



The Meaning of Green

ONE EVENING IN 1951, so the story goes, a New York businessman named Frank McNamara was out dining with friends. The check arrived, and McNamara was chastened to realize that he had left his wallet at home. That chastening experience led him to invent the Diners Club card, which allowed members to charge meals at participating restaurants and pay their tabs at the end of the month. Apparently he wasn't the only one who'd suffered the embarrassment of finding himself cashless: within a year, twenty thousand people had signed up for Diners Club cards. The card itself was nothing remarkable, just a wallet-sized square of cardboard, but "the idea behind it — a third party facilitating a 'buy-now, pay-later' process — was revolutionary," as one history of credit cards noted. The concept of money had become attenuated, the line between cash and credit blurred. Money's new identity was lodged in a symbolic card that allowed you to pay even when you couldn't flash the legal tender. Money had taken on a new kind of plasticity.

Money would be truly yoked with plastic a few years later, in 1958, when American Express introduced the first plastic credit card — yet another in the tide of transformative plastic goods that Americans

began to embrace in the mid-twentieth century. AmEx promoted the plastic card as a step up from the flimsy paper ones then in use, promising it would “better withstand day-to-day use.” Implicit here was the notion that this card wasn’t a convenience for the occasional dinner out but a tool for daily life. We would no longer be bound by bank hours or the approval of a loan officer. We could buy what we wanted—any time, any day—and pay later. Unlike the prior card issuers, American Express, MasterCard, and others started to provide revolving lines of credit in the mid-1960s, which allowed customers to carry balances from month to month. Credit wasn’t a new concept, of course, but its instant availability was radical. Now we were fully released from the constraints of tangible money, our purchasing habits no longer limited by “cash on hand.” We were free to consume, whether we could afford it or not.

It’s no wonder that within another decade or so, credit cards were so commonplace the very word *plastic* became synonymous with money, edging out phrases that evoked the texture of tangible cash, the metallic clinking of *two bits*, the sandpapery feel of *sawbucks*. Any reader knew just what novelist Dan Jenkins meant when he wrote, “She had a whole purse full of plastic,” in his 1975 novel *Dead Solid Perfect*, the first recorded use.

Today, those plastic cards are the chief currency of commerce. Or as the website of one card manufacturer stated grandiosely, “A plastic card is a physical device that links people to civilization.” Three-fourths of American adults have at least one credit card; most have three or more. But the credit card isn’t the only plastic taking the place of cash in the average wallet. Four out of five Americans own debit cards, and one in six has a prepaid card to buy gas, make phone calls, or use for general purchases. Plastic cards are also increasingly the stand-ins for gifts, especially for giftees one doesn’t know well—the doorman, a coworker, a distant relative. Miss Manners may complain that the impersonality of gift cards has “taken the heart and soul” out of giving, yet they offer such a convenient and stress-free mode of appreciation that ten billion are now created annually. Who knew we were so altruistic?

Over the course of their evolution, these small vinyl rectangles have become a canvas of marketing goals and cultural preoccupations. Card issuers have played on status consciousness with color-coded luxury cards, from American Express’s first gold card to Visa’s popular Austin Powers titanium card, which was promoted with the slogan *It’s Titanium, Baby!* In the 2009 movie *Up in the Air*, the object of desire for the protagonist played by George Clooney was the elusive carbon-black million-mile frequent-flier card. Banks have appealed to emotional connections with affinity cards, first popularized by Visa in 1989, when it cobranded a card with the National Football League. Today, chances are good that I can find an affinity card for whatever cause I care about, from the National Rifle Association to People for the Ethical Treatment of Animals. Or at the very least I can choose an image for the front of the card that conveys what’s dear to my heart, whether it’s puppies, my alma mater, my favorite band, or my family.

It’s not only the terms of the card or the adorning imagery that offer a key to the Zeitgeist. It’s the material of the card itself—that five-gram sheet of plastic. At a time of growing concern about plastic’s toll on the environment, cards are undergoing a total transformation. These facilitators of consumption are going green.

I’m holding in my hand my new Discover card. It looks like any regular plastic credit card, yet it’s made out of a kind of polyvinyl chloride that I’m told will harmlessly biodegrade when I throw it away. The back of the card is colored an earthy brown and bears the word *biodegradable*. When I ordered the card over the phone, I was told I could pick from several options for the front: plain gray, an American flag, a polar bear, a panda bear, mountain scenery, a beach. None seemed especially relevant to the problems of plastic pollution, but with thoughts of the Pacific vortex in mind, I chose the beach, not realizing the image I’d wind up with would have the supersaturated colors and unreal look of a Club Med brochure. “Well, it is a *Discover* card,” my husband said when I showed it to him. “They want you to spend money to discover the world.”

