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# OUR ADDICTION TO PLASTIC

HOW CONVENIENT, DISPOSABLE PLASTIC OBJECTS CAME  
TO DOMINATE OUR DAILY LIVES—AND HOW WE  
MIGHT BREAK THE HABIT, FOR THE PLANET'S SAKE

PHOTOGRAPHS BY HANNAH WHITAKER

I

t might be hard at first glance to see what things like toothbrushes, tires, cigarettes, and shoes have in common.

But look closer and you'll find that, like so many objects in our daily lives, they're often made to a greater or lesser extent of the miracle stuff: plastic.

That stuff is now a planetary problem. Sometimes, because the plastic is mixed with other materials—including other plastics, such as in shoes—it's difficult or impossible to recycle. In many places, recycling, incineration, or disposal in a landfill isn't an option, not to mention all the litter that ends up in rivers and oceans. And so, more often than not, after a short useful life, plastic objects embark on what's likely to be a centuries-long afterlife as trash.

They're thrown into rivers and wash into the sea. They break down into tiny bits called microplastics. Marine creatures big and small eat those particles. Pieces get mixed in with sea salt and we wind up eating them, with uncertain effects. We breathe in even smaller particles, called nanoplastics: Scientists recently discovered them on remote mountaintops and even in the Arctic, where they are carried by winds and mixed with rain and snow.

The miracle has now become the stuff of nightmares.

Increasingly the challenge is to have the former without the latter. "Reduce, reuse, and recycle" has been the environmentalists' answer for half a century. Businesses that sell plastic products or packaging, however, have little incentive to encourage reducing or reusing, and recycling—once thought a panacea—can be complicated and expensive. But with plastic pollution now a global problem, the stakes are raised, and so is public awareness.

A cultural shift seems to be in the offing. Plastic waste has started to worry us. Entrepreneurs are creating new options for avoiding it. The point is not to demonize things that were invented for good reason and with good intentions; the point is to find a way to have our plastic and not eat it too.

Every facet of our lives that has been touched by plastic presents a different challenge. Every object has a story. Here are a few of those stories—and some solutions. —LORI CUTHBERT



The nonprofit National Geographic Society helped fund this article.

1  
MILLION

plastic beverage bottles are bought every minute around the world. Yet recycling rates remain low.

### Planet or plastic?

National Geographic is committed to reducing plastics pollution. Learn more about our nonprofit activities at [natgeo.org/plastics](http://natgeo.org/plastics). This story is part of Planet or Plastic?—our multiyear effort to raise awareness about the global plastic waste crisis. Learn what you can do to reduce your own single-use plastics, and take the pledge.

Find out more about the plastic products featured here in videos and articles at [natgeo.com/plastic](http://natgeo.com/plastic).





# BILLIONS

of plastic utensils are  
thrown away each year  
around the world.  
How did we ever get  
along without them—  
and could we again?







# 24.2 BILLION

pairs of shoes were made worldwide in 2018. Shoes are hard to recycle because different types of plastic and other materials are glued and molded together.







1  
BILLION

toothbrushes will be discarded in the U.S. this year. There are biodegradable alternatives, but plastic toothbrushes prevail.

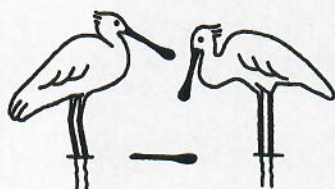


# 60 MILLION

tires are rotting  
in U.S. landfills. They  
shed a lot of their  
plastic and rubber  
beforehand—in tiny  
bits as the tires  
rub against the road.







## DISPOSABLE CUTLERY

PLASTIC  
ADDED  
1940s

**PLASTIC CUTLERY** is everywhere. Like plastic straws, billions of forks, knives, and spoons are used, then thrown away, each year. And like most plastic, cutlery can take centuries to break down naturally, giving the pointy and sharp-edged objects ample time to reach the sea. Disposable utensils, mostly made of polystyrene, are considered among the items most deadly to sea turtles, birds, and marine mammals.

When plastic cutlery first came on the scene during World War II, it was considered as reusable as the metal it replaced, safe after a good washing. But plastic is much cheaper, and as the frugal war mentality faded, so did the urge to reuse. In the 1970s, inventions like the plastic spork and an all-in-one picnic plate and cup holder gave people even more utensils to throw away. Cutlery is now the seventh most commonly collected plastic item during beach cleanups. (Food wrappers, bottle caps, and beverage containers are at the top by far.)

Several companies are creating utensils from alternative materials such as wood from fast-growing birch or bamboo, or from excess lumber. A back-to-the-future "bring your own cutlery" movement is gaining steam as well. In France, a nation of picnickers, a ban on plastic utensils takes effect in 2020.

— TIK ROOT

### THINGS YOU CAN DO TO HELP

1. Carry reusable cutlery.
2. If you use disposable cutlery, make sure it's biodegradable or compostable.
3. Eat at establishments that don't use plastic utensils.

## BOTTLES



Of all plastic products, the beverage bottle stands out because of how quickly it became ubiquitous and changed drinking habits. In the 1960s Americans and others bought beverages in glass bottles or aluminum cans. Polyethylene terephthalate, or PET, changed the game: Light enough to slash transportation costs, PET bottles were strong enough to keep drinks fizzy. Bottled water, common in Europe, began conquering the U.S. market in the late

PLASTIC  
ADDED  
1973

1970s. Although bottled water costs up to 10,000 times more

than tap water, global sales surpassed soft drink sales in 2016. Today a million plastic beverage bottles are bought every minute.

