Life after Death:

The Environmental Benefits of Natural Interment

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Abstract

Death is an inevitable and unavoidable part of life. Man has been compelled to acknowledge the passing of the deceased through various ceremonial practices and methods of interment throughout history. There have been many methods of laying the fallen to rest since the dawn of mankind. Many of those ancient structures and sites have withstood the test of time. Burial and cremation have been some of the most accepted forms. Burials fill countless cemeteries with unnatural structures and chemicals that are completely ineffective in combating the inevitable decomposition of the body. Cumbersome caskets, vaults, mausoleums, and monuments not only take up valuable space and resources, but the materials and the chemical byproducts of these structures are polluting the soil and groundwater. Cremation requires the use of fossil fuels, and the process releases harmful emissions into the atmosphere. The population is on the rise, and death is not taking a vacation anytime soon. Hunger, homelessness, pollution, lack of resources and destruction of the environment are global challenges that will only become more severe if mankind doesn't take proactive measures. A solution to the dilemma when dealing with death is found in natural burials. Natural burials reduce the need for resources, reduce the contamination of the environment and could even repair weakened ecosystems. Tombstones are the universal symbol of death. Natural burials replace the dreary tombstone with a vibrant tree.

Outline

I. Introduction
   A. The amount of land available for standard burials is on the decline as the human population continues to increase. The agents and materials involved in traditional methods contribute to the contamination of surrounding soil, water, and air.
   B. Natural burials are the most efficient, conservative and even restorative options for the environment. In essence, death can create life.

II. Body
   A. Background
      1. Historical and modern overview of ceremonial practices and the various types of final resting places
      2. Statistics regarding rising population and the need for alternatives to the rising demands of land
   B. Pros
      1. Natural approaches reduce contamination of the environment, and trees act as efficient filtration systems
      2. Unnecessary and harmful funeral practices
      3. Demands less material; thus, materials could be used elsewhere
      4. The Federal Trade Commission and The Funeral Rule
   C. Cons
      1. Overcoming the religious, cultural and ethical taboos associated with the natural process of death
      2. Embalming is sometimes necessary
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   D. Solutions and compromise

III. Conclusion
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   B. Overview of the pros and cons
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Death is an unavoidable and inevitable part of life. Even so, the discussion on when, where, how and why to lay the deceased to rest has always been a taboo subject, mainly because of the gruesome implications associated with death, such as the process of decomposition. The human race has been motivated by spiritual and sanitary reasons in dealing with the dead. Two of the most popular methods in modern times are burial in a cemetery or cremation. Due to the countless souls who have been laid to rest in this manner, the amount of available land for final resting places is on the decline (Biegelsen, 2012). Not only does the limited amount of space impact the dead, but the living as well, mainly in shortages of land needed to provide food and shelter. Severe environmental impacts are created from the use of standard burial practices. Some examples of contaminants found in the soil are the toxins used in embalming fluid and other unnatural materials such as concrete and metals ("Environmental Impact of Death," 2012). Taking more of a natural approach would conserve land, support local wildlife, and reduce the introduction of unnatural materials and chemicals into the environment. However, some religious and cultural objections could arise due to the more limited time frame available to arrange or conduct memorial services. The more natural and aggressive rate of decomposition could implicate a sense of violation of the deceased's dignity. Although the aversion to accepting more natural approaches are logical, the natural interment of the dearly departed is the most efficient, conservative and even restorative solution for the diminishing and contaminated environment (Zareva, 2011). This can be achieved by the use of biodegradable caskets and urns in which seeds are inserted upon burial, and eventually a tree replaces the usual cumbersome tombstone. In essence, the practice of natural burials manipulates the finality of death into creating a new life.