Discover introduced these new “environmentally friendly” cards in late 2008, just in time for the Christmas season. “We hope this will appeal to those interested in living a greener life,” a company spokeswoman said at the time. The company won’t say how many green-living customers have taken them up on the option, only that “We are encouraged by the results thus far which have exceeded expectations.”

PVC, you’ll recall, is the plastic environmentalists hate more than any other, the one known in Greenpeace circles as “the poison plastic.” Nearly all credit cards, as well as gift cards and debit cards, are made of PVC and have been since the American Express debut. Card manufacturers like PVC because it’s easily processed, offers the right blend of rigidity and flexibility, and is durable enough to last the standard three-to-five-year term of a credit card.

Granted, environmental issues rank well below debt issues when it comes to the hazards usually associated with credit cards. Nor are credit cards the products activists usually point to when warning about the dangers of PVC. Yet in Plasticville, even small objects like credit cards add up. By one estimate, there are more than 1.5 billion credit cards in use in the United States. A stack of them all would reach more than seventy miles into space, the *New York Times* calculated; it would tower nearly as high as thirteen Mount Everests placed one on top of the other. But the natural laws of erosion and degradation that whittle away mountains would scarcely dent that polymer peak. Even a single PVC card can persist for decades, if not centuries, and each year, we toss away more than seventy-five million. And that’s just credit cards; those tallies don’t include the much greater number of gift cards, prepaid cards, hotel keycards, and other varieties of plastic used to transact life these days.

The thought of all those plastic cards accumulating in landfills was what motivated the man who is responsible for the plastic used in Discover’s allegedly ecofriendly card. For twenty years, Nevada businessman Paul Kappus had sold PVC to the makers of credit cards, and he’d often thought there should be a way to make the used cards decompose. He spent several years talking to scientists and chemists,

searching for some chemical that might make the PVC mortal. “I tried all sorts of different things, like the enzymes that eat cat urine off the floor. You wouldn’t believe what I tried. All of it was a gross failure.” Until one day he stumbled across what he says was an obscure technology that turned out to work.

Kappus was vague on the details, saying his formulation, BioPVC, is a trade secret. He’ll state only that it involves a special additive blended into the PVC that acts like bait to the microorganisms that are ubiquitous in the environment, including in landfills. The additive doesn’t affect the card’s durability while it’s in use; it’ll stand up to years of swiping and stowage in a wallet. But deposit that card in a landfill or compost pile or any similarly “fertile environment,” and, according to Kappus, it will draw hordes of microscopic critters that can take it apart. “They actually eat it, believe it or not,” he said. Even a card that’s litter on the ground will be scavenged, he claimed, without leaving behind any of the polymer’s toxic precursor vinyl chloride. He said the card would be fully degraded within ten years, a blink of an eye compared to a regular PVC card.

This all sounded really wonderful—until I started talking to experts on biodegradability.

“That’s a load of hooey” was the reaction of Tim Greiner, a Massachusetts sustainability consultant. Like other experts, he was dubious that PVC could be made to harmlessly melt away. But even if it did work, Greiner questioned the need for it. Biodegradability is a nice solution for litter, perhaps. But credit cards aren’t generally littered. So, Greiner asked, “What is the problem this card solves?”

What problem, indeed?

It was a useful question to bear in mind as I started wading into the thicket of “green” plastics. What I found was a broad and sometimes bewildering variety of products made with or packaged in resins that manufacturers claim are safer for the environment and our health, including chip bags, water bottles, cell phones, BB gun pellets, diapers, carpets, cutlery, ballpoint pens, socks, cosmetic cases, plant pots, Easter-basket grass, flip-flops, and trash bags “with a conscience.” Some, like the Discover card, involve conventional plastics with a

green twist. Others are made from alternative “biobased” polymers: for example, the Apple iTunes gift card my daughter recently got for her birthday is made of a corn-based plastic.

Green plastic might sound like an oxymoron, but it’s one of the industry’s fastest-growing fields. Production of biobased polymers has been expanding at the rate of 8 to 10 percent a year and is expected to grow much faster in coming years. There’s so much excitement about bioplastics that it’s tempting to describe their rise as a boom. But when I used that term with Ramani Narayan, one of the country’s leading biopolymer experts, he reminded me that biobased plastics are still only a drop in the resin bucket, less than 1 percent of global plastics production. The field is in its infancy, with a steep technological learning curve ahead. Nonetheless, a recent study estimated that bioplastics could one day replace as much as 90 percent of today’s plastics. Said Narayan, “This is the future of plastics.”

