



The Language of Cells

Life as Seen Under the Microscope

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commodation is a greater reality than walking. *They* probably dream of a lasting ability to transfer; unhinged from gravity, they float from place to place like butterflies and die with dignity before they are grounded.

SPENCER

NADLER

—
160

CHAPTER EIGHT

Dying Matters

IT IS CURIOUS HOW DEATH SIDLES UP TO us, dispatching some before they can settle in to life, catching up with others only after the longest lifetimes. A similar disparity occurs with our cells: Those that compose our skin or line our digestive tract are quickly sloughed into the environment or gut; others live longer, and nerve and muscle cells live as long as we do. Since our cells seem programmed to die at different rates, how can we know our body's true age? Gerontologist Leonard Hayflick suggests that we are

as old as our oldest cells, that a birthday really celebrates the age of our nerve and muscle cells.

As a surgical pathologist, I am a daily presence at cell death: If it is death from injury or disease, inflammatory cells often gather around to mourn; if the death is DNA-programmed and has no visible cause, seldom does a single other cell appear to take note. No matter. These multiple daily minideaths I see build inside me until I am hardened to them.

Despite my acquired emotional detachment from dead and dying cells, I must be wary of them to be competent. I focus on what may be lurking behind these tiny corpses, looking beyond them for causal organisms, deficient blood flow, ever ominous cancer cells. I am aware that dead and dying cells are often merely clues left behind by an omnipotent cause: My rooting out a disease's origin leads to treatments and cures. By emphasizing cause in this way, I can relegate cell death to the background, in effect, deny it.

Almost daily, I stare down the facets of disease, cellular tales of woe that have a hand in human dying. Despite this exposure, the final phase of cell life is as mysterious to me as human dying. Cells will darken their nuclei, shrivel their cytoplasm, become opaque as they die; but deciphering their opacity—the reality

of their dying—is beyond me. This awesome complexity falls largely within the realm of cell biologists these days. Their video-enhanced microscopes allow them to see the live interplay of cytoplasmic organelles, to fathom the meshing of all these tiny engines that drive us.

Although my work is hospital-based and eighty percent of people in this country die in hospitals, I seldom visit the terminally ill for purposes of a needle biopsy or aspiration. On occasion, in anticipation of a surgical biopsy, I go up to the patient floors or the special-care units to review a chart. Seeing patients all tubed and taped there, I am often struck by the flagrant loss of their privacy, how the impact of all that is impersonal is magnified. It is the sight of someone's life ebbing in such a place, with fear or anger or humiliation on display, that stays with me; somehow these patients seem less than the sum of their cells.

The word "aging" is a euphemism for dying. And though our decay teaches us in very visual and perceptual ways how our bodies begin to close down, we choose to deny its lessons. We spend billions of dollars each year cosmeticizing ourselves: we dye our gray hair, adorn our balding scalps with toupees, fill in the clefts of our wrinkles, lift our faces, and suck out our

fat. Until the decline of our bodies directly threatens our lives, we forever fret over them, chemically or surgically alter the visible testaments of age, and never contemplate dying. Preoccupation with veneer distances us from death, making it more extraordinary than it really is; it shrouds death in myth, in the fear of excruciation and humiliation.

Our cells, however, seem to accept their decay in a natural manner: Lipofuscin, the granular pigment that accumulates in aging heart and liver cells, is proudly flaunted around time-worn nuclei like golden necklaces; and nuclear faces, age-altered, seem not to effect the slightest pretense.

I SIT IN THE steam room at the local YMCA with an old friend. Alone and naked, we talk about death.

"Each of our lives is a story in search of an author. When I listen to dying people, I am less concerned about their character than what kind of a character they are, and how they have populated their lives with other characters," Brad Deford says. He is a middle-aged pastor who gave up his congregation to become a chaplain—a spiritual and grief counselor—

at the local hospice; it is attached to the hospital where I work. "The meaning of people's lives then becomes evident in a narrative construct."

I inhale the steam until it cuddles my bronchial byways. "How do you elicit the stories of people's lives?" I ask.