The historical recognition of death by the human race can be traced back to approximately 60,000 BC with the burial grounds of the Neanderthals and then forward through ancient civilization. While these early burial grounds consisted of natural materials and markings, it can be assumed that since the dawn of man, there has been a universal need to properly deal with the bodies of the deceased ("The History of Funerals," 2014). The ceremonial recognition of one's death has remained a constant practice throughout history and has resulted in the creation of a wide array of intriguing methods and unique structures. The ancient civilizations left behind spectacular tombs, such as the pyramids of Egypt, the Taj Mahal of India, the Dome Des Invalides--Tomb of Napoleon I, and the catacombs of Paris. Although now absent, the Mausoleum of Halicarnassus was one of the seven wonders of the ancient world, which inspired the concept of mausoleums ("Tomb," 2008). The ancient civilizations initiated ceremonial practices and inspired timeless architecture in acknowledgement of the dead that became prevalent in the traditions of future generations.

Cultures of the past and the present developed diverse practices of preparing and relocating the dead. Embalming was created by the ancient Egyptians to preserve the body in the mummification process. Cultures have used burial at sea, funeral pyres, and entombment into caves. The more graphic natural methods, such as the Tibetan sky burial ("Birth, Death and Rebirth: Sky Burial," 2014) and the Towers of Silence ("Funeral History in India," 2014) consisted of leaving the body out in the open and allowing exposure and scavengers to handle the consumption of the flesh. The dead have been donated and used for research and teaching in scientific circles for many centuries. More specific modern examples include the "Body Farm" in Tennessee, in which the donated cadaver is exposed to the elements as part of

forensic research (Carson, 2002). The more gruesome practices were first used for practicality, such as the Sky Burial and the Tower of Silence were used because the hardened landscape would have made burials impossible, while the "Body Farm" is practical in providing a means for critical forensic research.

Plastination removes liquids and fats from the body, followed by introducing a gel-like substance that permanently preserves the body and renders the appendages flexible for display. Plastination is used for donated cadavers that will be displayed for educational purposes, such as the Mutter Museum in Philadelphia (http://www.muttermuseum.org) and "Bodies-The Exhibition" ("Celebrate the Wonder of the Human Form," 2011) of Atlanta. Further examples include the cryogenic laboratories, space burial, dissolution (dissolving of the corpse with acid), and even cannibalism (Grisby, 2008). These methods of preservation for display and future use or complete destruction of the human body lay the groundwork for more innovative and proactive ways to handle the deceased.

Newer and more eco-friendly options include placing cremated remains into a biodegradable urn that eventually results in the growth of a tree. Then there are the natural burials that place the body into the earth either uncovered, or within a biodegradable casket. While there are various reasons behind the natural approach, the main idea is to reduce the impact upon the environment by way of reducing contaminants and conserving space, and also to promote the growth of the surrounding ecosystem.

In addition, the limited amount of viable land for the living is steadily decreasing as the global population continues to rise, thus resulting in even more space needed for the increase in number of annual deaths. According to the *Ecology Global Network*, as of 2011, the statistics

project 131.4 million births per year, and 55.3 million deaths per year ("World Birth and Death rates," 2014). A United Nations agency has estimated the Earth's population to rise from the current number of 7.2 billion people to 9.6 billion by 2050. By 2100, the approximate population will be around 10.9 billion (Climatewire & Sullivan, 2013). These statistics are important in estimating the amount of materials and space needed to continue the standard methods of interment.

Considering the statistics, the best option for the future population and the environment is to adopt the more natural approach. Biodegradable urns can be used to turn the ashes of a loved one into a tree. Designs may vary by company; however, the processes used to use biodegradable urns are quite similar. The ashes of the deceased are placed into the bottom compartment of the urn. Soil is then placed over the ashes in which tree seeds eventually sprout. As the tree's roots reach the bottom of the urn, the ashes serve as a nutrient source. Once the young tree is healthy enough, the entire urn can be planted, at which point the materials of the urn will eventually safely degrade into the soil. Another bonus to this approach is that the urn can be planted at home, in a cemetery, or a park. Biodegradable urns offer an alternative to the scattering of ashes, allowing friends and family to see a re-birth of the dearly departed (Zareva, 2011).

