11

Out of the Fire, into the Compost Bin

And other new ways to end up

When a cow dies on a visit to the hospital, it does not go to a morgue. It goes to a walk-in refrigerator, such as the one at Colorado State University Veterinary Teaching Hospital, in Fort Collins. Like most things in walk-in refrigerators, the bodies here are arranged to maximize space. Against one wall, sheep are stacked like sandbags against a flood. Cows hang from ceiling hooks, effecting the familiar side-of-beef silhouette. A horse, bisected mid-torso, lies in halves on the floor, a vaudeville costume after the show.

The death of a farm animal is death reduced to the physical and the practical: a matter of waste disposal and little more. With no soul to be ushered onward, no mourners to attend to, death's overseers are free to pursue more practical approaches. Is there a more economical way to dispose of the body? A more environmentally friendly way? Could something useful be done with the remains? With our own deaths, the disposal of the body was for centuries incorporated into the ritual of memorial and farewell. Mourners are present at the lowering of the coffin and, until more recently, the measured, remote-control conveyance of the casket into the cremation furnace. With the majority of cremations now done out of view of the mourners, the memo-

rial has begun to be separated from the process of disposal. Does this free us to explore new possibilities?

Kevin McCabe, owner of McCabe Funeral Homes in Farmington Hills, Michigan, is one man who thinks that the answer is yes. One day soon, he plans to do to dead people what Colorado State University is doing to dead sheep and horses. The process—called "tissue digestion" when you speak to the livestock people and "water reduction" when you speak to McCabe—was invented by a retired pathology professor named Gordon Kaye and a retired professor of biochemistry named Bruce Weber. McCabe is the mortuary consultant for Kaye and Weber's company, WR^2, Inc., based in Indianapolis, Indiana.

The mortuary end of corpse disposal had been a low priority over at WR^2 until the spring of 2002, when Ray Brant Marsh of Noble, Georgia, dragged the good name of crematory operators everywhere about as far through the mud as a name could go. At last count, some 339 decomposing bodies were found on land surrounding his Tri-State Crematory—stacked in sheds, dumped in a pond, crammed in a concrete burial vault. Marsh initially claimed the incinerator wasn't working, but it was. Then rumors of decomposing body photos in his computer files made the rounds. It began to look as though Marsh wasn't simply cheap and unethical, but deeply strange. As the body count grew, Gordon Kaye began to get calls: half a dozen from funeral directors, and one from a New York State assemblyman, all wanting to know how soon the mortuary tissue digestor might be available, should the public begin to shun crematoriums. (At that time, Kaye estimated it would be another six months.)

In a few hours, Kaye and Weber's equipment can dissolve the tissues of a corpse and reduce it to 2 or 3 percent of its body weight. What remains is a pile of decollagenated bones that can be crumbled in one's fingers. Everything else has been *turned*

into what the WR² brochure describes as a sterile "coffee-colored" liquid.

Tissue digestion relies on two key ingredients: water and an alkali better known as lye. When you put lye into water, you create a pH environment that frees the hydrogen ion of the water to break apart the proteins and fats that make up a living organism. That's why "water reduction," though clearly a euphemism, is an apt term. "You are using water to break the chemical bonds in the large molecules of the body," says Kaye. But Kaye does not gloss over the lye. This is a man who has spent eleven years in the world of carcass disposal (or "disposition," if you are speaking with McCabe). "In effect, it's a pressure cooker with Drano," says Kaye of his invention. The lye does more or less what it would do if you swallowed it. You don't digest it, it digests you. What's nice about an alkali, as opposed to an acid, is that in doing the deed, the chemical renders itself inert and can be safely flushed down the drain.

There is no question that tissue digestion makes good sense for disposing of dead animals. It destroys pathogens, and, more important, it destroys prions—including the ones that cause mad cow disease—which rendering cannot reliably do. It does not pollute, as incinerators do. And because no natural gas is used, the process is approximately ten times cheaper than incineration.

What are the advantages for humans? If they're humans who own funeral homes, the advantage is economical. A mortuary digestor will be relatively inexpensive to buy (less than $100,000) and, as mentioned, a tenth as expensive to run. Digestors make especially good sense in rural areas whose populations are too small to keep a crematory furnace continuously active, which is the best way for it to be. (Firing it up and letting it cool all the way down and refiring it over and over damages the furnace lining; ideally, you want to keep the fire going

nonstop, turning it down just low enough to remove the ashes and put the next body in, but this presumes a steady lineup of corpses.)

What are the advantages for humans who don't own funeral homes? Assuming it's going to cost a family more or less the same as cremation would, why would someone choose to have this done? I asked McCabe, a chatty, affable Midwesterner, how he plans to market the process to bereaved families. "Simple," he said. "To families who come in and say, 'I want him to be cremated,' I'm gonna say, 'No problem. You can cremate him, or you can do our water reduction process.' And they're gonna say, 'What's that?' And I'm gonna go, 'Well, it's like cremation, but we do it with water under pressure instead of fire.' And they're gonna go, 'All right! Let's do it!' "

And the media is gonna go, "There's lye in there. You're boiling them in lye!" I mean, Kevin, I said, aren't you leaving out a pretty big part of it? "Oh, yeah, they're gonna know all that," he said. "I've talked to people and they have no problem." I'm not sure I believe him on these two points, but I do believe what he said next: "Besides, watching somebody cremated is not pretty."

