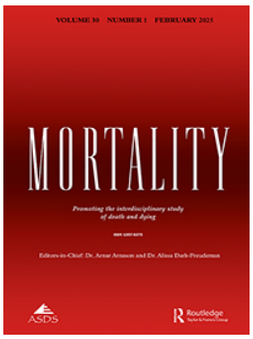

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Alkaline hydrolysis and respect for the dead: an ethical critique

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ABSTRACT

Alkaline hydrolysis is an increasingly popular method of disposing of human corpses, which involves dissolving them into a solution of 95% water and 5% alkali, producing some bone residue and a liquid waste that can be flushed into the sewer system or otherwise hygienically disposed of. Favoured particularly by environmentalists for its perceived ecological advantages over traditional methods of inhumation and cremation, alkaline hydrolysis has been charged by some critics with being insufficiently respectful of the human corpse, and by implication the living human being whose body it once was. Following a discussion of the idea of respect for the dead and its cultural variability, it is argued that alkaline hydrolysis breaches no fundamental principles of respect for the deceased or their remains and that worries on this score are based on misunderstanding or prejudice. The question is raised whether alkaline hydrolysis might nevertheless be considered less respectful to the dead than traditional methods of burial and cremation. Three *prima facie* reasons in support of this claim are weighed and rejected. It is concluded that there are no sound objections based on considerations of human dignity to the adoption of alkaline hydrolysis as a disposal method for human bodies.

KEYWORDS

Alkaline hydrolysis; burial; cremation; disposal methods; respect for the dead; 'necro-waste'

O, that this too too solid flesh would melt,
Thaw, and resolve itself into a dew!
(Hamlet, Act.1, Sc.2, ll,129-30).

Introduction

Alkaline hydrolysis, alternatively referred to as 'aquamation', 'resomation' or 'water cremation', has recently been gaining favour in a number of countries (including the USA, Canada, the UK, Mexico, Australia and South Africa) as a way of disposing of the human dead alternative to the more traditional methods of burial or cremation. In brief, alkaline hydrolysis involves dissolving bodies in a solution of 95% water and 5% alkali in a pressurised stainless-steel tank heated to 1500 degrees C, producing a liquid waste which can be flushed into the sewer system or otherwise disposed of

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hygienically, plus the mineral residue of bones which can be ground into white ash. Originally patented in the USA in 1888 as a method intended primarily for the production of fertiliser from the carcases of animal in *late* years, alkaline hydrolysis as a mode of treating human corpses has increasingly attracted interest on account of its perceived environmental and hygienic advantages over burial and cremation. So great, indeed, have those advantages appeared to some that Lauren Oster, in an article in the *Smithsonian Magazine* in July 2022, has been led to ask: 'Could water cremation become the new American way of death?' (Oster, 2022). In the USA, legalisation has occurred more readily in liberal-leaning states, and by mid-2022 alkaline hydrolysis had been permitted in 22 states, with similar permissive legislation pending in others. But alkaline hydrolysis has been slower to find acceptance among some more conservative-minded constituencies, including sectors of the Roman Catholic Church. In 2011, Donald Cardinal Wuerl spoke for many religious conservatives in objecting to the fact that alkaline hydrolysis is 'unnecessarily disrespectful of the human body' (Archdiocese of St Louis, n.d.); some years later, the Catholic bishops of Missouri expressed their concern that it 'failed to show due reverence' to human remains to flush them into the sewer system (Robinson, 2021, p. 11).[1]

The increasing availability and presumptive popularity of alkaline hydrolysis over the coming years will undoubtedly intensify the debate over its ethical credentials. Alongside the question of whether the process is adequately respectful of the human corpse, and by implication the human being whose living body it formerly was, alkaline hydrolysis also raises issues which are both practical and ethical about its safety, cost, cleanliness and environmental impact.[2] In the present paper, I propose to concentrate primarily on questions pertaining to the preservation of the dignity of the human being in the aftermath of death, where the challenge is to dispose of several kilos of inanimate organic material in a manner that respects both the deceased individual and, so far as possible, the beliefs and feelings of grieving relatives, friends and community members. By taking this approach, I do not mean to imply that ethical questions concerning the ecological costs and environmental impact of alkaline hydrolysis are not also of great importance. Quite the contrary: in our environmentally challenged world, we are morally obliged to opt for eco-friendly alternatives wherever we can, and it is a crucial question how well alkaline hydrolysis measures up to these standards. Fortunately, the evidence so far suggests that alkaline hydrolysis passes environmental tests with flying colours, and I shall assume as a working hypothesis here that this conclusion is basically correct. Georgina Robinson notes that 'alkaline hydrolysis is significantly better for the environment than other forms of corpse disposal', requiring no land as inhumation does and being considerably more energy-efficient and having a lower carbon footprint than cremation (2021, pp. 15–26). These are highly positive points in its favour, yet how much attention would we be disposed to pay to them *if* strong arguments could be adduced to show that alkaline hydrolysis was nevertheless deeply offensive to human dignity? It would take a great deal of environmentally focused pleading to persuade most people that a benefit such as saving energy or lessening carbon pollution sufficed to compensate for the ethical outrage of 'flushing granny down the sewer', if that were really what we were doing. Questions about the ability of alkaline hydrolysis to sustain human dignity and respect for the dead thus take a certain precedence in the order of ethical debate, and for that reason I shall be focussing on them in the following pages.

