

Eco-funerals

Nourishing life after death

by Robert Zipplies

Death and funerals, topics we prefer not to think about, are an inevitable reality for us all. And an important question to ask ourselves is: Would I want to turn a loved one or myself into pollution when we pass on? Of course not! But this is exactly what we do. Instead of our decomposing bodies nourishing future life, we let them pollute our ecosystems and us. This article explores the issues and alternatives.

To not think of dying is to not think of living (*Jann Arden*)

Humans are highly intelligent and industrious, and over the past few generations we have made enormous progress in developing new technologies. With these we are able to produce an ever-larger range of products and chemical substances. But regrettably our growth in wisdom has not kept pace with our growing abilities and we are now fast stripping our planet of its very richness that we rely on. Now you may think this destructiveness comes to an end when you eventually give up your ghost. Not quite!

In nature all 'waste is food' where things that decay become food for other organisms – an elegantly balanced, cyclical system. Whether it is a plant, animal or other organism that dies, the decomposition sets free nutrients that become food for other life to thrive on. Our distant ancestors too, like animals in the wild, decomposed where they happened to fall or, later, were buried in shallow graves without coffins. This allowed their bodies to nourish future life.

Breaking the cycle

However, our modern funeral practices are far from being in tune with nature's 'waste is food' design and are under growing pressure for their polluting practices. On the one hand, we don't allow the cycling of essential organic and inorganic matter as our body decomposes and, on the other hand, we introduce numerous toxic substances into the soil, water and air.

This all got me thinking many years ago when I planned for when I eventually reach my expiry date. My objective was to minimise the ecological damage my funeral caused and to maximise the utility of my remains. So I decided to become an organ donor (to hopefully prolong someone else's life) and to bequeath the remains to a medical school (for students to enthusiastically pick apart; and possibly learn from). More recently, however, I undertook some research in preparation for a presentation on eco-funerals I was giving to the National Funeral Directors Association (NFDA). The result: it is again time to change my will.

Now before we look at the eco-alternatives, let us first investigate how we currently turn our human remains into pollution. Broadly speaking, there are two mainstream funeral options available to us: cremation and burial.

Cremation

Cremation is a practice widely used and is the process of burning a human body in a special chamber. Its benefit is that it reduces land pressure, because many cemeteries are bursting at the seams. But this is where the benefits end. For starters, significant amounts of fossil fuel are required to reduce the body to ashes, thus contributing to global warming. In addition, a host of other harmful substances are emitted into the atmosphere. Toxic compounds include persistent organic pollutants, or POPs, which also include carcinogenic dioxins and furans – Wikipedia them; they are all rather unpleasant substances that are harmful to all things living. Also released is the toxic heavy metal mercury, which mostly comes from our amalgam fillings. In the UK, it is estimated that crematoria emit 16% of national airborne mercury and 11% of airborne dioxins. These toxins eventually find their way into the food chain and inevitably us. As an example, various countries advise pregnant women not to eat tuna, because of its high mercury content. As a result of these concerns, residents in many countries now actively campaign against having a crematorium sited near them, and a growing number of governments are applying pressure on crematoria to reduce harmful emissions. But even then, this will only make them marginally less bad.

Burial

Burial, you may think, surely nourishes the soil because the body is placed underground. But the facts here – and please bear with me – are also rather depressing. Let's start with commonly used coffins and caskets. The wooden ones are often made from pressed wood and foil board (containing fossil-fuel-based, toxic glues), nylon and other plastic linings and cushions, and varnishes. The negative impact of producing steel or aluminium coffins and caskets is probably

even greater. The mining and refining of the metals is a highly energy intensive and polluting process, and then of course the other non-sustainable finishes are added to the final product. This means that caskets and coffins in general, require much energy to produce and transport, are typically made from non-renewable resources, only decompose partially, or not at all, and introduce toxins into our soil and water. It thus does not come as a surprise that in the US, casket manufacturers are listed as one of the top 50 hazardous waste producers. A further problem is that the body is usually dressed in clothes containing synthetic fibres and dyes – again both ecologically undesirable.

In some cases, where a body needs to be transported or is wished to be preserved for other reasons, it is embalmed prior to cremation or burial. Formaldehyde and other objectionable substances, such as preservatives, disinfectants and additives to sanitise and slow decomposition, are used. These compounds can contaminate soil and ground water, and the use of formaldehyde is a cancer-causing hazard putting mortuary workers at risk. For this reason, a growing number of countries are banning the use of formaldehyde.