I decided I had to see the process for myself. I contacted the chairman of the state anatomical board in Gainesville, Florida, where for the past five years digestors have been taking care of anatomy lab leftovers—here under the name "reductive cremation," in order to hopscotch state regulations that willed bodies be cremated. When I got no reply, Kaye gave me a contact at Colorado State. And that is how I came to be standing in a walk-in refrigerator full of dead livestock in Fort Collins, Colorado.

The digestor sits on a loading dock, fifteen feet from the walk-in. It is a round stainless-steel vat similar in size and circumference to a California hot tub. Indeed, when full, the two hold

approximately the same mass of heated liquid and passive bodies: about seventeen hundred pounds.

Manning the digestor this afternoon is a soft-voiced wildlife pathologist named Terry Spracher. Spracher wears rubber boots pulled over his pants, and latex gloves. Both are streaked with blood, for he has been doing sheep necropsies.* Despite what his job duties might suggest, this is a man who loves animals. When he heard I lived in San Francisco, he brightened and said that he enjoyed visiting the city, and the reason he enjoyed it was not the hills or the Wharf or the restaurants but the Marine Mammal Center, an obscure ecology center up the coast where oil-soaked otters and orphaned elephant seals are rehabbed and released. I guess this is how it is with animal careers. If you deal with animals for a living, you generally also deal with their deaths.

Above our heads, the unit's perforated liner basket hangs from a ceiling-mounted hydraulic hoist on a track. A taciturn, ginger-haired lab assistant named Wade Clemons pushes a button, and the basket travels across the loading dock to the door of the walk-in, where he is standing. When he's done loading the basket, he and Spracher will guide it back to the airspace above the digestor and lower it in. "Just like french fries," says Spracher quietly.

Hanging from the hoist inside the walk-in is a large steel hook. Clemons bends down to couple this to a second hook, anchored on a thick band of muscle at the base of the horse's neck. Clemons presses a button. The half-horse rises. The sight is a disquieting blend of horse-as-we-know-it—placid, dejected horse face; silken mane and neck where young girls' hands went—and slasher-flick gore.

* He does not use the word "autopsy," for the prefix denotes a postmortem medical inspection of one's own species. Technically speaking, only a human's investigation of another human's death can be called an autopsy—or, supposing a very different world, a sheep's investigation of another sheep's.

Clemons loads one half, then the other, lowering it down in beside its partner, the two halves fitting neatly together like new shoes in a box. With the seasoned expertise of a grocery bagger, Clemons loads sheep, a calf, and the nameless slippery contents of two ninety-gallon "gut buckets" from the necropsy lab, until the basket is full.

Then he presses a button that sends the basket along the ceiling track on a short, slow trip across the loading dock to the digestor. I try to imagine a cluster of mourners standing by, as they have stood by gravesides as winches lower coffins, and in cremation parlors as coffins on conveyor belts are pulled slowly into crematory retorts. Of course, for mortuary digestions, some alterations will be made in the name of dignity. The mortuary model will use a cylindrical basket and will process only one body at a time. McCabe doesn't see this as something the family would stand around and watch, though "if they wanted to see the equipment, they'd be welcome."

With the basket in place, Spracher closes the digestor's steel hatch and presses a series of buttons on the computerized console. Washing-machine noises can be heard as water and chemicals pour into the tank.

I return for the raising of the basket, the following day. (The process normally takes six hours for a load this size, but Colorado State needs to upgrade its pipes.) Spracher unbolts the hatch and raises the lid. I don't smell anything, and am emboldened to lean my head over the vat and peer inside. Now I smell something. It is a large, assertive smell, unappetizing and unfamiliar. Gordon Kaye refers to the smell as "soaplike," leading one to wonder where he buys his toiletries. The basket appears largely empty, which is pretty amazing when you think about what it looked like going in. Clemons turns on the hoist, and the basket rises from the machine. At the bottom is a foot and a half of bone hulls. I resolve to take Kaye's word for it that you can crumble them in your fingers.

Clemons opens a small door near the base of the basket and scrapes the bones out into a Dumpster. Though it's no more grisly than the emptying of a crematory retort, it's hard for me to imagine this catching on as part of the American funerary tradition. But here again, the funerary rendition wouldn't go quite like this. Had this been a mortuary digestion, the bone remnants would be dried and either pulverized for scattering or, as McCabe envisions, placed in a "bone box," a sort of mini-coffin that could be stored in a crypt or buried.

Everything other than bone has liquefied and disappeared down the drain. When I got back home I asked McCabe how he was going to handle the potentially disturbing realities of the dearly departed's molecules ending up in the municipal sewer system. "The public seems okay with it," he said. Contrasting it with cremation, he said, "You're either going to go in the sewer or you're going to go up in the atmosphere. People who are environmentally conscious know that we're better off putting something sterile and pH-neutral into the sewer than we are letting mercury [from fillings] go into the air."* McCabe is counting on environmental conscience to sell the process. Will it work?

We'll soon see. McCabe is poised to take delivery of the world's first mortuary tissue digestor sometime in 2003.

* In the grand scheme of industrial air pollution, crematoria rank low on the fret list. They emit about half as much particulate matter as a residential fireplace and about as much nitrous oxide as the typical restaurant grill. (This is not surprising, as the human body is mostly water.) Of greatest concern is mercury from dental fillings, which vaporizes and drifts into the atmosphere at a rate of .23 grams per hour of operation (about a half gram per cremation), according to research done jointly by the EPA and the Cremation Association of North America. An independent study done in England in 1990 and published in the journal *Nature* estimated the average amount of mercury released into the atmosphere at three grams per cremation—a notably higher and, the author believed, worrisome total. All in all, compared to power plants and incinerated trash, the dental work of the dead generates a small fraction of the planet's airborne mercury.