The plan of the paper is as follows: Section 2 begins with a short description of the alkaline hydrolysis process and records some of the ethical responses it has attracted. Discussion of the relationship between deceased persons and their bodies leads to an examination of the moral responsibilities of the living to show respect to the dead, and of the cultural variability of concepts of respect. I argue that alkaline hydrolysis breaches no fundamental principles of respect for the dead and their bodies, and that fears that it does so are largely based on misunderstanding, prejudice or false associations. Section 3 takes the argument further by asking whether, although alkaline hydrolysis infringes no basic moral principles, it might nevertheless be considered to be *less* respectful to the dead than are burial or cremation, and hence ethically inferior. Three *prima facie* reasons in support of this claim are weighed and found to be wanting. It is concluded that there are no sound objections grounded on considerations of human dignity to the adoption of alkaline hydrolysis as a disposal method.

Respecting the dead and their bodies

Alkaline hydrolysis involves placing the body in a stainless-steel tank (not dissimilar in appearance to a cremator) containing around 1500 litres of water together with a small proportion of alkaline potassium hydroxide (and/or sodium hydroxide) to hasten dissolution. Because the process only impacts protein, the corpse must not be dressed in cellulose-based materials such as cotton, polyester or linen, and the coffin is normally removed before the body, clothed in a silk or woollen shroud, is placed in the retort. The contents are then heated under pressure to a temperature of 1500 degree Celsius, which is maintained for a period of four to six hours.[3] This causes the organic components of the body to be reduced to their basic elements of water, sugars, salts, amino and fatty acids, plus some skeletal material that is subsequently ground into a white powder. The mixture has a high pH value which is lowered by the addition of sulphuric acid, enabling it to be released safely into the sewer system. By this stage, it contains no RNA or DNA that individuates the individual whose body it was. According to the Report of the Advisory Committee appointed by the Health Council of the Netherlands, the solution, instead of being flushed away, can also be treated by a purification process to make it suitable for use as a fertiliser – perhaps for deposit on some special site of remembrance – or for conveyance by tanker to a sludge digester where it can be used to make biogas (Health Council of the Netherlands Advisory Report, 2020/06e). The bone residue is also available to be taken away by the family or friends of the deceased for memorial purposes.

Ethical criticism of alkaline hydrolysis has tended to focus less on the process itself (what goes on inside the stainless-steel tank) than on its sequel: the discharge of the resulting solution into the public sewer system. A common complaint is that treating what remains of the human being in this manner ('necro-waste' in the pithy phrase of Philip Olson (Olson, 2016, p. 59)) is unbefitting to human dignity. But it is important to bear in mind that what is eventually discharged into the sewer system is merely a solution of organic and inorganic chemicals from which all traces of humanity have been eliminated. Discharging the products of alkaline hydrolysis into the sewer system is thus not at all like throwing out a human cadaver with the household garbage or depositing it on a waste heap – actions which no one disputes would be highly disrespectful to the decedent, and wholly unacceptable. K.J. Lasnoski suggests that while 'Alkaline hydrolysis seems to show the least respect for the person and the body that perception may be linked more to rhetoric than to reality' (Lasnoski,

2016, p. 235). Why, he asks, should we suppose it to be more disrespectful to pour remains 'down the drain' than to send them 'up in smoke', as happens in regular cremation? (Lasnoski, 2016, p. 235). The only real difference seems to be that one of these processes is established and familiar, while the other is still a novelty. Lasnoski is doubtless right to ascribe some of the discomfort felt about alkaline hydrolysis to its relative unfamiliarity. However, it is also true that the liquid waste produced by the alkaline hydrolysis process is a more substantial substance than the smoke generated by cremation and in need of further disposal. But here again it is important to remember that this fluid effluent retains no traces of humanity, still less of any identifiable individual. Once this fact is grasped, then unease about the final stage of the alkaline hydrolysis procedure of the kind expressed by the Missouri bishops can be seen to rest on an error; their charge that 'the soft tissue and vital organs [are] flushed into the sewer system' is simply factually incorrect (Robinson, 2021, p. 11).