He laughs. "Most of us spend our lives in solution, where we appear very similar to one another, and we fear that our lives don't mean much to anybody." He is a large, muscular man who so often laughs at what he says that it is easy to miss the sweep of his conceptions. I listen with care. "I try to be the precipitant, to precipitate out the stories that are already there and allow for meaning in life that is clear and embraceable."

I think it must take courage to enter a dying person's story, to press buttons here and there, to fix on a denouement and allow for a revelation. Brad's role is not a passive one, but it is not active either; he does not *edit* a dying person's story; in the course of conversation, he facilitates it, allows it to come forth of its own volition.

Steam hovers thick and white until we can barely see each other. The room is edenic, or is it hadean?

Our lungs, now laden with steam, sigh in exhalation. The heat and humidity balance our humors, purge us.

It was Michel de Montaigne who said that “he who would teach men to die would teach them to live.” If hospice counselors like Brad bring meaning to people’s dying, make them see the value in their lives, perhaps we need this kind of gentle affirmation *throughout* our lives. I tell him so.

“Our stories—the ones that give meaning to our lives—can best be told when we accept our death,” he says. “Unfortunately, for most of us, this doesn’t occur until shortly before we die.” Only his words are audible now; steam-weighted, they ride the air until they fall like drops on my exposed surfaces. “An intuition, without obsessing about it, that death could come at any time is an acceptance of it; such an intuition propels us to edit and reedit our stories until we get to the deepest truths,” he says. “Death then becomes the long-term goal that sets our life in motion. Intensifies it. Enhances it.”

“IT’S FEAR THAT ENCUMBERS dying, isn’t it?” I say. I have joined Brad for an early-morning coffee at the

local Starbucks. The caffeine seems to rouse those around us until we can hardly hear each other above the din.

“Often so. When it’s crunch time, we’re quite likely to be greatly surprised by what we fear most, even ashamed by it.” His easy smile gives the seriousness of his words a gentle edge. “When dying people tell me their fears, it often takes everything in me not to provide some easy reassurance,” he says. “It’s very hard to hold fear with someone because everything in me cries out to say ‘Let’s find a practical way to address this.’ But if we rationalize too much about our fears as we die, we are not accepting death.”

How Brad cares for the dying, how he helps people come to creative, if not peaceful, ends by working the narrative kinks out, seems inspired; life stories get crafted from snippets of bliss and woe, hope and yearning, anxiety and despair.

“Death is not a particularly rational happening, and much of what we have not known about ourselves gets exposed in the process.” He scratches his thick brown beard with its shards of gray, and his eyes widen as if to reflect all they have seen. “Sometimes it is best to listen and hear a patient; sometimes it helps

to go deeper," he says. "There are moments when we come to wordless understandings, often with tears in our eyes, that dying is not something that can be made better or made to go away."

I can't help but wonder how many tears he has shed in the throes of all these deathbed cogitations.

"I have to have good inner boundaries to continually take into myself and feel the sorrows and fears of others, and not become overwhelmed," Brad says. "I know I'll be surprised by my own fears when my time comes, and I believe that listening to others helps me prepare my own possible future."

He seems to practice his own dying with every patient he sees. I wonder, by filling his life in this way, with an inchoate sense of his death, how much he comes to savor the reward of each granted moment.

WE DRIVE TO THE home of a man who died the day before to visit with his grieving family. En route, Brad tells me how he empties himself of expectations and whatever it is he thinks he knows before each house call. We park in front of a small wood and stucco structure painted yellow and white. A large maple

tree towers above it. It is late fall, and brown and orange deciduous leaves cover the lawn like a vibrant shawl. As we stand at the door, two sizable, well-disposed fellows, I feel a little like an apprentice door-to-door Bible salesman.

"Meet Dr. Nadler," Brad says as we enter the house. "He's shadowing me these days to witness the spirit of hospice."

