BASIC CREMATION

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“If no one asks me, I know: what it is. If I wish to explain it to one that asketh, I know not.”
—Saint Augustine

Technological innovation can disrupt shared cultural meanings, making difference and disagreement explicit where consistency and agreement were presumed. Funerary alkaline hydrolysis (“AH”) is one such technological innovation, and it has disrupted United States death care culture in several ways. In addition to increasing attention to the negative environmental impacts of contemporary funeral and disposition practices, AH has challenged the bases and boundaries of funeral professionals’ expertise and invigorated public discourse about the ethics of human disposition. In popular online and print media, public debates about AH tend to focus on ethical interests about whether AH ought to be legalized and regulated as a funerary technology over which funeral professionals and state funeral boards have jurisdiction. Detractors generally argue that AH is an undignified means of disposition, while AH defenders consistently cite the technology’s purported environmental advantages over other disposition

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practices, including embalmed earth burial and incineration. However, among funeral industry insiders (including funeral service professionals, state legislators and regulators, organizations of funeral professionals, manufacturers and distributors of AH systems, and other industry stakeholders), an equally contentious debate about AH centers on what AH technologies are. Are AH technologies a form of cremation, or are they a unique form of disposition that differs from cremation in important ways? This Article examines the insider debate about whether or not AH ought to be classified and regulated as a form of cremation, focusing on the kinds of reasons evoked on either side of the debate, and, ultimately, what those reasons reveal or evoke about the axiological landscape of United States death care culture.

The “whether” and “what” questions are closely interconnected, not only because a “no” to the question of legalization could render moot the question of what funerary AH is, but also because answers to questions about what AH is may influence responses to the question of whether it ought to be legalized. Moreover, the outcomes of the insider debates may have important consequences for the public at large, which has a stake in the social and cultural uptake of AH technologies. At issue in the “what” question is the very meaning of cremation—not only in the sense of how cremation and AH are defined (formally or colloquially)—but also with respect to the status and significance of cremation within United States death care culture generally, as well as the ethical and aesthetic values of cremation. Funerary AH may be disruptive, but it is instructively (and constructively) disruptive. AH technologies have stirred up well-settled meanings, assumptions, values and practices: transforming settled, ordered meanings into unstable problematics. It is upon this instructive and constructive disruption itself that I will focus in this Article. My aim is not to persuade anyone to adopt any particular position about what we might call the “cremation status” of funerary alkaline hydrolysis. In short, this Article seeks not to decide what funerary AH is but instead focuses on what the debate about the

5. Id.
6. My intention is not to make an argument about the boundaries between industry insiders and outsiders. I have elsewhere addressed some of the questions that AH raises about this boundary. See Olson, supra note 2, at 84.
7. Olson, supra note 3, at 682.
8. See Olson, supra note 2, at 76-87.
cremation status of AH teaches us about the values that shape United States’ death care culture. The values so revealed are the most important factors to consider when making judgments and decisions about how funeral AH ought to fit into and shape our shared interests in the care and disposition of the dead.

I. WHAT IS ALKALINE HYDROLYSIS?

There are many ways to approach the task of determining what something is, and each approach can teach us something about the object of inquiry. We may ask what something is called or what its name is. We may consult definitions of the object of inquiry. We may ask how something is classified within the law or within some other formal schema. We may seek to determine what something is by comparing it to other things that we take ourselves already to understand. We may take a metaphysical interest in what the object of our inquiry really and truly is. That is, we could embark on a philosophical quest to discover what we ought to think something is according to its own nature, or on its own terms. These and other approaches to the task of determining what something is may overlap with one another, cooperatively contributing to a more or less coherent understanding, or producing inconsistent meanings that only further inquiry could resolve, if ever those inconsistencies could be resolved. Funeral industry insiders have used each of the approaches mentioned here in their efforts to determine what cremation is, and whether funerary AH is a form of it.

One familiar way to begin to determine what something is would be to provide a description. Descriptions are inevitably partial; they select and deselect features of the object of description, emphasizing the importance of certain features while downplaying the importance of other features. Descriptions may also rest content with generalities or fussily insist upon the importance of scrupulous detail. That said, I proffer the following partial description as a starting point for discussing the cremation status of funerary AH.

AH is a reductive chemical process through which bodily tissues are liquefied in a heated (sometimes pressurized) solution of ninety-five percent water and five percent strong alkali (with a
caustic pH of fourteen). In funerary contexts, a single body is sealed in a cylindrical stainless steel vessel into which the water and alkali are added. The design of the vessel and the duration of the process vary, depending upon the temperature and pressure at which the process is carried out. Low temperature (less than 210 degrees Fahrenheit), unpressurized systems can hydrolyze a human body in about twelve hours. At higher temperatures and pressures, the process can take as little as three to four hours. The AH process yields an inert, sterile effluent and brittle bone material. Like much of the biological and chemical waste produced during the process of embalming, AH effluent is disposed of through the municipal sewer system. The brittle bone material is cooled, dried, crushed, and may be returned to the decedent’s next of kin.