There is no doubt: our cemeteries should be declared hazardous waste sites. But I am not quite done yet. A further quandary is that the coffin is typically buried one-and-a-half metres or more under the ground. Such deep burial sadly results in the mortal remains decomposing in an oxygen-starved environment and this anaerobic process leads to the release of methane (CH₄), a greenhouse gas 25 times as potent as carbon dioxide (CO₂). The less potent CO₂ is released when organic material decomposes, as in normal garden composting, in an aerobic environment. A deep burial also means that the body's nutrients are situated below the level of the rich topsoil and are too deep for shallow-rooted plants to access.

Then one must not forget the tombstone, which was quarried, processed and shipped longer distances and in rare cases – the mind boggles – even across oceans. We then still need to factor in the considerable space a cemetery requires as well as its operations, which includes the use of excavators, tractors, water, herbicides and pesticides, and synthetic fertilisers.

Which is the lesser of the evils?

If you haven't yet thrown up your hands in ecological despair, you may be asking yourself: Which is less bad for the environment and ultimately us, cremation or burial? This is difficult to answer, as it depends on numerous factors. An Australian study, only looking at carbon dioxide emissions, indicated that on the day that a cremation or burial takes place, cremation

produces about four times more carbon dioxide emissions. But when long-term grave and cemetery maintenance are factored in, burial performed marginally worse in terms of emissions. But I would not suggest using these results to reach a verdict. There are many factors that may vary considerably (e.g. crematorium equipment, soil type, depth of burial, cemetery maintenance effort and how far the cemetery is located out of town) and there are other factors that are not included in this comparison (e.g. mercury and other airborne pollutants in the case of cremation or soil and water pollution in the case of burial). The bottom line is that both are bad and are not something one would like to associate with the respectful passing of a loved one.

So, how do we prevent turning ourselves into pollution? What can those who care do about seeking a more responsible funeral? In keeping with nature's basic 'waste becomes food' design, all our organic remains and trace elements should ideally be returned to the agricultural fields whence they came. All our lives we denude the richness of our soils. Would it not be wonderful to give back by having our remains nourish the ecosystems that gave us life? But I do not think we will anytime soon overcome the cultural strictures of eating potatoes or apples that were fertilised with the remains of a loved one (or anyone for that matter); although what a celebration of their lives that would be. So let us instead explore a few other alternatives that are being used or developed.

Sky Burial

This ancient Asian practice – of feeding human remains to vultures – does in fact allow the body's nutrients to be released back into nature in a useful form. And in the words of Edward Abbey, naturalist and author: "*If my decomposing carcass helps nourish the roots of a juniper tree or the wings of a vulture - that is immortality enough for me.*" But while ecologically appropriate, it may leave some readers gasping in horror. And even if we did overcome the taboo of dispatching our loved ones in this manner, there are just too many of us for our small vulture populations to cope with (if in fact there are any vultures around). But, don't despair yet; fortunately there are a number of more sustainable – and palatable – alternatives that are becoming popular.

Natural Burial

Natural burial, also called eco-burial, is when the human body is laid to rest in a manner that promotes decomposition of the body and release of its nutrients into the surrounding earth. The burial is usually undertaken in a so-called natural burial ground. While this practice is embryonic in most countries, it is growing apace in Europe and

the USA. In the UK, for example, there are now more than 200 natural burial grounds that attract more than 10% of national burials. The deceased are typically laid to rest in shallow, hand-dug graves – obviating the need for diesel excavators – and are wrapped in shrouds or placed in coffins made from entirely organic, ideally locally sourced, materials. No tombstones are used. Instead, GPS technology, tiny plaques, simple wooden crosses or an indigenous plant mark the grave location.

The shallow grave – the depth depends on soil type – allows the human remains to decompose aerobically, thus minimising the generation of the greenhouse gas methane. Shallow burial also means decomposition is rapid and the grave can be reused much sooner than is normally the case, in this manner significantly reducing the pressure for more burial space. Human ashes, following cremation, can also be scattered in the grounds or be buried in biodegradable urns.

The natural burial grounds typically have a policy of little or no grave or grounds maintenance to reduce negative environmental impacts, thus avoiding the use of chemicals, water and vehicles. And the sites that are more environmentally aware will also ensure their site only contains vegetation indigenous to that area.

Sea Burial

Sea burial may in certain cases be an ecologically responsible option, particularly for coastal towns. The deceased person is wrapped in a shroud, weighted, and bequeathed to the oceanic depths for decomposition. However, there are a number of issues to consider. Boats consume large quantities of dirty fuel and to have a steady stream of funeral boats heading out to sea would make every burial a high-pollution affair. Sailing boats may be an alternative, but could in rough weather leave many a guest clinging to the railing, green around the gills; or the funeral procession may be indefinitely becalmed due to lack of wind. Also, if our multitude were to be buried at sea, more than an occasional fisherman may snag a nasty surprise in their nets. That said, it seems that sea burial may be an appropriate option in limited cases, if correctly managed and possibly piggybacking off scheduled boat trips.