There’s no mystery why. A century into mankind’s love affair with plastic, we’re starting to recognize this is not a healthy relationship. Sure, plastics have been a good provider, but that beneficence comes with many costs that we never even considered in our initial infatuation. Plastics draw on finite fossil fuels. They persist in the environment. They’re suffused with harmful chemicals. They’re accumulating in landfills. They’re not being adequately recycled. In short, they exemplify shortsighted thinking about the long-term impacts of manufactured materials and represent an unsustainable wasting of resources. Environmentalists have been making that case for years. Now even the plastics industry is coming to the same conclusion. As a Dow executive told *BusinessWeek*, “Our whole industry agrees that plastics have to be more sustainable.”

In any event, it’s not as if we can get a divorce. Plastics are one of the material foundations of modern life, and in many contexts, that’s a good thing. We want our solar panels, bike helmets, pacemakers, bulletproof vests, fuel-efficient cars and airplanes, and, yes, even much of our plastic packaging. As they did in the late nineteenth century, plastics have a vital role to play in a world of dwindling natural resources. And that will be even truer in coming decades as we

grapple with climate change. More and more of our decisions about how to build our homes, transport ourselves, and package our stuff will be driven by carbon calculations. By that measure, lightweight, energy-efficient plastics can offer extraordinary opportunities.

But to live in harmony with plastics, we have to change the terms of the relationship. We need to develop plastics that are safer for people and the planet, and we need to deploy them more responsibly. And that means change on the parts of all residents of Plasticville: the producers of plastic things, such as credit cards, and the consumers who use them.

What constitutes a green plastic? Though there’s plenty of debate, most would agree that one starting place is the use of renewable raw materials, a quest that, ironically, takes the industry full circle, back to plastic’s earliest roots as a material derived from plants. Remember celluloid? That wasn’t the only plant-based polymer. Throughout the early decades of the twentieth century, there was widespread interest in making other types of plastics from agricultural crops, such as corn or legumes or soybeans. Indeed, agricultural interests competed fiercely with the nascent petrochemical industry to capture the market on polymers.

Henry Ford, who was eager to find industrial uses for surplus crops, put his money on soybeans. He often claimed it would be possible to grow most of an automobile. To that end, he planted thousands of acres of soybeans and converted one of his plants at River Rouge to the production of a soy-based plastic. The typical 1936 Ford had ten to fifteen pounds of soy plastic in its steering wheel, gearshift knob, window frame, and other parts. In 1940, Ford famously invited reporters to see a “farm-grown” car. Ever the showman, the septuagenarian hefted an ax and swung it hard against the back of the custom-built car. Instead of crumpling, the panels bounced back into shape. Or, as a reporter for *Time* magazine put it, “the fenders of the Buck Rogers material . . . withdraw from collisions . . . like unhurried rubber balls.”

But Ford didn’t get a chance to make more than one plastic car be-

to being practitioners of the evolving science known as green chemistry. (Green chemistry goals include making synthetic chemicals with as few toxic substances as possible, generating the minimum amount of waste, and using renewable resources.) "The minimum amount of waste that can be generated, and that won't persist in the environment," says Narayan. "The manufacturer using the term 'biodegradable' is on a 'no-harm' list," which bars the use of "hazardous substances, toxic pollutants, endocrine disruptors, and other dangerous chemicals."

polylactic acid
(PLA)

If you browse the shelves of bioplastic products, you'll notice that the most common problem they claim to address is plastic's stubborn durability. "Go ahead, throw it away! No composting required," boasts a maker of picnic forks, suggesting that once discarded, they will simply melt away. Fork gone; problem solved. But advertising, even the greenest, seldom tells the whole story.

I thought I knew what *biodegradable* meant, but in talking with experts, I came to realize it's a far more complicated process than my hazy notion of something just "breaking down." The term has a precise scientific meaning: *biodegradable* in this context means that the polymer molecules can be completely consumed by microorganisms that turn them back to carbon dioxide, methane, water, and other natural compounds. "The key word is *complete*," cautioned Narayan. It doesn't count as biodegradation if only a portion of the polymer can be digested.