At this point, we may pause to ask the deeper question of why the bodies of the dead should be thought to merit ethical respect at all. To put it bluntly, a dead body is a mass of organic material on the cusp of decomposition, an object that will rapidly become a health hazard unless it is disposed of safely and speedily. 'What is more foetid than a human cadaver?' asked Cardinal Lothario (subsequently Pope Innocent III) at the end of the twelfth century; 'what more horrible than a dead man?' (Lothario, c.1196). For Lothario like other medieval Christian theologians, the body was merely 'the prison of the soul', a site of pain and suffering during life and an object of disgust thereafter. Human physical remains are today of professional interest to medical researchers, anthropologists and archaeologists in ways that no medieval Christian could have imagined, but this only imputes to them some instrumental value, not the intrinsic worth that would entitle them to any deeper form of ethical respect.

In reality, of course, it is not the physical properties of cadavers that ground the respect that we spontaneously incline to show them but their relational features, their connection to the living persons they once were. To De Baets (2004, p. 134), corpses are 'former human beings', while Gramsch and Liv Nilsson (2013, p. 459) remind us that human physical remains retain 'various symbolic and social meanings and roles'. Our interactions with living human beings are essentially bodily interactions, mediated through sensory contacts, not mystical communications between disembodied souls or spirits. We cannot *think* of other human beings in abstraction from their bodies, even their mental aspects – their intellectual qualities, their character traits, their likes and dislikes, their hopes and fears – being present to us only via our perceptions of them as embodied persons moving, acting and speaking in our shared physical world. It is a small wonder, therefore, that when they die, it is hard to regard their remains as the mere shell or casing of the 'real' them. Even so committed a Christian writer as St Augustine, who believed that the human soul lives on after death while the body returns to dust, considered that 'the bodies of the dead are not to be contemned and cast away'. Because we naturally feel an affection even for the things that formerly belonged to the dead and remind us of them, we will feel a similar yet even stronger emotion in regard to their physical remains, these being 'no part of external ornament or assistance unto man, but of his express nature' (Augustine, 1945, p. 17). Many more recent writers have taken a similar stance. Sarah Tarlow and Liv Nilsson Stutz remark that 'The body of the deceased gains much of its cultural significance because it is a place of emotional investment' (Tarlow & Stutz, 2013, p. 7). To D. Gareth Jones and Maja I. Whitaker, 'the cadaver represents an array of built-in memories that can

never be completely separated from it. … Respect for the cadaver is respect for the relatives' grief' (Jones & Whitaker, 2009, p. 22). Thomas Laqueur argues that the dead possess a social life which outlasts their biological life since 'it takes time for the rent in the social fabric to be rewoven and for the dead to do their work in creating, recreating, representing, or disrupting the social order of which they had been a part' (Laqueur, 2015, p. 10). Even the dead bodies of perfect strangers are liable to arouse in the living emotions of awe and reverence as they recognise the persons they once were. Perhaps, too, they remind us of our own mortality: 'As I am now, so you will one day be'.

That human corpses are objects of natural emotion goes far to explain why the belief that dead human bodies deserve the respect of the living has a strong claim to be considered as a cultural universal rather than as an idiosyncrasy of western modes of thought.[4] However, it is a fact well known to anthropologists that ideas about *how* respect ought to be expressed have displayed striking cultural variation. As Tarlow says, '"Respect" is differently constituted in different cultural milieux, … and what denotes respect in modern Britain or America might not be appropriate elsewhere' (Tarlow, 2006, p. 208). World-wide, the most common modes of disposal have been inhumation, cremation, and the exposure of corpses or 'sky burials', with many variations on these basic models to suit local cosmological and religious belief systems. Alkaline hydrolysis, it may be thought, merely introduces a further, more technologically sophisticated method of disposing of the dead to add to the large repertoire of existing funeral methods. But it would be premature to concede the ethical propriety of alkaline hydrolysis on the ground that it is 'just another method'. An ethical critique needs to ask not only whether alkaline hydrolysis meets any serious objections of principle but also how well it measures up when compared to other, more conventional processes at disposal.

What counts in any culture as showing respect for human cadavers is a function of broader beliefs about the personal, social and religious significances of death, and these beliefs start from the undeniable fact that death is an event that happens to the *whole person*, whether or not the event is thought to mark the start of a subsequent 'afterlife' for some detachable soul or spirit. When one of its members dies, a community must come to terms with the loss of an individual who played a distinctive social role, who loved and was loved, gave and received, made a greater or lesser impact for good on community life, and contributed to determining its future (maybe by leaving children). Ritual correctness at the disposal of remains is of paramount importance where it is believed to affect the fate of the surviving spirits of the dead. For example, the Berawan people of North Borneo conduct a lengthy, and to Western eyes grisly, series of operations of dismemberment and exposure of cadavers to ensure that decomposition proceeds in the manner required to release the ghost of the deceased person from its physical prison. It might be suggested that in treating bodies in this way, the Berawan are, strictly speaking, demonstrating their respect for the persons of the dead rather than for their bodies. But this would be to draw a false dichotomy. In treating the body as they do, the Berawan express their respect for the dead person seen holistically, a compound of body and spirit according to the tenets of Berawan religion and cosmology. Unsurprisingly, from the Berawan point of view, it is Western habits of dealing with their deceased members which fall short on doing justice to the dead. The anthropologist Peter Metcalf has remarked on the extreme distaste with which the Berawan received accounts of the embalming and beautification of corpses in Californian funeral parlours – a disastrous procedure, in their view, liable permanently to entrap the unhappy ghost in its earthly shell (Metcalf, 1993, pp. 329–330).[5]