Missing from this description is any reference to the origins of funerary AH, as well as any comparisons of AH to other, more conventional disposition processes. Missing too are any details about the chemical reaction itself, the class of chemical reactions to which AH belongs, the environments in which the process is carried out, or the persons who facilitate the AH reaction. Among the many other features absent from this description are the social interests and values that may adhere to AH technologies, as well as any political arrangements, social structures, or forms of social life that are, to borrow a term from Science and Technology in Society scholar Sheila Jasanoff, “co-produced” along with AH technologies. Whether and how these additional features do or do not properly belong within (or are or are not relevant to) a description of AH is part of what is at stake in the insider debate about the cremation status of AH. Indeed, the propriety or relevance of some of the features I have included in the partial description

10. Olson, supra note 2, at 77.
11. Id.
12. Id.
13. Olson, supra note 3, at 668.
14. Id. at 667.
15. Id. at 666.
16. Olson, supra note 2, at 77.
II. WHAT IS CREMATION?

In December 2003, the Supreme Court of Massachusetts ruled that a prohibition on same-sex marriage violates the Commonwealth’s constitution. According to legal scholar Cass Sunstein and federal judge Richard Posner, the ruling “exemplifie[d] the federal system at its best” by leaving it up to individual states to “submit [same-sex marriage] to social experimentation” and consequently to produce empirical evidence that could stand for or against other states’ rulings—and perhaps eventually a federal ruling—on the issue. Prior to the United States Supreme Court’s 2015 ruling in *Obergefell v. Hodges* that state-level bans against same-sex marriage are unconstitutional, it was left to states to determine the legal status of same-sex unions. But it was not just the status of same-sex unions that was being deliberated; debate about the nature and status of same-sex unions initiated a questioning of the meaning of marriage. Disrupting presumed agreement, the debates about same-sex marriage demanded that differing values and beliefs regarding the meaning of marriage be made explicit in public discourse.

Something analogous is happening with AH technologies. The funeral industry is almost exclusively regulated at the state level, and it has been left to states to determine the legal status of

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21. *Id.*
AH technologies.\textsuperscript{25} AH is now legal in ten states (Colorado, Florida, Georgia, Idaho, Illinois, Kansas, Maine, Maryland, Minnesota, Oregon and Wyoming) and three Canadian provinces (Saskatchewan, Ontario, and Quebec), and AH is just beginning to emerge in British funeral markets.\textsuperscript{26} Most of the states that have legalized AH have classified it as a form of cremation, placing AH under the same regulations as cremation.\textsuperscript{27} However, Minnesota, Oregon, and Wyoming have classified AH as a form of disposition other than cremation, developing separate regulations for the technology.\textsuperscript{28} A state’s classification and regulation of AH technologies does not solve the question of whether AH is a form of cremation; rather, state determinations function as arguments within a broader public debate about the cremation-status of funerary AH. The law is not the final authority on technological identities.\textsuperscript{29} Regardless of how individual states classify and regulate AH technologies, debate about what AH is raises questions about the meaning of cremation in United States death care culture. The “what” question compels those who ask it to make explicit various—and sometimes conflicting—beliefs and values regarding cremation. Yet, responding to the ‘what’ question does not merely compel an unpacking of beliefs and values that already constituted the meaning of cremation; responding to the ‘what’ question also involves intervention into the meaning of cremation.


\textsuperscript{27} Kent Hanson, Comment, Choosing to Be Flushed Away: A National Background on Alkaline Hydrolysis and What Texas Should Know About Regulating Liquid Cremation, 5 EST. PLAN. & COMMUNITY PROP. L.J. 145, 154 (2012).

\textsuperscript{28} See, e.g., id. at 154, 157.

\textsuperscript{29} Consider the fact that Bradshaw Funeral and Cremation Services of Minnesota markets AH as “Green Cremation” [emphasis added], despite the state’s classification of AH as a form of disposition separate from cremation. See Green Cremation, BRADSHAW FUNERAL & CREMATION SERVICES, http://www.bradshawfuneral.com/_mgxroot/page_i0837 .php (last visited Nov. 8, 2017).
III. FORMAL AND INFORMAL CLASSIFICATION

In 2010, the Cremation Association of North America (“CANA”) amended its model cremation law by expanding the definition of cremation to include AH.30 Most states that have legalized AH have followed CANA’s model law—a move that streamlines the legal and regulatory process by placing AH under existing cremation regulations.31 Yet, classifying and regulating AH as a form of cremation does more than accelerate industry uptake of the technology; it also functions as an argument on behalf of CANA’s authority over AH technologies.32 Unsurprisingly, the National Funeral Directors Association (“NFDA”) insists that AH ought to be classified and regulated as a form of disposition other than cremation.33 The first adopter of funerary AH technologies, Jeff Edwards of Edwards Funeral Service in Columbus, Ohio,34 captures an important aspect of this inter-organizational disagreement. He argues that funeral directors “made a mess of things”35 by acquiescing to cremation’s disruption of “traditional” funeral services centered around the viewing of embalmed bodies. Edwards stresses the importance of regulating AH as a form of disposition distinct from cremation.36 While creating new rules and regulations for AH is much more costly and time-consuming than placing AH under existing cremation regulations, the construction of new legal infrastructures around the technology allows for greater flexibility in the process of interpreting the technology for lawmakers, funeral professionals, courts, the public, and manufacturers and distributors of AH technologies.