You have only to look at the story of cremation to appreciate that changing the way America disposes of its dead is a feat not easily accomplished. The best way to do this would be to buy a copy of Stephen Prothero's *Purified by Fire: A History of Cremation in America*. Prothero is a professor of religion at Boston University, a masterful writer, and a respected historian; his book includes a bibliography of more than two hundred original and secondary sources. The second-best way to do it would be to read the passage that follows, which is basically small chunks of Prothero's book run through the tissue digestor of my brain.

Ironically, one of the cremationists' earliest and loudest arguments in America was that cremation was less polluting than burial. In the mid-1800s, it was widely (and wrongly) believed that buried, decomposing bodies gave off noxious gases which polluted the groundwater and made their way up through the dirt to form deadly, hovering graveyard "miasmas" that tainted the air and sickened those who wandered past. Cremation was presented as the pure and hygienic alternative and might well have caught on then, had the first U.S. cremation not proved to be a PR disaster.

America's first crematory was built in 1874, on the estate of Francis Julius LeMoyne, a retired physician, abolitionist, and champion of education. Though his credentials as a social reformer were impressive, his beliefs about personal hygiene may have worked against him in his crusade for funereal cleanliness and purity. According to Prothero, he believed that "the human body was never intended by its Creator to come in contact with water," and, as such, traveled about in his own personal miasma.

LeMoyne's first customer was one Baron Le Palm, who was to be incinerated in a public ceremony to which national and European press had been invited. Le Palm's reasons for request-

ing cremation remain murky, but somewhere in the mix was a deep-seated fear of live burial, for he claimed to have met a woman who had been buried alive (presumably not very deeply). As things turned out, Mr. Le Palm was finished some months before the crematory was, and had to be preserved. He fell victim to the spotty and improvisational embalming techniques of the day, and wasn't looking his best when rowdier elements of the crowd—uninvited townsfolk, mainly—pulled the sheet from his earthly remains. Crude jokes were made. Schoolchildren snickered. Reporters from newspapers across the country criticized the carnival air of the proceedings and the lack of religious ritual and due solemnity. Cremation was all but doomed to an early grave.

Prothero posits that LeMoyne had erred in presenting a more or less secular ceremony. His unsentimental memorial speech, devoid of references to the Hereafter and the Almighty, and the bare, utilitarian design of his crematory (reporters likened it to "a bake oven" and "a large cigar box") offended the sensibilities of Americans used to Victorian-style funerals with their formal masses and their profusely flowered, ornately appointed caskets. America was not ready for pagan funerals. It would not be until 1963—when the Catholic Church, in the wake of the reforms of Vatican II, relaxed the ban on cremation—that disposal by incineration would start to take hold in a serious way. (1963 was a banner year for cremation. It was that summer that *The American Way of Death*, the late Jessica Mitford's exposé of deceit and greed in the burying business, came out.)

What has inspired funeral reformers throughout history, Prothero maintains, has been a distaste for pomp and religious pageantry. They may hand out pamphlets detailing the horrors and health risks of the grave, but what really bothered them was the waste and fakery of the traditional Christian funeral: the rococo coffins, the hired mourners, the expense, the wasted land. Freethinkers like LeMoyne envisioned a purer, simpler,

back-to-basics approach. Unfortunately, as Prothero points out, these men have tended to take mortuary utilitarianism too far, outraging the churches and alienating the public. Take the American doctor who put forth a plan to boost the dead's utility by skinning them prior to cremation and making leather. Take the Italian professor who advocated burning cadaveric fat in streetlamps, speculating that the 250 people who died each day in New York would yield 30,600 pounds of fuel daily. Take the cremationist Sir Henry Thompson, who sat down and calculated the value in pounds sterling of the 80,000-odd people who died each year in London, should their cremated remains be used as fertilizer. It worked out to about £50,000, though the customers, should any have emerged, would have been dealt a raw deal, as cremains make lousy fertilizer. If you wanted to fertilize your garden with dead people, you were better off doing it the Hay way. Dr. George Hay was a Pittsburgh chemist who advocated pulverizing dead bodies so that they would—to quote an 1888 newspaper article on the topic—"return to the elements as soon as possible, if for no other purpose than to furnish a fertilizer." Here is Hay, quoted at length in the article, which is pasted into a scrapbook belonging to the Historical Collection of the Mount Auburn Cemetery in Cambridge, Massachusetts:

> The machines might be so contrived as to break the bones first in pieces the size of a hen egg, next into fragments of the size of a marble, and the mangled and lacerated mass could next be reduced by means of chopping machines and steam power to mincemeat. At this stage we have a homogeneous mixture of the entire body structures in the form of a pulpous mass of raw meat and raw bones. This mass should now be dried thoroughly by means of steam heat at a temperature of 250 Fahr. . . . because firstly we wish to reduce the material to a condition convenient for handling and secondly we wish to

> disinfect it. . . . Once in this condition, it would command a good price for the purpose of manure.

