African Journal of Medicine and Pharma Research
E-ISSN: 2992-4197; P-ISSN: 2992-4170
https://africanjmpr.com/
Volume-1, Issue-2, 2023: 31-37

Review Article

Understanding Death as a Process: When is the Self Lost?

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Received: September 14, 2023 **Accepted:** October 17, 2023 **Published:** October 30, 2023

Abstract
This review article deals with quantum biology, the new tool that enlightens profound questions in classical physiology and medicine. The paper is a response to the book "Erasing Death," by a British physician and one of the leading experts in emergency medicine and the scientific study of death. His book explains what death looks like at the organ level; our review clearly states what death is at the quantum level. We define living organisms and distinguish non-living molecules from living atoms. We explain how non-living atoms become living molecules; we define life and death. We demonstrate the conditions upon which death occurs in the body and explain the two fundamental ways all living organisms die. Finally, we discuss the reversibility of the dying process.
Keywords: Entropy, Massive particles, Entangled system degradation/synthesis, Vital energy, Cardiac arrest, Hypoxia and anoxia, Cardiopulmonary resuscitation.

1. Introduction

This review is a response to the book "Erasing Death," by Sam Parnia, the British author, professor of medicine, and leading researcher in cardiopulmonary resuscitation [1]. I am an emergency medical technician by training, so to speak, a grasshopper in front of giants and the least among the medical staff. I stand in this field because of my thirst for knowledge, my spiritual background, and my unusual journey as an independent researcher in philosophy and science. The first paper I wrote was to respond to Professor Gina Turrigiano from Brandeis University, who was puzzled by a phenomenon in sleep studies; she asked why homeostasis is inhibited during sleep [2]. I followed the 2017 Nobel laureates in physiology and medicine to their workplace and stumbled upon Professor Turrigiano's research. Since I am very comfortable with the questions related to the immaterial components of human beings, I take at heart to answer her inquiries as I am doing the same with this review. I intend here to provide a rational explanation of the investigation of Doctor Parnia concerning death. On page 65, chapter four of his book, Professor Parnia asks the following questions after puzzling over the process of death:

"Since we know cells can potentially remain in a state in which they can be saved for many hours after we die, the big unknowns during this process are reflected by the questions: How can we best intervene and prevent cells from being irreversibly damaged in someone who has died? When does our consciousness, or the real self, become lost? And what happens to that consciousness?"

Traditional biology and modern medicine cannot do it efficiently without the help of quantum biology. These questions above could never be answered with the simple tools available in Classical physiology and medicine; biologists and medical doctors must borrow from quantum biology with new concepts and understanding of living organisms [3, 4]. Humans are not solely flesh, and Professor Parnia has already noticed it; that's why he came to the same conclusion that death is not a specific point in time but a process that culminates in two crucial steps we will discuss in this article.

When consciousness or the self leaves the body will be the focus of this paper; therefore, we define a human being and his constitution. The first step to understanding how brains are conscious is to grasp how non-living atoms become living molecules; thus, we will elucidate this mystery and clarify the self. We will explain human life and how the individual stays alive until death. We will define death and discuss the two fundamental ways all living organisms die. Finally, we will discuss the reversibility of the dying process.

Science is a collective enterprise, and we expect the light we shine here on the subject would be an additional response element Professor Parnia needs to unlock his investigations [5]. Classical physiology and medicine cannot do it alone; they need quantum biology. The new discipline is the best place where biologists and physicians can tackle the phenomenon of life and living organisms head-on. We know that many things mainstream science says and teaches about human beings and living organisms are recondite because science has scanty information concerning human life. It has never been easy to escape a well-trodden path and dare venture into the unknown [6]. Doctor Parnia is one of these courageous researchers of mainstream science to challenge the status quo, as the child psychiatrist Jim B. Tucker has already done with his works [7, 8]. It takes courage to be different.

2. The Constitution of Living Organisms: A Special Focus on Human Beings

All living organisms are made of objects and subjects; the German philosopher Arthur Schopenhauer said they all have a Representation; of course, they do [9, 10]. The object is the physical body made of atoms arranged to form a container in which the subject incarnates. The subject is the vital energy, a frequency that vibrates and animates the object. Thus, we talk about life when the vital energy deploys its activities inside the material shell, which can be single-cell or multicellular.

All life forms have a boundary fence, a system of executive Information, and the entangled system degradation/synthesis; these three elements are common to all living organisms. The brain, the heart, or the blood do not characterize all life forms; these three elements do.