Bios Urn is a company dedicated to awareness and designing such alternatives to the standard cremation. Some of the trees offered are pine, gingko, maple, oak, ash and beech. Attributed to founders Gerald and Roger Moline with their design studio Estudimoline, the main idea behind their product is simply, "There's life, after life":

> The Bios Urn is a fully biodegradable urn designed to convert you into a tree after life. Mainly composed by two parts, the urn contains a seed which will grow to remember your loved one. Bios Urn turns death into a transformation and a return to life through nature. ("Let's Convert Cemeteries into Forests," 2013)

Basically transforming the cremated remains with the Bios Urn will result in a healthy and beautiful life instead of tired and drab ashes (see Figure 1 below).

Fig. 1 Bios Urn Biodegradable Urn

(http://www.scattering-ashes.co.uk/products/memorial-tree-planting-biogradable-urn-that-contains-ashes-compost-and-seed/)

Poetree is the brainchild of the Industrial Designers Society of America (IDSA). Poetree, like Bios Urn, offers biodegradable urns for the purpose of growing a tree. In fact, once a Poetree urn is planted, the top ceramic ring remains around the base of the tree, engraved with the deceased's information and serving as a replacement to the cumbersome tombstone. (See

Figure 2 below.) "A simple and elegant physical manifestation of where emotional intelligence meets not only a poetic idea, but a powerful one that touches the soul of the human condition," states Carrie Russell, the Senior Design Manager of IDSA and in partnership with Proctor & Gamble (Poetree, 2011).

Fig. 2 Poetree Biodegradable Urn

(http://www.gadgetfeast.com/2012/poetree-plantable-funeral-urn/)

If all cremations were followed by insertion into biodegradable urns, local ecosystems would benefit significantly and serve as a more attractive alternative to the tired, bleak, and debilitated grounds of the typical cemetery.

The other environmentally responsible option would be the natural burial. Natural burials differ from the standard in that there is no need or use of a concrete vault, no embalming of the body, and no metal caskets. The body is covered in a shroud, or placed within a casket made of cardboard, willow, or other natural materials. The Green Burial Council (GBC) is a non-profit organization that works with and advises providers and consumers of environmentally friendly options and alternatives to traditional burials and cremations. Natural

burials are legal in all 50 states; however, some states may have their own restrictions and zoning laws. There are about 300 funeral providers certified by the GBC in the United States ("Who We Are," n.d.).

In the United Kingdom, the Natural Death Centre (NDC) is an independent funeral advice service. The NDC strongly supports the natural burial. One of the leading figures of the NDC, Ken West, explains the benefits of the ecological cemetery he founded over 20 years ago in Carlisle, Cumbria, "It became a piece of land where the dead were literally creating new life, and ideal natural environment where voles, owls, newts, frogs and toads thrived instead of the desert that the Victorian cemetery had become" (Feinmann, 2007).

Fig. 3 Ash Tree

(http://www.electricalaudio.com/phpBB3/viewtopic.php?f=4&t=60949)

The major benefit of natural burials and biodegradable urns is not only the conservation of land and materials, and the promotion of re-forestation, but trees serve as nature's filtration system for the atmosphere, soil and water. (See Figure 3 above.) Trees also provide shade and act as barriers in reducing heat, ultraviolet radiation, erosion, pollutants and

allergens. Trees remove carbon dioxide (CO_2) from the atmosphere and release oxygen (O), which can be scarce in urban areas.

> Urban trees can do more for clean air. Depending on location, species, size, and condition, shade from trees can reduce utility bills for air conditioning in residential and commercial buildings by 15 to 50%. Through shade and the evaporation of water from their leaves, trees also provide natural low-tech cooling that reduces energy use and the need to build power plants. ("Clean Air & Water," 2014)

Pollutants and other harmful substances are removed out of the soil and water by the natural filtration system of trees, in turn reducing the amount of fossil fuels needed for the remainder of water treatment carried out by man. Trees can improve and raise ground water levels and act as the first-responders regarding storm water. The tree's roots capture and remove many harmful particles, and even benefit from the excess nitrogen, phosphorus and potassium found in urban areas.