That distinction is why Narayan has criticized my purportedly biodegradable Discover card. His studies show that despite the PVC-microbe bait, the micro-critters consume only about 13 percent of the card; after that, the process plateaus. It's also at the heart of a controversy over a rash of plastic bags that are marketed as "oxo-biodegradable." They're made of conventional plastics blended with an additive that causes them to break up when exposed to the sun. The bags do quickly crumble, but there's little evidence that the resulting plastic bits are ever fully consumed by microbes. Instead, critics contend, they may simply litter the earth with yet more tiny flakes of plastic.

Another complication affecting a product's biodegradability is that

the process unfolds in different ways, depending on the material, the setting, and the microbes in residence. A felled tree is eminently biodegradable. In a steamy rainforest teeming with fungi and microbes, it could be gobbled up in a matter of months. Yet if it topples in the hot, dry desert where there are few microorganisms around, it will petrify long before it can be consumed. And if it sinks to the anaerobic bottom of a river, it will be preserved for centuries because the microbes that digest wood need oxygen to do their work. Plastics are intrinsically more difficult to break down than wood, but their capacity to biodegrade is a function of a polymer's chemical structure, not its starting ingredients. There are fossil-fuel-based plastics that will biodegrade (often used to make compostable bags and film), and there are plant-based plastics that won't.

In principle, both PLA and Mirel are biodegradable. In practice, it occurs more easily with Mirel. I could take a used Mirel gift card and toss it into my backyard compost bin, where microbes would digest it, creating lovely rich dark humus, over the course of a few months. The same would happen, though at a slower rate, if I lost it in the park, or even if I dropped it in the ocean. Mirel is just about the only plastic available today — petro- or plant-based — that will break down in a marine environment. So while you wouldn't want to build a dock with it, it could be a great material for plastic packaging, especially of foods and goods designed for shipboard use. Indeed, the U.S. Navy is exploring the use of Mirel utensils, plates, and cups.

PLA is trickier. It will biodegrade, but only under optimal composting conditions, which are challenging to achieve on one's own. Given the so-so state of my backyard compost bin, I suspect that if I deposited the PLA iTunes gift card there, it would remain intact for a good long while. Really mobilizing the microbes that can pry apart PLA's long polymer chains requires a balance of oxygen, moisture, aeration, and steady temperatures between 120 and 140 degrees — in short, the sort of conditions most readily found in an industrial composting facility. Unfortunately, there are only about two hundred to three hundred facilities in the country that process consumer food waste, and far fewer communities that actually collect residential

food scraps for composting. Most of those are located in California and Washington.

As with any new technology, it takes time for a supporting infrastructure to develop. NatureWorks hopes that PLA products can eventually be chemically recycled, through a chemical process that breaks them back down to the starting ingredient, lactic acid. But as of 2010, there's only one facility in the world capable of doing that. At the moment, the plastic is creating a mini-crisis in the recycling world, where all is geared to conventional plastics. PLA is increasingly used for food packaging, but many consumers don't realize a PLA bottle can't go into the recycling bin. "We're freaking out about these," said one executive at San Francisco's Recology as he showed me a plastic water bottle made of PLA. The bottle looked exactly like one made of PET, yet it could contaminate a batch of PET being recycled. While some cup makers have started using green or brown logos and labels to indicate the cups are made of PLA, as of yet there's no standard system for differentiating biopolymers.

The allure of biodegradability is understandable. (Though it's ironic to see it assume the kind of marketing cachet for plastics that durability once held. I can't imagine any plastics maker today using this ad that ran in the 1980s: "Plastic is forever . . . and a lot cheaper than diamonds.") Still, the ability to biodegrade is neither a panacea for pollution nor the end-of-life solution to all things plastic.

Consider all the products, like that Discover card, that claim to break down in a landfill. It's a myth and a misplaced hope, said Steve Mojo; he's the director of the Biodegradable Products Institute, a trade group that polices the biopolymers world, certifying products that pass international standards of compostability and biodegradability. Ideally, nothing should biodegrade in a landfill, he explained. Landfills are engineered to deter that process as much as possible because it generates greenhouse gases. Yucky as it may be to think that our garbage will outlast us as well as our great-great-grandchildren, that's actually preferable to having it break down and give off methane, the most potent climate-change gas. Listening to Mojo describe how landfills work, I thought about the many biodegradable bags that

are sold for collecting dog poop and that most people simply throw into the trash. These well-intentioned folks may be hoping that by their using biodegradable bags rather than regular plastic sacks, their pooches' poop will be more likely to decompose. But as with anything deposited in a landfill, "it's going to be preserved," said Mojo. "So when [future] generations go out and excavate the landfill, they will know we had a lot of dogs."

