

An Excerpt From

Outsmart Waste

The Modern Idea of Garbage and How to Think Our Way Out of It

by Tom Szaky

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OUTSMART WASTE

The Modern Idea of Garbage and
How to Think Our Way Out of It

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Founder and CEO
of TerraCycle

FOREWORD BY DEEPAK CHOPRA

Outsmart Waste

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and How to Think Our Way Out of It

Tom Szaky



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To Edith and Martin Stein

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Foreword

Waste is natural to every living system. We all consume and at some point eliminate. Eventually, everything and everyone has an end of life.

We may frown on someone who litters or tosses a cigarette butt on the street, but is putting a candy wrapper in the garbage bin—only for it to be trucked to a landfill—much better for the planet? With the more than 4 pounds of garbage the average American discards every day, our individual contributions to this collective trove of waste are hard to countenance, and, largely, we don't.

Globally, humanity has evolved into the modern disposable society, readily buying and discarding non-recyclable products and packaging that were designed to enhance consumer convenience and regular repeat purchases. For the most part, consumers—and I am very much a part of this—buy disposable items and discard them, and we are largely inattentive to where our waste goes. With an addictive satisfaction (but largely without conscience), we each contribute to vast concentrations of waste that nature

can't digest and that add toxins into the atmosphere. Our blind eye to how much waste we produce and contribute is a spiritual breach. The flush syndrome is very much an aspect of our shadow, and it festers into a collective disrespect for our home—our planet.

Tom Szaky is a waste pioneer and an eco-capitalist. At age 31 he's running a company that operates in 24 countries, collecting and recycling waste that is otherwise landfilled or incinerated. In this book Tom illuminates pathways to finding "gold in garbage heaps" and, more importantly, explains how human-created waste can be reused, recycled, and reintegrated into our commercial systems. Through his company, TerraCycle, and this book, Tom is tackling a seemingly unsolvable global problem to which each individual contributes. Thanks to this book, I can no longer acquire and discard unconsciously, and as I've long said, change begins with awareness.

Tom's prescription isn't abstinence: He too likes to buy and own, and he is very much aware of the short life cycle of most goods. Rather, Tom suggests that we might consume our way out of the problem—practically aligning the economic forces that drive consumerism to a positive role in the solution. Tom brings the global waste picture into new focus, and in so doing he may help us solve the individual and societal compromises we each make when we somewhat blindly and seemingly helplessly discard and pollute our planet, our home, and our corporal body.

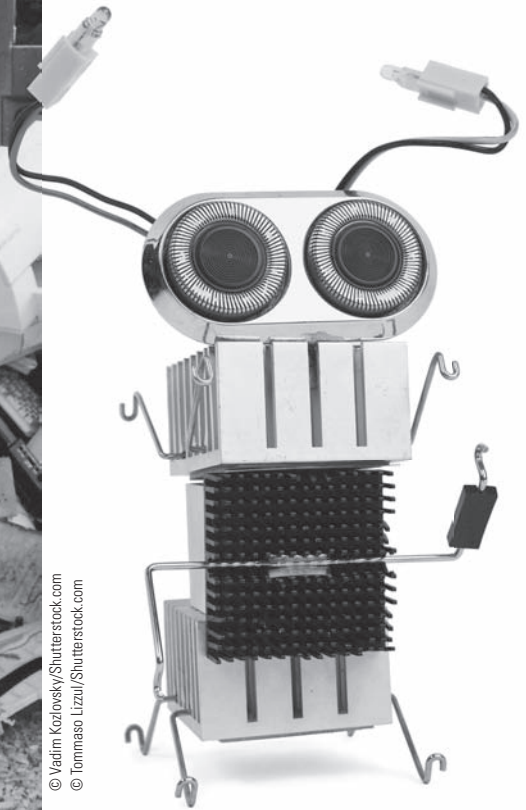
—Deepak Chopra





Introduction

The Unique Nature of Garbage



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Garbage” is a uniquely human concept that does not exist in nature. In nature the output, or waste, of one organism is the useful input for other organisms. Feces from a fox can become food for a berry bush, whose fruit can later become the food for a bird that may end up as supper for the fox whose droppings started it all. This natural harmony is rooted in the principle that the outputs of organisms tend to bring significant, if not fundamental, benefits to other organisms.

With the creation of synthetic materials, humans have broken this natural harmony. While plastics and other man-made materials have allowed us to innovate and create products cheaply, when they hit the end of their useful life they become useless outputs that nature doesn’t know what to do with. Not only are many of these new products relatively cheap to buy but many of us typically don’t even have to have the actual resources to buy them; gaining debt (through credit cards and other loans) is perhaps the easiest it has ever been.

