Cosmology, Embryology and the Journey of Self-Discovery

Article · December 2017

DOI: 10.18638/dialogo.2017.4.1.13

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19 PUBLICATIONS **18** CITATIONS

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December 2017 preprint

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***Abstract*: On the grounds of a possible parallel between embryogenesis, including the fertilization process, and the development of the Universe, the validity of the Big Bang theory is questioned. In this article, it is suggested that the fundamental nature of the Universe is a cosmic play of opposites, the male and female principle; a polarity, which is inherent in everything as indicated by the yin yang symbol. Even for an electrical charge to exist one needs a positive and negative pole. It also proposes 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. Although this invisible spiritual principle behind creation becomes tangible in animals and humans via the heart, it is only the human being who can realize his or her fundamental nature or true Self through a journey of inner discovery. As the development of the Universe might reflect the process the embryo undergoes in forming a body, the principles discussed in this article might also apply to the nature of Nature itself. This implies all of Nature might be a living being or organism, an interconnected whole united through the underlying creative pulsating force. The suggestions put forward here have theological and cosmological implications.**

Keywords:

embryogenesis, Universe, Big Bang, polarity, pulsation, Self, creative principle, conscious Mind, living organism

1. Introduction

According to most physicists, the Universe began with the Big Bang. The term was coined by Sir Fred Hoyle, an astrophysicist who used the term in one of his talks with derision when referring to a theory in which he did not believe [1]. In 1931, the catholic priest Lemaître proposed in his "*hypothèse de l'atome primitif*" (hypothesis of the primeval atom) that the universe began with the "explosion" of the "primeval atom" which later became known as the Big Bang theory [2, p. 19]. Whereas Aristotle had held that the universe had an infinite past, medieval Jewish and Islamic philosophers preferred a creationist model consistent with their own religious traditions involving creation [3]. For me the Big Bang sounds like a crude way for referring to sexual intercourse where there is no foreplay. And that is really how scientists seem to conceive the Universe for nobody appears to ask what came before the Big Bang.

There are normally two accepted ways of knowing more about the cosmos and nature. One is using the scientific approach which seeks to understand the universe and her secrets from the outside using the scientific method. The other way is what people have done for thousands of years, and that is take their questions about the nature of Nature deep inside and sit down and wait until Mother Nature gives them an answer. In India, these people were known as yogis, rishis or philosophers [4].

In this paper, I suggest there is yet another way; the study of the human embryo principally during the first 49 days of its earthly life. In the past this was impossible, at least scientifically, but modern technology plus the collection of embryos such as those of the Carnegie Stages [5], have made a previously invisible process accessible to scientific scrutiny. To see the bigger picture, I also refer to the comparative morphological approach as used by van der Wal [6]. This way of doing science is inspired by the phenomenological method of Goethe, which he developed as a way to go beyond the reductionist Newtonian method [7] [8]. By looking at the juxtaposition of two isolated but polar objects, one can begin to see "more of the essence of the separate parts." 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" [6, p. 2]. This way of seeing is known as "dynamic perception" [6, p. 3].

As a complementary way of discovering our true nature and the nature of the Cosmos, the process of Self-discovery via heart-based meditation methods are also discussed.

2. Embryogenesis

In the following sections, embryonic development, including the fertilization process, is briefly presented using the comparative morphological perspective as used by van der Wal [6].

A. The Ovule and Sperm

When contemplating the egg cell and sperm, the huge size of the ovule only becomes apparent when we compare it to the tiny size of the sperm. Likewise, the ovule is full of cytoplasm, whereas the sperm has virtually no cytoplasm. The ovule is almost immobile, but sperm 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. This comparative approach opens us to a broader reality and makes us realize that inherent to the fertilization process is a play of opposites, a male and female principle, which are polar but complementary in nature [6].

B. Fertilization

We know from fertilization in vitro, that the conception of one sperm winning the race is incorrect and that the process requires many hundreds of sperm, which form in a circle around the egg. The sperm put their head ends into her protective outer layer, which is known as the corona, and this new unity forms an attraction complex that begins to move. This can be likened to a cosmic dance of love between inherent opposites. Eventually one sperm is let in and the ovule now becomes known as a zygote, a unicellular organism. Here an organism is seen as a living being, it is first and foremost a whole that then starts to differentiate and organizes itself in different ways. 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 van der Wal:

> 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! [6, p. 37].