The widow—I'll call her Mrs. Jones—is there with a woman friend. We are ushered into the living room where light-colored walls and fabrics counter the dark wood floors and furniture. The women, both lean and tall and middle-aged, are in surprisingly good spirits. Mrs. Jones quickly credits the hospice nurse and volunteers with her husband's peaceful demise. She tells us how relieved he was when they entrusted the family with his care, instructed them in the control of his pain with drugs, and enabled him to die in his home with easy access to family and friends.

"After my husband died, the body remained here for five hours," she says. "It gave us a chance to let go of him slowly." I try to picture the body, the bone and flesh that Mr. Jones left behind. This em-

grief gives her the chance to rework and regret her father's death and come to a new peace with it."

This is the first of several cryptic or symbolically expressed communications I will miss as we visit the dying and their families in their homes.

DURING THE MEDIEVAL CRUSADES, a hospice was a resting place for weary pilgrims. Today it is the conceptual hub of a reactionary movement, a way of confronting and caring for the dying and newly bereaved that humanizes the process. It often helps patients conjure up the import of their lives by winnowing time-faded merits; and it teaches them to readjust their hope rather than lose it in the face of mounting losses.

"I never visit a dying patient's bedside to chatter idly. I try to find meaning in what they tell me, to help with deeper issues." We are sitting in Brad's tiny hospice office. The walls are covered with poems, pertinent articles and cartoons, bon mots, thank-you cards, diplomas. A picture of Mahler, his favorite composer, is on his desk, and above him is a Lichtenstein print of a beautiful woman speaking in a cartoon bubble: "I know how you feel, Brad."

bodiment of her husband allowed Mrs. Jones to slowly and gently back away from his sphere.

Brad engages her in conversation. She talks about her future plans as though she is already acclimating to her loss. She tells him that her father died at this time of year twenty-five years ago, how her husband's death has enabled her to make peace with her father's.

The purposeful serenity, the thoughtfulness that appears to have surrounded Mr. Jones's death, is in stark contrast to the medicalized dying that occurs in hospitals. Since dying is not a medical process, hospitals mostly devalue it, strip it of its potential. Despite their technical bravura, medical centers have mostly failed to weave the process of death into their fabric.

"This was a good death," Brad tells me in the car. "It fits with our sense of what we might hope for ourselves."

"And Mrs. Jones's apparent lack of grief is a part of this good death?"

"Ah. But she does grieve," Brad says. I am Dr. Watson to his Sherlock Holmes.

"Now twenty-five years older and wiser, she is more effective with the dying of her husband than she could ever have been with her father. So her present

His sounds like a practiced art to me, to find meaning in someone's life under the duress of dying, an intense companionship that helps to ease the bottled fear, to quell the somber rumblings.

Today we drive to the east side of Palos Verdes. A physicist I'll call Homer lives there with his wife. A three-pack-a-day smoker for more than thirty years, he has widespread lung cancer. Their daughter is visiting from Seattle for two weeks, and this gives Homer a window in which to die, to allow the daughter to help her frail mother with the death and all of its multifarious arrangements.

They are happy to see Brad, but there is something wrong with the scene: We sit in the den, to Homer's left; he is tucked into his recliner and faces a large rear window that looks out onto San Pedro Harbor; a giant-screen TV with its outdoor satellite dish and 257 channels is stationed beside him. We gaze at his distorted profile, his belly bloated with fluid, his flexed legs elephantine. Although his position is fetal, he stares out at the ocean with the solemn bead of a ship's captain.

"I see you have a new clock," Brad says. A large digital clock keeping military time and the date sits on a shelf to his right.

"Ah." Homer fixes Brad with lucid, bilious-green eyes. "It lets me know if it's day or night. Sometimes I doze off and get confused about that."

We sit and quietly allow him his observations.

"The line of zero longitude at Greenwich is the basis for calculating military time, you know," he says.

Brad's laugh is infectious yet gentle. "You sound as if you're going on a voyage."

"Not until I can handle all this." He chuckles.