Which brings us, ready or not, to the modern human compost movement. Here we must travel to Sweden, to a tiny island called Lyrön, due west of Gothenburg. This is the home of a forty-seven-year-old biologist-entrepreneur named Susanne Wiigh-Masak. Two years ago, Wiigh-Masak founded a company called Promessa, which seeks to replace cremation (the choice of 70 percent of Swedes) with a technologically enhanced form of organic composting. This is no mom-and-pop undertaking of the lunatic Green fringe. Wiigh-Masak has King Carl Gustav and the Church of Sweden on her side. She has crematoria vying to be the first to compost a dead Swede. She has the dead Swede ready to go (a terminally ill man who contacted her after hearing her on the radio; he has since taken up residence in a freezer in Stockholm). She has major corporate backing, an international patent, over two hundred press clips. Mortuary professionals and entrepreneurs from Germany, Holland, Israel, Australia, and the United States have expressed interest in representing Promessa's technology in their own countries.

She appears to be doing, in a matter of years, what took the cremationists a century.

This is especially impressive given that what she is proposing has its closest precedent in the ideas of Dr. George Hay. Let's say a man dies in Upsala, and that he has checked the box on the church-distributed living will that says, "I want that the new method freeze-drying ecological funeral will be used if it is available when I die." (The equipment is still being developed; Wiigh-Masak hopes to have it ready sometime in 2003.) The man's body will be brought to an establishment that has licensed Promessa's technology. He will be lowered into a vat of liquid nitrogen and frozen. From here he will progress to the second

chamber, where either ultrasound waves or mechanical vibration will be used to break his easily shattered self* into small pieces, more or less the size of ground chuck. The pieces, still frozen, will then be freeze-dried and used as compost for a memorial tree or shrub, either in a churchyard memorial park or in the family's yard.

The difference between George Hay and Susanne Wiigh-Masak is that Hay, in suggesting that we feed crops with the dead, was simply trying to be practical, to do something beneficial and useful with a dead human body. Wiigh-Masak is not a utilitarian. She is an environmentalist. And in parts of Europe, environmentalism is tantamount to its own religion. For this reason, I think, she may just succeed.

To understand Wiigh-Masak's catechism, it helps to pay a visit to her compost pile. It lies beside the barn on the acre and a half that she and her family rent on Lyrön. Wiigh-Masak shows her compost pile to guests the way an American homeowner might show off the new entertainment center, or the youngest son's grades. It is her pride and, it is no exaggeration to say, her joy.

She pushes a shovel into the heap and raises a loamy clod. It

* Frozen humans shatter easily because they are mostly water. How much water is a matter of some debate. A Google search unearthed sixty-four Web sites with the words "body is 70 percent water," 27 sites that say it's 60 percent water, 43 that tell you it is either 80 or 85 percent water, 12 that say the figure is 90 percent, 3 that say it's 98 percent, and one that says it's 91 percent. A better consensus exists for jellyfish. They are either 98 or 99 percent water, and that is why you never see dried jellyfish snacks.

Todd Astorino, director of the Exercise Science Program at Salisbury University, in Salisbury, Maryland, was able to answer the question not only with certainty, but to a decimal point: We are 73.8 percent water. The figure, he said, is calculated by giving a volunteer a measured quantity of water laced with tracers to drink. Four hours later, the subject's blood is sampled and the dilution of the tracers is noted. From this, you, or Todd anyway, can figure out how much water is in the body. (The more water in the body, the more diluted the tracers in the blood.) Compare the water weight to body weight, and there's the answer. Isn't science terrific?

is complex and full of unnamable fragments, like a lasagna baked by an unsupervised child. She points out feathers from a duck that died a few weeks back, shells from the mussels that her husband, Peter, farms on the other side of the island, cabbage from last week's coleslaw. She explains the difference between rotting and composting, that the needs of humans and the needs of compost are similar: oxygen, water, air temperature that does not stray far from 37 degrees centigrade. Her point: We are all nature, all made of the same basic materials, with the same basic needs. We are no different, on a very basic level, from the ducks and the mussels and last week's coleslaw. Thus we should respect Nature, and when we die, we should give ourselves back to the earth.

As though sensing that she and I might not be entirely on the same page, perhaps not even in the same general vicinity of the Dewey decimal system, Wiigh-Masak asks me if I compost. I explain that I don't have a garden. "Ah, okay." She considers this fact. I get the feeling that to Wiigh-Masak, this is not so much an explanation as a criminal confession. I am feeling more like last week's coleslaw than usual.

She returns to the clod. "Compost should not be ugly," she is saying. "It should be lovely, it should be romantic." She feels similarly about dead bodies. "Death is a possibility for new life. The body becomes something else. I would like that that something else be as positive as possible." People have criticized her, she says, for lowering the dead to the level of garden waste. She doesn't see it that way. "I say, let's lift garden waste to as high a level as human bodies." What's she's trying to say is that nothing organic should be treated as waste. It should all be recycled.

I am waiting for Wiigh-Masak to put down the shovel, but now it is coming closer. "Smell it," she offers. I would not go so far as to say that her compost smells romantic, but it does not smell like rotting garbage. Compared to some of the things I've been smelling these days, it's a pot of posies.

Susanne Wiigh-Masak will not be the first person to compost a human body. That honor goes to an American named Tim Evans. I heard about Evans while visiting the University of Tennessee's human decay research facility (see Chapter 3). As a graduate student, Evans had investigated human composting as an option for third-world countries where the majority of the people can't afford coffins or cremation. In Haiti and parts of rural China, Evans told me, unclaimed bodies and bodies from poor families are often dumped in open pits. In China, the corpses are then burned using high-sulfur coal.