Then there are two further, rather innovative, funeral alternatives that I would like to discuss: Resomation and Promession. They reduce pollution and alleviate the pressure for cemetery or natural burial land. And in the case of Promession, like natural burial, also allows nutrients to cycle back into nature.

Resomation

Resomation (www.resomation.com) is a recently developed process where the body, wrapped in a

silk shroud, is dissolved in a vessel containing a strong alkaline solution consisting of approximately 95% water and 5% potash lye (potassium hydroxide; potassium is an abundantly available mineral and potash lye is also used in the manufacture of everyday products such as liquid soaps). The vessel is heated under pressure to avoid boiling and two to three hours later the body's soft tissues are dissolved into a sterile solution. The only solid remains are a pure white powder from the bones, which is returned in an urn and can be buried or scattered as after cremation. The liquid, which does not contain any human DNA, but only our basic building blocks – salts, sugars, small peptides and amino acids – can be safely returned to the water cycle. Resomation also elegantly avoids the problem of mercury pollution from amalgam fillings, as these are easily removed afterwards. While the production of potash lye and the heating process do require considerable energy, the carbon emissions for the Resomation process are supposedly four times lower than for cremation (note that this compares just the two processes and does not include other emissions such as from the funeral procession vehicles or heating, cooling and lighting of buildings). Where available, renewable energy can be used to power the Resomator.

More than 1000 bodies have to date been resomated at the Mayo Clinic in the US and the procedure is now permitted in seven US states. The first commercial installation is in place in Florida and a further two installations are soon to be commissioned in Minnesota and Los Angeles. Numerous other states and countries are evaluating the technology.

Promession

Promession (www.promessa.org.uk) is another new alternative and was developed by the Swedish biologist Susanne Wiigh-Mäsak who has a deep appreciation of ecosystems and nutrient cycles. Her particular ambitions were to develop a method for allowing human remains to nourish our soils, as was nature's original design, while also reducing the cemetery space problem. In the Promession process, the human body, placed inside a plain wood coffin, is slowly frozen to a temperature of minus 18 °C. The temperature is then further lowered using liquid nitrogen until the body and coffin become so brittle they can be reduced to a frozen dust by vibration. Once the frozen water has been removed in a special vacuum chamber, medical implants and amalgam fillings can be removed. What is left are 25 – 30 kilograms of organic powder for an average adult. This powder is then placed in a (second) biodegradable coffin, about half the size of a normal one, and they are then buried in a shallow grave. In rare cases, Promessa advises cremation of the dust remains where the

deceased was on a particular medication that may cause soil and water pollution.

The real elegance of the Promessa process is that within a year, depending on the coffin, soil type and moisture, the body is reduced to compost thus returning our remains to the soil. One environmental concern is that the initial freezing process and the production of liquid nitrogen, used for the second-stage freezing, are energy intensive processes. But reportedly the greenhouse gas emissions related to these are lower than for cremation; and the initial freezing, can be powered by renewable energy. The Promessa process has been tested successfully on animal carcasses and the first Promator is now being built in Sweden. It is being anticipated with growing international interest.

It does seem that Promession and Resomation, when compared to burial and cremation, reduce greenhouse gas emissions and air, soil and water pollution. And like cremation, but with a much lower pollution side effect, these two technologies could reduce the demand for limited cemetery space.

While some people may feel uncomfortable about being dissolved or frozen and shattered – not that you are likely to feel much at that stage – I find these options to be far more appealing than being burnt or buried in a manner that is toxic to us all. My guess is that we will see a steep rise in demand for natural burials, Resomation and Promession. They allow for a more ecologically caring and dignified transition into the afterlife.

That said, I would nonetheless like to see comprehensive independent and full life cycle analyses done to allow for a more objective comparison among the different eco-options.

A last concern that I would like to expand on, and that applies to all funeral options, is that at the time of death we may carry a host of undesirable compounds in our bodies – such as chemotherapy medication or wide range of other chemicals we ingest or absorb – which are then released into the environment. These chemicals are virtually impossible to extract from our bodies and this is an issue that will require ongoing research.

Making a choice

What has become clear to me while researching eco-funerals, is that it is almost impossible to completely eliminate the environmental impact of a funeral. But my guess is that we are likely to develop ever lower impact alternatives, possibly with the help of specialised bacteria, fungi or even insects to speed our decomposition, break down undesirable chemicals and improve nutrient cycling. Time will tell.

For now though, my personal preference – a note to my dear family and friends – would be for a

shallow natural burial, which I feel would probably have the lowest overall impact. A further preference, since these sites are typically located out of town, is to reduce travel-related emissions by only having close family attend the funeral. A memorial service could be held in town for other guests.