"All this" refers to his illness. Homer has yet to accept its lethal nature. He is fighting for a cure in the face of insurmountable odds. A cannula attached to an oxygen cylinder is inserted into his nostrils and he leans forward, methodically smacking his buttocks to prevent bedsores. Then he leans back in the recliner and suddenly falls asleep.

"I've had to up the dose of morphine this week," his wife says as we leave the room. She is stooped and withered, as if her husband's dying is more than she can bear, yet she smiles inscrutably. As we retreat through the hallway and living room to the foyer to make our exit, I notice how all the paraphernalia of his illness—oxygen cylinders, cannula coils, oxygenators, boxes of medication—seem to clash with the low-slung wooden beams and country-style charm of the house.

“They don’t yet accept his dying and have no wish to talk about it,” Brad says when we leave. “Homer refuses a hospital bed that’s far more appropriate to his care. As long as he’s in that recliner, he’s not a ‘cancer patient’ and doesn’t have to deal with all that that implies.”

The digital clock, the multichannel TV, the harbor view keep him tuned in to life. He is not yet ready to accept his oncoming death. Brad has no intention of drawing him into his dying. This man will have to find his own way. And if he comes to accept what must be (many die and never do), Brad will escort him, in amity and love, to the river and see him off to the other side.

The digital clock, its conveyance of military time, may have other implications here. Scientists are largely future-oriented and have greatly expanded time perspectives; they often seek to predict future occurrences by understanding past events. The clock may simply be reflecting the time-orientation maxim of this man’s profession. But it ticks amid so many other denial clues that its scientific significance pales.

In nearly all cigarette smokers, cells that are harbingers of cancer arise in the lining of the bronchial

tree that wends its way like roots into the porous loam of the lungs. Behold the angry-looking cells revised by perpetual puffs of smoke, their nuclei as deeply blue and broody as a stormy sky, their cytoplasm a fiery pink and recoiled as if in repudiation of all the abuse. In needle aspirations of lung cancers like the one that will soon take the life of this physicist, I often see intimate clusters of tumor cells, craggy nuclei molded together, uselessly merged. Tumor cells break away into the flow of blood and lymph, nestle in liver, adrenal glands, brain, bone, or anything else they can. Once ensconced in distant sites, they cannot be entirely ex- tricated; they multiply to a critical mass and overwhelm the body unto death.

Bronchial lining cells will take only so much abuse before they turn on you.

THE FOLLOWING WEEK we head north through the beach cities to visit a biology teacher and her husband. Their house is cluttered with Christmas decorations (it is February). Wreaths, children’s toys, decorative lights, and candles are everywhere. The husband is reluctant to remove these vestiges of his wife’s final holiday.

The woman I'll call Barbara is marred by the spread of her breast cancer, and her wanton wastefulness, her woe, tells all. Her hematolylin-blue eyes hold a confident detachment as she awaits death with impatience. She wants to die, she calmly tells us. To get the thing over with. Living with dying has allowed her to make her final peace and it has no further meaning for her; all that she needs to move on to her hereafter is now within her.

Her husband brings her a peeled and sliced pear; with tremulous hands she slowly and disinterestedly consumes it.

"You don't look ready to die, Barbara," Brad says.

His words surprise me; she seems nirvanic, taking in her final breaths. Later he will tell me that eating and wearing lipstick are expressions of a persisting life force that is clashing with her will to die.

She focuses firmly on Brad when she hears his words. Slowly she tells him how she awoke at seven o'clock last evening thinking she had slept through the night. Finally realizing that it was only dinner-time, she was greatly disappointed that she had not put another meaningless day behind her, that she would have to face that day.

Brad sits by the head of Barbara's bed, as close to her as he can get. He observes and gently engages her as the husband talks to me about his book club.

"When we read *The Handmaid's Tale*, the Margaret Atwood book, I realized how the whole thing could work in reverse," the husband says. This is a curious observation: Atwood's "Handmaids" and "Handmas" are servants in this dystopian novel. Does this husband see his current role in such a demeaning way? Perhaps it is the dying itself and not servitude that is dystopian, the reversal referring to the change from what was utopian.