In 1998, Evans procured the body of a ne'er-do-well whose family had donated him to the university. "He never knew he was going to end up as compost guy," recalled Evans, when I telephoned him. This was probably just as well. To supply the requisite bacteria to break down the tissue, Evans composted the body with manure and soiled wood shavings from stables. The dignity issue rears its delicate head. (Wiigh-Masak would not be using manure; she plans to mix a "little dose" of freeze-dried bacteria in with each box of remains.)

And because the man was buried whole, Evans had to go out with a shovel and rake to aerate him three or four times. This is why Wiigh-Masak plans to break bodies up, with either vibration or ultrasound. The tiny pieces are easily saturated with oxygen and so quickly composted and assimilated that they can be used immediately for a planting. It was also, in part, a matter of dignity and aesthetics. "The body has to be unrecognizable while it composts," says Wiigh-Masak. "It has to be in small pieces. Can you imagine the family sitting around the dinner table and someone says, 'Okay, Sven, it's your turn to go out and turn Mother'?"

Indeed, Evans had something of a rough go of it, though in his case it was more the setting than the deed. "It was hard being

out there," he told me. "I used to think, 'What am I doing here?' I'd just put on my blinders and go to my pile."

It took a month and a half for compost guy to complete his return to the soil. Evans was pleased with the result, which he described as "really dark, rich stuff, with good moisture-holding capacity." He offered to send me a sample, which might or might not have been illegal. (You need a permit to ship an unembalmed cadaver across state lines, but there is nothing on the books regarding the shipping of a composted cadaver. We decided to leave it be.) Evans was pleased to note that a healthy crop of weeds had begun growing out of the top of the compost bin toward the end of the process. He had been concerned about certain fatty acids in the body, which might, if not thoroughly broken down, prove toxic to plant roots.

In the end, the government of Haiti respectfully declined Evans's proposal. The Chinese government—in what was either a remarkable show of environmental concern or a desire to save money, manure being cheaper than coal—did express interest in human composting as an alternative to open-pit coal burnings. Evans and his adviser, Arpad Vass, prepared a white paper on the practical advantages of human composting (". . . material can then be safely used in land applications as a soil amendment or fertilizer") but received no further word. Evans has plans to work with veterinarians in southern California to make composting available to pet owners. Like Wiigh-Masak, he envisions families planting a tree or shrub, which would take up the deceased's molecules and become a living memorial. "This is as close," he said to me, "as science is going to get to reincarnation."

I asked Evans if he plans to try to crack the mortuary market. There are two questions there, he answered. If I was asking whether he wanted to make composting available to people, the answer was yes. But he didn't feel sure he wanted to make the process available through funeral homes. "One of the things that

got me interested in this is a disdain for current practices of the funeral industry," he said. "You shouldn't have to pay exorbitant amounts of money to die." Ultimately, he'd like to offer it through a company of his own.

I then asked how he imagined he'd get the word out, get the ball rolling. He said he had tried to get a celebrity interested in the cause. The hope was that someone like Paul Newman or Warren Beatty might do for composting what Timothy Leary did for space burials. As Evans was living in Lawrence, Kansas, at the time, he called fellow Kansan William S. Burroughs, who struck him as suitably eccentric and moribund to consider it. The calls were not returned. He eventually did try to contact Paul Newman. "His daughter runs a horse stable doing rehabilitation for handicapped kids. I thought we could use the manure," Evans said. "They were probably thinking, 'What a freak.' " Evans isn't a freak. He's just a freethinker, on a topic most people would rather not think about.

Evan's adviser, Arpad Vass, summed it up best. "Composting is a wonderful possibility. I just don't think the mentality of this country is there yet."

The mentality of Sweden is a good deal closer. The thought of "living on" as a willow tree or a rhododendron bush might easily appeal to a nation of gardeners and recyclers. I don't know what percentage of Swedes have gardens, but plants seem very important to them. Business lobbies in Sweden hold tiny forests of potted trees. (In a roadside restaurant in Jönköping, I saw a ficus plant *inside* a revolving door.) The Swedes are a practical people, a people who appreciate simplicity and abhor frou-frou. The stationery of the Swedish king is simply embossed with his seal; at a distance it appears to be a plain sheet of cream-colored paper. Hotel rooms are furnished with what a reasonable trav-

eler might need and nothing more.* There is one pad of paper, not three, and the end of the toilet paper is not triangulated. To be freeze-dried and reduced to a hygienic bag of compost and incorporated into a plant, I suppose, might appeal to the Swedish ethos.

That is not the only thing that has made Sweden the right place at the right time for the human compost movement. As it happens, the crematoria in Sweden have been hit with environmental regulations regarding volatilized mercury from fillings, and many need to make costly upgrades to their equipment within the next two years. Purchasing Wiigh-Masak's machinery would, she says, cost many of them less than would complying with government regulations. And burial hasn't been popular here for decades. Wiigh-Masak explained that part of the Swedes' distaste for interment can be traced to the fact that in Sweden you must share your grave. After twenty-five years, a grave is reopened, and "the men in gas masks," as Wiigh-Masak puts it, haul you up, dig the grave deeper, and bury someone else on top of you.