At this point, some readers may now want to rush out to plan their own or someone else's eco-funeral. But please hang on until the end of this article. A problem is that the eco-funeral industry is still in its infancy, and that the alternatives described above may not be available in many places. In their absence, there are nonetheless a number of things you can do – see 'Funeral greening tips' below.

A few more thoughts

There is no doubt: much more needs to be done to expand our choice of eco-funeral options. As individuals we need to engage with local government and the funeral sector to promote change. Where this has not already been done, there would be merit for government to commission comprehensive studies on eco-burial options to speed up the process.

The time may also have come for independent funeral associations to be established that are run by and represent the interest of citizens. These organisations should not just have an environmental focus, but also a socio-economic one. There is much need to also educate the public about options on how to reduce funeral expenses, a significant cost-factor for many people. Such associations can accelerate the change process by disseminating information to the industry as well as the public, and by lobbying for more progressive laws.

Globally we are now entering an exciting period of transition, where we are realising the folly of our existing ways and are reinventing how we operate as a society. We are becoming wiser and are gradually exchanging unsustainable values and behaviour patterns for more responsible and caring ones. And with this our polluting funeral practices are being redesigned too. While we don't generally have much choice over how or when we die, we can choose a transition that most contributes to the flourishing of future life.

Funeral greening tips

- As a first option and where available, select natural burial, Promession or Resomation.
- Avoid cremation. If it is nonetheless chosen, select a crematorium that has installed after-burners and that uses gas, instead of dirtier-burning fossil fuels such as diesel or paraffin. Where possible, request to be cremated in a cardboard coffin or natural-fibre shroud on a

simple wooden board. While there is apparently no technical constraint to doing this, outdated bylaws often still require a body to be cremated in a wooden coffin.

- If the ashes are to be kept in an urn, ensure it is made from locally sourced, sustainable material. Avoid rare woods and materials such as glass, ceramic and metal, which require high amounts of energy to produce.
- Identify cemeteries in your vicinity, which only contain or favour indigenous plants, and minimise irrigation and use of chemicals. Ask to see the cemetery's (or natural burial ground's) environmental management plan to establish what procedures are in place to reduce electricity, fuel and water consumption, and reduce waste to landfill by recycling and composting.
- Whichever option is chosen, establish whether you can purchase certified carbon offsets for the greenhouse gas emissions caused by the funeral.
- Request the removal of amalgam fillings and other implants, such as pacemakers, prior to cremation or burial.
- Ask for a burial that is as shallow as possible – special permission might be required – as this accelerates decomposition and reduces methane emissions. Consider lobbying for local bylaws to allow for shallower burial.
- Request for the deceased to be buried in a plain natural-fibre shroud, as is allowed with special permission in some areas. If a casket or coffin is chosen, use one made from natural, local materials and that is not varnished, glued or treated and does not contain artificial liners and metal or plastic handles. Increasingly, it is possible to obtain coffins and urns made from more sustainable natural materials, such as wicker, banana sheaves and leaves, bamboo and wood obtained from invasive trees – and as almost always, locally sourced and produced are best. I am somewhat sceptical of recycled paper and cardboard coffins, as these often contain toxic glue, ink and paper coating residues.
- Do not use a tombstone. Rather use untreated, sustainably sourced wood or, better still, mark the grave with rocks and vegetation indigenous to that area.
- The emissions from the funeral procession vehicles are a major contributor to the environmental impact of a funeral. So minimise the travel required and encourage attendants to lift share or organise group transport for guests.
- In some areas, one can request so-called 'reduction burials', where after 20 – 30 years the decomposed remains are carefully removed and reburied in the same grave to make space for other family members. This helps reduce space pressure.

Dying to Live

I didn't live to die,
Not me.
By dying I could live,
If I became a tree.

Me? A tree?
Inspired by CO₂,
I could cleanse the air,
And give oxygen to you.

So, after death,
I still could live and do some good.
Just think of me,
When you touch wood.

I will not be entombed,
Not me!
Nor burnt to ash,
I want to live again!

So grant me this, my living wish ...

Just bury me beneath a tree.
My roots and shoot and leaves,
Will help the lives of others,
And thus grant me a true eternity.

I will go back in time,
Before mankind was born,
Free from all care and strife,
Please grant me this ... another life.

*By Professor Roger Short
(Australian eco-burial enthusiast)*

Robert Zipplies is a sustainability consultant, trainer, speaker and writer.

He is the editor of the book 'Bending the Curve – your guide to tackling climate change in South Africa' (now available as a free e-book download).

Robert also offers courses and training workshops for organisations and individuals ready to turn their concern about the state of our world into inspired action. Participants are challenged, motivated and equipped to drive the change we all want to see in the world.

Visit: www.bendingthecurve.co.za