Tree have other positive effects. According to Los Angeles project Million Trees LA, trees can reduce asthma, and reduce noise pollution ("Examples of the Benefits," 2006). The other beneficial aspect about trees is that their presence seems to have positive psychological effects on citizens in Chicago. According to data collected by the University of Illinois, instances of domestic violence and child abuse were decreased in homes near trees versus those that weren't ("Examples of the Benefits Trees Provide," 2006). Turning a deceased body into a tree is altogether a positive transformation, much better than the process of embalming.

One of the first things done to the body postmortem is embalming. In the U.S., the practice of embalming gained popularity during the Civil War, when fallen soldiers needed to be preserved for the transport home. During the 1800's, the main ingredient used was arsenic—up to 12 pounds of arsenic per corpse (Goodman, 2006). Embalming fluid is composed of over 40 chemicals, the main ingredient these days being formaldehyde, and usually takes approximately 3.5 gallons per body. This toxin is a known carcinogen and increases cancer risk with repeated or prolonged exposure, most notably the embalmers themselves. Formaldehyde becomes an environmental risk when flushed down the sewer system with the other bodily fluids during the embalming process, and formaldehyde is also released into the atmosphere during cremation. Once the body is buried, embalming fluid gradually seeps into the soil and groundwater over time, creating hazards for plants and wildlife. As far as sanitation, embalming fluid does replace the blood and serves as a disinfectant, but the components found in the typical embalming cocktail are extremely hazardous. It is important to understand that the decomposition of a human corpse is only deemed hazardous when riddled with certain diseases, such as plague, typhoid or cholera. In contrast, embalming fluid is ineffective in ridding the cadaver of anthrax, tetanus, or gas gangrene (Chiappelli, & Chiappelli, 2008). Overall, embalming the dead does not prevent the inevitable process of decomposition and places the environment and embalmers at risk due to the potent chemicals that constitute this preservative.

Structures that occupy valuable space are mausoleums, concrete vaults, and the extravagant metal caskets. While mausoleums are a practical substitute for burial in regions prone to flooding, they can create extreme biohazards as well. Many mausoleums require

sealer caskets on the presumption that they prevent air and organisms from entering. Unfortunately, without proper ventilation to allow the escape of volatile gasses produced by decomposition, many of the "sealed" caskets have leaked liquefied human remains, and in extreme cases, have actually exploded ("Mausoleum Sued for Propping Open Caskets," 2009).

The underground concrete vault that houses the interred casket serves as a support structure for the soil. This prevents the soil from sinking or caving in due to the gradual decomposition process, and so permits the frequent maintenance by heavy landscaping equipment of the cemetery grounds. Not enough research has been performed to test the risks associated with the concrete used. Even if concrete does not contaminate the soil, it does create waste because each vault requires a minimum of 1.6 tons of concrete. Caskets are another culprit as they take up valuable space and contain toxic components that harm the surrounding soil and groundwater. Green Burial Boulder County is a site created by supporters of natural burials, with the interest in raising awareness of the problems associated with conventional burials. Regarding caskets, it states,

> About 2 million caskets are made in the U.S. each year, and around 75% of these are metal. Casket manufacturers are on the EPA's [Environmental Protection Agency] list of top 50 hazardous material waste producers. Each year, wood caskets require about 45 million board-feet of mostly hardwood lumber (primarily oak, maple, and cherry). ("Environmental Impact of Conventional Burial," n.d.)

If vaults and caskets were replaced with more natural containers, not only would the quality of the soil and air improve, but demand for products would be reduced, especially the wood. The conservation of wood alone could prevent the destruction of an entire forest.

According to the Cremation Association of North America, the average number of cremations is steadily increasing in comparison to the average burial ("History of Cremation," 2012). Cremation may save space, but the process does require the use of fossil fuels as the body is not actually set ablaze, but rather gradually reduced to ash from intense heat. Crematoriums also release mercury and various green-house gases into the atmosphere. However, the cremation industry is gradually making improvements that reduce air emissions and conserve energy.