The subject, which is immaterial in nature, is a field of continuous symmetry with a particular frequency. The object, on the flip side, is asymmetric. We define symmetry as any transformation that preserves and conserves a system; that said, the vital energy remains invariant and is made of a concatenation of Information and Order. The object or the material shell that harbors the vital energy undergoes transformation and is made of a concatenation of Information, Order, and Disorder. Notice how Darwin, in his endeavor, emphasized variations and found change to be ubiquitous in Nature; the asymmetry of the material universe is not new; it has been well-documented throughout the history of science [11]. Only the object changes; the subject always remains invariant and unchanging, even after death. It does not decay; the body does. Life as we know it on Earth, therefore, consists of maintaining the subject in activity within the object, and the tool that monitors such condition is the entangled system degradation/synthesis or, at the subatomic level, Disorder/Order. Non-living and living atoms are distinguished by the entangled system Disorder/Order at their core.

Today, it is commonly believed in mainstream science that brain cells produce consciousness; they don't. Cells are made of ordinary atoms, and the vital energy is necessary to animate them; that's why newborns who fail to pick up their first breath die, although the brain is still inside their skull. In the womb, the life of the mother maintains the entangled system Disorder/Order at the core of the atoms that make up the baby's body. At birth, the mother's life steps aside, and the baby has to pick up his own vital breath to live; this is a fact, not philosophy. The body needs an energetic being; whenever critical parts are damaged, disabled, or removed, the self will not function correctly. One example in Parnia's book was the firefighter Don Herbert, who suffered an anoxic brain injury in the line of his duty and "lost the self." The most notorious case known in neuroscience is Phineas Gage, who had a personality change after an iron rod went through his skull, destroying his frontal lobe [12, 13]. The body broadcasts the self; thus, some key components must be readily available, or the manifestation of consciousness will be impaired, as often happens with people in persistent vegetative states.

Unlike other living organisms, humans are persons because of the particularity of their vital breath. As we always define it, a person is a particular state of consciousness characterized by self-awareness, power, force, volition (desire and reason), purpose, judgment, beliefs, and the quest for knowledge [14]. At birth, when the vital energy enters the body of humans, it splits into three major components. In the same way light passes through a prism and splits into seven different colors, the vital energy divides into three segments or frequencies, namely the spirit (over the heart), the soul (over the circulating blood), and the mind (over the brain). These three frequencies in concatenation form the self; religious people call it the inward man. It is also known as the energetic being or the person.

The spirit, the soul, and the mind are not the same, although people confound and use them interchangeably. The spirit is the pilot, the soul is the modulator, and the mind is the operation center. As the blood connects the heart to the brain, the soul mediates between the spirit and the mind. When the heart pumps blood to the

brain, consciousness is modulated and projected on the screen of the mind as Will and Representation [9,10]. In the Will, we have Desire governed by Reason. In the Representation, we have Memory and Perception. Notice how the spirit and the soul are the immaterial aspects of what medical staff call the cardiovascular system, the most crucial system of the organism; all deaths pass by this system. Remark also how the cardiovascular and nervous systems have their own power plants, generating their own electricity, which doctors measure as EKG and EEG, respectively. In light of this, doctors can sometimes keep patients alive with artificial ventilation while their brain is almost dead (check the last chapter in Parnia's book).

3. From Non-living (I∞O~D) to Living (I∞O/D) Atoms: What Is Life?

Life is a self-sustaining chemical system, or broadly speaking, it is a dissipative system with consciousness, capable of self-organization within a boundary fence, possessing the following characteristics: metabolism, homeostasis, reproduction, response to stimuli, and adaptation; the list is not exhaustive [14, 15].

At the quantum level, living organisms are different from objects by three fundamental elements namely, the boundary fence, the system of executive Information, and the entangled system degradation/synthesis. Notice that the same atoms composing objects are also part of living organisms' bodies. Why do atoms and molecules forming living organisms become living things while particles of material objects do not?

As we have said earlier, all atoms are massive particles made fundamentally with the concatenation of Information, Order, and Disorder (I∞O~D). As the research of Nambu, Goldstone, and Higgs demonstrates, spontaneous symmetry breaking causes massive particles to be; hence, entropy is inherent to them [16]. Therefore, all objects have to manage entropy, which is not the case for subjects, fundamentally made of a concatenation of Information and Order or pure energy. As the physicist John Archibald Wheeler said, everything is Information [17]. It is a code that makes a dog, a dog, and a human being a human; it is also information that makes a rock a crystal. Thus, all objects are made of Information, Order, and Disorder (I∞O~D), while all subjects are Information and Order (I∞O).