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 I follow van der Wal [6] in how he looks at embryonic development.

C. The Process of Somatogenesis (formation of a body)

Van der Wal [6] sees the embryo as going through four phases, which are reminiscent of the main kingdoms in nature, the mineral, plant, animal and he includes a fourth, the human phase. During these phases the morphology of the human embryo becomes increasingly more complex. However, as said, an increase in complexity does not imply an increase in what we are, a living being. During the progression of each phase, slight changes in expression in the form can also be observed which suggests that the whole process is essentially dynamic.

1) The mineral phase: After conception, the organism, now known as a zygote, closes itself off by forming a protective outer shell. From its center it starts splitting up into segments in a mathematical fashion, first two, then four, then eight etc. to which the term "cleavage" is sometimes applied. These particles are microscopic and 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 a reproduction of particles in a closed environment. These particles are not building blocks but "represent an organizing principle" [6, p. 36].

At this point in time the organism is 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" [6, 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" [6, 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 segments start to die off. Some of the segmented parts cluster near the basal end of the zygote and become known as the *embryoblast.* The other cells, which are gathered around the inner periphery wall, are referred to as the *trophoblast.* This structure now 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. 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.

a) Way of being: The principle characteristic of the mineral phase can be seen as one where the organism obeys the laws of matter, physics and mechanics [6, p. 31].

2) Plant phase: For the organism to grow, a new phase needs to occur. This involves implantation, also known as *nidation*. This is a process in which a developing embryo,

moving as a blastocyst through the uterus and then makes contact with the uterine wall where it remains attached until birth [9].

If we are reading "this gesture correctly...[this] represents an interruption, a revolution" [6, p. 36]. During this new phase the organism reaches out and extends its boundaries deep into the maternal womb. 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" [6, 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.

a) Way of being: The principle characteristic of this phase is its capacity to reach out and interact with its environment via its metabolism. It also exists in time and is subject to the laws of gravity but strives against them [6, p. 31].

3) 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 [10]. 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) [1] which connects and mediates between the two dimensions by means of the body stalk" [6, p. 41]. Van der 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" [6, p. 42]. For van der Wal, the *trophoblast* also represents the embryo but for many other embryologists, 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 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. 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" [6, 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" [6, 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 in 6, 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!" [6, 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 [6, 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" [6, p. 44].

a) 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. On day 17 (this is also the same day the heart primordium starts pulsating) the notochord also starts to form [11]. It is this that it said to have an effect on the formation of the neural plate that starts to form on day 18/19, which in turn

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

gives rise to the neural tube and thereafter the central nervous system (CNS) and the brain [4].

b) 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 upper chest, where it later tucks the endocardinal tubes ventrally in the thoracic region at the base of the yolk sac [12]. 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 the whole of this process is a growth phase, which needs to be completed physiologically at birth with the cutting of the umbilical cord.

c) Way of being: The principle characteristic of the animal phase is that it has innerness and a sentient body. It can also interact with its environment by moving its outer shape. It has a soul and exhibits a range of complex behavior and possesses perception [6, p. 31].

4) Differences Between Humans and Animals: This is not the end of the process as, for van der Wal [6], 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" [6, 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" 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" [6, p. 49]. Although humans share the upright position with penguins and kangaroos, van der Wal is talking about "a balance of the head on the trunk which in turn is balanced on the lower extremities" [6, p. 49]. This allows the human to move in a unique way, which is not shared by other animals whose center of gravity is outside and as such, they are pulled towards the environment and earth. It is only humans whose center of gravity draws us to ourselves. The impulse for coming upright begins 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 at the same time, "the pelvis 'turns' caudally 'away' from the trunk coming under it, resulting in the waist being formed" [6, 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."

a) Way of being: The principle characteristic of the human phase is that the center of gravity is inside and this allows humans to become aware of their inner world and experience "a center in ourselves" [6, p. 49). It also permits them to come aware of their true nature or Self [4].