I realize that the husband needs attention, too. He is weary of his wife's dying, the intensity of it, the abrupt necessity of his loss. I let him gently vent while my attention is held by Brad's earnest gestures. Soon Barbara tells him she is in pain today, that she will be better able to talk of her feelings when next we visit. As we exit, the husband uses an eyedropper to drip morphine onto her tongue.

"You made things easier for me today by engaging the husband," Brad says to me in the car. "I was able to stay with Barbara, acknowledge the meaninglessness of her days. I could feel her comfort."

It is a paradox that cancer arising in such a readily accessible organ as the breast continues to exact such a heavy toll. In half of these patients, malignant cells have dispersed beyond their organ of origin by the time the tumor is discovered. It is often an insidious wandering, a spread to the remotest areas of the body. This woman's bones and flesh are now as seeded as pomegranates with cancer cells.

"Barbara's plight, her wish to be done with dying, is not uncommon," Brad says. "Too many of us have no idea how to make our last days and hours meaningful."

Having thrust myself into Barbara's life as an observer, I find it curious how her impasse becomes my own. Life stockpiles our griefs and losses, and as we die, still greater losses are added to the inventory. The loss of our sense of self—even our basic bodily functions that we mastered at the age of two—must go very deep. I cannot conceive of a way to make this kind of experience meaningful.

"We are independent and active for most of our lives," I offer. We are sitting in late-afternoon traffic. Brad shifts in and out of lanes, but we don't advance; we are in our own impasse. "I think that aging has to

teach us to adapt, to trust and surrender to our inevitable decline," he says.

We talk about *Tuesdays with Morrie*, the bestselling book by Mitch Albom. In it, Albom rekindles his relationship with his dying college professor, Morrie Schwartz. "Morrie was able to find dying of undying interest and Barbara could not," Brad says. "The key was Morrie's willingness to be dependent. To enjoy this dependency. To revel in it. To return to a childlike state of being completely taken care of. Unconditional love. Unconditional attention." Albom concludes that as Morrie was dying, he "was giving as an adult and taking as a child."

When we visit the following week, Barbara lies in her bed embowed like a fetus, her hands contracted, her body twitching, her eyes tightly closed. The cancer is having its way with her, and she is no longer in communication with her surroundings. The time for her departure seems at hand. Her husband lovingly massages her feet as Brad and I sit quietly by. I cannot know the strength or complexity of the bond they are severing, the degree of their intimacy. I do know that the husband has been a constant at her bedside, that her children and grandchildren have

been frequently there, that hospice nurses and volunteers have meshed with the family, according this woman the right to have control over her own death, in her own home, with hardly a falter.

Two days after our final visit, Barbara dies in her sleep. Despite the loss of meaning in her life in those final days, her dying is compelling to me; there is a peculiar beauty in the peace of it, in the family and hospice nurturing that quietly palliated her bodily discomforts. Is a beautiful death oxymoronic?

"Not at all," Brad says. "The love this woman cultivated in life was ardently returned to her in her dying. And there is beauty in that."

It's as though the bonds you form in the course of life raise the stakes of your denouement, move those around you in ways you can hardly conceive.

I'M SITTING IN THE Memory Chapel of the mortuary where Homer's body lies. To the end, he had never accepted his dying. It is evident from the large, respectful gathering of mostly gray-haired scientists and their wives that Homer's life had been far-reaching.

Brad is officiating. His tone is upbeat. He is clearly celebrating Homer's life. He asks those gath-

ered to rise and tell their Homer stories, and a number of the gray-haired colleagues do. Resurrected from without, the sum of his endearments, Homer now reemerges larger than he was in life. Stories of him that reverberate in the neurons of people's memories keep Homer alive and testify to the value of his life. So will the stories live on in his children and grandchildren. We can never underestimate the sway—good or bad—our lives can have over others. Although some of us believe deeply in an afterlife, what *is* certain is the afterlife of our stories, how they reside in the cells of others, capable of enduring for as long as humans do.

