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Review Article

# The Soul Is a Biophysical Reality: Review of the Experimental Evidence

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## Abstract

**Introduction:** In the present report, we studied the responses of a dwarf form of the unicellular organism, *Stentor coeruleus*, at the life/ death interphase.

**Methods:** Uncovered deep well slides were filled with culture media containing the large forms of *Stentor coeruleus*. On evaporation of the culture medium, the cell membrane of these larger forms disrupted. When rehydrated 24 hours later the micronuclei previously released from the dying cells showed the formation of numerous, mobile dwarf cells. Chlorinated tap water added to the medium was used to induce cell death.

**Results:** The initial indication of the dying dwarf cell is "blebbing," a signature of programmed cell death known as apoptosis. Within 8-12 min, the stationary dwarf cell progressively released a morphological replicate of the dead cell before the replicate faded into the ambient environment. In other experiments, just prior to fading, the slide was exposed to a magnetic field (75 milligauss) which caused a retraction of the replicate back into the dwarf cell. Subsequently, the cells resumed their previously mobile activity.

**Conclusions:** These findings support the hypothesis that a phenomenon analogous to the characteristics ascribed to the soul in the metaphysical literature can be demonstrated in the laboratory. We suggest that the responses shown by this unicellular organism at the life/death interphase may be conserved across the evolutionary spectrum.

## Introduction

The concept of a soul has been imbedded in all religious and philosophical thought throughout the history of humankind. The soul consists of one's individuality, both as one's distinct appearance and consciousness\* (personality) which is separate from the physical body. In 1975, a psychiatrist, Dr. Raymond Moody interviewed scores of patients who claimed to have been alive after clinical death and after having been resuscitated. He coined the term "near death experience." His book, "Life after Life" was the impetus for a new genre of afterlife studies and publications [1]. To this day, these reports have remained anecdotal and mainly subjective. In the present study we have reviewed the objective, scientifically based evidence for two of the major observations commonly described by subjects at the life/death interphase, i.e., the soul leaving the body and the return as an "Out-of-Body" experience.

**Consciousness:** An awareness of one's environment and actions taken in response to that awareness. Antithesis: The state of unconsciousness.

## Methods

### The Model

One of the most investigated unicellular organisms, dating back to the 19th century, is the protozoan genus *Stentor* [2]. Based on its relatively large size, up to 1 mm, it became a focus of studies showing it could regenerate a complete organism from surgically dissected small segments [3]. In a recent publication, we discovered a previously unreported dwarf variety of actively mobile *Stentor coeruleus* [4]. These dwarf forms derived from progenitor micronuclei shed from the dead larger cells. In this review, we describe the studies performed with these dwarf forms at their life/death interphase. Deep well slides were filled with culture media containing *Stentor coeruleus* (Carolina Biological, Burlington, NC). The latter died and their cell membranes were disrupted due to 24 hours of evaporation in the uncovered slides. The wells were rehydrated with a solution made from pellets that were dissolved in deionized boiled water (synthetic, cell free protozoa media, Carolina Biological, Burlington, NC). Within 24-48 hours numerous, mobile dwarf forms each 25-45µg in length were observed. Chlorinated tap water was then added to the deep well slides to induce a toxic state leading to cell death of the dwarf forms.

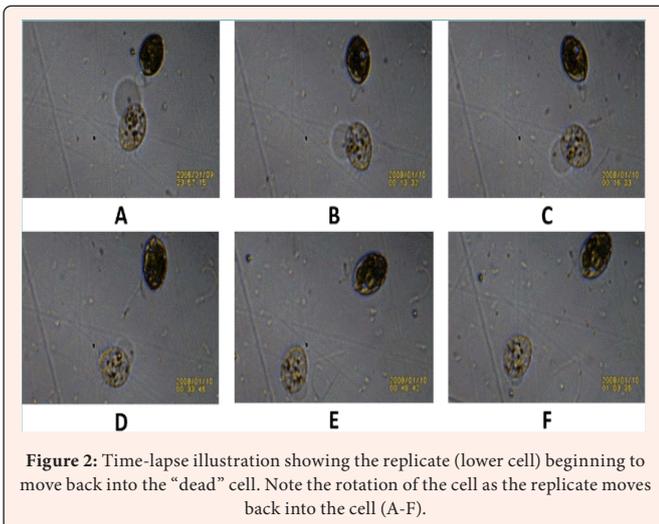
## Results

Over a period of 8-15 minutes, after the induction of the toxic state, the cells lost mobility and became spherical in form. In addition, their inclusions ceased any movement. Evidence of cell death, apoptosis, was indicated by characteristic "blebbing" which consisted of small blisters protruding from the cells, which then retracted back into the cell. The stationary cells then showed sequential changes consisting of the progressive development of a replicate image being released from the original cell (Figure 1).