The funeral industry as a whole is still adjusting to a dramatic increase in United States cremation rates, which have rapidly grown from a mere four percent in the early 1960s to a current rate of roughly fifty percent.37 According to a 2013 Time Magazine

30. Olson, supra note 3, at 674.
31. Id. at 666-93.
32. Id. at 674.
33. Id.
34. Olson, supra note 2, at 78.
35. Thomas Parmalee, NFDA TAKES A STAND ON HOW TO CLASSIFY ALKALINE HYDROLYSIS IN THE FUNERAL DIRECTOR’S GUIDE TO ALKALINE HYDROLYSIS 12 (Tanya Kevevich ed., 2011).
36. Id.
37. Andrew Kahn, Cremation in America: A State-by-State Map, Slate (May 20, 2015, 11:13 AM), http://www.slate.com/articles/business/moneybox/2015/05/cremation_rates_in_the_u_s_a_state_by_state_map.html; David Madrid, Cremation Trends Changing Death
article, cremation is emerging as “the new American way of death.” This transformation in American deathways has generated an identity crisis of sorts for funeral directors, whose social and professional identities have been shaped, historically and collectively, in contrast to the philosophical, social, and economic aims and interests of cremation. We have thus encountered the first of several key features of United States death care culture that debates over the cremation of AH reveals. The very social and professional identity of funeral directors, cremationists, and AH adopters is at stake in debates about the cremation status of AH. This crisis was experienced quite intimately by Jeff Edwards, whose very status as a licensed funeral director in Ohio was called into question due to his relationship to AH technologies.

The classification issue is hardly just semantic; it is of substantial practical concern. Some funeral professionals worry that referring to AH as a kind of cremation could potentially confuse or mislead clients, which could elicit litigation against funeral homes and crematories. Also, some states require that crematories be located on cemetery property. If AH is not classified as cremation, then the equipment could be located in funeral homes or other facilities apart from cemetery property, which could in turn occasion new zoning codes regarding AH equipment, as well as new avenues of industry competition.

Despite legal classification and regulation, AH goes by many names in the marketplace. Sometimes AH is marketed explicitly as a form of cremation, going by names like “Green Cremation,” “Bio-Cremation,” “Flameless Cremation,” or “Liquid Cremation.” The technology also bears names like “Resomation” and “Aquamation,” which strongly suggest that the act, process, or

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Rituals, USA TODAY (June 1, 2015, 8:09 PM), https://www.usatoday.com/story/news/nation/2015/06/01/new-cremation-trends/28329461/.
39. Olson, supra note 2, at 76–77.
40. Id. at 78–79.
42. Id.
product of alkaline hydrolysis is akin to those of cremation. Finally, terms like “tissue digestion,” “water reduction,” and “biochemical hydrolysis” are used to refer to AH—albeit very rarely with respect to funerary AH, and almost universally with reference to non-funerary applications of AH technologies. Like legal classifications, naming practices stand as arguments regarding the technological identity—specifically the cremation status—of funerary AH. Moreover, naming practices intimate the two aspects of AH technologies around which most of the insider debate about the technological identity of AH revolve, namely the product of AH and the AH process.

IV. PRODUCT

As an intended funeral product, both funerary incineration and funerary AH yield bone matter that is ground fine, and which may be claimed by the decedent’s next of kin. According to early AH adopter Jason Bradshaw of Bradshaw Funeral and Cremation Service in Minnesota, funeral consumers choose AH for the same reason they choose cremation:

[P]eople don’t choose cremation because they like the process; it’s [that] they like the end product. So it kind of gets at why do people choose cremation. They like the flexibility of it, they like the fact they can scatter, they can do this, they can separate the ashes, they can do these things . . . They don’t like the actual [cremation] process . . . We can separate [the process] by saying there’s another way of getting at the same end, and [some consumers will] like this [AH] better.47

44. Interviews conducted with attendees at the National Funeral Directors Association [NFDA] Convention and Expo, in Charlotte, N.C. (Oct. 8-9, 2012) [hereinafter NFDA Interviews].
45. See Olson, supra note 3, at 672-74, for further discussion of funeral insiders’ interests in dissociating funerary AH from non-funerary applications of AH.
46. Interview with John McQueen and John Anders, Anderson-McQueen Funeral Home, in St. Petersburg, Fla. (Nov. 1, 2013) [hereinafter McQueen Interview].
47. Interview with Jim and Jason Bradshaw, Bradshaw Funeral Services, in Stillwater, Minn. (July 3, 2013) [hereinafter Bradshaw Interview].
John McQueen of Florida’s Anderson-McQueen Funeral Home, another early adopter of funerary AH technologies, likewise separates cremation product and cremation process:

I take a human body, I reduce it to bone and bone fragments, I then pulverize that bone and bone fragment into cremated remains that go in an urn and go back to the family. One uses a direct flame, the other one uses heat and form a thermal method, but either way both of them reduce the body to bone and bone fragments, then turned into cremated remains. Tell me how that’s not cremation.48

AH disrupts the unquestioned unity of cremation product and cremation process, provoking McQueen and Bradshaw to return to their cremation basics and interpret and articulate their understanding of cremation’s meaning and value to funeral consumers. Bradshaw and McQueen, whose firms market AH under the respective labels “Green Cremation”49 and “Flameless Cremation,”50 leverage the product-process distinction to anchor cremation’s meaning and value in the product. In interviews I conducted with attendees of the 2012 NFDA Convention and Expo, very few viewed AH as a form of cremation. But those who did invariably anchored the comparison in the products of AH and cremation. “It’s the same result, even if it uses a different process,” remarked one funeral director; “It does the same thing as cremation. The end product is the same. It doesn’t matter how you get there,” said another.51

Yet, it is not obvious to some of Bradshaw’s funeral customers how a body processed with water can yield cremation “ash.” “This uses fire. Ash at the end. That makes sense to [them]. Water, ash. [They] don’t get it.”52 In response, Bradshaw directs attention away from the befuddling issue of process in order to provide “some re-education that with flame-based cremation most of that [product] is not really ash . . . but pulverized skeletal bone

48. McQueen Interview, supra note 46.
49. Bradshaw Interview, supra note 47.
50. McQueen Interview, supra note 46.
51. NFDA Interviews, supra note 44.
52. Bradshaw Interview, supra note 47.
fragments. In states that have followed CANA’s model law, legalizing AH by changing the definition of cremation to include a variety of processes, including “[t]he mechanical and/or thermal or other dissolution process that reduces human remains to bone fragments,” the product (processed bone material frequently referred to as “cremated remains”), not the process, anchors the legal meaning of cremation.

With respect to cremation’s product, the ideal of purity is a matter of immense material and rhetorical importance. In large part this is because the idea of purity encompasses the two primary concerns that govern United States death care culture: namely, public health and the dignity or sacredness of human remains. Concerns about the purity of cremated remains have traditionally centered on the partitioning of “foreign matter” (including implants, prostheses, eye glasses, and casket materials) from cremation’s product and on avoiding the comingling of different decedents’ cremated remains. In addition to purity, the ideal of the completeness of remains carries normative weight in United States death care culture. Wasted bone matter—that is, cremated remains that inadvertently or carelessly end up being treated as waste—frustrates expectations for a dignified disposal of human remains. Some participants in the insider debate over the status of AH appeal to the values of purity and completeness to suggest that there are product-based grounds for preferring AH to incineration. Bradshaw sums it up this way: “[Y]ou get twenty percent more [bone matter]” and “they’re much whiter.” McQueen draws attention to the same two features of the AH product. “The

53. Id.
55. Olson, supra note 2, at 666, 679.
59. Bradshaw Interview, supra note 47. Funeral director John Anders of Anderson-McQueen also points out “we do get back more cremated remains with this process,” and “they’re white as a piece of paper.” McQueen Interview, supra note 46.
biggest difference,” says McQueen, “is that we get back about twenty-five percent more cremated remains from [the AH] process,” and the AH remains are “white,” unlike the color of incinerated remains, which McQueen describes as “much more gray.”

For some funeral insiders, differences in the color and quantity of bone remains is grounds not only for preferring AH to cremation but also for identifying AH as a form of disposition other than cremation. When asked why she thinks AH differs substantially from cremation, a mortuary science student that I interviewed at the 2012 NFDA conference in Charlotte, NC, explained that, “[w]hat you get back looks better and is cleaner than what you get back from cremation, and with alkaline hydrolysis you get more remains back.”

Indexed to the norms of purity and completeness, color and quantity are value-laden characteristics of incinerated and hydrolyzed remains, and these values function as key battlegrounds for competition amongst rival AH system developers as well as users of these rival systems. Consider, for example, a contestation involving the low pressure AH systems developed by Indiana-based Bio-Response Solutions, Inc. (“BRS”) and the high pressure system developed by Scotland-based Resomation, Ltd. In an article published in The Director, Dean Fisher, a licensed funeral director and Director of the UCLA’s Donated Body Program (which uses Resomation’s system), contends that only high pressure systems ensure that the AH process is performed “in a dignified manner,” ensuring “that the unit can’t be opened during a cycle—to prevent co-mingling of remains and to protect employees from exposure to a potentially hazardous chemical (potassium hydroxide or sodium hydroxide).” He adds that “the high heat and pressure will remove the yellow marrow . . . from the bone and guarantee that a safe and viable by-product is returned to the family . . . [T]he finished product should be stark white and identifiable” Fisher invokes color as a symbolic and material expression of purity, while also suggesting that low pressure systems introduce the risk of comingling human remains, which is widely considered a

61. NFDA Interviews, supra note 44.
62. Olson, supra note 3, at 673, 686.
particularly disagreeable corruption of the dignity of the deceased and the purity of human remains in contemporary United States death care culture.