This is not to say that Promessa faces no resistance. Wiigh-Masak must convince the people whose jobs will be affected should composting become a reality: the funeral directors, the coffin makers, the embalmers. People whose apple carts stand to be upset. Yesterday she gave a talk at a conference of parish administrators in Jönköping. These are the people who would care for the person-plants in the churchyard memorial park. While she spoke, I scanned the audience for smirks and rolling

* And sometimes less. My business-grade room at Gothenburg's Landvetter Airport Hotel ("For Flying People") had no clock, the assumption being, I suppose, that a businessman can simply consult his watch. The TV remote had no mute button. I pictured Swedish remote designers arguing quietly in their cleanly appointed conference room. "But Ingmar, why do you need a special button when you can just put down the volume?"

eyes, but saw none. Most of the comments seemed positive, though it was hard to tell, as the comments were in Swedish and my interpreter had never actually interpreted before. He consulted frequently with a piece of graph paper, on which he had written out a list of mortuary and composting vocabulary in Swedish and English (*formultning*—"moldering, decay"). At one point, a balding man in a dark gray suit raised his hand to say that he thought composting took away the specialness of being human. "In this process, we are equal to some animal that dies in the woods," he said. Wiigh-Masak explained that she was only concerned with the body, that the soul or spirit would be addressed, as it has always been, in a memorial service or ritual of the family's choosing. He didn't seem to hear this. "Do you look around this room," he said, "and see nothing more than a hundred bags of fertilizer?" My interpreter whispered that the man was a funeral director. Apparently three or four of them had crashed the conference.

When Wiigh-Masak finished and the crowd moved to the back of the hall for coffee and pastries, I joined the man in the gray suit and his fellow undertakers. Across from me sat a man with white hair, named Curt. He wore a suit too, but his was checkered and he had an air of jollity that made it hard for me to picture him running a funeral home. He said he thought that the ecological funeral would one day, perhaps in ten years, become a reality. "It used to be that the priest told the people how to do it," he said, referring to memorial rites and rituals and the disposition of the body. "Today the people tell the priest." (According to Prothero, this was also the case with cremation. Part of the appeal of scattering ashes was that it took the last rites out of the hands of the undertakers and handed them over to the family and friends, freeing them to do something more personally meaningful than what the undertaker might have had in mind.)

Curt added that young people in Sweden had recently begun

moving away from cremation because of the pollution it creates. "Now the young can go to Grandma and say, 'I have a new way for you—a cold bath!' " Then he laughed and clapped his hands. I decided that this was the sort of man I wanted running my funeral.

Wiigh-Masak joined us. "You are a very good salesman," the man in the gray suit told her. He works for Fonus, Scandinavia's largest mortuary corporation. The man let Wiigh-Masak take in the compliment before stepping on it: "But you haven't convinced me."

Wiigh-Masak didn't flinch. "I expected to get some resistance," she told him. "That's why I'm so surprised and pleased to see that almost everyone in the audience looks happy while I talk."

"Believe me, they're not," said the man pleasantly. If I didn't have an interpreter, I'd think they were discussing the pastries. "I hear what they say."

On the drive back to Lyrön, the man in the gray suit became known as The Slime.

"I hope we don't see him tomorrow," Wiigh-Masak said to me. At three o'clock the following afternoon, in Stockholm, she was scheduled to give a presentation before the top regional managers of Fonus. That she was speaking there was a matter of some pride. Two years ago, they hadn't returned her phone calls. This time it was they who called her.

Susanne Wiigh-Masak does not own a business suit. She delivers her presentations in what American dress code arbiters would term "smart-casual" trousers and a sweater, with her waist-length, wheat-colored hair braided and pinned up in back. She wears no makeup for these talks, though her face tends to flush mildly, bestowing a youthful blush.

In the past, the organic look has worked in Wiigh-Masak's

favor. When she met with Church of Sweden clergy back in 1999, they were comforted by Wiigh-Masak's noncommercial mien. "They said to me, 'You are really not a seller,' " she tells me as she dresses for the trip to Fonus's Stockholm headquarters. She really isn't. While as 51 percent owner of Promessa's shares Wiigh-Masak stands to earn a substantial sum should the process take off, wealth is clearly not her motive. Wiigh-Masak has been a hard-core ecologist since the age of seventeen. This is a woman who takes trains instead of driving, to make herself less of a burden on the environment, and who disapproves of holiday-makers flying to Thailand when a beach in Spain would suffice, on the grounds that jet fuel is needlessly burned. She readily admits that Promessa has little to do with death and everything to do with the environment, that it is essentially a vehicle for spreading the gospel of ecology. The dead bodies attract the media and public attention in a way that the environmental message alone could not. She is a rarity among social advocates: the environmentalist who is not preaching to the converted. Today is a good example: Ten mortuary company executives are about to sit through an hour-long talk about the importance of giving back to the earth through organic composting. How often does *that* happen?

The Fonus headquarters takes up the better part of the third floor of a nondescript Stockholm office building. The interior designers have gone out of their way to infuse color and nature into the surroundings. An arrangement of café tables is surrounded by a sort of indoor hedge of potted trees, in the midst of which stands an immaculate tropical fish tank the size of a plate-glass window. Death is nowhere in evidence. A bowl of complimentary lint brushes bearing the Fonus logo calls out to me from the receptionist's desk.

