

Title: Outline a current environmental, political, or social issue that requires redesign.

Explain how you will solve this issue over the duration of your future design career.

Underline the tools and approaches you will use and discuss how and why.

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Death is unavoidable. While it is impossible to avoid dying, it is possible to reduce the negative physical impact death has. Due to modern western practices such as chemical embalming and using hardwood enclosures, the current practices within the industry of death in western society is causing harm to the planet.

There are many burial customs in the world that are different from western customs. For instance, in Islam burials the body is buried in the earth wrapped in sheets, without a coffin or embalming fluids. Hindu ceremonies involve cremation, often at holy sites and riverbanks (Majmudar, 2014). Ancient Egyptians are known for entombing their dead in sarcophaguses and preserved in a process known as mummification (Antoine, et al., 2014). However, this essay will focus on the problem of environmental issue of burials and cremations in western cultures and explore ways to redesign the enclosures used to house the dead. To solve this problem, I will conduct several experiments and plan out suitable designs. This will involve identifying the most suitable materials for redesigning the current burial customs.

Burials in western culture contribute to the loss of natural materials like wood and metal through burying caskets in the earth. The death industry uses these materials in huge quantities, and they will not only never be used again, but they will not decompose for decades. Polished coffins in concrete vaults will take longer still to decompose (Grant, 2022). As well as this, many coffins contain toxic chemicals such as formaldehyde and embalming fluid. If buried near streams, these chemicals can taint the water. Even the act of maintaining cemeteries often causes harm to the environment, as they usually use pesticides chemical fertilisers. Furthermore, a BBC report states that we cemeteries are running out of land for burials. In 2013, a survey suggested that nearly half the cemeteries in England will not have enough space by 2033 (Strangways-Booth, 2013). Unfortunately, to make more space, cemeteries are having to dig up trees or resort to reusing graves to bury more than one body. A report written in the United States concluded that the damage done to the land used for cemeteries is unlikely to ever return to pasture or woodland. This means the burial industry has cause permanent ecological damage (U.S. Department of Agriculture, 1989). While this has been a known issue since at least 1989, little has been done to

change the situation. A popular alternative to burials in a lot of countries is cremation. The Federation of British Cremation Authorities claim that cremations represent around 71% of all deaths (Hickman, 2005). Cremation is often seen as less impactful on the environment because it does not require “the slow and dirty process and dissolution in the grave” (Jupp, 2016, p. 66). Cremated remains also take up less space than burials because ashes can be kept or scattered, or urns can be buried in a much smaller area than a coffin. However, cremations have a massive environmental impact for several reasons. Firstly, the energy required to burn remains is a massive 285 kilowatt hours of gas and 15kWh of electricity for a single cremation. To put this into perspective, an average person would take a month to create a similar amount of greenhouse gas emissions (Hickman, 2005). The gasses released in cremations can be harmful to the environment, such as mercury from dental amalgams. Ashes can also cause environmental damage if scattered over land as they can contain heavy metals such as chromium, copper, nickel and zinc. These can be harmful to plant life (Franco, et al., 2022).

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A key consideration about cremations is the chamber for the ashes. Most ashes are put into urns which are buried in the ground. The most common materials for urns are non-biodegradable meaning they will never break down in the earth or will take hundreds or thousands of years to decompose. Most urns are made from ceramics, metals, or marble. Urns that are made from wood are often coated in gloss that contain harmful chemicals, and some boxes contain metal nails and hinges.

A positive change for re-designing burial chambers is to consider biodegradable urns. Urns take up less space than coffins, but they remain in the earth for centuries or longer. Having an urn that is more environmentally considerate than traditional urns have other benefits such as financial, as cheaper materials could be used, and emotional as having an environmental urn gives a stronger connection to nature.



Figure 1: Untitled from the Silueta Series by Ana Mendieta (1973-78)

When starting to think about redesigning an urn, I was inspired by artist Ana Mendieta. In her live sculpture (fig 1), it appears as though plants are growing from within her. The work was about how she reconnects to the universe. “My art is the way I reestablish the bonds that unite me to the Universe. It is a return to the maternal source” (Mendieta,

2024) This made me think about a biodegradable urn that can also grow flowers. I researched this idea and found a similar concept where a designer created a coffin that can fertilise soil. Shaina Garfield designed these coffins as a way to reduce the negative impact humans have on the earth. As a way to connect with the earth, the coffins were made from funguses so that they are biodegradable and encourage the growth of plant life (Design Indaba, 2019).