In an unpublished letter to the editor of The Director, Joe Wilson, CEO of BRS, replies to Fisher’s article, contending that “the final products (bone and liquid) of a non-pressurized process . . . are sterile just as they would be in a pressurized process,” noting that “the breakdown [of the body] is a chemical process, not a pressure process.” Wilson also argues that “[t]here is no greater risk of commingling [human remains] in a zero-pressure system as there is in a high pressure system,” adding that “[i]f regulators want to clarify that commingling is not lawful (as it is written with almost all cremation regulations), then that regulation can be implemented without any mention of pressure.” According to Wilson, concerns about the misuse of AH systems are best dealt with through “proper training, procedural regulations, licensure, and professionalism,” but not through legislation that would standardize and authorize only high pressure AH systems. Finally, Wilson’s letter challenges Fisher’s normative claim that resultant bone material ought to be stark white. “Natural bone is not white,” Wilson writes, it “varies from shades of bright white to creams and browns.” Wilson claims that stark white bone matter can be achieved by either high or low pressure systems by way of running “a second alkali cycle, or even better yet, by a simple post processing bleaching of the bone remnants,” noting that “this has no effect on sterility,” and suggesting that families who choose AH for environmental reasons might prefer to forego a second alkali cycle in order to conserve energy and resources.

I would like to draw attention to two important lessons that can be gleaned from the foregoing remarks about the physical product of AH technologies. First, it is important to note that both Fisher and Wilson accept that public health and the dignity of human remains are the key points around which debates about the quality of AH remains ought to revolve. This is true despite the

64. Letter from Joe Wilson, CEO of BRS, to the editor of The Director (Jan. 3, 2012) (on file with author).
65. Id.
66. Id.
67. Id.
68. Id.
fact that Resomation, Ltd. markets its AH system as an improved form of cremation, while Bio-Response Solutions markets its AH systems as an alternative to cremation.\textsuperscript{69} Regardless of insiders’ positions regarding the cremation status of AH, what is not up for grabs in the debate is whether public health and dignity are to serve as the primary conduits of communication and evaluation with respect to funerary AH technologies. Second, insider debates about the cremation status of AH reveal the stability of—or at least an effort to stabilize—public health and dignity as central values of United States death care culture even in the face of technological innovation. Most funeral insiders do not see (and do not want to represent) AH as a radical innovation that will fundamentally alter death care culture. Rather, they approach AH as a means by which to preserve and maintain the very cultural values that have sustained funeral insiders’ professional status and social roles as authorities over the safe and dignified handling and disposition of dead human bodies.

V. PROCESS

For insiders who view AH as a form of cremation, similarities between the products of incineration and AH serve as common and intuitive grounds on which to anchor the meaning of cremation. Process, on the other hand, most frequently acts as grounds for identifying AH as an alternative to cremation. A wide majority of the NFDA Convention and Expo attendees that I interviewed in 2012 maintained that AH is something other than cremation, and nearly all of these appealed to process as grounds for distinguishing AH from cremation, arguing that AH does not use “heat,” “fire,” “flame,” “a furnace,” or “burning.”\textsuperscript{70} For one of the funeral directors I interviewed, the difference in processes justified a distinction between the products of AH and incineration. “Cremation involves fire. AH is totally different. We shouldn’t call the results of AH cremains or cremated remains.”\textsuperscript{71} According to Jason Bradshaw, however, it is not clear in which sense the AH process differs from the process of incineration:

\textsuperscript{69} Olson, supra note 3, at 684.
\textsuperscript{70} NFDA Interviews, supra note 44.
\textsuperscript{71} Id.
[Y]ou go to the dictionary and the dictionary will say “use of flame” to reduce the body, etcetera. Yeah, you can also look at the definition of caustic, which means “to burn.” So you could make a very easy argument that yes, we are still by definition burning the body.\footnote{Bradshaw Interview, supra note 47.}

Just as AH challenges the presumed unity of cremation’s product and process, Bradshaw suggests that AH is disruptive of the unity of meanings of burning, fire, and flame. Both AH and cremation burn away the decedent’s flesh; the only difference lies in the kind of burning that is taking place. Here, burning is offered as a genus of which incineration and caustic reduction are distinct species. What could “burning” mean? Must the cremation process always involve burning of some sort or other?

