OF THE HEART THROUGH MEDITATING ON THE SELF

Participant Signature: *My signature below formally acknowledges that I have read this document and understand the information contained herein. The researcher has answered my questions and concerns.*

Participant Signature:

Date:

APPENDIX C

COMMENTS ON THE PILOT STUDY

Here I share some comments on the pilot study and some of the problems that were found.

Questions or Statements

I tried both statements and questions on a small group by asking them to give us feed back. I found that questions were much more ambiguous in their meaning when translated from English to Spanish. For this reason I opted for using statements in our scale rather than questions.

Arrangement of Statements

I gathered a selection of statements from practitioners of the IM method who had practiced it for over 7 months and less than 2 years. These I "cut up" and asked the same group of eight people to rearrange them in the order they felt they fitted together. It is from this list I extracted many of our scale items for the pilot study.

Selection of Scale Items

I selected our scale items based on the work of Srinivas Arka and also the statements of practitioners as described above. I had to reduce the number of items as the number of participants was only expected to be between 30 and 40 people.

Pilot Study

During the pilot study consisting of three people, one of the participants asked if he could fill in the scale again as he realized that although he at the time had felt he was doing it honestly, he realized he actually knew very little about feeling after starting to practice the IM method. This alerted me that some people were assessing themselves in different

ways and for some people feeling was mind based. On the basis of this I changed some of the scale items to read "inside of me," "in my body," "inside" or "as an inner experience." I hoped in this way I would overcome these difficulties.

APPENDIX D

PROTOCOL FOR TEACHING THE IM METHOD

Below is an outline of teaching instructions followed in this study.

Week 1 Session 1

Welcome students

Welcome students and ask for them to introduce themselves and share a little of their background.

Protocol regarding the filling in of the scale.

Ask them to fill in the Feeling-Consciousness Scale (important this is done before introducing them to the method *Arka Dhyana*). They can fill it in on line if there is Internet coverage or on paper. Teachers must have copies ready to hand out if necessary. Tell them that participation in the study is not obligatory, but that we would appreciate their co-operation.

Share this is part of an international study on the *IM* method.

Also ask them to also sign the University consent form (this can also be done the following week so there is not to overload them with paper work during this first session).

Explain they can give a pseudo name but to remember what name they give for they will be given another questionnaire at the end of the study to ascertain changes. They can also fill in their real name if they prefer.

Ask them to answer all the questions and give realistic answers regarding the statements. Check that all the questions in the paper version have been answered when the participants hand in their completed sheets.

The questionnaire/scale must be completed by the students before teaching of the method begins, as we want to see if there are changes in consciousness after learning IM. (All the pupils must be novices in the IM method. It does not matter if they practice other methods of meditation for each person will be measured according to their own changes on the scale).

Introduction to the IM method (*Arka Dhyana)*

Introduce mind to heart

Introduce Touch

Introduce Breath

Introduce Touch and Breath

Introduce the sound *SaaRooGoVaum*

Introduce 8 point *Arka Dhyana*

Practice of the 8 point *Arka Dhyana*

Yoga Nidra

Week 2: Session 2

Answer any queries

Practice mind to heart

Introduce 12 point *Arka Dhyana*

Practice of the 12 point *Arka Dhyana*

Yoga Nidra

Week 3: No Session

No class so they can practice the 12 points

Week 4: Session 3

Answer any queries

Practice mind to heart

Introduce 19 points *Arka Dhyana*

Practice of the 19 point *Arka Dhyana*

Yoga Nidra

Week 5: Session 4

Answer any queries

Practice mind to heart

Practice session - 19 point Arka Dhyana

Yoga Nidra

Week 6: Session 5

Answer any queries

Practice mind to heart

Practice session - 19 point Arka Dhyana

Yoga Nidra

Administer Feeling-Consciousness Scale

Give them the Feeling-Consciousness Scale to fill in again. They can fill it in on line or on paper. Give them time to fill it in with no rush.

APPENDIX E

"ADDITIONAL RESOURCES" APPENDIX

Steiner, R. (2008). *Goethe´s theory of knowledge: An outline of the epistemology of his worldview*. Written 1884–1885 (P. Clemm, trans.) Great Barrington, MA: Steiner Books.

BIOGRAPHICAL SKETCH

Tina Lindhard has spent most of her life investigating the nature of Consciousness. This has taken her deep into Nature and research labs, found her speaking to scientific groups and attending, running, and giving retreats, becoming a teacher of Arka Dhyana (IM), an eclectic therapist, and a researcher of the inner world. It also has involved service to the greater community. Tina is currently president of the nonprofit organization Centre for Conscious Awareness in Spain. It is part of an international organization founded by Srinivas Arka.

Tina was born and brought up in Africa and her interest into different states of consciousness was awakened with her first conscious experiences of the endless peace, of which there is no name, at the feet of humble black laborers cooking their *mealy pap* on the farm next door to where she lived. Curiosity about this state led Tina to study psychology at the University of Cape Town and her specific interest was different states of consciousness. However, at that time psychology was not interested in this topic and she also felt that to investigate different states scientifically, she first had to experience them for herself, on the inside. This led to a search, which ended in 1997 when she met the yogi and philosopher Srinivas Arka, who became her inspiration and guide into how to open to one´s inner world of feeling and intuitive guidance.

With Arka's encouragement, Tina decided to return to University to bring the knowledge about his method of meditation *Arka Dhyana* (Intuitive Meditation) and his Theory of the Six Main Levels of Consciousness to the attention of the scientific and academic community. Tina first completed a MA in Spiritual Psychology at Sofia

University (ITP) and then, in 2014, she started her PhD studies into the nature of Consciousness at International University of Professional Studies (IUPS).

Through all her explorations, Tina has discovered it is only though our heart that we can weave everything, including all humanity, into a garland of Oneness.