A vital lesson to be drawn from the recognition of the wide cultural variation in ideas about 'correct' ways of disposing of the dead is that discussion of the ethical propriety of specific methods needs always to be indexed to a particular cultural background. As Magda Slabbert and Melody Labuschaigne remark, 'it is the congregation of the loved ones who stay behind and the rituals they perform, that determines the respectfulness and dignity of the [grieving] ritual' (Slabbert & Labuschaigne, 2021, p. 359). It would, to be sure, be shocking to encounter a person who seemingly displayed no concern at all about treating their deceased members with respect, appearing to look even on the dead bodies of close family members as just an especially distasteful form of rubbish. Such extreme lack of sensibility would, I suggest, be open to ethical censure, as indicating something missing in the fundamental moral feelings that go to make us human. But it would be difficult to identify a culture which fits, or fitted, this description. Cynic Diogenes's request that his own corpse should, as a profane thing, be thrown out for the dogs to eat was a rare and eccentric 'rejection of all that decency and custom prescribe' (Laqueur, 2015, p. 35). As Laqueur describes in *The Work of the Dead*, societies from ancient times to modern times have honoured their dead, though they have chosen different ways to express their respect in accord with their religious and cosmological beliefs, their social conventions and environmental circumstances (2015). No single mode of disposal has ever found, or is ever likely to find, universal acceptability, still less be seen as the optimal choice. When a novel funerary method, such as alkaline hydrolysis, is proposed, the proposal is judged by reference to each culture's distinctive parameters of acceptability. In consequence, alkaline hydrolysis may find it hard to find a welcome within Judaism or Islam or other belief systems which prescribe interment as the sole admissible method of disposing of the dead; whether the process is likely to prove acceptable to Hindus appears at the moment something of a moot point (Robinson, 2021, p. 10).[6] On the whole, Christianity appears to be the most likely among the major monotheistic religions to be willing in time to accept alkaline hydrolysis as a permissible means of dealing with the dead.[7]

Secular outlooks which reject the prospect of an afterlife are naturally the least constrained by concerns about the impact on the soul of the post-mortem handling of the body. It is therefore unsurprising that some of the most radical thinking about the disposal of the dead has issued from writers who have no religious axes to grind. Yet some of the more extreme ideas for making use of the dead that have issued from radical thinkers in recent years betray an ethical insensitivity amounting to crassness. Asmara M. Tekle reports that 'one doctor proposed that the human dead should be skinned prior to cremation, and the skin used to make shoes', while someone else suggested that the fat of the human dead could be used to power street-lamps (Tekle, 2016, p. 145). These startling proposals are disturbingly reminiscent of the tales invented by Allied propagandists during World War I that the Germans had established 'corpse factories' in which dead human bodies were rendered down for the manufacture of soap (see Badsey, 2019). If this 'hyper-utilitarian' approach, as Tekle labels it (2016, p. 45), has the power to shock, a more humane version of the notion that the remains of the dead may be put to some useful purpose has become widely accepted in the context of the posthumous transplant of organs. Here, the use made of the body-parts of deceased people is for a much more honourable purpose than the manufacture of shoes or soap. Even so, in the early days of life-saving transplant surgery, some people felt disturbed by what they saw as the 'utilitarian' character of using the bodies of the dead to save the living. Writing in 1985, Joel Feinberg condemned as

obstructive 'sentimentality' the objection that transplant surgery was an affront to human dignity; to think so was to commit the error of 'attaching a value to a symbol, and then absorbing oneself in the sentiments evoked by the symbol at the expense of real interests, including the very interests the symbol represents' (Feinberg, 1985, p. 32). Feinberg pointed out that human dignity was not undermined but precisely the opposite by the 'effective humanitarianism' that, instead of burning or buying organs, employed them in the saving of other human lives. Stressing that his objection was to unreasoning sentimentality and not to sentiments, Feinberg argued that the latter need to be carefully monitored if we are to 'render them more discriminating motives for conduct' (1985, p. 37).[8]