In the case of AH, debate about the meanings of burning and cremation sometimes turns to discussions about scientific terminology. Several AH system developers and users have a background in science, including biochemist and Resomation CEO Sandy Sullivan, biologist and BRS Vice President of Research Samantha Sieber, licensed funeral director Jason Bradshaw, who holds a B.S. in Biology, and BRS CEO Joe Wilson, who majored in Forestry and Natural Resources.\footnote{See About RESOMATION, http://resomation.com/about/needforchange/ (last visited Oct. 21, 2017); Contact Us, BIO-RESPONSE SOLUTIONS, http://bioresponsesolutions.com/ContactUs.html (last visited Oct. 21, 2017); Our Staff, BRADSHAW FUNERAL, http://www.bradshawfuneral.com/\_mgxroot/page\_10721.php (last visited Oct. 21, 2017).} Appealing to terminology from chemistry, Wilson, who views AH technologies as an alternative to cremation, directly challenges Bradshaw’s identification of AH and incineration as forms of burning.\footnote{See Bradshaw Interview, supra note 47.} From a chemical point of view, incineration is an oxidative process, while AH is a reductive process. “Alkaline hydrolysis is in a sense the opposite of burning by fire,” writes Wilson. “Burning is an oxidative process, whereas alkaline hydrolysis is a reductive process.”\footnote{Joseph H. Wilson, The History of Alkaline Hydrolysis, GOOD FUNERAL GUIDE, http://www.goodfuneralguid.e.co.uk/wpcontent/uploads/2013/09/HistoryofAlkalineHydrolysis.pdf (last visited Sept. 6, 2017).} In this statement Wilson draws attention to the oppositional features of the chemical definitions of oxidation and reduction: oxidation is a process by which a substance loses electrons, while reduction is a process by
which a substance gains electrons. One could alternately emphasize what oxidative and reductive processes have in common, since both are chemical reactions in which there is a transfer of electrons between two substances.\textsuperscript{76}

If legal definitions of cremation are any indication, it is unlikely that appeals to scientific terminology could settle the debate over the cremation status of AH technologies. In Wyoming, a house bill distinguishes between “chemical disposition” (e.g., AH) and “cremation,” which is referred to as a reductive process.\textsuperscript{77} In Illinois, where AH is classified a form of cremation, both processes are referred to as reductive processes.\textsuperscript{78} Appeal to scientific terminology is unlikely to be decisive in debates over the cremation status of AH; there is no reliable mechanism by which scientific discourse can determine the meaning of nonscientific terms, such as burning or cremation. That is not to say that technical, scientific discourse does not have an important role to play in the determination of what AH technologies are or whether AH becomes fully integrated into United States death care culture. Yet, if scientific discourse is to have a more influential role in the shaping of AH technologies, it is likely to do so only through close attention to certain challenges to scientific communication amongst a variety of actors. Nearly all AH system developers and providers have been frustrated by macabre media coverage of funerary AH—coverage that, according to providers like the Bradshaws, has interfered with their efforts to communicate with funeral consumers.\textsuperscript{79} Science communication scholars and professionals are likely familiar with the Bradshaws’ experience: it is more difficult to communicate with customers who have done a little research into AH than it is to communicate with customers who have not done such research:

So where misconceptions really come in from is a very small portion of people: either those people who have done research. But acid is one [misconception]. What the effluent is all about afterwards [is another]. This is not something that has a lot of complete biological

\textsuperscript{76} Encyclopedia of Inorganic Chemistry, 4643 (R. Bruce King 2d ed. 2005).
\textsuperscript{78} 410 Ill. Comp. Stat. 18.5 (2017).
\textsuperscript{79} See generally Bradshaw Interview, supra note 47; NFDA Interviews, supra note 44.
material in it. I mean it’s very highly, highly processed, and very sterile.  

Misconceptions about the nature or contents of the effluent also affected communications between AH providers and the wastewater authorities in their localities. Initially, wastewater authorities in St. Petersburg had reservations about accepting the effluent produced by Anderson-McQueen’s AH system, incorrectly imagining that the effluent could contain visually identifiable human tissue.  

Does this mean that “cremation is a made-up word,” as Jason Bradshaw has suggested? According to Bradshaw, the funeral business is “a trust business,” and most families “don’t want to know” about the scientific or technical details of the AH process; “[t]hey want to hear us say, ‘It’s ok and it works really well, and a lot of other people are using it’. That’s what they want to hear. And that’s all they want to know.” Bradshaw enacts what sociologist Spencer Cahlil calls the “funeral directors’ professional prerogatives” over the care of dead bodies. Yet, this prerogative is bounded. What assures funeral consumers that AH is “ok” is not up to funeral professionals. According to Bradshaw and McQueen, an increasing percentage of those customers who value cremation’s end product are opting for AH over incineration. AH offers a route to cremation’s end product that doesn’t pass through flame. “[M]ost people say, ‘I like cremation but I don’t like fire’, says Bradshaw; “that’s what most people who have chosen [AH] have said.” Initially, the first providers of funerary AH technologies promoted AH as environmentally friendlier than incineration. However, Bradshaw, for one, was surprised to learn that his

80. Bradshaw Interview, supra note 47. To forestall associations with mobstyle uses of acid to destroy evidence of murder, AH advocates are quick to point out that AH uses strong base chemicals that reside at the end of the pH spectrum opposite to that of strong acids—though Bradshaw himself might point out that chemicals at either end “burn.”  
81. McQueen Interview, supra note 46.  
82. Bradshaw Interview, supra note 47.  
83. Id.  
85. Bradshaw Interview, supra note 47; McQueen Interview, supra note 46.  
86. McQueen Interview, supra note 46.  
87. Bradshaw Interview, supra note 47.  
88. Id.; McQueen Interview, supra note 46.
customers were choosing AH over incineration not because of the purported environmental benefits of AH, but because they deemed AH “gentler” than incineration. "That’s been the number one reason... Far above the eco stuff."