Where biodegradability makes sense is in products that are associated with food or organic waste (the sort that, unlike dog poop, can be safely composted), such as disposable plates and cups and cutlery, snack packages, and fast-food containers. All are single-use items that aren't often recycled today, especially the ones made of film. (Biodegradability would also be useful for the millions of pounds of agricultural film used by farmers every growing season to block weeds from sprouting among crops and that no one has found a way to economically recycle.) Making these kinds of products out of biodegradable bioplastics not only provides a solution for disposing of the package, it helps encourage the composting of food waste—which is a far bigger part of the garbage stream than plastics. Americans throw away more than thirty million tons of food waste each year, and most winds up in landfills. Zero-waste advocates see compostable plastic packaging as a two-for-one solution.

But is biodegradability the answer to the waste problems posed by quasi-cash plastic cards? Maybe. But what about redesigning them so that it's easier to load on new credit, allowing a card to be reused? That way, fewer new cards would have to be made. As for credit cards, why not reduce the frequency with which new cards are issued for existing accounts? Or expand on the few paltry card-to-card recycling programs that currently exist? Or make the cards out of a less toxic plastic than PVC so they can be more easily recycled? That's the route some European banks have gone and the one chosen by HSBC when it wanted to issue a more earth-friendly credit card for its Hong Kong market. Its green card, unveiled in 2008, is made from the most recycled plastic, PET. And it's backed by even more tangible ecobenefits: digital billing, which cuts down on paper waste, and the

bank's pledge that a portion of all spending will be donated to local environmental projects.

Manufacturers have long chosen the plastics for their products on the basis of price and functionality. But creating a more sustainable relationship with plastics will require a new dexterity on our part. It will require us to think about the entire life cycle of the products we create and use. A green plastic that's suitable for one application may not be suitable for another when all environmental factors are taken into account. Biodegradation may not always be the best answer.

Consider the recent report in the *New York Times* that some designers of furniture and other housewares are taking pains to make sure their products are biodegradable. At one level, that's a laudable application of cradle-to-cradle thinking. Montauk Sofa, for instance, designed a line of couches in which all the components were made of organic, nontoxic materials that could biodegrade. As the chief executive of the company told the *Times*, "At first the whole idea was to have as little impact on the environment as possible. And then I started to think, wouldn't it be great to have no impact? Then it was, hey, what if the sofa just disappears when you're done with it?"

Leaving aside the question of whether that goal is even feasible, what does it say about our culture? Is a biodegradable couch a sign of a more sustainable mentality? Or is it just a greened-up version of the same old shop-and-toss habits? Traditionally, durability and longevity have bestowed additional value—a great-grandparent's walnut dresser isn't merely a place to store clothes; with time it becomes an heirloom, a connection to a past that has been conserved. Buying a two-thousand-dollar sofa designed for guilt-free disposal bears an uncomfortable resemblance to buying a ninety-nine-cent lighter also designed to be tossed. Wouldn't the lowest-impact sofa be one designed for and purchased with the expectation that it would be safely in use for decades?

Technology has come to define modern life, and we love the idea of gee-whiz technological fixes, even for the problems technology itself has created. Outrage at the Gulf oil spill is blunted by a fascination with high-tech blowout preventers and other technological

marvels that promise to rescue us from our own complex creations. But the greening of Plasticville will require more than just technological fixes. It also requires us to address the careless, and sometimes ravenous, habits of consumption that were enabled by the arrival of plastic and plastic money—a condition for which there is surely no better symbol than the maxed-out credit card. It means grappling with what historian Jeffrey Meikle called our "inflationary culture," one in which we invest ever more of our psychological well-being in acquiring things while also considering them of such low value "as to encourage their displacement, their disposal, their quick and total consumption."

What would it be like to turn your back on that culture—or at least the part of it involving plastic? I suppose I could have traveled to Lancaster, Pennsylvania, and spent time with an Amish family to find out. But instead I just picked up the phone and called Beth Terry, a fortysomething part-time accountant in Oakland, California, who in 2007 decided to start purging plastic from her life and is writing about her experiences on a blog she calls *My Plastic-Free Life*.