From this idea, I wanted to redesign an urn using seeded paper to similarly encourage growth (fig 2). Seed paper can be made by hand by embedding different flower seeds into handmade paper, usually from recycling old paper or card (Hiebert, 2022). The seeds can sprout once the paper is planted into soil and watered. The benefits of using seeded paper for an urn are that they are biodegradable as it decomposes, leaving no waste, and they promote greenery. The idea is that when the paper starts to decompose and mixes with the earth, the ash will help fertilize the seeds, creating a meadow full of flowers. For the flowers to continue to grow, perennial varieties such as shasta daisies, peonies, lavender, daffodils, foxgloves, and poppies should be considered. These help the environment by providing food for bees, butterflies, and other pollinators. Being made from seeded paper would mean that there is no waste when making the urns. Certain flowers can also have sentimental value to remember their loved ones. By having perennial, nature will continue maintain the burial site, which gives peace of mind to surviving relatives about the site being looked after when they are gone. Areas full of flowers gives off a more peaceful, relaxing atmosphere than a traditional graveyard which can be eerie.

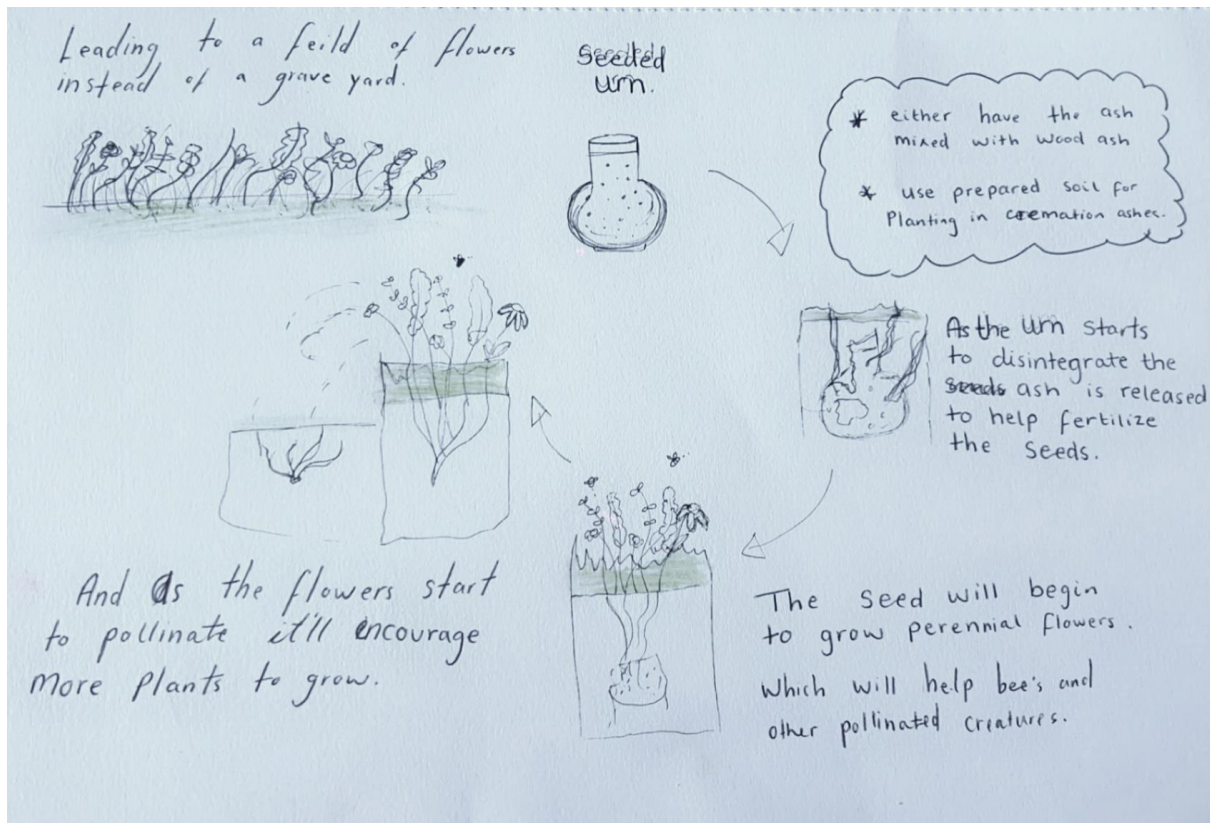


Figure 2: Initial ideas for redesigning an urn with seeded paper, own sketch (2024)

To make sure I was using the best material for these urns I experimented with dough and handmade paper to see if the materials would dissolve faster (fig.3).



Figure 3: Test to time how long it takes to dissolve other materials, own photo (2024)

As well as making seeded paper, I also bought some to see the difference. I placed both sets of seeded paper into glasses to see how long they would take to dissolve. It took my handmade paper three days to dissolve to the bottom of the glass, whereas the bought one did not dissolve. The handmade material dissolved in a fast enough time but it was not strong enough to hold weight needed for an urn.