The insider debate regarding the cremation status of AH suggests that in United States death care culture, technical, scientific discourse takes a back seat to more poignant, emotional interests. Funeral industry veterans like Jim and Jason Bradshaw are sensitive to the emotional repertoire of United States funeral consumers, even when they do not themselves inhabit that repertoire. Reflecting on his customers’ apparent belief that AH is a gentler alternative to incineration, Bradshaw says:

[1] If you’re very pragmatic and looking at [AH and cremation], either process is just as “destructive” as the other... But as we know from this business, there’s an emotional component that may make sense or may not make sense, but it’s there, and [AH] seems to connect with people as being just gentler.

By offering AH and discussing that offering with customers, the Bradshaws have learned something unanticipated about the “emotional repertoire” of their customers: “making sense” of this new knowledge is a process in which funeral service providers and funeral consumers collectively participate. Actors who have newly entered the funeral industry via technologies like AH are discovering the importance of learning the emotional repertoire of United States funeral consumers. For example, while bodies are loaded horizontally into the AH systems developed by funeral industry newcomer BRS, during operation the system is tipped to an angle of thirty-three degrees in order to increase the efficiency of the hydrolization process. When proponents of the system devel-

89. Bradshaw Interview, supra note 47.
90. Id.
91. Id.
93. Bradshaw Interview, supra note 47.
94. E-mail from Samantha Sieber, biologist & Vice President of Research, Bio-Response Solutions, to Philip Olson, Assistant Professor of Sci. & Tech., Va. Tech. (Aug. 20, 2013) (on file with author).
oped by funerary AH competitor Matthews Cremation suggested that tipping the body at an angle was undignified, BRS was taken off guard.95 “In fact,” writes BRS’s Sieber, “it never crossed our minds that this would be a discussion. Perhaps that might not have been the case if we had a background in this industry. It’s hard to say.”96 BRS quickly learned that the orientation of the body during disposition is a salient concern within United States death care culture—as it is in the death ways of other cultures as well.97

From the foregoing discussion, it is clear that there is a moral dimension to insider debates about the cremation status of funerary AH. Both technical features of AH systems and moral-metaphysical understandings of the technology can play an important role in the debate. Indeed, in two articles published in the National Catholic Bioethics Quarterly, Sister Renee Mirkes98 and Kent J. Lasnoski99 appeal to technical, scientific discourse to assess the moral status of AH, comparing the AH process to cremation, embalming, and earth burial in order to identify morally salient differences or similarities between AH and death care technologies that the Catholic Church already deems acceptable.100 In The Mortuary Science of Alkaline Hydrolysis: Is It Ethical?, Mirkes discusses cremation, AH, and burial from “a technical perspective” before offering an assessment of the morality of AH.101 Mirkes seeks to discredit process-specific objections to AH technologies by noting that the same grounds for objection can be found in the processes of cremation and earth burial.102 Ultimately, Mirkes reaches the

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95. Id.
96. Id.
97. See Elizabeth Kenney, Shintō Mortuary Rites in Contemporary Japan, 9 CAHIERS D’EXTREME-ASIE 397, 423 (1996) (describing the Japanese tradition of kotsuage, where “the bones of the dead are reformed in the vase, like a fetus within a womb, but with the head on top, making it the opposite of the birth position.”); see also Mark Rowe, Stickers for Nails: The Ongoing Transformation of Roles, Rites, and Symbols in Japanese Funerals, 27 JAPANESE J. RELIGIOUS STUD. 353, 368-69 (2000) (noting that during traditional Japanese cremation, the operator picks out certain bones to represent the entire body for the rite of collecting the remains and placing them in the urn).
100. Id. at 235-39; Mirkes, supra note 98, at 690.
102. Id. at 693-95.
conclusion that, from what Lasnoski terms an “objective” point of view, AH, like cremation, is “a morally neutral action,” and that any moral concerns related to AH lie in what Lasnoski calls “subjective assessment” of “the intentions and circumstances of the acts.” In “Are Cremation and Alkaline Hydrolysis Morally Distinct?,” Lasnoski, like Mirkes, deploys technical, scientific rhetoric to arrive at the conclusion that “alkaline hydrolysis and incineration are morally equivalent in terms of respect for the dignity of the body.”