Of course, there are ways to better realign ourselves with the harmony of nature. Buying products differently—buying consciously, buying durable, buying used, or simply not buying at all—is a straightforward way that individual consumption can have a smaller impact on nature.

It is quite difficult, however, to lead a life in which we do not buy anything or buy only our bare essentials (food and a few

scraps of fabric to cover our bodies). I have started down the path of rethinking what I buy and have found it to be an uphill battle. Like most people, I enjoy acquiring things; the feeling when I open a box with something new to possess inside it is still thrilling, and that fleeting thrill is encouraged by a global culture of rampant consumerism. Just think of how many stores and advertisements we pass by on a daily basis that encourage more and more consumption—all seeming to scream, “You’ll gain happiness by buying me!”

We see fish with bellies full of plastic and birds making nests from cigarette butts, and the problem only compounds with our tendency to overconsume. Easy and cheap access to many goods, a dramatic increase in global population, and a throwaway consumer culture have resulted in a global garbage crisis.

What Currently Happens to Our Waste?

Our waste is a monumental problem. Over the past 100 years, the amount of waste that humanity produces has increased by almost 10,000 percent. Developed countries produce more than 4 pounds of waste per person per day.¹ Of that staggering volume, it is estimated that 25 percent ends up in our oceans, forming five gigantic, Texas-sized ocean gyres of garbage.² Because of the complexity of much of our garbage, only a small percentage gets recycled.

The majority of the waste that isn’t recycled and doesn’t wind up in the ocean is effectively mummified and

compressed in landfills, leaching out methane and other toxic outputs over time. If it is not buried, it is typically burned in incinerators. While a very small percentage of incinerators do produce some energy as an output, in the process they also destroy all possible value except the caloric (or energy) value inherent in the materials. You can burn something only once.

While the global garbage crisis touches every individual in the world and grows every year, there is cause for optimism. Garbage is a rare example of an environmental problem over which, as individuals, we have tremendous control. The key question is: why do we spend huge amounts of resources—energy, money, and time—to extract oil from the ground and refine it into high-grade plastics, only to burn or bury it after one short use?

Unfortunately, and unlike nature, we often view our waste as something without any inherent value. Fortunately, it doesn't have to be this way.

A Circular Solution to Waste

To properly manage our waste, we need to bring a perspective of value to it, as nature does. Instead of seeing waste purely as a negative—a useless by-product that we spend money to burn or bury—perhaps we can start seeing it as a positive: an inherently valuable combination of materials that can be processed and shaped into objects with specific purposes. The key is to see our outputs not as

problems but as assets; it is to see “waste” not as the end of a linear process but as a stage in a circular life cycle.

Reuse—a synonym of *buying used*—is perhaps the solution that most clearly sees the value inherent in our waste. It effectively says that the “waste” object is waste only in the eyes of the initial user; the object retains all of its initial utility in the eyes of the next user and because of that perspective doesn’t actually end up as “garbage.” If I’m tired of my jeans and put them in the local clothing drop and someone else buys them a few months later, that pair of pants was never rendered waste: they didn’t end up in a landfill, and a new pair of pants did not have to be made to meet the needs or desires of the second user.

Not everything is as simple to reuse as a pair of jeans, and most human waste cannot be reused at all. From an empty potato chips bag to a used toothbrush, many objects can serve their intended function only once. *Upcycling* is an emerging trend whereby one sees value in both the composition and the form of an object but not the intention. That crumpled bag that once held a few handfuls of chips can be folded into a purse or bracelet. The used toothbrush can become a pen, a doormat, or one of any number of useful objects. Although more energy is used to upcycle an object than is needed to simply reuse it, it is usually a relatively small amount.

If upcycling a particular waste product is not possible—as is the case with items like dirty diapers and cigarette

butts—the product can typically be deconstructed into its component parts and used again. A used diaper or pile of cigarette butts can be shredded and separated into their respective raw materials. The resulting material, from the plastic to the organics, can be used again for different purposes. While the initial intention and form of the object is destroyed, new raw materials don't have to be extracted from the earth, and synthetic products aren't added to a landfill or some plastic island in the ocean.

It's All about the Economics

In the end all waste can be reused, upcycled, or recycled, avoiding the need to burden our planet with the constant extraction of raw materials and the introduction of synthetic ones. The challenge in all of this—whether you are trying to limit your purchasing or process waste through circular solutions—is one of economics.

In terms of waste generation, if we seriously limit our buying or exclusively buy used durable goods, we will likely negatively affect our economy, making it harder to keep our growing population gainfully employed. In terms of waste processing, circular solutions depend on waste separation, which is typically more expensive than simply burning or burying waste.