THE HOSPICE PROTRUDES like a tiny appendage from the giant hospital much like meager Death pouts from robust Life. But the hospice movement is catching on, and people are dying outside of hospitals these days in ever growing numbers. One out of every seven deaths is currently bolstered by hospice. As baby boomers age, death will continue to leave hospitals to life and pervade, whenever possible, our communities. Hospice will then emerge from the hospital's shadow, bringing death out among us where we can see and feel and smell it before making it our own. All the im-

personal movie and television deaths will have to compete with true, living versions of it. These living deaths will bring an ambrosial urgency to our lives, engross us with our finity. They will play havoc with our stagnation.

Carole Hoffman, a nurse I've known for many years, coordinates the sixty-one volunteers who are the heart of the hospice. They fill the caretaking gaps left by family and friends, and can be genial, talismanic presences to those who come alone to their dying. "They're young and old, professional and nonprofessional, working and retired. They all want to give something back," Carole says. "Lawyers, accountants, psychologists wear two hats here, their hospice volunteer hats and their pro bono professional ones."

I wonder how much wisdom these volunteers acquire and dispense about life, about death, by treating dying patients as human beings rather than people who are on the verge of death.

"I get to know volunteers intimately when I train them. This is how I sense who'll be right for each patient." A smile opens across Carole's face, anticipating her observation. "When I leave this job, I'm going into matchmaking," she says. "I've discovered skills I never knew I had."

Like Brad, she laughs easily in the course of conversation. Blood rushes to her head and her eyes fill with the kindest light. When I ask her to tell me how caregivers interact with the dying, she does so with stories.

"We had an engineer whose wife was dying. They had been married for fifty years," Carole says. "We were concerned because he wasn't expressing his feelings and wasn't letting any of us share his grief. But he made his wife a footboard and on it he wrote the date, day of the week, weather, and anything else he thought might be of interest to her. So whenever she woke, if he wasn't there, she could still be in touch with the world." This brief story moves me, the poignant creativity that can rise from a man's devotion. His tact was exquisite.

Carole shifts seamlessly to a new story. "One of our young woman volunteers is an attorney. I sent her to visit a dying old man who lived alone with his cat and wanted to draw up a will. He chose to leave all his money to his only friend and requested that this man be the executor. On his way to meet with the attorney, the friend keeled over dead. So the old man asked the attorney to be his executor and told her what he wanted done. He died himself a few weeks later."

These stories are filled with urgent sensibilities, earnest connections between moments, and Carole seems to have a deep satisfaction in the telling of them.

"As the executor, the attorney decided that a funeral was in order and telephoned me to bring some of the volunteers," she says. "First we all went to the old man's house to settle some of his affairs. There we met the little old lady next door who knew him, and we asked her to join us at the funeral."

"How many people were at the funeral?"

"Myself, three volunteers, the attorney, and the little old lady," Carole says. "During the service, four little old men enter the chapel and sit at the back. When the priest finishes and asks if anyone would like to speak, these men come to the front and, one by one, tell their stories."

Carole is laughing now as this funereal experience gathers narrative force, and I'm thinking that it is cynical to assign too much simplicity to anyone's life.

"They tell how they met the deceased at a card club in Gardena," Carole continues, "how he came to the club because he was lonely and liked to be around people. He didn't play cards, so he sat in a chair by the

door and talked to everyone as they entered and left. In time, these five men, who previously hadn't known each other, became good friends, and the remaining four reflected on the difference the deceased had made in their lives. One man told how he never talked to a soul at the club, he had just played cards until the old man began greeting him at the door. Another told how the old man would always smile at him. 'What did he have to smile about? He was all alone.'

"By the time they finished, I came away feeling I knew more about this man than most I've lived with and buried." Carole pauses dramatically and I am struck by the extraordinary, how it can rise unexpectedly, even exhilaratingly, from the ordinary. "And it's all because of the love this attorney had for the old man and how she insisted that he have a funeral."