As Terry tells the story, she was home recuperating from a hysterectomy when she heard a radio report about Colin Beavan, a.k.a. No Impact Man, a New York resident who had pledged to live as lightly as helium for a year. Terry was moved by his story and decided to check out his blog. There she grabbed hold of an electronic chain that took her first to the (now-defunct) blog of Envirowoman, a Canadian woman who spent a year eliminating plastic from her life, and then to accounts of the plastic vortex, and then to the picture that she said changed her life: a photograph of a Laysan albatross carcass stuffed with plastic trash. The image tattooed itself onto her brain, forever altering her perspective on the world. "That bird was full of things that I use: it was bottle caps and toothbrushes and all the little pieces of plastic," she said. Looking at the photo, she was struck by how little control she had over things once they left her hands. Maybe, she said in hindsight, it was recovering from the hysterectomy, realizing she would never have children and being open to the idea of taking care

of something else, like . . . the planet. Whatever the reason, she felt an urgent need to convert her horror into action.

She told me this story over lunch at an Oakland restaurant where we had arranged to meet. I had a feeling it was her when I saw the sensibly dressed woman with dark curls and wireless glasses push through the front door holding a cloth bag with the slogan Canvas Because Plastics Is So Last Year. The bag contained some of the accessories she carries with her to minimize her plastic intake, including cloth bags for the grains and produce she buys in bulk, as well as her kit for eating out: a wooden fork, spoon, and knife, in case she's presented with plastic cutlery; a pair of glass straws; and a cloth napkin. That day she was also toting a stainless steel pot, which she brought out when we later went to the butcher across the street to buy ground turkey for her cat (she is a vegetarian). In order to avoid the plastic film or plastic-coated paper used to wrap meat, she asked the butcher to put the ground turkey into the pot. I noticed she paid for it with a credit card. She says she doesn't have a problem using credit cards—the plastic lasts a long time—but she does worry a bit about the receipts because of the waste of paper and the fact that they are coated with bisphenol A. (Yet another of the ubiquitous chemical's uses: it bonds with the invisible ink used in carbonless copy paper to make an image appear when pressure, such as when one writes one's signature, is applied.)

As if I hadn't guessed it already, Terry explained she's not the sort of person who does things in half measures. When she took up running, she had to run a marathon; when she began knitting, she made scarves and hats for everyone she knew. So her goal of reducing plastic quickly went far beyond prosaic measures like using reusable bags and travel coffee cups. She began tracking the tiniest scraps of plastic that crossed her threshold—pieces of tape on packages received, the plastic windows in envelopes, the bits of film wrapped around the ends of organic bananas (a measure to prevent mold). She goes out of her way to rid herself of unwanted plastic: she's sent Tyvek mailers back to DuPont for recycling, returned the unneeded CDs that automatically were sent to her when she updated her version

of TurboTax, and biked across town (she doesn't own a car) to take back Styrofoam peanuts to the shipper who had delivered a package from her dad. In all of 2009, she accumulated only 3.7 pounds of plastic—just 4 percent of the American average, she proudly noted on her blog. She cheerfully admits she's extreme but sees herself blazing a path that others can follow as far as they want to.

It's surprising how many people are game to try (though not her husband; he supports her efforts but hasn't joined her plastic-free crusade). Dozens of her readers have taken her up on her challenge to collect their plastic trash for a week or longer and then send in photos. In fact, the blogosphere is filled with plastic purgers and zero-waste zealots determined to reduce their footprints to the slightest tiptoe. They share recipes for homemade condiments and deodorant, fret over the frustrations of trying to find synthetic-free running clothes and sunscreen in nonplastic bottles, and swap tips for recycling unwanted plastic things such as gift cards. "Use them to scrape dried soy candle wax from tabletops, fabric, flat candleholders," one of Terry's readers suggested. "Use them to crease folds in papercrafting . . . [C]ut them into squares, glue them onto cork, and make coaster mosaics." They confess their consumption sins online—"Out of laziness, I broke down and bought tortillas in plastic," one reader wrote Terry.

Even among this hard-core crowd, there are levels of extreme. A fellow green blogger accused Terry of "hair shirt environmentalism" for using baking soda and vinegar to wash her hair. This, noted Terry, from a woman who advocated using cloth wipes in place of toilet paper, "which I think is really extreme." But to Terry, it didn't feel like any great sacrifice to give up bottled shampoo in favor of baking soda and vinegar. It's cheaper, which appeals to her frugal nature. Besides, she added, "I'm not very girly and never have been." (Envirowoman, one of the first blogging plastiphobes, complained regularly about the difficulty of finding plastic-free cosmetics.)

"Is there anything you've done that *does* feel like hair-shirt environmentalism?" I asked.

