

Taming the Plastic Monster

By Sharon Guynup

Walking along El Salvador's palm-treed Pacific beaches last summer, I picked my way through mounds of mostly-plastic debris washed ashore by the waves. Along some stretches, the endangered sea turtles that nest there must dig through two feet of plastic to reach the sand.

The world's oceans are awash in plastic junk. With some 46,000 pieces of plastic afloat on each square mile of the sea, every creature in the marine food web is consuming degraded, nearly indestructible, bite-sized "mermaid's tears."

Plastic debris kills some 100,000 whales, dolphins and other marine mammals and one million birds each year, says the United Nations Environment Program. Untold numbers of sea turtles choke on floating plastic bags they mistake for jellyfish, a favorite food.

But plastics also threaten human health: the ubiquitous presence of these petroleum-based polymers has altered our body chemistry. Most of us carry plastic chemicals in our tissues. Our children often carry higher concentrations.

Many of these substances mimic or disrupt normal hormone function. Researchers have found altered genital development in baby boys whose mothers were exposed to phthalates during pregnancy. These plasticizers are used in food packaging, flooring and other products. Three-quarters of American infants carry measurable levels.

Bisphenol-A (BPA), a chemical used in clear bottles and canned food linings, has been linked to type 2 diabetes, immune system disorders, abnormal penile development, and behavioral problems in toddlers. Ninety-three percent of people tested by the U.S. Centers for Disease Control had BPA in their urine.

Some endocrine disruptors, like BPA, have extremely low-dose effects, adversely altering hormone function at exposures nearly 1,000 times below the U.S. Environmental Protection Agency's (EPA's) recommended limits. But a decade's lobbying by the American Chemistry Council against "negative" research has delayed government action regulating BPA.

Meanwhile, we are exposed to plastics everywhere. Next year, 300 million tons of plastic will be manufactured worldwide, weighing more than 800 Empire State Buildings. Since the millennium, we have produced nearly as much plastic as in the prior half-century.

One-third of all plastics go into packaging – ripped open and tossed, with bags and beverage bottles being the next most pervasive items. Worldwide, over one billion plastic bags are handed to consumers daily. In the U.S., eight billion pounds of bags are trashed each year, costing retailers and consumers \$4 billion. Petroleum used to make plastic bottles alone could fuel one million cars for a year.

Overall, eight percent of the world's oil goes to manufacturing plastics – and just five percent are recycled. Most are entombed in landfills where they'll persist for centuries, often leaching toxic chemicals into groundwater. Less than 0.2 percent of today's plastics are biodegradable and there are few facilities to compost "bioplastics" made from corn or other food crops. Enormous quantities are also dumped into the ocean. These and other impacts are detailed in "Plastics, the environment and human health," a recent Royal Society report.

There are solutions. Simple ones. Australia, Ireland, Italy, Taiwan and South Africa are leading an international movement to discourage or ban plastic bags. Since 2002 when Ireland introduced a 15-cent "PlasTax," plastic bag use has dropped 90 percent and tax revenues have funded

recycling programs. The head of the U.N. Environment Program has called for a global ban on thin plastic bags.

But in the U.S., there's little progress. Powerful industry lobbies resist plastics regulation.

Chemicals that threaten health or don't quickly degrade into harmless compounds must be identified, controlled or outlawed. Congress has endangered us all by exempting 60,000 of 80,000 chemicals currently in use from testing under the 1976 Toxic Substances Control Act. Just 200 have been tested; all but five received EPA permits.

We also need mandatory plastic ingredient labeling to identify environmentally-friendly, healthy products. And we need an international plastics pollution treaty to clean up oceans and protect wildlife.

Individually we can all make a difference. Wallace J. Nichols, a marine biologist and science advisor to the Plastic Pollution Coalition, challenges us to examine our weekly "plastic footprint."

It's easy to reduce that footprint, he says. Say no to Styrofoam, single-use plastic bottles, bags, straws, to-go containers and razors. Shop with a reusable bag. Carry your own stainless steel water bottle and coffee mug. Buy in bulk and choose products with minimal or recycled packaging. Reuse glass and stainless steel containers. Recycle the rest.

Pass on toys, baby items, electronics, and more through Freecycle or Goodwill. Buy less plastic: instead, choose durable products and maintain them.

Among young adults, " 'plastic' is used as an epithet for what is phony, morally hollow, or environmentally hurtful," writes AdWeek. To change that perception, SPI (a plastics trade group) has launched a \$10 million, four-year social-media blitz on Facebook and Twitter aimed at Generation Y.

But here, I stand with the young: I don't want to live in a plastic world.

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Sharon Guynup's writing has been published by The New York Times Syndicate, Popular Science, The Boston Globe, nationalgeographic.com, and other publications.