Wiigh-Masak and I are introduced to Ulf Helsing, a vice director of the corporation. The name hits my ears as Elf Helsing, causing great internal merriment. Helsing is dressed like all

the other elves in the lobby, in the same gray suit, with the same royal-blue dress shirt and the same subdued tie and silver Fonus lapel pin. I ask Helsing why Fonus instigated the meeting. As Wiigh-Masak envisions it, it is Sweden's crematoria, until recently operated by the church, that would be doing the freeze-drying. The funeral homes would simply make the option known to their clients—or not, depending on what they decide. "We have been following this in the paper, but we kept a low profile," came his enigmatic reply. "It is time we heard more." Possibly contributing to the decision was the fact that 62 percent of three hundred visitors to the Fonus Web site answered, in a survey, that they would be interested in an ecological funeral.

"You know," Helsing adds as he stirs his coffee, "that freeze-drying corpses is not a new idea. Someone in your country came up with this, about ten years ago." He is talking about a retired science teacher from Eugene, Oregon, named Phillip Backman. Wiigh-Masak told me about him. Backman, like Tim Evans and the cremationists of yore, was inspired by a loathing of funerary pomp. He spent several years at Arlington National Cemetery arranging military funerals that, much of the time, no one showed up for. This, combined with a background in chemistry, got him interested in the possibilities of freeze-drying as another alternative to burial. He knew that liquid nitrogen, a waste product of certain industrial processes, is cheaper than natural gas. (Wiigh-Masak estimates the liquid nitrogen cost per body at $30; the gas for a cremation costs about $100.) To break down the frozen bodies—for freeze-drying a whole human body would take over a year—into tiny, quickly freeze-dryable pieces, he proposed running them through a machine. "It's something on the order of what they do with chipped beef," he told me when we spoke. ("It was a *hammer mill*," Wiigh-Masak later told me.) Backman managed to secure a patent for the process, but the concept was coolly received at

local mortuaries. "No one wanted to talk about it, so I just let it go."

The meeting begins on time. Ten regional directors for the company, along with their laptops and their polite gazes, gather in the conference room. Wiigh-Masak begins by talking about the difference between organic and inorganic remains, how cremains contain little nutritive value. "When we are burning remains, we don't give it back to the earth. We are built up from nature, and we have to give it back." The audience seems respectfully quiet and attentive, except for my interpreter and me, whispering in the back row like poorly brought up schoolgirls. I notice Helsing writing. At first he appears to be taking notes, but then he folds the sheet in two, and, when Wiigh-Masak's back is turned, slides it across the table, where it is passed along to its recipient, who slips it under his notebook until Wiigh-Masak turns away again.

They let Wiigh-Masak talk for twenty minutes before they begin asking questions. Helsing leads the pack. "I have an ethical question," he says. "An elk dying in the woods and returning to the earth is just lying on the ground. Here you are doing something to break it up." Wiigh-Masak replies that in fact, an elk that dies in the woods is likely to be torn up and eaten by scavengers. And while it is true that the dung of whoever eats the elk would act as a sort of elk compost and, in effect, achieve the desired goal, it was not something she could envision families being comfortable with.

Helsing pinkens slightly. This was not where he intended things to go, conversationally. He persists: "But can you see the ethical problem of breaking it up this way?" Wiigh-Masak has heard this line of argument before. A technician at a Danish ultrasound company, whom she contacted early on in the project, declined to work with her for this reason. He felt that representing ultrasound as a nonviolent way of breaking up tissue was dishonest. Wiigh-Masak was undeterred. "Listen," she said

to the morticians. "We all know that taking a body down to powder requires some kind of energy. But ultrasound, at least, has a positive image. You cannot *see* the violence. I would like it to be possible for the family to watch it happening, behind a glass wall. I want something where I can show a child, and the child won't start crying." Glances are exchanged. A man clicks his pen.

Wiigh-Masak makes a small detour into defensive mode. "I think that if you put a camera inside a coffin we wouldn't be very impressed with ourselves. It is a terrible result."

Someone asks why the freeze-drying step is needed. Wiigh-Masak answers that if you don't remove the water, the little pieces will start to decompose and smell before you can get them into the ground. But you mustn't get rid of the water, the man counters, because this is 70 percent of this person. Wiigh-Masak tries to explain that the water inside each one of us changes day by day. It's borrowed. It comes in, it goes out, the molecules from your water mix with someone else's. She points to the man's coffee cup. "The coffee you are drinking has been your neighbor's urine." You have to admire a woman who can toss the word "urine" into a corporate presentation.

The man who has been clicking his pen is the first to raise the subject that is surely on everyone's mind: coffins, and the disappearing profit therefrom that an ecological funeral movement will mean. Wiigh-Masak envisions the freeze-dried, powdered remains being placed in a miniature, biodegradable cornstarch coffin. "That's a problem," acknowledges Wiigh-Masak. "Everyone will be angry at me." She smiles. "I guess there will have to be a new thinking." (As with cremation, a standard coffin could be rented for a memorial service.)

Cremationists faced the same objections. For years, according to Stephen Prothero, undertakers were advised to tell their clients that scattering was against the law, when in fact, with few exceptions, it wasn't. Families were pushed to buy memorial

urns and niches in columbaria and even standard cemetery plots in which to bury the urns. But the families persisted in their push for a simple, meaningful ceremony of their own making, and scattering caught on. As did the use of rental caskets for pre-cremation services and the manufacturing of inexpensive cardboard "cremation containers" for the actual burning. "The only reason there are rental caskets," Kevin McCabe once told me, "is that the public demanded it." The tremendous attention that Promessa has received since its founding has forced the funeral industry to deal with the possibility that very soon people may be coming to them requesting to be composted. (In a Swedish newspaper poll taken last year, 40 percent of respondents said they'd like to be freeze-dried and used to grow a plant.) Mortuaries in Sweden may not be actively recommending the ecological funeral any time soon, but they may stop short of trying to derail it. As a friendly young Fonus regional director named Peter Göransson said to me earlier, "It's pretty hard to stop something once it's rolling."