Figure 4: Experiment with dough, own photo (2024)

I then experimented with dough, inspired by artist Sachi Tungare (Future Materials Bank, 2024). During covid, she created some usable zero –waste vessels out of dough and a bioplastic mixture to prevent them from decomposing. I wanted to experiment with ingredients that were easily accessible from the kitchen. I decided to heat up the dough to create a more playdough consistency instead of being too sticky. After, the experiment the dough was not really dissolving. There had been some changes to it but had not been completely broken down (fig.4).

From these experiments, it was clear that handmade seeded paper would be the better material for redesigning an urn. Although this idea is a good concept, further research revealed that it would not be suitable for an urn because of how deep urns must be buried, making it impossible for the seeds to sprout.

Other inspiration came from a company that made individual reef balls from environmentally safe material, that could easily assimilate into the ocean environment. These reef balls were made to look like a natural reef system and are designed to be permanent memorials to be placed on the ocean floor.

Eternal Reefs take the cremated remains of an individual and incorporates them into a proprietary, environmentally safe cement mixture. The Eternal Reefs are then placed in one of our permitted ocean locations selected by the individual, friend, or family member (Eternal Reefs, 2020).

This is a good example of a redesigned urn that can be used in the ocean, but I wanted an urn that can be traditionally placed in the earth. This led to considering the traditional materials of an urn and identifying the main problems.

Ceramic is one of the most used materials for urns. Many people choose them because they are durable and can withstand some time which makes them suitable for holding ashes. I am looking for a material that is strong enough to hold a human's weight of ash, but can break down fast enough to release the ash quickly so it will fertilize the flowers. In The Light Urns (a company) states that it takes decades for ceramic urns to decompose compared to stone and metal which can take centuries (In The Light Urns, 2024).

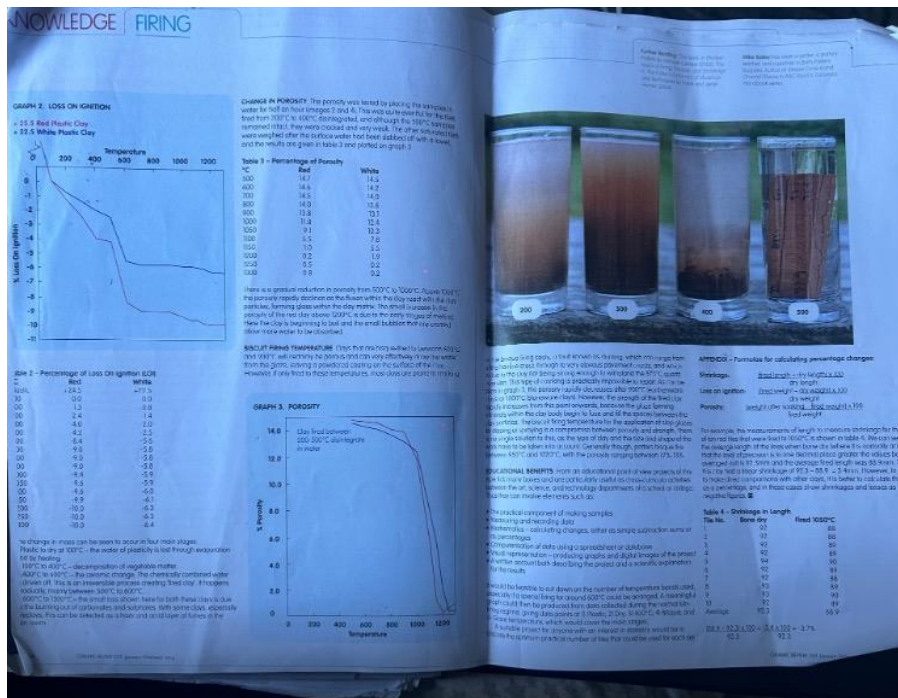


Figure 5; Article about ceramics and clay, own photo (2024)

However, after doing further research, I found the article in figure 5 that states that ceramics can dissolve back into clay like texture if it is burnt under 600 degrees. This would be a perfect material for the biodegradable urns because once it has been fired it turns solid like stone. This makes it strong even to withdraw the weight; but takes less time to dissolve, depending on how high the temperature they are fired at (Bailey, 2013). While this was interesting, the article did not mention how long it would take to dissolve. I tried to find out by firing clay I processed from the beach at different temperatures. I made test tiles going up in hundreds to indicate how long they have been fired (Fig. 6). I then placed each tile into beakers filled with cold water and to time how long it took for it then go back to clay (Fig. 7).



Figure 6: Clay test tiles with temp stamps, own photo (2024)



Figure 7: Tests to time how long it takes for clay to break down, own photo (2024)

After 10 minutes tiles 200 and 300 broke. Then after another 20 minutes tile 400 broke and after 3 hours tile 500 was starting to bend but it took another 6 hours until it was broken completely. Leaving only tile 600. All tiles broke in one day apart from tile 600

which never broke, proving the article right that ceramics can dissolve after being fired under a certain temperature.