The question we must grapple with is this: Are we willing to live with moderated economic growth in exchange for a healthier planet? We can make environmental progress

in the short term without sacrificing our staggering economic growth, but a long-term, sustainable solution will require fundamental changes to our culture, economy, and individual perspectives. Do we want to live in a world where we are actively destroying our planet to fuel a need to acquire physical objects? Or do we want to rethink how we create and handle our waste, making possible a more balanced—and perhaps even happier—existence?

The best part of attempting to deal with the problem of garbage is that it is something we can do immediately, as individuals. We are, after all, the root cause of garbage.

To outsmart waste, we have to understand what it is and where it comes from; then we can rethink the ways in which we create waste and what, ultimately, we can do with it.

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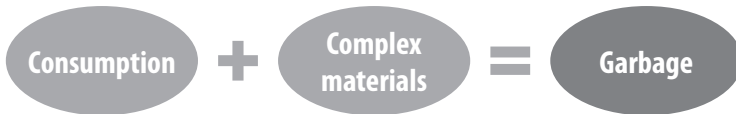
Chapter 1

Where the Modern Idea of Garbage Originated



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Human refuse—“garbage”—is a modern idea that arose out of our desire to chronically consume stuff that is made from ever more complex, man-made materials.



To outsmart waste we need to eliminate the very *idea* of waste; to do so we need to understand where the concept of waste came from and what factors brought about its existence.

Useful versus Useless Outputs

Why is it that garbage exists in the human system but not more broadly in nature? Nature is a beautiful harmony of systems whereby every system’s output is a useful input for other systems. An acorn that falls from a tree is an important input for a squirrel that eats it. The by-product of that delicious meal—the squirrel’s poop—is an important input for the microbes that consume it. The output of the microbes—rich humus and soil—is in turn the very material from which a new oak tree may grow. Even the carbon dioxide that the squirrel exhales is what that tree may inhale. This cycle is the fundamental reason why life has thrived on our planet for millions of years. It’s like the Ouroboros—the ancient symbol depicting a serpent eating

its own tail; in a way, nature truly is a constant cycle of consuming itself.

Even we humans, up until about a century ago, lived our lives in the same way: all of our outputs—from the carbon we exhaled to our feces and product waste—were cycled by nature until they became useful inputs again.

Yet today much of our waste breaks this age-old cycle by not being useful to any living organism. In the past century, the raw materials that make up our products have changed from easily degradable animal, plant, and other natural sources to highly refined, typically non-renewable resources (primarily oil). Today even when we use renewable resources (like trees), we typically render them useless outputs (like a used coffee cup) that cannot be easily recycled (due to the thin plastic lining on the inside).

This transition represents the first time in history that a species has moved away from a circular material supply chain—where every output in nature is cycled through

input Something that is used as food or raw material for an organism. *Example:* an acorn for a squirrel.

output Something that leaves an organism and is no longer useful to it. *Example:* one's poop.

multiple organisms until it becomes an input again—toward a linear one.

Take, for example, the plastic bag that may have been given to you when you bought this book. The useful life of a plastic bag is perhaps an hour or two—in other words, about the time it takes you to travel from the mall to your home. After that one trip, the bag typically ends up in your garbage on its way to the local landfill. Once at the landfill, it stays there, in some form, virtually forever.

Plastics, due to their molecular stability, do not easily break down into components useful to nature. Some estimates show a plastic bag taking 500 to 1,000 years to degrade.¹ We say “estimates” because Alexander Parkes invented the very idea of plastic in 1856, and not enough time has passed for any plastics to fully degrade.²

Additionally, a plastic bag does not just degrade like a banana peel, which is consumed by a variety of hungry microbes. Instead the plastic bag photodegrades—a process whereby the bag breaks apart into smaller and smaller pieces. The resulting particles are deadly when ingested by living things and can also contain pollutants like polychlorinated biphenyls (PCBs) and endocrine disrupters. Worse yet, they often resemble food, like zooplankton, and are inadvertently consumed by animals, such as jellyfish, who mistake the harmful materials for lunch.

product waste An object that itself (not its packaging) becomes waste. *Example:* a toothbrush or dry pen.