It is important to acknowledge the amount of materials needed to provide these standard methods of interment. Seven Ponds is a resource for those planning the final arrangements, but is unique in suggesting the more natural arrangements. Founder Suzette Sherman states, "We are a contemporary resource for those who wish to celebrate memory and personalize the end-of-life. At SevenPonds, we believe that cremation and natural burial are the new traditions," (2012). When discussing the environmental impacts of the traditional burials, some of the statistics area given:

- About 800,000 gallons of formaldehyde-based embalming fluid are buried in U.S. cemeteries each year.
- Ten acres of a typical cemetery contain nearly 1,000 tons of casket steel, 20,000 tons of concrete in burial vaults, and enough wood used in coffins to build 40 homes. ("Environmental Impact of Death," 2012)

These statistics show that there is more than enough land and resources within the typical cemetery that could create entire neighborhoods and still reduce pollution caused by the countless gallons of formaldehyde introduced into the soil.

The National Funeral Directors Association (NFDA) projects the industry's revenue to grow to $16.2 billion in 2014 ("Statistics," 2014). The Federal Trade Commission (FTC) enforces consumers' rights defined by The Funeral Rule. Embalming, caskets, vaults, the hiring of professionals to prepare the deceased for burial and conducting the actual memorial service at a funeral home are NOT required by law—these are usually the funeral home or cemetery's own rules and regulations. The law only requires embalming in instances where the body will be delayed in being buried or cremated. Some states require embalming when transporting a body over state lines. Caskets and vaults, again, are not required by law, and if a consumer wishes to purchase one elsewhere, the funeral home cannot refuse to serve the consumer on that basis ("Consumer Information: The FTC Funeral Rule," 2012). The use of funeral homes are not required by law, but since most people have little to no experience in dealing with death, funeral homes are a convenience ("Consumer Information: Choosing a Funeral Provider," 2012).

The Funeral Rule also explains that it is illegal for any provider to falsify or mislead the consumer regarding the effectiveness of their products and services. For example, a funeral director cannot state that embalming, caskets, vaults, or any other option will permanently preserve the deceased. Some actions can slow down the decomposition of a human body (sometimes by years depending on certain conditions and climates), but absolutely no product or procedure offered by the funeral home will completely guard against decay indefinitely. It is

also important to point out that neither embalming or a casket is mandatory by law for a cremation ("Common Funeral Myths," 2011).

Despite the various benefits of natural burials, there are many drawbacks. Certain religious doctrines view the traditional burial as the only accepted method. Many Christians and Muslims hold strong beliefs in the placement of the body into an appropriate grave, usually positioned or facing a certain direction in accordance with their beliefs or teachings regarding the afterlife. If the more natural standards ever became mandatory, it could cause serious conflict between an individual's right to his or her beliefs and the funeral providers' restrictions ("Cemetery," 2014). With this said, it would be necessary to find a middle ground. The environment needs conservation and protection from contamination, but natural burials should not be imposed or mandated onto anyone, especially if it should violate his or her religious beliefs.

Another serious drawback to consider is the issue of forgoing embalming in natural burials. While embalming fluid exposure puts funeral workers, and later the soil and groundwater at risk, its role as a preservative is helpful in allowing ample time for transport of the body and time to arrange and conduct memorial services. The purpose of embalming is to stave off decay long enough to give the bereaved and the professionals ample time to make final arrangements ("Common Funeral Myths," 2011). Such arrangements and memorial services, regardless of region, custom or religion, have provided the human race with the psychological and emotional need for closure. While every death is a traumatic loss, humans are better able to handle the tidal wave of emotions if allowed some sense of control and the

means of acknowledgement and closure; denying embalming could prevent the bereaved from finding closure.

Yet another potential issue with natural interments is the conflicts that could arise from the legal standpoint. For example, even though embalming does not preserve the body indefinitely, the replacement of the bodily fluids with the more disinfectant components reduces the amount of bacteria, pests, and slows decomposition. In the situation of a questionable death or homicide, exhumations would become impossible or impractical in the pursuit of justice. Law enforcement and the family of the deceased would have to take the possibility of a potential need for an exhumation into consideration before allowing nature to take its course. Another conflict added to the scenario would be if the deceased victim had legally willed his or her remains to only be laid to rest via natural processes, thus creating a moral and legal dilemma. The newer concept of the more natural approach suggests that many ethical and legal kinks will need to be ironed out.

