

## A WORLD OF PLASTIC

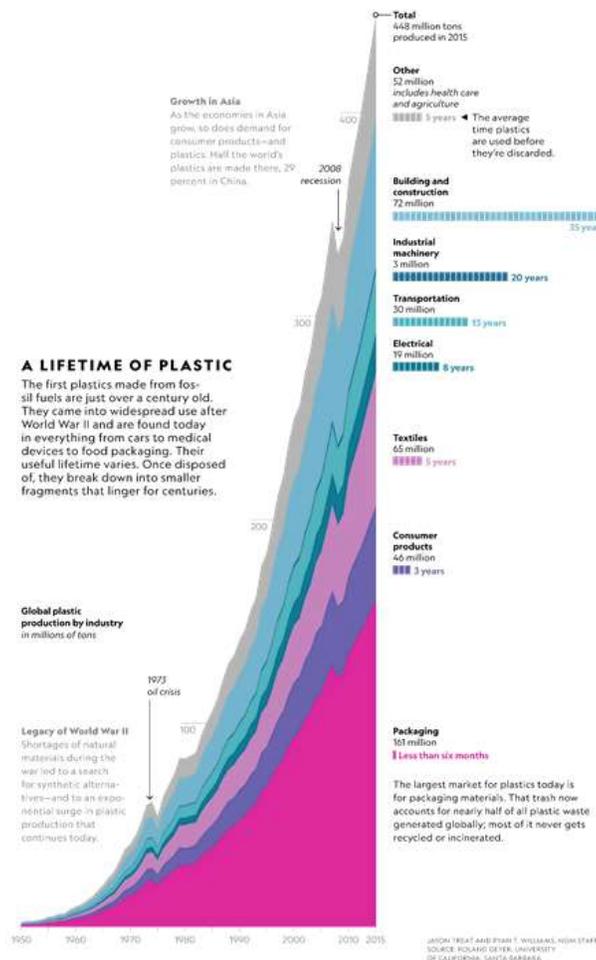
“Plastics,” *National Geographic* (June 2018)

By Laura Parker

Reviewed by Herman Greene

*National Geographic* magazine increasingly is paying attention to the state of our planet. The impact of plastics is the subject of the feature article of its June 2018 issue. This review covers some of the learnings from the article.

When Thomas Berry talked, he often lamented the growth in the use of chemicals. Plastics are novel human chemical compounds unknown to nature until recently. Berry could not have imagined the extent of the growth in plastics, nor could I without reading this article. Global plastic production has increased from 2.3 million tons in 1950 to 448 million tons in 2015. Just since Berry died in 2009, annual production has grown by over 100 million tons. Half the plastic ever produced has been produced in the last 15 years and production is still increasing.\*



\* The June 2018 *National Geographic* article contains this graph by Jason Treat and Ryan T. Williams of the magazine's staff. Source: Roland Geyer, University of California, Santa Barbara.

Early on plastics saved wildlife. Elephant tusks were used for ivory piano keys, billiard balls, combs, and even bowling balls. A New York company offered a \$10,000 reward for an alternative and John Wesley Hyatt responded with a new material named celluloid. This was made of cellulose which is a polymer in all plants.

Today plastics kill wildlife and may be toxic to humans as well. Of primary concern is single-use plastic products, such as plastic drinking straws and shopping bags. More than 40% of plastic products are used just once. Just in the United States, 500 million drinking straws and 275 million shopping bags are used each day. Only 1% of the shopping bags are recycled. Worldwide 500 billion to one trillion single-use plastic bags are used annually. But these are not the only single-use plastics. There are others such as coffee stirrers, soda and water bottles, food packaging, eating utensils and chopsticks, and Styrofoam plates, carryout containers, and packaging materials. Then there are myriad industrial single-use plastics, such as disposable syringes, work gloves, mailing envelope liners, and temporary covers for equipment, carpets and floors.

Jenna Jambeck of the University of Georgia in 2015 estimated that between 5 and 14 million tons of plastic enter the oceans each year. Jambeck said this is equivalent to five grocery bags stuffed with plastic trash for every foot of ocean coast around the world. This plastic is thrown off boats or is carelessly dumped on land or rivers and washed into the sea. Land too is littered with plastic trash.



Beach in Mumbai, India

Scientists had wondered why, with the large volume of plastics entering the oceans, they were not seeing more floating plastic. Richard Thompson provided part of the answer. In a lab test he observed tiny shrimplike crustaceans devouring plastic bags by breaking each down into 1.75 million fragments. After digesting the fragments coated with microbial slime that was their

normal food, they excreted the tiny plastic fragments. These fragments, which Thompson called microplastics, are now found everywhere in the ocean from the deepest seafloor to floating ocean ice. On some beaches in Hawaii what looks like grains of sand can be as much as 15% microplastics. Plastic kills millions of marine animals every year and 700 species are known to be affected by it. Not only the plastics kill but also the chemical additives to the plastic. For plastics to degrade fully may take more than 400 years. Thus the problems related to plastics will be with us for a very long time.