"I miss cheese." She laughed wistfully. The sharp cheddar she likes

almost invariably comes wrapped in plastic. Eventually she managed to find a cheese—not cheddar, alas—wrapped in natural beeswax. But she had to buy the entire fifteen-pound wheel. Occasionally she tries to give herself a break from herself. “I went to Trader Joe’s the other day just to get something quick for lunch. I used to be able to eat at Trader Joe’s all the time. I wanted to get a salad.” She was fully prepared to confess the transgression in her next blog entry. But then that image of the plastic-stuffed albatross flitted across her mind. “I just couldn’t do it. I looked at all the plastic and just walked out.”

Over the course of her deplasticization, she’s had to abandon purchases ever more frequently. As Terry recalled, at first she simply wanted to replace plastic stuff with things made of glass or wood or paper or other natural materials. She bought sauces in glass jars, scoured the grocery stores for frozen dinners that came in nonplastic trays, tried soy milk powder to make soy milk (pronouncing it “feh!”), and gave up disposable razors in favor of an old-fashioned safety razor she found at a local antique store.

“I thought I could find an alternative for everything in my house,” she said. But over time, she found that “there were fewer and fewer things I could buy.” When her hair dryer broke, she had to go without or figure out a way to repair it, which she did. Instead of buying almond milk and yogurt and cough syrup, she taught herself how to make them. Rather than purchase new tools, she borrowed them from friends or a local tool-lending program.

“Giving up plastic,” Terry said she realized, “meant I was kind of forced to consume less.” She may not have environmental quibbles with her plastic credit cards, but the fact is, a life without plastic means she has fewer and fewer occasions to use them.

Plastic is so deeply embedded in our consumer culture it is almost synonymous with it. Look at the bright, shiny hygienic surface of Plasticville and you’ll see a wealth of products that make life easier, more convenient. But start scratching that surface and you’ll begin to see that minor, even trivial, conveniences can have profound consequences—whether that’s reflected in disposables that will outlive us, chemicals that can undermine the health and fertility of future gen-

erations, or albatrosses choking on things we’ve discarded because they can’t be reused or recycled.

Does this mean we must follow Terry down that road out of Plasticville? Must we choose between our plastic and our planet? If those were the only options on offer, I’m not sure I could trust myself or my fellow citizens to make a good decision. Fortunately, building a sustainable future doesn’t require such a stark and dramatic choice. In fact, an overly simplistic pursuit of perfection can get in the way of a mostly green good.

Consider local dairies trying valiantly to improve on the way milk is produced and sold. One in my area sells organic milk in returnable glass bottles. But the cap is still plastic, and for Terry that’s a deal breaker. It’s a question of priorities, she said. “You have to prioritize what’s important in your life. I don’t need to drink milk.” That may be a reasonable choice for Terry, but if enough people followed her example, that organic dairy with its returnable glass bottles would go out of business. If we want to bring about a greener world, personal virtue must take into account the larger political and social contexts of individual actions. Still, Terry’s uncompromising example provides a reminder of the tradeoffs we casually make every day, as I realized when I finally decided to take up her plastics challenge and track my plastics consumption for a week.

I’d been putting it off. I’m not sure why, except the whole idea made me feel vaguely uncomfortable. I knew there was no way I was going to scale back plastics to the degree Terry had. I have three kids, full-time work, and a far less obsessive temperament; I’ve never felt compelled to run a marathon. I wasn’t convinced that collecting my plastic trash for a week would tell me anything I didn’t already know. Or, if I’m honest, anything I wanted to know.

To my surprise, it turned out to be a very useful exercise, like my earlier experiment in writing down everything I touched that was plastic. It reminded me once again of plastic’s ubiquity and how easy it is to stop noticing that fact. Knowing that I would have to keep and consider every plastic item I used transformed each use—even the most trivial—into a conscious decision. At the gym, I could get my-

self a drink of water from one of the plastic cups by the cooler—and add that cup to my collection. Or I could walk downstairs and sip from the water fountain.

Looking at the pile of trash I accumulated in a week—123 items, which was probably more than Terry generated in a year—a few things became clear. One was how often my purchases are made on the basis of convenience. Do I really need to buy zucchini from Trader Joe's, where it comes nestled on a plastic tray, covered in plastic wrap, with little plastic stickers adorning each individual squash? Sometimes. But most weeks I can make the time to stop by the farmers' market or the neighborhood produce stand, where all the fruits and vegetables come unencumbered by synthetic skin.