We see, then, that both alkaline hydrolysis and incineration involve the rapid chemical fragmentation of the human body and the expulsion of a byproduct. Interestingly, only alkaline hydrolysis provides the possibility of retaining the entirety of the fragmented body—of keeping both the aqueous and the solid remains. With incineration, removing 100 percent of the ashes is a practical impossibility. Of the two processes, therefore, alkaline hydrolysis more closely approximates the chemical decomposition of the body that takes place after burial, that is, chemical digestion at the hands of microbes.

A careful examination of the human body’s natural decomposition process after burial and the bodily decomposition involved in cremation reveals that the flashpoint of indignity with alkaline hydrolysis—specifically, pouring the liquid remains down a drain—is found in a similar form in the seepage after burial and in cremation through rain. Also, in the embalming process that precedes traditional burial, the blood and body fluids that are drained from the body are flushed into the sewer. Yet the Church does not forbid embalming. Furthermore, burning a dead human body any less aggressive and, at first blush, any less offensive or violent, than the process of alkaline hydrolysis? And yet the Church allows cremation. Or, when we understand the slow, relentlessly destructive disintegration process within the buried body, is natural decomposition really any less offensive or repulsive than that which happens in alkaline hydrolysis? Yet, we began by recalling that the Church holds up burial (with its natural process of bodily decomposition) as the normative means of disposing of human bodies.

Id. at 694.

103. Lasnoski, supra note 99, at 234–35; Mirkes, supra note 98, at 695.

104. Lasnoski, supra note 99, at 236.
Despite this analysis, which likens AH to burial, Lasnoski deems both cremation and AH “morally inferior to unembalmed burial” from an ecological perspective—because “both hasten decomposition through non-ecological means”—as well as from a doctrinal perspective because “[t]he objective distinction between the act of placing a body at rest and allowing it to decompose naturally and the act of destroying it is morally significant,” and the latter “aligns less closely to God’s will for the human body.”

Lasnoski is one amongst many people who have compared the AH process to the process of decomposition that takes place after burial. 105 AH system developers and providers as well as funeral consumer advocacy groups 106 and popular media outlets make the same comparison. BRS puts it this way on their website:

The alkaline hydrolysis process is essentially an accelerated form of the process which takes place in the natural cycle of life. A combination of gentle water flow, temperature, and alkalinity is used to accelerate the natural course of breakdown accomplished by our ecosystem. At the end of the process the body has been returned to its natural form, dissolved in the water. 107

The strategy of comparing the AH to the “natural” process of decomposition after burial is not unique. Some early advocates of cremation, too, compared the process of incineration to burial. Seeking to discredit cremation’s detractors who considered the incineration violent, in comparison with the supposed peaceful reposé of the body in earth burial, Unitarian preacher O.B. Frothingham argued that in earth burial “[n]ature...seizes at once the cast-off body, and with occult chemistry and slow burning decomposes and consumes it.” 108 The logic behind these comparisons is not unlike the logic that sometimes drives comparisons between AH and cremation. Comparisons between new disposition tech-

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105. Id. at 233–42.
niques and established methods (or natural processes) suggest an interpretation of the new technique that works to anchor restless novelty in the reassuring stability of that which is already cognitively and emotionally familiar.

VI. CONCLUSION

Even if cremation is “a made-up word,” there are constraints upon the making of cremation’s meaning. Not everything goes. Insider debates about the cremation status of AH can teach us a great deal about United States death care culture even if we do not seek to resolve those debates. Importantly, debates about new technologies can expose cracks and incongruities within meanings and values about which shared understanding and agreement were presumed. It is these destabilized meanings and values that at once mobilize and constrain efforts to make sense of new death care technologies. There is much at stake in debates about what AH is. When funeral professionals respond to this question they are forced to consider the facts and values that inform their individual and collective senses of self, social identity, and professional prerogatives. State lawmakers and regulators are called upon to consider the relative (but not necessarily conflicting) values of regulatory streamlining, public health and safety, the commercial interests of funeral service providers and consumers, and the importance of decisions regarding the promulgation of technical, scientific information. Through debates about the cremation status of AH, funeral professionals, consumers, and public officials can both reveal and, to a certain extent, reshape the emotional repertoires that govern United States death care culture.

The destabilized meanings and values that become increasingly visible through debates about AH are likely to animate and limit debates about other new disposition technologies, including the freeze drying technologies being developed by the Swedish company Promessa Organic109 and the British company Incinera- tor Replacement Technology, Ltd.,110 as well as the funerary composting facilities envisioned by Katrina Spade in the Urban Death

Project, and the many intriguing designs for urban disposition imagined by participants in Columbia University architect Carla Rothstein’s Death Lab.\textsuperscript{111} Debates about these technologies are bound to reveal still more assumptions and latent values than those that have been exhumed by funerary AH technologies, and these new revelations may incite us to rethink the significance of debates about the cremation status of AH, just as this debate has fostered closer scrutiny of embalming, cremation, and burial techniques. Insider debates about “basic cremation” offer an opportunity to reconsider not only our cremation basics, but also the facts and values that inform United States death care culture at large.