

Just like pelicans, people can't avoid oil either

Seth Borenstein, Associated Press, 6-11-10

WASHINGTON — So the Gulf oil spill has you ready to quit petroleum cold turkey? Louisiana's brown pelicans have more of a chance of avoiding Big Oil than you do.

Merely parking the car and riding a bike won't cut it. Your sneakers and bike have petroleum products in them. Sure, you can shut off the AC, but the electric fans you switch to have plastic from oil and gas in them. And the insulation to keep your home cool, also started as oil and gas. Without all that, you will sweat and it'll be all too noticeable because deodorant comes from oil and gas too.

You can't even escape petroleum products with a nice cool fast-food milkshake - which probably has a petrochemical-based thickener.

Oil is everywhere. It permeates our daily lives in ways we never think about. It's in carpeting, furniture, computers and clothing. It's in the most personal of products like toothpaste, shaving cream, lipstick and vitamin capsules. Petrochemicals are the glue of our modern lives and even in glue, too.

And because of all that, petrochemicals are in our blood.

When the Centers for Disease Control and Prevention tested humans for environmental chemicals and metals, it recorded 212 different compounds. More than 180 of them are products that started as natural gas or oil.

"It's the material basis of our society essentially," said Michael Wilson, a research scientist at the University of California Berkeley. "This is the Petrochemical Age."

Louisiana State University environmental sciences professor Ed Overton, who works with the government on oil spill chemistry, said: "There's nothing that we do on a daily basis that isn't touched by petrochemicals."

When in the movie "The Graduate" young Benjamin is given advice about the future, it comes in one word: plastics. About 93 percent of American plastics start with natural gas or oil.

"Just about anything that's not iron or steel or metal of some sort has some petrochemical component. And that's just because of what we've been able to do with it," said West Virginia University chemistry professor Dady Dadyburjor.

Nothing shows how pervasive and malleable petrochemicals are better than shampoo, said Kevin Swift, director of economics and statistics for the American Chemistry Council, the chemical industry's trade association. The bottle is plastic. The cap is plastic. The seal and the label, too. The ink comes from petrochemicals and even the glue that holds the label to the bottle comes from oil or gas.

"The shampoo - it's all derived from petrochemicals," Swift said. "A bottle of shampoo is about 100 percent chemistry."

Often, some natural fragrance is thrown in.

What makes oil and natural gas the seed stock for most of our everyday materials is the element that is the essence of life: carbon.

The carbon atom acts as the spine with other atoms attaching to it in different combinations and positions. Each variation acts in new ways, Dadyburjor said.

John Warner, a former Polaroid scientist and University of Massachusetts chemistry professor, called petroleum "fundamentally a boring material" until other atoms are added and "you unleash a textbook of modern chemistry."

"Take a very complicated elegant beautiful molecule, bury it in the ground 100 million years, remove all the functionality and make hydrocarbons," said Warner, one of the founders of the green chemistry movement that attempts to be more ecologically sustainable. "Then take all the toxic nasty reagents and put back all the functional groups and end up with very complicated molecules."

The age of petrochemicals started and took root shortly after World War II, spurred by a government looking for replacements for rubber.

"Unfortunately there's a very dark side," said Carnegie Mellon chemistry professor Terry Collins. He said the underlying premise of the petrochemical industry is that "those little molecules will be good little molecules and do what they're designed for and not interact with life. What we're finding is that premise is wrong, profoundly wrong. What we're discovering is that there's a whole world of low-dose (health) effects."

Many of these chemicals are disrupting the human hormone system, Collins said.

These are substances that don't appear in nature and "they accumulate in the human body, they persist in the environment," Berkeley's Wilson said. The problem is science isn't quite sure how bad or how safe they are, he said.

But plastics also do good things for the environment, the chemistry council says. Because plastics are lighter than metals, they helped create cars that save fuel. A 2005 European study shows that conversion to plastic materials in Europe saved 26 percent in fuel.

"Compared to the alternatives, it reduces greenhouse gases (which cause global warming) and saves energy; that is rather ironic," Swift said.

Still, chemists who want more sustainable materials are working on alternatives. Another founder of green chemistry, Paul Anastas, an assistant administrator for the Environmental Protection Agency, said: "We can make those things in other ways."

LSU's Overton is old enough to remember the days before petrochemicals. There were no plastic milk and soda containers. They were glass. Desks were heavy wood. There were no computers, cell phones and not much air conditioning.

"It's a much more comfortable life now, much more convenient," Overton said.

Swift said trying to live without petrochemicals now doesn't make sense, but he added: "it would make a good reality TV show."