3. 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 that when pulsation starts on day 17, the plant phase is clearly over; for instead of growing upward like a plant [4], the heart doubles and begins its decent toward the interior of the organism. Here pulsation can be seen as heralding a new phase. If Steiner is right, this also coincides with the entry of soul/spirit into the physical kernel itself with the heart being considered as the organ of incarnation. Arka, [in 4] sees the creative impulse or creative principle behind all matter incarnating into matter through the heart, for, to him, "*pulsation* is the underlying core principle, and the property of universal existence, cosmic existence and local existence" (italics author) [4, p. 87].

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 [13]. From this, Hoffmann suggests they have "created a picture of a particle with a definite rate of pulsation." He also invites us to concentrate on pure pulsation, which we can interpret "as a bottled up heartbeat or else as a spread out pulsation" [13]. According to Hoffmann, de 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 [13, p. 75].

Without going into the argument of relativity here, it seems de 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" [13, p. 80].

Instead of seeing waves and particles as a duality as did de Broglie [14], maybe waves and particles can be seen as complementary opposites in the Goethean sense. Quantum physicists also do not inquire what or who causes the waves in the first place? Arka [in 4] claims that pulsation is the underlying core principle behind all matter, and therefore links both particles and waves. Lindhard inspired by Max Planck [15] to look for

> the Absolute, the universally valid, the invariant that is normally absent when only concentrating on relative, testable relationships . . . (takes this one step further and 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 [4, abstract].

This spiritual principle is not only intangible, but through the pulsating heart become tangible in animals and man. Pulsation is part of the never-ending wave of creation whose function is to manifest and move on [Arka in 4]. As the heart tube begins to pulsate at the same time soul is said to descend into matter, 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 impulse of the Universe and the entity that is created, appear in essence to be *One* [4, p. 90].

A. The three in one

At this level of analysis, it becomes very difficult to separate the force that creates, the intelligence behind this force, and the self or soul. 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 [16, p. 10].

Through modern science we have become accustomed to thinking of "physical reality as waves of energy – the matter-energy continuum" [16][2], 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 [16].

B. The paradox of our existence

These insights imply that through pulsation we are a manifestation of 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 system" *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 [4].

4. The journey of Self-discovery

The coming upright phase of the human embryo is linked to the elongation of the brain. As most of our sense organs for operating in the outside world are also found in the face, this early anatomical-morphological formation as gesture might play a role in human's predilection for finding the seat of consciousness in the brain [4].

However as many meditation traditions imply, it is only by withdrawing our senses from the outside world and contemplating our inner world that we can begin to discover our true nature or Self [17]. To do this we have to go above the mind or below the mind and feeling-based methods that go below the mind are slightly easier [Arka in 4, p, 13]. Heart based-methods have been used throughout history; a method known as Prayer of the Heart was used by the Dessert Fathers and later adopted by the Orthodox Church. But prior to this it was known to the ancient Egyptians, Jews and other Mediterranean cultures, as well as to the Sufis and Tantric tradition in India. It is also close to the traditions involving Self-enquiry (*atma-vichara*) and Kashmiri Shaivism. "It is rooted in an understanding of the Godliness of man and the humanness of God" [18, p. 35].

Whereas Western science has also traditionally been involved with understanding the world outside of us by using our senses, the discovery of our true nature requires a different method and relies on intuition and guidance, as has been suggested by spiritual traditions throughout the ages. It also requires that we transcend our egos "[19, p. 82] or rewind the evolution of all that has happened to us [20, p. 29]. 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 " [19. 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 [20, p. 29]. Heart-based methods regardless of their individual peculiarities, involve connecting with the feeling *mind* of the

[2] Outside back cover

heart rather than the thinking mind of the brain [20] [4]. It has been shown that more information is sent from the heart to the brain than vice versa [21]. 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* [22-24] (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 [4].

In a pre-post test design, Lindhard has shown that participants who receive 13.5 hours of a heart-based method of meditation know as Intuitive Meditation, significantly increased their feeling capacity as measured by a scale known as the Feeling Consciousness Scale [4] [25]. The 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 [4, p. 184]. 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 in 19, p. 81].