But the story of garbage doesn't end with a few dead jellyfish. The United Nations Environment Programme (UNEP) estimates that there are 46,000 pieces of plastic floating in every square mile of our oceans;³ this material, after damaging the aquatic ecosystem, may somewhat ironically end up in our order of sushi or fish-and-chips—potentially helping us get cancer earlier in life. This is just one of the many possible consequences of throwing out product waste. A recent report from a cooperative that includes UNEP and the World Health Organization (WHO) said that more than 800 man-made chemicals, including bisphenol A (BPA), were found in products we consume every day.⁴

The Birth of Widespread Chronic Consumerism

To further compound the problem of useless outputs, today we live in a world of chronic consumerism—a world where we buy much more than we need. This unique behavioral trend began just after the Second World War. In the late 1940s, our forebears had not only lived through the Great Depression but also just emerged from the biggest war the world had ever seen. Humanity needed to rebuild. Some

countries started by putting returning veterans to work converting wartime factories into firms that served civilian consumption, later expanding to meet growing demand.

Due to the development and the commercial viability of plastics and other man-made materials, we were perfectly suited for the arrival of cheap, disposable products. The production of such products made it easier for common people to acquire luxuries that were once expensive or even unattainable—not to mention to buy their way out of doing dishes by hand and keep food from spoiling longer than before. Just think of the joy brought to homemakers when in 1947 Earl Silas Tupper patented Tupperware or when the scientists at DuPont invented nylon.⁵

And it worked. In the years following WWII, the economy rebounded better than anyone could have expected, and we have maintained a growing consumer appetite ever since. In parallel, and in no small part due to postwar global prosperity, the human population grew sevenfold during the same time period; a population that was just over 1 billion people at the beginning of the twentieth century is today well over 7 billion.

As you might expect from a system based largely on the production and the consumption of synthetic materials, the resulting garbage problem followed our economic growth. In 1905 product-related waste was well under 100 pounds per person per year in the United States. Additionally, it was primarily made from useful outputs like wood, cotton,

and other materials that nature can use as a positive input. Since then product waste has grown by 1,400 percent.⁶ What's more, 75 percent of that waste is now made of useless outputs like plastics and other complex, man-made materials that nature cannot repurpose. It is even worse when you consider how much our population has grown and that the problem grows proportionally with it.

But why should we change? The production and the consumption of cheap goods was the silver bullet that brought us out of national depression and global war and into the greatest period of economic prosperity in human history. Perhaps we should go on celebrating this achievement with more marketing and more consumption.

And it looks like we have. Many people define their lives based on their accumulated stuff. Just look at the admiration our society has for people who drive a fancy car, live in a big house, or are profiled on TV shows like *MTV Cribs* and *Lifestyles of the Rich and Famous*. Our accumulated things define our rank in society and are points in the system whereby we are "scored." I personally fall into the same quagmire: I drive a fancy sports car, recently bought a larger house, and care about how much my business grows year over year. While I'm trying very hard to change, I can tell you that it is an uphill battle.

All economic and employment growth, by definition, was and still is predicated on people's buying stuff. To the detriment of our ecosystem, there is no public policy or

popular culture to curb consumerism or slow population growth. Both are direct drivers of our current definition of prosperity—a definition grounded in economic growth and measured by looking at gross domestic and national product. In fact, we seem to focus entirely on driving consumption instead of curbing it.

Recently, I was having a conversation with the chief executive officer of a major North American waste management company, who told me that the size of his business is directly related to the size of the economy (typically with a lag of about a year, as it does take time for the objects we buy to become waste). With the modern market economy, we value companies not only on their objective size but also on their growth and potential for more growth. Growth is our economy's insatiable goal, and the larger our economy, the larger the waste problem.

The Natural Controls of Chronic Consumption

Where we are today is entirely natural, and, in a way, it is built into our DNA, as the objective goal of all living organisms is to live and grow, both as individuals and as a species. These innate desires—some of the fundamental cornerstones of sustaining life—are met by gathering food, building a home, and reproducing.

Have you ever been stuffed after a big dinner only to find yourself downing a large piece of cheesecake that could have served as a meal in and of itself? In all living things, as

in humans, the desire to consume is largely uncontrolled. If you put a big pile of sugar in front of a healthy mouse, it will eat well beyond what it needs to survive each day until it becomes obese and diabetic and eventually dies. The poor (yet sugar-rich) mouse simply cannot control itself from binging on easily attainable calories.

The reason why nature has sustained itself in relative harmony for millions of years is because a number of external factors control the ability (or inability) of that mouse to gain food, find shelter, and have offspring. Instead of a mouse's controlling its individual consumption, its ability to consume is indirectly controlled by other organisms and nature at large. Even if the mouse wants infinite sugar, in nature it has to contend with predators, competition for sustenance, and a general lack of abundance.