Feinberg's advice that our sentiments require careful monitoring has particular relevance to the discussion of alkaline hydrolysis, where the newness and unconventionality of the procedure can arouse feelings of moral unease. Bio-conservatives object to novel procedures, such as genetic enhancement techniques, which, in the words of Leo Kass, are in 'danger of violating or deforming the deep structure of natural human activity' (Kass, 2003, p. 22). But nothing about alkaline hydrolysis appears to merit *that* description. However, the 'monitoring' of our sentiments that Feinberg recommends does not always yield entirely clear results, and in regard to the disposal of the dead it is easy for our sentiments to become conflicted. One reason is that, as Olson notes, the contemporary cultural scene affords multiple models for representing the dead human body, and negotiating between these can be both conceptually and emotionally challenging. Ours is a complex and far from monolithic culture, and different models for constructing the dead and the respect that is due to them vie for our adherence. Knowing how to think and to feel about the dead is made harder by the polyvalent nature of the corpse. In Olson's words, 'The human corpse can be conceptualized as a threat to human health, as a sacred object, as an object of considerable metaphysical power, as an aesthetic medium, as a source of nutrients, as a commodity, and as [a] form of material waste – call it "necro-waste"' (Olson, 2016, p. 327). Thus, 'the dead body is not unitary but multiple' and while all these models constitute valid ways of 'knowing the corpse', none can be held to be 'the true and proper way' of knowing it in every circumstance (Olson, 2016, p. 327). The sensible policy may therefore seem to be to follow whatever model is best suited to the specific context of action: hence a minister of religion officiating at a funeral service will view the body of the dead in a quite different light than does the local health inspector charged with the responsibility of ensuring that human cadavers are disposed of hygienically. But this does not wholly solve the problem, since some characterisations of 'the context of action' may not make easy bed-fellows with others. Olson concedes as much when he admits that his own advocacy of a 'waste-directed' approach to the disposal of corpses is likely to offend those to whom 'it will seem improper to think of human bodies as waste', finding that conception starkly incompatible with the idea of the dead human body as a 'sacred object' which deserves respect (Olson, 2016, p. 327). Even where different models can coexist without offence to logic, the psychological strains in transitioning from one model to another may be considerable. For instance, someone may acknowledge that the liquid waste left over from the alkaline hydrolysis process is not granny yet still feels uncomfortable about flushing that waste into the common sewer; here, an ideal answer would be to deposit it instead on a park or garden, which then becomes the final resting-place of and a memorial to the honoured dead.[9]

Where ideas about the rightful treatment of the dead are in conflict, one intuitively compelling strategy is to accede to the personal preferences of the deceased person,

where these are known. A person who during her life enthusiastically supported green environmental policies may see it as the best future for her physical remains to be dissolved by alkaline hydrolysis and the resulting liquid solution to be processed into biogas. Comparisons with the 'corpse factories' of the Great War would be out of place, because that association of ideas fails to distinguish between a context in which human life was frighteningly cheap, and one which celebrates a positive relationship between human beings and the earth on which they live, move and have their being. To oppose the decedent's wish with the argument that such a disposal is 'disrespectful' is to press a viewpoint that she would reject as blinkered by prejudice; and it would grievously insult her autonomy to refuse her request and inter her instead in the local cemetery. The concept of respect for the dead has more to do with honouring the decedent's own beliefs, desires and ideals than with determining from some 'objective' point of view how human corpses should be treated; for no such 'objective' viewpoint is available. Decedents should carefully consider how they wish their remains to be disposed of rather than simply follow prevailing custom; by conducting a Feinberg-style examination of their moral sentiments, they make their exit from the world a vivid expression of their autonomy and personal values. 'Ashes to ashes, dust to dust': since that is our inevitable fate, it is neither unreasonable nor indecent to wish our dust and ashes to perform some eco-friendly function if that speaks to our personal convictions about the human place in the natural world.

Needless to say, survivors or executors are not morally obliged to fall in with just *any* request that decedents might express concerning their mortal remains: some modes of disposal may be too impractical, too expensive, or too disgusting for the living to carry out. A dying person's plea that her remains should be scattered on the top of Mount Everest or be eaten by her relatives may be politely but firmly declined. Survivors have their rights, just as decedents do. The salient point is that the concept of respect for dead persons and their bodies is notably neutral in regard to how dead bodies are disposed of, the primary ethical consideration being the accordance of the method with the principles and desires of the decedent. Respecting those wishes is compatible with allowing a range of modes of disposal of human bodies that satisfy elementary hygienic, environmental and economic criteria (I shall say nothing further here about religious prescriptions and restrictions, which raise issues that go beyond the scope of this article).

To consider the dead human body simply as a variety of material waste or, in more utilitarian terms, as a potential source of nutrients does not do justice to the ethical status of either the body or its owner. To ask, 'How may we best get rid of/make some use of/turn a profit from dead bodies?' sets us off on the wrong foot from the start. Olson, as we saw, is keen to insist that adopting a 'waste-directed' study of the dead should not be allowed to deaden our sensitivity to the ethical resonances emanating from the human corpse. In his view, 'A waste-directed study of the human corpse is compatible with the symbolic dignity universally attributed to the dead human body' (Olson, 2016, p. 326). The Advisory Committee commissioned by the Health Council of the Netherlands agreed. Alkaline hydrolysis, it concluded, did well on environmental grounds since it utilised 'smaller amounts of finite resources than would be the case with burial and cremation'. But it stressed as being of vital importance too that the procedure can be conducted in a manner that maintains the dignity of the dead and causes minimal discomfort and distress to living survivors (Advisory Committee Report, 2020/06E, pp.12–14).