When the subject incarnates in the object, the atoms of this latter become alive because through their interaction, Order, and Disorder in every massive particle become entangled [18, 19]. For instance, atoms in rocks or water don't have entangled systems. However, when ingested as food, the same atoms participate in the activity of life because Order and Disorder (O/D) become entangled in the process of metabolism and gene expressions. For instance, the oxygen atoms in water are not alive, but the same oxygen atoms in the amino acid tryptophan will become alive in protein synthesis. What change? Order and Disorder get entangled in the atom participating in the activity of life. That's why the oxygen atom in tryptophan, for instance, will participate in the process of death while the one in the water will not experience death. Notice how I use the symbol "∞" to signify infinite concatenation, the symbol "~" for temporary or partial concatenation, and the symbol "/" for entanglement [20]. Energy is eternal and cannot be destroyed nor created (I∞O); it generates the material universe (I∞O~D). I sum it up as follows:

- I∞O = Energy or Vital Energy
- I∞O~D = Non-living Massive Particle
- I∞O/D = Living Massive Particle

Massive particles are formed because of Disorder. Energy coalesces and takes shape in space as matter because of Disorder, which creates a partial concatenation with Order inside the energy field. Thus, without entropy, the material world will not come into existence. Entropy is the cause of space, time, and mass; unfortunately, entropy will also cause the death of every living organism that roams Earth.

4. The Process of Dying: What is Death?

The term death only applies to biological entities that are alive. Death occurs when subjects cease animating objects; in other words, when the vital energy departs from a material shell, we call this process death. A rock cannot die because it is simply an object made of inanimate atoms. The fundamental elements composing the massive particles in objects, namely Information, Order, and Disorder, are concatenated but do not form an entangled system as the work of Nobel laureate Ohsumi means; it is so because their atoms cannot harbor the vital energy [21]. Thus, the vital energy is necessary to animate a non-living material.

The definition of death as a separation between subject and object is more problematic in the microcosmos where tiny creatures and single-cell organisms, like bacteria or ciliates, live. It is more evident for humans since the unknown energetic being inhabiting the body is still active during dreaming. In contrast, the physical body lies paralyzed on the bed [22, 23, 24]. However, anyone who has ever observed the death of a

unicellular organism through a microscope could notice how its membrane bursts to spill the content into the surroundings. Single-cell organisms also lose something in the dying process as we do.

Whether single-cell or multi-cell, death in living organisms occurs fundamentally in two ways: gradual loss of synchronicity and sudden loss of synchronicity [25]. Gradual loss of synchronicity leads to senescence with progressive telomere shortening, as demonstrated by the work of Nobel laureates Blackburn, Greider, and Szostak [26, 27]. Sudden loss of synchronicity often occurs due to traumatic insults with a surge in entropy, which the body fails to contain and manage; an example is a gun wound or a car accident.

Gradual loss of synchronicity is the common and the most popular way humans die; when degradation in the body becomes refractory, synthesis cannot cope with it. As a result, the equilibrium between degradation and synthesis ruptures, and the vital energy departs from the body [21]. Individuals who die from sudden loss of synchronicity often tend to reincarnate, as demonstrated in the book "Life Before Life," by Professor Tucker [7, 8]. This dying method is less common in humans but more prevalent in animals living in the wild. In both cases, whether gradual or sudden loss of synchronicity, entropy must become uncontrollable, leading to a spontaneous symmetry breaking at the core of the atoms composing the body of living organisms [28]. When that occurs, the entangled system degradation/synthesis will collapse, causing the vital energy to leak out of the body. As the object and the subject are now dissociated, dissolution settles, and cells that make up the object rot and disintegrate.

The scientific investigations "show that organs and cells die at varying rates depending upon their resistance to a lack of oxygen." Some tissues and organs decompose rapidly, while others take more time to decay [29]. According to Professor Parnia, the cornea can yield viable cells up to seven days after death; cells in bone degrade slowly and become useless after four days. Fat and adipose tissues are still usable for up to thirty hours, while brain cells and neurons deteriorate within eight hours after death is pronounced. Parnia's work clearly shows how the process of death culminates at two particular points: the departure of the self (subject) and the decomposition of the cells (object), in this order. Notice how the departure of the vital energy comes first; it precedes the thorough decay of the body.

To summarize the death process, we can zoom at the macroscopic and microscopic levels. While death at the organ level is synonymous with cardiac arrest, no circulating blood, no respiration, and fixed and dilated pupils, at the quantum level, the process equates spontaneous symmetry breaking with the collapse of the entangled system degradation/synthesis (or Disorder/Order). At this particular point, the energetic being or the vital energy or the self has left the body, and dissolution settles in tissues and organs. The proper sequence is as follows: first, the heart stops, then the brain shuts down, and the blood pools at the back as the individual lies supine; in other words, the spirit has departed, the mind collapses, and the soul vanishes. As Professor Parnia reiterates his questions concerning the self and actual death at the end of chapter five and later in the last chapter of his book, the simple answer is that after cardiac arrest with no circulating blood, the self leaves but does not disintegrate; the body does because of its asymmetry. Frankly, the self is never lost; the body simply fails to accommodate and display it. Death is the end of the body's modulation and broadcasting of consciousness; it is the separation of the thinking and immaterial conscious person from the physical body.