In consideration of the positive and negative implications of natural interments, if society, religious groups and the funeral industry would approach the topic with an open mind, the benefits to the environment alone could prevent and treat further contamination. If more providers in the funeral industry would offer these natural alternatives, the concept would become more accepted throughout society. Burial in a casket or cremation is the most used methods in modern times. Regardless of restrictions of certain beliefs and customs, a compromise could usually be met by adopting a more proactive approach. For the more traditional consumers who need the closure of memorial services, the body could be temporarily preserved through the use of refrigeration or the application of dry ice, which

funeral homes already offer in addition to formaldehyde-free embalming ("Embalming: What You Should Know," 2011). For the memorial service, the body could be placed into the usual decorative casket, and then buried naturally or ashes placed into a biodegradable urn after the memorial service is complete. This would allow for the traditional and dignified ceremony, while still remaining environmentally friendly. In these times when many communities are actually debating on the relocation or "doubling-up" of existing graves, it is essential to seek alternatives ("Graves May Have To Be Reused As Cemetery Space Runs Out," 2013). For the countless regions that struggle with hunger, homelessness, pollution, and disease, replacing tombstones with trees that can solve some if not all of those dilemmas seems to be the most logical answer to these global challenges.

Since the dawn of man, there has been a primitive need for the acknowledgement and memorialization of the deceased. From the prehistoric burial mounds, on to the enigmatic and majestic pyramids of Egypt, to the embodiment of eternal love that is the Taj Mahal in India, and the intriguing eeriness of the catacombs lurking beneath Paris, mankind has created some of the most awe-inspiring and amazing structures in the world—and yet they are all symbolic of death. As time progressed and more advancements were made in civilization, mankind has adopted less of a grandeur farewell towards the modern dealings with death and more of a sense of monotonous responsibility to properly "dispose" of the dearly departed. This façade of bereavement has resulted in the modern practice of flooding the circulatory system with poisons and imprisoning the body into metallic caskets suitable to be used in battle, thus placing more importance on the potential preservation of the physical remains rather than preservation of that person's spirit, memory, legacy and dignity.

The illusion of a clean, dry, dignified, and attractive image of the dead lying in a polished, shiny and sealed casket with his or her head resting on a silk pillow is the mechanism on death's assembly line to keep the whole process "sanitary." Unfortunately, the truth of these modern practices do not resemble the peaceful ideal whatsoever—but rather a decomposing, liquefying and putrefying body pumped full of toxins slowly seeping through the toxins of the metallic container into the earth (or sometimes the "bursting forth" as seen in mausoleums), compromising the soil, water, and air, not to mention choking the life out of the flora and fauna. Cemeteries are the quintessential representation of all of the faces of death that the human race desperately tries to conceal in the first place. While the world faces severe shortages of land that could potentially provide shelter and food, people continuously deplete entire forests and other natural resources, creating pollution and the spread of disease, not only to carry out all of the needs of the living, but for the trivial "needs" of the dead as well.

In order to protect, conserve and rehabilitate the environment, more eco-friendly approaches need to be applied not only to the way people live, but also to the way they slumber for eternity. The drawback to any benefit the natural approach could offer is the prejudice against the natural processes of death that keeps mankind unsuccessfully pre-occupied with the denial of its own dwindling mortality—out of sight, out of mind. Natural burials are legal throughout many regions, notably the entire U.S. and United Kingdom, so more attention needs to be given to this integral aspect of conservation. Replacing the poisons of chemicals, the loss of acreage and natural materials caused by the traditional burial and cremation with a growing, contributing and attractive living entity (a tree) seems more plausible in providing relief for the suffering ecosystem, yet still allowing for dignity for the

deceased and closure for the bereaved. By handing over the dead to the earth, accompanied by a few seeds, nature will create the greatest memorial (see Figure 4 below) that no man-made structure could ever replicate—LIFE.

Fig. 3 Tree Symbolizing Life

Source: http://www.pondly.com/2011/09/majestic-tree-by-jessica-bader-94/

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