Might alkaline hydrolysis be ethically sub-optimal?

Granting that there is nothing 'intrinsically evil' (in Lasnoski's words) about alkaline hydrolysis (Lasnoski, 2016, p. 238) any more than there is about burial or cremation, it remains to be asked whether there are any persuasive ethical reasons for preferring one form of disposal to another. Might it be the case that while these methods of disposal can all be carried out in a respectful and dignified manner, some are more respectful and dignified than others? To pose the more specific question, can alkaline hydrolysis claim to be equally respectful as its main rivals, once we apply a more finely discriminating moral eye? Among conceivable grounds for holding that alkaline hydrolysis is less respectful to the dead than the standard alternatives, three might appear to have some traction:

(1) Alkaline hydrolysis is an unnatural way of dealing with the dead.
(2) Alkaline hydrolysis is essentially an industrial process.
(3) Alkaline hydrolysis is a method of waste-disposal.

I shall discuss each of these in turn.

1.The first allegation that alkaline hydrolysis is an 'unnatural' means of disposing of the dead, employs a trope familiar from similar attacks on practices that those who label them so have found distasteful. To name but a few, female equality, democracy, homosexuality, vegetarianism, abortion, air-travel, and even frequent bathing have all at one time or another been condemned as 'unnatural', and therefore improper. Often, the accusation that a novel practice is 'unnatural' rests on nothing more solid than an uneasy sense that it marks a break with convention, from which it is inferred, by some very bad logic, that it must also be wrong. In the late 19th century, cremation as a disposal method frequently met with just this response, the idea of decomposing human corpses in the 1100 degree Celsius heat of a blast furnace appalled people who saw burial as the sole appropriate mode of dealing with the dead. As Laqueur observes, 'An austere technological modernism seem[ed] finally to have disenchanted the dead body' in a way which could not fail to disturb; nevertheless, cremation gradually became a widely accepted funerary method, once its initial unfamiliarity had worn off (2015, p. 502).

Controversialists with a taste for charging practices they dislike with being 'unnatural' are typically vague on where, and how, they demarcate the 'natural' from the 'unnatural'; commonly, too, they omit to explain why the 'natural' is automatically to be identified with the right and the 'unnatural' with the wrong. Even Kass's proposal to understand the unnatural in terms of that which 'violat[es] or deform[s] the deep structure of natural human activity' presupposes, rather than provides an account of what exactly a 'deep structure' of human 'nature' is (Kass, 2003, p. 22). John Stuart Mill pointed out that the term 'nature' 'in its broadest application' is simply 'a collective name for all facts, actual and possible'. Construed this way, nothing that ever happens in the world is truly 'unnatural'. But Mill conceded that the word 'nature' is commonly used in a more specialised sense, to denote one-half of the opposition 'nature' and 'Art' (Mill, 1874, pp. 6–7). Even this, though, was misleading, given that 'Art is as much Nature as anything else . . . Art is but the employment of the powers of Nature for an end' (Mill, 1874, p. 7). If we follow Mill, as I suggest we ought to, we may consider the chemical dissolution of bodies, as an instance of 'Art', to be quite as 'natural' as building a house or writing an

article. While it is true that alkaline hydrolysis involves a more technically complex operation than do either cremation or inhumation, it is still an 'employment of the powers of Nature for an end' just as much as setting a body on fire or burying it 6-feet deep in the ground. Indeed, as a reviewer for *Mortality* has kindly pointed out to me, 'alkaline hydrolysis is in fact a chemical process that has been occurring in nature for millions of years. The contemporary use of alkaline hydrolysis … merely accelerates this natural process by increasing exposure to water, increasing temperature, increasing alkalinity, and increasing agitation'.