5. The Reversibility of Death

There is a reality beyond space-time that science will discover sooner or later [30, 31]. As energy and mass are equivalent, a realm of energy exists beyond this material world [32]. At death, the physical body spits out the energetic being into the immaterial realm; subjects and objects dissociate and part ways. There are countless testimonies of people who have died and come back with vivid memories, yet mainstream science continues to close its ears, although almost all physicists know this realm as Nothingness. John Wheeler called it the Insubstantial Nothingness [17]; to Plato, it is the world of Forms or Ideas. Descartes knew it as the immaterial realm. While Professor Hawking postulated cosmological singularity at the Big Bang, the Nobel laureate, Sir Penrose, invoked an immortal observer in his graphical review [33, 34]. Paul Dirac's equation predicted antimatter and an unknown dimension when confronted with the physical interpretation of the negative-energy states of particles; he would call this unknown realm the world of antimatter [35].

Death is irreversible because of the asymmetry of the physical body. As we have said earlier, the energetic being remains invariant, but the molecular structures of the body decay. Thus, the first step to reverse death is to control the dissolution of the organs and tissues that compose the body. Cells of the body deteriorate because the material world is asymmetric in nature. Atoms and molecules emanating from the material

universe are made of a concatenation of Information, Order, and Disorder (I∞O~D). While Information props Order, Disorder continually impedes the process. I∞O is the energy field at the core of every massive particle, and D gives it consistency and mass, according to the work of Peter Higgs [36]. It is entropy that causes spontaneous symmetry breaking within the energy field of massive particles, and whenever a material object harbors life, it will spit it out; both objects and subjects will part ways [37]. Right now, medical doctors have found a way to delay the decomposition of cells and, thus, can bring back the vital energy inside the body several minutes after death is pronounced. When death is declared, the heart stops beating; there is no respiration, and the pupil is fixed and dilated to signify the brain's inactivity, as Professor Parnia describes in his book. At the quantum level, it means a spontaneous symmetry breakdown has occurred, leading to the collapse of the entangled system degradation/synthesis. At this point, the energetic being has departed from the body [38].

Humans will conquer death if scientists solve the problem of spontaneous symmetry breaking, which is intertwined with entropy management. If doctors can contain, mitigate, and manage entropy inside molecules and cells of the body, the death process will become reversible. So far, this control can be done within certain limits, and the fantastic resuscitation of Joe Tiralosi and the professional soccer player Fabrice Muamba, related in the book "Erasing Death," are a few examples. The more people understand death, the better it will be. Muamba's heart stopped for 78 minutes; he was medically dead and was brought back to life [39]. This was not a near-death experience (NDE) but an actual death experience (ADE), as Doctor Parnia explained in his book.

In light of the hypotheses and theories discussed in this paper, one can understand that resurrection is not impossible after all. In the same way Arctic ground squirrels lower their body temperature to slow down chaos at the quantum level to prevent spontaneous symmetry breaking from occurring at the core of the atoms of their bodies, any doctor who can control and manage entropy in the molecular structures of the pronounced dead bodies could reverse the dying process [40, 41]. He can bring back the vital energy into the body as done with Tiralosi and Muamba [42].

6. Conclusion

Death is not what mainstream science is teaching us; it is not the end of a person's life. Death is not the cessation of life; instead, it is a process that separates the vital energy from the physical body. And when that schism occurs, the dissolution of the material shell follows. The dying process culminates in cardiac arrest with no circulating blood; at that point, the vital energy that regulates activities leaves the body. This phenomenon is a fact and not philosophy. And any physician with a keen intellect, operating with critical thinking, can testify to it.

Non-living objects differ from living materials by the vital energy that animates their atoms. All massive particles are fundamentally made of the concatenation of Information, Order, and Disorder. In living organisms, Order and Disorder are not only in partial or temporary concatenation but also form an entangled system: this is the key that separates living from non-living objects. Thus, living organisms die when the entangled system Order/Disorder collapses at the core of their molecular structures.

There is great hope that one day, humans may conquer death. That day will come even sooner than expected if the scientific community succeeds in getting rid of the "materialism cocoon" that envelops our thinking. Until that day, let's stay curious and open-minded like the founders of modern science. As Doctor Parnia concluded: "A new science or paradigm shift is needed to explain a relatively new discovery."

Declarations

Acknowledgements: Not applicable.
Author Contribution: The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.
Conflict of Interest: The author declares no conflict of interest.
Consent to Publish: The author agrees to publish the paper in African Journal of Medicine and Pharma Research.
Data Availability Statement: Not applicable.
Funding: This research received no external funding.
Institutional Review Board Statement: Not applicable.
Informed Consent: Not applicable.
Research Content: The research content of manuscript is original and has not been published elsewhere.

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Citation: Edoh ZA. Understanding Death as a Process: When is the Self Lost?. Afr J Med Pharm Res. 2023;1(2):31-37.