I was embarrassed to realize how many of the packages I'd collected that week contained food that had gone bad because we hadn't finished it. There were five bread bags, each of which held a few moldy slices—the dreaded heels of the loaf that my kids refused to eat. Those bags were evidence that I was doing far too much of my grocery shopping on autopilot, without thinking carefully about what we really need. But it also reminded me of something Robert Lilienfeld, the coauthor of *Use Less Stuff*, told me when I spoke with him about the debate over plastic shopping bags. He pointed out that for all the environmental troubles single-use shopping bags cause, the much greater impacts are in what they contain. Reducing the human footprint means addressing fundamentally unsustainable habits of food consumption, such as expecting strawberries in the depths of winter or buying varieties of seafood that are being fished to the brink of extinction.

Beth Terry's challenge pinched awake my sense of mindfulness about my grocery shopping, reminding me to ask myself as I wheeled my cart through the store: Is this something we really need? I'm going to answer that question "yes" more often than Terry. But it's never a bad question to ask oneself, especially in a consumer culture that encourages people to swipe their credit cards regularly but not necessarily thoughtfully.

Those credit cards provide a powerful way to help shape the

choices consumers are offered. We can use them to vote for healthier, safer products and to support the development of plastics that are genuinely green. We can also vote by keeping them firmly tucked inside our wallets and rejecting overpackaged goods and products that can't be reused or recycled. The power of the purse has helped make sustainability a viable niche in the market, fueling sales in durable water bottles, travel mugs, and the like. It's why Walmart now sells organic produce and why Clorox introduced a toxin-free line of cleaning products and why the makers of baby bottles and sports water bottles voluntarily switched to bisphenol A-free alternatives. We can move markets, as Terry demonstrated in 2008 when she organized a successful campaign to get Clorox to recycle the carbon cartridges used in its Brita water filters—something the European maker of Brita had begun doing years before, thanks to the requirements of extended-producer-responsibility laws.

But individual actions alone are unlikely to bring about change on the scale that is now required—whether the task is stopping the plasticization of our oceans, protecting our children from endocrine disruptors, or curbing the carbon emissions that fuel global warming. The forces that shaped our marriage with plastics—a powerful petrochemical industry, a culture of acquisition, an erosion of community-mindedness in the suburban diaspora—evolved in a political culture that assumed a world without biological limits. That genie can't be put back in the bottle, but we can remold our political culture to make the genie a better citizen.

Government at all levels—from city councils to Congress—has a role to play in reinventing our communities as places where it is easy, convenient, and cost-effective for people to use less, reuse more, recycle, and compost; where businesses that serve those ends can thrive; where all producers take cradle-to-cradle responsibility for the things they create; and where the ocean is valued for the vast resource it is rather than being the final dumping ground of our plastic folly.

It's a huge project, remaking our relationship with this family of materials.

We've produced nearly as much plastic in the last ten years as we have in all previous decades put together. We've become used to our polymer partners, for better and worse. Today's college graduates may not want a career in "Plastics!" any more than Dustin Hoffman did, but their lives are going to be defined by the presence of plastics to a greater degree than the lives of any previous generation. Plastic production is accelerating, plastic goods are spilling out across the landscape, a culture of use-and-dispose is being exported to a developing world whose consumption of plastic could, by some estimates, catch up to U.S. and European levels in the next forty years. Our annual global plastics production, if present trends hold, could reach nearly two trillion pounds by 2050. If it feels like we're choking on plastic now, what will it feel like then, when we're consuming nearly four times as much?

We have come a long way from the early promise of plastics, a substance we hoped could free us from the limits of the natural world, democratize wealth, inspire the arts, enable us to make of ourselves virtually anything we wanted to be. But for all the wrong turns we've taken, plastic still holds out that same promise. Especially in a world of seven billion souls—and counting—we need plastics more than ever. We have to remind ourselves that our power to create a sublime world resides not in the materials we deploy but in our gift for imagination, our capacity to create community, our ability to recognize danger and to seek a better way.

Just as individual action is no substitute for the exercise of our collective political will, neither can we simply legislate our way to that sustainable, enriching future we know is possible. Remaking Plasticville into a place where our children and their children and their children can safely live will require us to confront assumptions about ourselves and what we need for fulfilling lives and satisfied minds. We don't need to reject material things but to rediscover that their value may reside less in the quantity of things we own and—as with Della's comb—more in the way our material possessions connect us to one another and to the planet that is the true source of all our wealth.