2. The charge that alkaline hydrolysis is a form of industrial process and therefore less suited than inhumation or cremation to sustain the level of respect to which the dead are due has a little more substance than the accusation that alkaline hydrolysis is 'unnatural', but only a little. Presuming that the difference between an 'industrial' and a 'non-industrial' process is that an industrial process necessitates more elaborate equipment and a more complex technical operation than a non-industrial one, then it may be admitted that alkaline hydrolysis has more of the character of an industrial process than do either burial or cremation. In noting that alkaline hydrolysis ('resomation') is 'an industrial process', Douglas Davies comments that 'the twenty-first century's appetite for such a process of body-disposal remains to be tested' (Davies, 2015, p. 116). But why should the 'industrial' aspect of alkaline hydrolysis be found off-putting, or be thought to impact negatively on human dignity? After all, a funeral parlour equipped to perform alkaline hydrolysis resembles far more closely a crematorium than a factory. Lasnoski, as we saw, bites the bullet boldly, asserting that while alkaline hydrolysis is a complex chemical process one of whose products is a sterile solution that can safely be disposed of 'down the drain', there is nothing in this to lead us to consider alkaline hydrolysis to be any less dignified a way of treating bodies than sending them 'up in smoke' or leaving them in the ground to rot (Lasnoski, 2016, p. 235). Seen in this light, the fact that alkaline hydrolysis is 'a technological, industrial, sterile process', rather than constituting an objection to it, may reasonably be considered a strong argument in its favour. In Lasnoski's view, objecting to alkaline hydrolysis on the ground that it is the most technologically sophisticated method of disposal – to which we may add, the least polluting and most resource-economical method – manifests a perverse attitude 'symptomatic of the cultural inability to confront the reality of bodily corruption in death' (Lasnoski, 2016, p. 241).

How far there exists, as Lasnoski alleges, a 'cultural inability to confront the reality of death' in the present day and age, is a contentious question; the 'denial of death' thesis that was popular some decades back with certain social psychologists and sociologists has recently come under fire from several quarters; like many social generalisations, evidence can be marshalled both for and against it.[10] However, a critic of alkaline hydrolysis may wish to question Lasnoski's claim that those who reject alkaline hydrolysis in favour of more traditional methods are failing to face up to the reality of death. For it could be argued that it is not the opponents but rather the advocates of alkaline hydrolysis who are the more reluctant to acknowledge corpses for what they really are – potential masses of corruption, food for worms and sources of disease. People who prefer inhumation to alkaline hydrolysis are hardly unaware of what goes on in the ground once the body of a loved one has been buried, whereas aseptically dissolving a body in a stainless-steel tank makes it possible to ignore its corruptibility by precluding its corruption. So maybe it is the supporters of alkaline hydrolysis

who manifest 'the greater inability to confront the reality of death'. Be that as it may, the significant point is that it is hard to see in either the quasi-industrial or in the technically complex character of alkaline hydrolysis any genuinely persuasive ethical reason to oppose it. Technology and industrial processes are prominent in every aspect of our contemporary lives and it is hard to see why they should not also have a role to play at the hour of our death.

3. If the industrial nature of alkaline hydrolysis may be forgiven it, might it still be subject to some ethical objection on account of its character as a waste-disposal method? Some people have felt uneasy about extending to the disposal of human corpses, a process previously employed for dealing with animal carcases. But it is worth reflecting that animal carcases are also regularly buried or cremated without that engendering similar qualms about the use of those methods in the human case. As Olson insists, there is no getting away from the fact that a human corpse is, at one level, waste material that needs to be disposed of cleanly and securely, by one method or another. A *prima-facie* more substantial reason for moral suspicion is the association that has developed between advocacy of alkaline hydrolysis and the enthusiasm of many environmentalists for recycling absolutely anything and everything that could prove to be of some future use. Making waste work for us sounds fine in general principle, but reservations may be felt about applying it to deceased human beings. The idea of converting the remains of loved family members into fertiliser or using their bodies in the manufacture of biogas is repugnant to many people whom it would not be just to accuse of naivety or squeamishness. Yet those who maintain such misgivings have no need to reject alkaline hydrolysis on that account, for while alkaline hydrolysis has a strong appeal to some thinkers of a 'green' persuasion, using the residue of the reduction process for such practical purposes as fertilising the crops is not an integral part of it. Whether the remains of the reduction process (including the bone residue) are discarded, recycled or deposited in some place of memory may safely be left for individual decision by decedents and their families.

The fact that a person's body is, as St Augustine expressed it, 'of his express nature' goes far to explain why many people object to conceiving a dead human body simply as 'waste'. The term 'waste' operates in the same linguistic territory as 'refuse', 'garbage', 'scrap', 'trash', 'junk' and 'dregs'. To think of a dead human body exclusively in such dyslogistic terms inevitably strains our ability to sustain the level of ethical respect that is properly due to the dead. Hence, it is important, as Olson reminds us, that we do not neglect those other ways of conceiving the post-mortem body which sound a more humane note while in no way masking the stark truths about mortality. (However, Olson may sometimes obscure his own intentions by his fondness for employing the term 'necro-waste' as the primary descriptor of the human corpse). Even considering human corpses to be potentially *useful* waste is inadequate, because regarding them with a hyper-utilitarian eye as no more than a recyclable resource encourages us to overlook the essential humanity of deceased persons, their former status as Kantian ends-in-themselves and valued social members. Nevertheless, it should also be remembered that, while bodies themselves are something more than mere waste, the liquid solution which is left over once the process of alkaline hydrolysis has been completed contains no surviving traces of DNA and RNA; therefore, there need not be so many scruples about describing these end-products as 'waste' (or 'necro-waste'), or as seeing them as valuable materials for recycling.