We are all lost in nature's great flow, but if we shape our own stories, if others help us configure them, our lives seem fraught with meaning, taken to a higher ground.

"A doctor contacts us about a middle-aged man who is dying with lung cancer," Carole says. "Our social worker and volunteer find him alone in his apartment. He's hungry and there's no food. He's so weak he has to crawl to the bathroom. When they call me I

bring a commode and I run to McDonald's to get him a hamburger and a Coke. . . ."

SPENCER

NADLER

WITH BRAD, I VISIT a Japanese-American woman who is dying of pancreatic cancer. Deep-seated, this tumor grew silently, its cells sprawling to adjacent, even distant, structures before symptoms appeared. It is fatal. Her prognosis notwithstanding, she has exceeded by many months her doctor's expectation.

As we enter their scrupulously tidy condominium we are greeted warmly by the patient and her sister. At a glance, I am not sure which of them is ill. They are both dressed in black slacks and printed blouses and bow graciously. Then I see that the hands of the woman I'll call Kiyoko are swollen, that her belly is too protuberant for her otherwise tiny frame, and she walks with the plodding shuffle of someone who is weakened. She is extremely polite, even jaunty, and as urgent as the taste of wasabi.

"It's almost time, Reverend Brad," she says with matter-of-fact friendliness as she ushers us into her living room. She is untwisted by disease.

"Yes," Brad says.

"When you speak at my memorial service, will you please keep it short?" she asks.

Brad's laugh is thunderous, and we all laugh, too.

"And not too flowery."

"You see how my reputation precedes me?" Brad says to me.

I am amazed at Kiyoko's candor, how clear-eyed she is about her impending death. She tells of her concern with the details of the memorial service and the cremation that will follow. She must choose what will be served at the tea, but she doesn't know how many people will be there. She frets about whether or not her relatives will be able to pick out some of her vertebrae and long bones after the cremation. As Brad will later observe, she has exquisitely separated that which endures from that which does not.

In her words and manners, Kiyoko masterfully incorporates death into life. She appears to have long ago accepted the inevitable and seeks to make her final phase of life as meaningful as she can to family and friends. She is completely committed to the moment.

She has concerns because she lacks a ritual framework with which to plan her death. In Japan, she remembers, a pagoda on wheels was used to

transport the body therein to the crematorium. The vertebrae and long bones were picked out after the cremation, preserved for the family, and the mourners had tea at the crematorium. Here, in California, there is no pagoda on wheels and few funeral homes even simulate the Japanese funeral as she remembers it; the crematoriums pulverize all the bones and return only ashes; and the tea must take place at a restaurant. So Brad listens to all of Kiyoko's requests, the minute details she and her sister have spent hours working out, and reassures her that she can entrust all the particulars to others, down to the specifics of the tea menu. And he will honor her request to celebrate and remember her life in every way she desires.

Kiyoko, so alive in her dying, is not sidetracked by it; although she has little interest in the machinations of her dying cells, she is raptly engaged by her life that remains.

THE HEART CAN BE scarred by life, much as the person who harbors it. Ruddy myocytes, their uniform contractions propelling the blood through arboreal vessels with a wondrously steadfast beat, can be replaced, in time, by the rigid fibroblasts of scar. This

gritty tissue repairs the heart rents of ischemia like a patch, keeping the surrounding myocytes tightly bound; but it cannot participate in the heart's forceful thrusts; the sheets of fibroblasts are too stiff. If scarring is excessive, so is the heart's inflexibility, and the loyal pump begins to fail.

A couple I'll call Lattie and Niles is the last household of our day. Lattie's heart, scarred beyond recognition, is failing her. At age eighty, it is barely able to keep her alive. Her inefficient contractions have caused a backup of blood, congesting her organs and ballooning out the chambers of her heart. Even the smallest increase in physical activity or emotional strife can overwhelm such a heart, cause it to fail. So Lattie lives a guarded existence, a temporizing that delays her heart failure (and death) and intensifies her fragile reality.