A. The Self

Our exploration into embryogenesis also takes us on a different kind journey; a journey that starts with a cosmic dance between the male and female principle. This dance results in the manifestation of a being which expresses itself as a form that is first spherical and through a process of cleavage, segments or particles arise in mathematical progression from the center of the sphere. After seven days, more of the same will not produce further growth and the organism has to adapt to a new way of being which involves putting down roots and extending its borders through hormones. The end of this plant phase is heralded by pulsation of the primordial heart at the cranial end of the germinal disc. This is accompanied by the development of the notochords which gives rise to the CNS and brain. Through the primordial heart, the soul is said to enter into matter. As pulsation might be related to the creative force behind all form; local, cosmic and universal, it seems as though through the heart it is this creative force that enters into matter. In looking for the absolute behind this force, it seems there might be an intelligent conscious Mind. It has been suggested here that this, in essence, is our true Self. It does not matter what one calls IT; the *Rigveda* is oldest of all the Vedas states: *Ekam Sat-Viprah Bahudha Vadanti*[3]. "The ONE BEING, the wise diversely speak of." This Self or conscious Mind 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.

[3] *Rigveda* Book 1, hymn 164

5. Conclusion

The account presented here not only has implications cosmologically, but also theologically. Theologically it is consisted with Vedic thought as expressed by the *Advaita*[4] tradition. It is also consistent with the traditions that meditate on the heart. Prayer of the Heart is said to allow the practitioner to go beyond the veils to discover his or her true nature or Self [19]. In these traditions the Self is seen as manifesting itself though form, but it is the human being who can discover his or her true nature and the nature of the Universe [17].

In the Christian tradition of the *Sacred Heart of Jesus,* the Heart of Jesus is an object of deep veneration as is the *blood of Christ.* Here wine, in representation of the *blood of Christ*, is physically imbibed [26]. Our overview possibly throws some light on these beliefs as we have seen how blood, the heart as an organ and the deeper Self as represented by Jesus, might be deeply interconnected.

With regard to cosmology, the fertilization process of the embryo suggests that the creation of the Universe might also involve a cosmic dance consisting of two polar principles. In fact every quality we can think of in the Universe has its opposite, for example day cannot exist without night, light cannot exist without darkness and a positive charge cannot exist without a negative charge. This is consistent with Chinese philosophy as represented by the yin yang symbol. The model presented is also dynamic not only in terms of morphology, but also in terms of "ways of being", suggesting that for each new growth phase to come about, there has to be a change in the previous way of being. Although at the start of a phase, growth appears to involve "a process of gradual, peaceful, progressive change or development", it seems that more of the same will eventually not be beneficial to the organism, and that it will have to change its way of being if it is to continue to grow.

When we look for the underlying principle that link the different phases, we discover “pulsation” which is invisible in particles but becomes tangible via the heart. It also appears as though pulsation might be the underlying core, principle, and the property of local existence, cosmic existence and universal existence. As such, the heart might be seen as part of the never-ending wave of creation [Arka in 4, p. 112]. This also encourages us to look at somatogenesis not only in terms of particles, but also in terms of waves where the formation of the body can be seen as unfolding in waves. This might throw some light on the wave particle duality in quantum mechanics.

As development of the universe might mirror the principles involved in the ontogenetic process of the embryo [4], the postulates discussed here might also apply to the nature of Nature itself. This perspective might present a new way forward regarding insights concerning how biological systems function. In addition, this approach may be a step forward in

[4] a Vedantic doctrine that identifies the individual self (atman) with the ground of reality (brahman). It is a nonduel.

finding a unifying theory not only of somatogenesis but also of Universe. By extending these insights to Nature, it seems that it might be an organism, a living conscious Being, which is manifesting itself through the different kingdoms each with its corresponding "way of being" or mode of consciousness. What distinguishes the mode of consciousness of human beings from other modes, is their capacity to know their essential Self, their true nature as a non-physical yet powerful conscious entity, organism or Being that is the pivotal point of all life and is expressing It Self through different modes in all the various forms found in visible nature.

ACKNOWLEGMENT

I am very grateful to the many people who have inspired me with regard to this topic, especially Dr. van der Wal for sharing his insights concerning embryogenesis, and the philosopher Srinivas Arka who helped me understand the nature of heart-based consciousness. I also wish to thank Matthew Syphus for his careful checking of the article and his timely insights. This article builds on a section of my Ph.D.-thesis in the field of Consciousness Studies at the University of Professional Studies, Hawaii.

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