In conclusion, there appear to be no convincing reasons for holding alkaline hydrolysis guilty of being either insufficiently respectful to the dead or less respectful than the

methods of disposal, inhumation and cremation. In the absence of cogent ethical arguments against alkaline hydrolysis, the probability is that coming years will see its popularity increase as its novelty wears off, though it is still too early to say whether, as Lauren Oster surmised, it may one day become 'the new American way of death' (Oster, 2022). The reluctance in some quarters to welcome alkaline hydrolysis as a clean and environmentally friendly method of disposal doubtless owes much to the cultural conservatism that is characteristic of the ritualised context of saying goodbye to our dead. As Arnold et al. remark, 'its take-up has been hampered by a lack of awareness and understanding of the technology in the public imagination' – a situation not at all helped by the 'traditional and often conservative models of operation and marketing' maintained by the funeral industry (Arnold et al., 2023, p. 2). Still, customs and conventions naturally adapt themselves as new challenges, opportunities and technologies arise, and there is no reason to think that funerary practices will prove an exception to the pattern. Once it is widely acknowledged that alkaline hydrolysis breaches no ethical principles, the question of its eligibility as a disposal method can be expected to turn on issues of a more practical sort concerning its environmental impact and its financial cost. Research and experimentation to date suggest that alkaline hydrolysis is unlikely to encounter any significant objections on environmental or hygienic grounds, though only time will tell whether it will come to equal, or supersede, inhumation and cremation as a popular choice. However, given the important preliminary need to establish that alkaline hydrolysis is unobjectionable on ethical grounds, the present essay is offered as a humble contribution to that goal.

Notes

1. A word on nomenclature. The name 'alkaline hydrolysis' provides an accurate description of the character of the disposal method in question but it is likely too clinical and cumbrous to catch on as a popular choice. Among the alternatives, 'resomation' (originally a trade-name) conveys the misleading impression that the process at issue somehow reconstitutes or remakes a body (*soma*). Worse still is 'water cremation', since while heat is employed in the rendering down of bodies, no burning of the corpse takes place (the Latin root verb '*cremare*' meaning 'to burn'). 'Aquamation' may be the best of the choices now available, but for present purposes I shall follow the majority of current writers and continue to speak of 'alkaline hydrolysis'.
2. Funeral directors may be reluctant to purchase and instal the equipment needed to carry out alkaline hydrolysis before they are persuaded that public demand for it will be great enough to repay their costs; in their turn, the public may be hesitant about opting for alkaline hydrolysis while it remains novel and unfamiliar. Although there may seem to be something of a vicious circle here, the force of example and the growing recognition of the impressive green credentials of alkaline hydrolysis are likely without too much lapse of time to break it.
3. There is a variant low-temperature method which takes around 14 to 16 hours to produce the same result.
4. The claim that respect for the dead bodies is a cultural universal does not, of course, mean that every society has looked on every dead human body as an object entitled to respect. The bodies of defeated enemies have often been treated with spectacular irreverence (a classic example is the dragging of the dead body of the Trojan hero Hector around the walls of Troy by his Greek conqueror Achilles (*Iliad*, Bk. 22)). Yet even such highly disrespectful dealing with the bodies of the hated dead implicitly testifies to the normalcy of the expectation that bodies should be treated in a reverential manner; it is a deliberately transgressive act, intended to shock by its flagrant flouting of the accepted rules.

5. Some modes of dealing with the dead may appear disrespectful at first sight without really being so. Remarking on the wide variety of funeral customs to be found in the world and the elasticity of the concept of respect, Jeremy Bentham cited Otto von Kotzebue's observations of the practice of the native people of Kamchatka: 'They did not bury their dead, but dragged the corpse into the open air, by a thong tied about the neck, and left it a prey to the dogs'. This looks quite the opposite of respectful, but what seems shocking to us was justified in the eyes of the Kamchatkans by their belief that 'those devoured by these animals, would, in another world, be drawn by the best dogs' (Bentham, 1842, p. 19). This seemingly barbaric treatment of the dead, therefore, actually did them a service!
6. The doubts about cremation entertained by some Christians have chiefly centred on whether the practice is consistent with the theological doctrine of the resurrection of the body. See (Lasnoski, 2016; Mirkes, 2008).
7. One prominent churchman to have set a precedent is Desmond Tutu, Anglican Archbishop of Cape Town, whose remains, at his own request, were disposed of by alkaline hydrolysis following his death in January 2022.
8. A person may feel great satisfaction in the thought that parts of her body will be used after her death in transplant surgery; this causes no sense that her remains are being disrespected: indeed, it may appear to afford to those transplanted organs a kind of 'afterlife'.
9. I am indebted to a reviewer for *Mortality* for this suggestion.
10. For a recent useful survey of the history of the 'denial of death' thesis and the responses it has evoked, see (Robert & Tradii, 2019; Tradii & Martin, 2019).

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