

The Green Zone

By Patricia Dines



Safer by Design

Greening chemistry for healthier living

My environmental writing career officially began in 1993. It was just another beautiful day, soon after I'd moved into a delightfully scenic country cottage, when suddenly my head was pounding and I smelled the wretched odor of pesticides. Outside my window, I saw a tractor in my neighbor's apple orchard pumping big plumes of spray into the air. These chemicals made me sick and turned my experience of this home from heaven to, well, that other, less enjoyable place.

As I sought to take care of myself, and received little help from local farm regulators, I came to see that this type of poisoning was actually quite common, both on farms and beyond. Though at the time I already ate organic food, I hadn't really understood until then how seriously toxics were harming our ecosystems and millions of people, costing us all emotionally and financially in so many ways. I also didn't know how much our regulations were falling short of protecting us. My heart broke at how unnecessary all this suffering was, given the many wonderful viable alternatives.

I decided to add this issue to my list of regular writing topics, in order to let others know what I'd discovered. As I delved into it more, I came to see another key truth: that we were using enormous resources trying to ineffectively control our many individual toxic exposures. We needed a truly systemic preventative solution instead.

That's why I was delighted to discover Green Chemistry (GC), which seeks to design our everyday chemicals and materials to be environmentally friendly from the start. My enthusiasm deepened when I saw Dr. Paul Anastas, director of Yale University's new Center for Green Chemistry, speak at the 2007

Marin Bioneers Conference. Anastas has written nine books on green science, including *Benign by Design*, *Green Engineering* and his seminal work with co-author John Warner, *Green Chemistry: Theory and Practice*.

Bioneers founder Kenny Ausubel introduced Anastas by first summarizing his own concerns about toxics, including the 200 pollution-created ocean dead zones, which have doubled since 1960; the average 200 industrial chemicals found in newborn umbilical cords, causing harm even before birth; and the risk of a terrorist attack on a chemical plant, which could potentially kill up to 2 million people.

On the other hand, Ausubel said, of all of our current environmental problems, changing our chemistry is "one of the most doable." Companies can actually benefit from a greener approach, by creating superior products, trimming toxic waste, reducing liability and avoiding harm to people and the planet.

Helping lead us in this direction, Ausubel said, is Paul Anastas, often called "the father of green chemistry," for naming and pioneering this path.

Anastas started his talk by discussing a notion uncommon in his field—that scientists introducing a new substance have a responsibility to consider its potential harm, just as an architect or car designer would consider their creations' impacts.

Instead, he explained, we release toxics widely, then try to control them by "hardening the perimeter," with guns, guards and personal protective gear. He found this approach flawed, first, because these systems are imperfect and will fail, causing significant

damage, and second, because costs are high but don't add to product capabilities or company profits.

A better way to address these problems, he advised, is to shift our way of thinking and intentionally design materials to be less toxic, biodegradable, safe for people and wildlife, and less vulnerable to accidents and terrorism. Production can also be set up in an earth-friendly way, by being energy-efficient, using renewable feed stocks and reusable catalysts, maximizing the amount of starting material that ends up in the final product and avoiding waste. These ideas might seem like common sense, Anastas added, but unfortunately aren't yet common.

It's a myth, Anastas declared, that we must poison ourselves for our modern conveniences. GC applications are already succeeding in a wide variety of sectors, he said, and they're essential to solving many of our current sustainability challenges. Governments in both Europe and California are pioneering ways to put GC into law, and even the American Chemical Society (ACS) has a Green Chemistry Institute with 24 chapters around the world. The ACS has said that GC "unleashes the creativity and innovation of our scientists and engineers in designing and discovering the next generation of chemicals and materials."

So do I dare hope that, from all this work, farm country might actually become healthy again?

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