**PET is recyclable, but recycling rates remain low. In 2016 fewer than half the bottles bought worldwide were collected. In the U.S., new PET bottles have**

only 7 percent recycled content. Discarded bottles break down into microplastics, and scientists are studying the full extent of harm those tiny bits cause to us and wildlife.

The plastics and beverage industries have fought bottle deposits because of increased costs. But from Kenya to India, bottle bans are being considered. Public drinking fountains are reemerging: A hundred are planned in London. Entrepreneurs and businesses are finding ways to reuse plastics, including ink cartridges and clothes. And in Nova Scotia, Canada, a three-bedroom house recently was built out of some 600,000 bottles.

— LAURA PARKER

### THINGS YOU CAN DO TO HELP

1. Carry a reusable bottle.
2. Choose aluminum cans when possible.
3. Recycle all plastic bottles.

## SHOES

More than 24 billion pairs of shoes were made worldwide in 2018; some 2.4 billion pairs were sold in the U.S. alone. With an average of seven new pairs of shoes per person last year, closets across the U.S. are exploding with footwear. Plastic was introduced to shoes in the 1950s. Today

most sneakers are partly or all plastic, from the squishy foam sole to the polyester upper, and we can thank plastics for the profusion of stilettos too.

Materials are stitched and glued and molded together in complicated ways, so shoes are almost impossible to recycle. Our



# TOOTHBRUSHES

PLASTIC  
ADDED  
1930s

**PLASTIC HAS SO FULLY** infiltrated toothbrush design that it's nearly impossible to clean our teeth without touching the stuff. Handles typically are made of polyethylene or polypropylene, the bristles of nylon. And because plastic takes so long to degrade, nearly every toothbrush made since the 1930s is still out there in the world somewhere, continuing on as a piece of trash.

Teeth cleaning is an old and universal habit. Archaeologists have found "tooth sticks" in the

IN A 2003 SURVEY THE TOOTHBRUSH RATED HIGHER THAN CARS AND CELL PHONES AS THE INNOVATION PEOPLE COULDN'T DO WITHOUT.

tombs of Egyptian pharaohs; across Asia and the Middle East, people chewed sticks into fluffy-ended scrubbers. In the late 1400s a simple design emerged from China and endured, essentially unchanged, for centuries: a short, dense pack of bristles cut off a hog's neck, set into a bone or wood handle. In Europe, only the wealthy could afford such marvels until the mid-1800s.

The U.S. military helped bring dental care to the masses. Civil War soldiers needed to bite the thick paper wrapping off bullets, and without good teeth—or at least some teeth—U.S. Army troops couldn't eat the dry military rations they were provided. The military "had a standard, and it's pretty basic—have six teeth in your mouth so you

can chew," historian Alyssa Picard says.

Soldiers coming home from World War II brought their military-issued toothbrushes with them, and cheap and moldable plastic made it possible for all Americans to embrace better dental hygiene. In a 2003 MIT survey of public opinion on innovations, the toothbrush rated higher than cars, personal computers, and cell phones as the one respondents couldn't live without.

If only the price of healthy teeth wasn't an imperishable piece of waste.

"I like to ask people, what's the first thing you touch in the morning? It's probably your toothbrush," says Kahi Pacarro, founder of Sustainable Coastlines Hawaii, who has plucked quite a few toothbrushes off Hawaiian beaches. "Do you want the first thing you touch every day to be plastic?" Some designers are now incorporating natural materials. Handles can be made of metal or bamboo; bristle heads can be replaced, and bristles packed more densely for longer lives. Toothbrushes of the future may still use plastic, just less of it.

— ALEJANDRA BORUNDA



## THINGS YOU CAN DO TO HELP

1. Try out bamboo brushes—and compost the handle after pulling out the plastic bristles.
2. Choose a toothbrush with a replaceable head.
3. If your dentist gives out free toothbrushes, ask for nonplastic options.

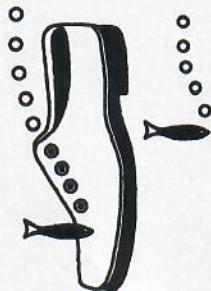
feet are only a short stop in shoes' long lifetimes, mostly spent in landfills and waterways.

Plastics have made shoes lighter, faster, cheaper, and more comfortable; they enabled the boom in recreational running. Reining in their use won't

be easy. Some companies are making shoes out of recycled plastic, or from natural materials like bamboo and wood. Leather is natural too, but some people object to animal products.

— ALEJANDRA BORUNDA

PLASTIC  
ADDED  
1950s



## THINGS YOU CAN DO TO HELP

1. Repair shoes as often as possible.
2. Buy fewer pairs of shoes.
3. Donate rather than discard old shoes.

ILLUSTRATIONS BY PABLO AMARGO





# 3 TRILLION

cigarette butts are carelessly thrown away each year. Their filters are made of plastic, which makes them a key source of plastic pollution.





# 10 THOUSAND

tampons or pads are about what an American woman will throw away in a lifetime. Tampon applicators are usually plastic.





# MILLIONS

of rolls of plastic food wrap are used by households in the U.S. every year. Typically used only once then discarded, plastic wrap can be difficult to recycle.