Like most people we visit, she is buoyed by Brad's presence. She is excited and animated as he sits down beside her, and I hope her heart is equal to the task. The coming to meaning at the end of life is a spiritual process, Brad often says, not a religious one. But Lattie is a religious Christian.

"Why am I so afraid to die now?" she asks.

"How much do you believe that God loves you?" Brad answers her query with one of his own. Such a

question has little merit for someone like Kiyoko, but it goes to the heart of the matter with Lattie, who is a religious Christian.

SPENCER

NADLER

— She does not answer.

190

Last year, her husband Niles's Parkinson's disease was controlled by Sinemet, so she was not afraid of dying and leaving him physically bereft. But she lingered on, her spirit keeping her at the helm, a heroic coxswain to her oarsman-like myocytes, a racing shell of a heart that never said die.

Of late, Niles's rigidity is causing him to fall repeatedly. He is unable to get up, to care for himself without Lattie's help. In their married years together, they have become two nuclei in a single cell. Although Lattie's heart is rapidly tiring of the race, she is afraid to lose that race and leave Niles in his own deteriorating state.

They have come to hospice care as a binucleated cell. If Niles were to die before Lattie, she could easily accept her own death and die in peace. But she has less bravado now as her rapid deterioration makes it clear that she will precede her husband. Niles is the one-word answer to the poignant question she raises about her death fears. She struggles not to leave him

in the morass of his disease, and so the myocytes of her heart keep up their desperate vigor.

THE

LANGUAGE

OF CELLS

HUMAN LIFE MUST TRANSCEND the lives of its

— 191

cells, but the two are so inextricably bound that I cannot think about one and not the other. Cellular death is not always essential to cellular life. Harken back to the earliest bacteria; they reproduced asexually by binary fission, replicated their own DNA, and divided into two perfectly coequal clones of themselves. In this way they bypassed death. Bacteria today still reproduce in this manner and, in the absence of accidental death, are immortal.

With the evolution of sex and multicellular organisms, only germ cells—sperm and ova—came to retain the potential for immortality. Gerontologist Tom Kirkwood has postulated that all somatic (body) cells are evolutionarily dispensable. Although our somatic cells come together as the incarnate, thinking humans we are, Kirkwood suggests that our bodies serve primarily as vehicles for launching our germ cells into future generations. Hence the evolution, after reproductive maturity, of senescence and death by natural se-

lection. All somatic cells that escape death from disease or accident eventually age and "naturally" die.

SPENCER

Is transmission of our germ cell DNA from one generation to the next our lives' basic purpose? Will our somatic humanity—the sum of all our magnificent scientific and artistic endeavors—become more than busy footnotes in the grand and universal scheme of things?

NADLER

—

192

Will we ever be as immortal as our germ cells?

ON HOME VISITS with Brad, I see different scenarios played out, note the quiet heroics of everyday people. At sixty-something I think about my own dying and grapple with the emotional arc of it. Witnessing others meet life's end in meaningful ways has made my own seem plausible and has me thinking about all that my cellular body may cease to be: I visualize my hundred trillion cells gradually dying and critical organs beginning to fail; myocytes of heart muscle ceasing their marathon of synchronized contractions; flowing cells of blood tumbling to a flagrant halt; mazy tiers of charged brain neurons pulsing with final thoughts. How awesome is this cellular ride, so steeped in mysterious efficiency. But it is human dying, so urgent and inevitable, that is graven into me.

Epilogue

I meet Comille and his mother at the hospital. It has been three years since I have written their story, and I am delighted to see that he is eight inches taller despite the presence of his sickle cells. Almost eleven years old, he has come to have his mother's lean and graceful look and seems poised on the edge of manhood. We sit and talk about their life with his continuing pain, their retrospective knowledge in dealing with it, their growth.

Kim's interpretations of the tilts of Comille's blood flow allow her to gauge the level of his fragility and either gear up for the more serious back pain or nearly relax when the pain in his hand or foot needs little more than sympathy and gentle massage.

Three years ago, morning pain resulted in Comille's loss of a school day. Now, unless it is severe,