Predators In nature our friend, the soon-to-be-obese mouse, has to worry about a whole host of other animals, from the friendly barn owl to the sly house cat—creatures that would love to make the mouse their supper. Humans have solved that problem by controlling, avoiding, or killing all of our natural predators and by preventing and combating disease (perhaps our last true predator). These days we don't see wolves and bears roaming around our villages like they used to, and when we get sick we have better treatment than ever before.

Competition for sustenance Anytime there is food in nature, the “dinner bell” is heard (or smelled) by every potential diner in earshot (or perhaps “noseshot”), making it hard to gorge oneself into obesity. If you leave a pile of nuts and berries in the forest, within minutes a whole host of woodland creatures would get in on the party. The pile would be gone by the time late-comers arrived.

Because we effectively match the supply of goods with demand (and in most cases overproduce), humans simply don’t have competition for consumption in the way there is competition in nature. So when that new iPhone sells out, we simply make more (God forbid limiting supply!). It is bad business to run out of stock.

Lack of abundance In nature it takes time and hard work to find food. Just think about the energy you would expend to feed yourself if you were dropped in a forest while reading this book. First, I would apologize to you for the teleporting powers of this text. It would be very hard for you to find food, and you may not come out alive (unless you have trained or watched enough of those TV survival shows). Either way, the slimy grubs and the bark you would eventually have to consume wouldn’t be quite the same as ordering Chinese takeout, and they would be much harder to find than the delivery guy on his Vespa outside your door.

In the human system, with the amazing progress of science, we produce more food than we can possibly eat and more

products than we can possibly enjoy. According to a recent study, 30 to 50 percent of the food we produce is thrown away due to its appearance or a lack of demand.⁷ That's 1.2 billion to 2 billion tons of food per year being thrown out!⁸ While that may seem staggering, we often throw away durable goods, such as clothing, before we have even used them, just because our tastes have evolved since we bought them.

No predators, no competition, and uncontrolled abundance put us in a truly unique position. With few external controls to speak of, we are that gluttonous mouse, gorging itself on the proverbial pile of sugar.

But it doesn't have to be this way. By rethinking how we produce and consume, we can live sustainably and return to a harmonious relationship with nature. As individuals we can impose on ourselves the same limitations that predators, competition, and lack of abundance have placed on our nonhuman earthly co-inhabitants. From there a personal shift in consumption habits can move outward through our friends and networks, ultimately affecting the larger society in the form of our culture and perhaps later our laws.

So far as ideas for where to start are concerned, nature itself seems to have some pretty good ones.

The Wisdom in Mimicking Nature

Nature simply has no concept of garbage, or useless outputs. Think about when your dog eats a plastic object, thinking it is food, or your cat chews on an extension cord. In nature all outputs are useful. It is a natural wisdom that we should echo, not in the innocent ignorance that leads some unwitting creatures to eat inedible trash but in its fundamentality.

The emerging field of biomimicry, championed by luminaries from Janine Benyus to Paul Hawken, has effectively commercialized this exact notion. They have found repeatedly that taking inspiration from nature can help us solve concrete human engineering challenges.

For example, chemical companies seeking to develop self-cleaning paint turned to the lotus—a plant that needs to keep the surfaces of its leaves clean despite living in muddy ponds and swamps (which are, admittedly, strange environments for something so beautiful and seemingly pristine).⁹ To help stay dirt-free, the lotus plant evolved tiny ridges and bumps that stop water droplets from spreading across the entire surface of its leaves. Water beads form, slide down the leaves of the plant, and carry off dirt with them. Taking a tip from nature, paint developers created paint that leaves tiny bumps when it dries—helping water form droplets to carry dirt away.

Another example of effective biomimicry is the Japanese Shinkansen “Bullet Train.” At more than 200 miles per hour, the Shinkansen is the fastest train in the world. Due to changes in air pressure and the speed of the train, every time the train came out of a tunnel it would create a micro sonic boom. The Bullet Train became something of a noise problem, with villages miles away complaining. Eiji Nakatsu, avid bird-watcher and the chief engineer on the case, found that modeling the front end of the train after the beak of the kingfisher—a bird that can dive into bodies of water with almost no splash—not only solved the sound problem but also saved 15 percent in power while increasing the train’s speed by 10 percent.¹⁰

When it comes to mimicking nature to our own benefit, we should be aware that nature doesn’t innovate at the rate humans do.

To learn from nature and be responsible to it in the long run, we should focus on creating useful outputs rather than outputs that are useless (and potentially toxic). It is a proposition where all stakeholders are winners.

As individual consumers, we should look to buy products that are made from natural materials (their by-products make for useful outputs), ideally avoiding complex materials altogether. By consciously controlling our consumption and buying products that produce useful outputs instead of useless ones, we can take a big step toward eliminating the idea of garbage.



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