

## **Plastics: Their Rise and Fall From Favor**

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What comes to mind when you hear the word plastic? Brightly colored children's toys? Convenient disposables such as water bottles or grocery bags? Derived from the Greek *plassein*, meaning "pliable and easily shaped," the word *plastic* has become the new name for polymers. These versatile, durable materials are found in nature, and synthetically manufactured to create new products for consumers often for rapid disposal. These disposables then enter our environment, breaking down into smaller particles, or microplastics, before infiltrating every part of our beloved earth.

Made of strands of repeating molecules, polymers are diverse and integrated into nearly every aspect of modern life. Depending on their makeup, polymers can be rigid or pliable. Naturally occurring polymers are found in the cell walls of plants which are made up of cellulose, or in rubber trees which create a milky liquid containing thirty percent rubber.

The earliest evidence we have of polymers being used by humans was the Olmecs, who used the latex from rubber trees to create balls nearly a millennium and a half before the common era, but it wasn't until the 1800s that people began to create synthetic plastics. Billiards was putting a strain on the Ivory supply, prompting a New York firm to offer a \$10,000 reward to anyone who could create an adequate replacement. John Wesley Hyatt discovered that, by treating the natural cellulose from cotton fibers with camphor, he could create a new material which he could manipulate to imitate natural items, including ivory. Hyatt's creation was a brilliant success, marking the first time in history where human invention was not limited by what was provided by nature; now we had the capability to create new material. Beyond that, contrary to modern perspective, plastics were seen as an environmental saviour, providing an alternative to slaughtering rhinoceri and elephants for their horns.

Over the decades, our ability to create plastics and products from them inexpensively and rapidly, led to a growing demand for the product

that had quickly become a staple in everyday life. Food suppliers swapped out glass or paper packaging for the more durable and convenient material, toys were mass produced, and leaps were made in medical fields. Soon we became dependent on this new, underresearched, material.

Durability, one of the characteristics that made the material popular, is now leading to its ultimate fall from favor. When we drop a plastic bottle, we can thank the durable composition of the material which prevents the container from breaking and keep the liquid contained, but when we drop it in the trash that same durability immediately becomes a major downfall. Yes, plastics will eventually break down, but not in the way we want. Aside from the nine percent which get recycled, the rest breaks into microplastics which then pollute every corner of our planet. These microscopic pieces have been found in marine animals, in human tissue, and in the water we drink. An intact grocery bag was found in the Mariana trench in the depths of the ocean,

and microplastics have been found on top of the French Pyrenees, an isolated mountain range.

These troubling discoveries have led to the call to ban plastics in recent years, and the growing popularity of trash free movements. As the climate crisis rages around us, we are being forced to face what we have done to our planet, and people are beginning to take action. Beginning March 1, 2020, New York City followed a few other metropolises and created a ban on plastic bags. Bans such as these are controversial, with their effectiveness constantly in question, but for now it's a step in the right direction. Someday we will have to truly come to terms with the fact that our creation and use of polymers is irresponsible and unsustainable, and when that day comes, we will be glad we made these first steps to reducing our dependence.

So let me ask you once again: what comes to mind when you hear the word plastics? Is it the convenience of the material? Or is it the dependency we have created? Is it the abundant pollutants found in the depths of the oceans and in human tissue? It is undeniable that many of

the advancements we have made as a human race would not have been possible without the aid of synthetic polymers, but with the not-so new realization of the trauma plastic creates in our natural environment it is time we move beyond. The human mind is limitless, the inventions we have created are both great and terrible, but this shows us that there are no confines to what we can do. It is time to dedicate this ability to finding a solution to the plastics crisis once and for all.