Within 20-30 minutes, the replicate gradually fades. None of the control group showed these changes. When most of the cells in the active group reached full replicate development (8-15 minutes), a plate magnet, 3975 Gauss, was placed on either side of the deep well slide in order to create a magnetic field (+/-) across the slide. Using a hand held magnetometer we registered the field strength ranging from 60-90 milligauss [6]. (Figure 2) shows a time lapse over a 20-minute period during which the replicate was progressively retracted back into the "dead" cell.



**Figure 1:** Three dwarf cells of *Stentor coeruleus* were subjected to the addition of chlorinated tap water to their natural media. There was a progressive release of a replicate of the cell. When fully extended from the dead cell, unlike an apoptotic bleb, the replicate faded into the ambient environment after 20-30 minutes [5].



**Figure 2:** Time-lapse illustration showing the replicate (lower cell) beginning to move back into the “dead” cell. Note the rotation of the cell as the replicate moves back into the cell (A-F).

## Discussion

### Background

It is commonly thought that the soul is invisible but may have attributes that can be measured. In 1907 by Duncan MacDougall, a physician from Haverhill, Massachusetts hypothesized that souls have physical weight, and attempted to measure the mass lost by a human when the soul departed the body [7]. According to present day scientific measurement methods, the results of Dr. MacDougall’s experiment seem highly problematic. The search for the human soul is destined to be a daunting task; perhaps that search may be more fruitful when applied on a much smaller sized organism. In that regard, our studies were focused on unicellular organisms, which allowed a greater opportunity for manipulation during life and death conditions. Our initial experiments were based on the general susceptibility of microorganisms to the killing effects of tap water containing chlorine for disinfection.

## Mechanisms

Our working hypothesis is that the replicate represents the electromagnetic energy that is an inherent part of the organic, i.e., physical body. The replicate or “soul” which is visualized based on its energy resides in the visual portion of the electromagnetic spectrum. The separation and fading of the replicate, we suggest indicates its energy moving into the non-visual part of the electromagnetic spectrum. The question arises is this series of events unique to known physical laws? The formal principles of quantum theory applied to subatomic particles relates to the duality of matter, existing as particles or waves. Moreover, these states are entangled but can be separated under well-defined conditions. In the macroscopic domain, analogous features can be observed such as the particle nature of the physical cell and the waveform of the replicate. The separation [5] and forced return [6] of the replicate closely corresponds to the principles of de-coherence and coherence delineated in Quantum theory. Our hypothesis is that these observations represent a trait, which is conserved across the evolutionary spectrum with inherent variants shown from unicellular to multicellular organisms including humans.

## Conclusions

The review of previous studies provided the basis for an objective scientific evaluation of phenomena ascribed to the soul in the metaphysical literature. Our studies show that these anecdotal and subjective reports analogized in actual laboratory demonstrations. We suggest that these responses of a unicellular organism at the life death interphase conform to principles of quantum theory on a macroscopic level rather than confined to sub-atomic particles.

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## Epilogue

We are like the stars. If one goes out on a dark, starry, night we view the billions of stars in the sky. One can pick a star from its location in the sky and discover it has an individual designation, e.g., 8742A6. How did astronomers determine the individuality of that particular star? By passing the light from that star through a spectroscope, which determines that the star is composed of 40% iron, 60% potassium, and an array of other elements in specific quantities. Each star has a singular signature just as each of the 7 billion individuals on the planet have a singular biological (DNA) signature. The light (energy) from that Star, perhaps by travelling for hundreds of years (light years) to reach our eyes may no longer exist physically. According to the Law of conservation of Energy: Energy can neither be created nor destroyed. Just like the stars whose light (electromagnetic energy) goes on forever, our electromagnetic soul (energy) is immortal.

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