After this experiment, I feel that 500 is the perfect temperature to fire re-designed urns as they will eventually break down but will remain intact long enough for a burial.

Further to this, I was inspired by Raoul Bretzel and Anna Citelli, who own and run the company Capsula Mundi. Instead of a coffin or casket, Capsula Mundi creates burial pods that can hold human remains that will be wrapped in biodegradable, natural fabric. These pods are made from natural materials including corn starches and potato. The benefit of the pod is that a tree can be planted on top, with the microbes and nutrients from the body nourishing the tree.

"The biological life cycle and its transformations are the same for every living being. It is time for humans to realise our integrated part in nature," they explained. "Capsula Mundi Wants to emphasise that we are a part of nature's cycle of transformation." (Yalcinkaya, 2019).

A tree takes 10 – 40 years to go into its full maturity. For my re-design, I was looking for something that sprouted faster. I am focusing on bulbs because they only take an average of 8 – 16 weeks depending on the temperature. I want the urns to do as little damage to the soil as possible, so I want plants will continue to sprout. Instead of using annual flowers, which live for just one season, I will use perennial plants which live for multiple years.

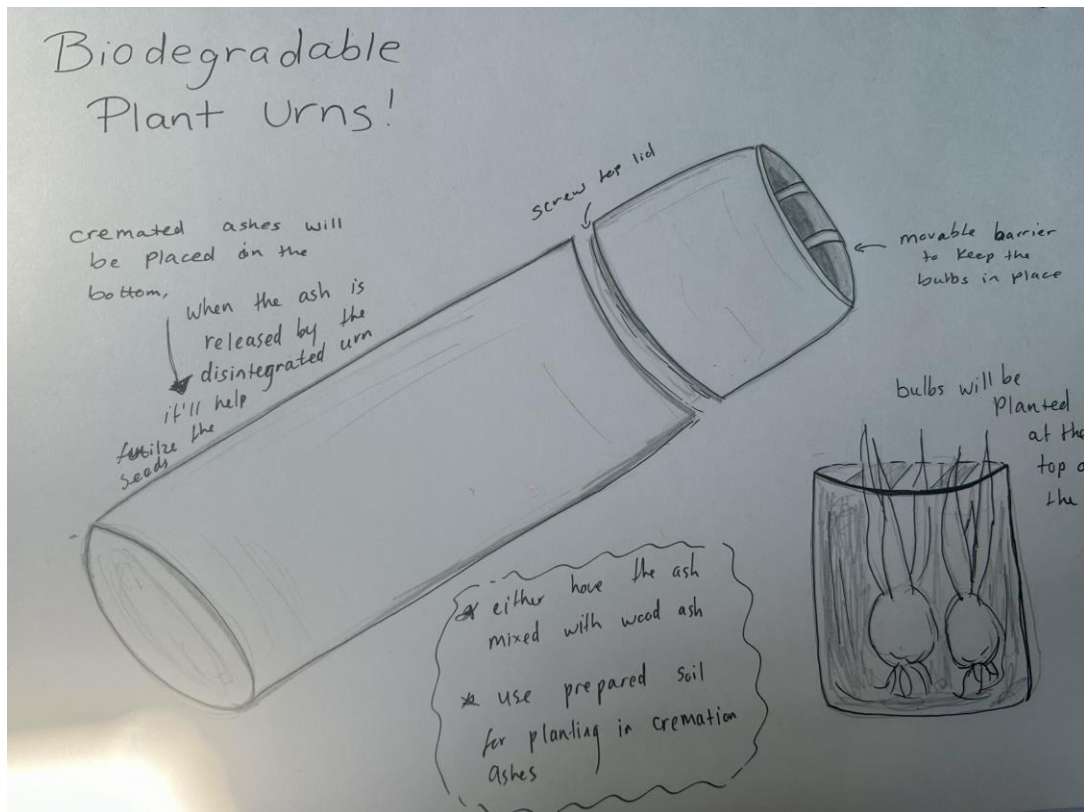


Figure 8: Re-design of biodegradable urn with bulb, own sketch (2024)

After my experiment with seeded paper, I updated the design to include an attachment that will place bulbs into the top of the urn (fig. 8).

In conclusion, traditional burials are not good for the environment. The materials used for coffins and urns can not only harm the soil but can also take decades or centuries to decompose. A solution to this is the redesign a biodegradable urn. From all my experiments and research, it was revealed that clay is the best material to use to solve this problem, but only when fired under 600 degrees. To encourage plants and flowers, the redesign should include a place for a perennial bulb. This reduces the harmful materials that enter the soil, and helps turn cemeteries from grassy areas into flowery meadows.

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