The last question comes from a man seated next to Ulf Helsing. He asks Wiigh-Masak whether she plans to first market the technique for dead animals. She is adamant about not letting this happen. If Promessa becomes known as a company that disposes of dead cows or pets, she tells the man, it will lose the dignity necessary for a human application. It is difficult, as it is, to attach the requisite dignity to human composting. At least in the United States. Not long ago, I called the U.S. Conference of Catholic Bishops, the official U.S. mouthpiece of the Catholic Church, to ask its opinion on freeze-drying and composting as an alternative to burial. I was put through to a Monsignor John Strynkowski in the Doctrine office. While the monsignor allowed that composting and nourishing the earth was little different from a Trappist monk's plain shroud burial or a church-sanctioned burial at sea, following which the body will, as he put it, provide nourishment for fish, the idea of composting struck him as

disrespectful. I asked him why. "Well, when I was a kid," he answered, "we had a hole where we put peelings from apples and such, and used it for fertilizer. That's just my association."

While I had him on the phone, I asked Monsignor Strynkowski about tissue digestion. He replied with minimal hesitation that the church would be opposed to "the idea of human remains going into the drain." He explained that the Catholic Church feels that the human body should always be given a dignified burial, whether it's the body itself or the ashes. (Scattering remains a sin.) When I explained that the company planned to add an optional dehydrator to the system that could reduce the liquefied remains to a powder that could then be buried, just as cremains can be, the line went quiet. Finally he said, "I guess that would be okay." You got the feeling Monsignor Strynkowski was looking forward to the end of the phone call.

The line between solid waste disposal and funerary rituals must be well maintained. Interestingly, this is one of the reasons the Environmental Protection Agency doesn't regulate U.S. crematoria. For if it did regulate them, the rules would be promulgated under Section 129 of the Clean Air Act, which covers "Solid Waste Incinerators." And that would mean, explained Fred Porter, of the EPA Emission Standards Division in Washington, "that what we're incinerating at crematoria is 'solid waste.'" The EPA does not wish to stand accused of calling America's dead loved ones "solid waste."

Wiigh-Masak may succeed in taking composting mainstream because she realizes the importance of keeping respectful disposition distinct from waste disposal, of addressing the family's need for a dignified end. To a certain extent, of course, dignity is in the packaging. When you get right down to it, there is no dignified way to go, be it decomposition, incineration, dissection, tissue digestion, or composting. They're all, bottom line, a little disagreeable. It takes the careful application of a well-considered euphemism—burial, cremation, anatomical gift-

giving, water reduction, ecological funeral—to bring it to the point of acceptance. I used to think the traditional navy burial at sea sounded nice; I pictured the sun on the ocean, the infinite expanse of blue, the nowhereness of it. Then one day I had a conversation with Phillip Backman, during which he mentioned that one of the cleanest, quickest, and most ecologically pure things to do with a body would be to put it in a big tidepool full of Dungeness crabs, which apparently enjoy eating people as much as people enjoy eating crabs. "It'll do the thing in a couple of days," he said. "It's all recycled, and it's all clean and taken care of." My affinity for burial at sea—not to mention crabmeat—was suddenly, dramatically diminished.

Wiigh-Masak finishes speaking, and the group applauds. If they think of her as the enemy, they do a good job of concealing it. On the way out, a photographer asks us to pose with Helsing and a couple of the other executives for the company Web page. We stand with one foot and shoulder forward, arranged in facing columns, like doo-wop backup singers in unusually drab costumes. While I avail myself of a Fonus lint brush, I hear Helsing say that the company plans to add a link to Promessa on its Web site. A wary friendship has been forged.

On the road between Jönköping and Wiigh-Masak's home on Lyrön is a graveyard on a hill. If you drive all the way through to the back of this graveyard, you come to a small field where the church will one day dig more graves. Halfway up the unmown terrain, a small rhododendron bush stands among the weeds. This is the Promessa test grave. Last December, Wiigh-Masak concocted the approximate equivalent of a 150-pound human cadaver, using freeze-dried cow blood and freeze-dried, pulverized bones and meat. She placed the powder in a cornstarch box, and the box in a shallow (thirty-five centimeters down, so the compost could still get oxygen) grave. In June, she

will return to dig it up and make sure the container has disintegrated and the contents have begun their metaphysical journey.

Wiigh-Masak and I stand in silence beside the grave of the unknown livestock, as though paying our respects. It's dark now and hard to see the plant, though it appears to be doing well. I tell Wiigh-Masak that I think it's great, this quest for an ecologically sound, meaningful memorial. I tell her I'm rooting for her, then quickly rephrase the sentiment, omitting gardening-related verbs.

And I am. I hope Wiigh-Masak succeeds, and I hope WR^2 succeeds. I'm all for choices, in death as in life. Wiigh-Masak is encouraged by my support, as she has been by the support of the Church of Sweden and her corporate backers and the people who have responded positively in the polls. "It was and is," she confides as the wind shimmies the leaves on the cow's memorial shrub, "very important to feel I'm not crazy."