



Worse Than Lead?

Special Investigation: The chemical industry strikes again, shifting from lead to flame retardants that also sicken and kill.

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The Secret History of Lead

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Fire alarm: US government tests found that flame retardants “did not...provide any significant protection.” (Consumer Product Safety Commission)

Today, thanks in part to the efforts of a single Virginia family, as many as 97 percent of Americans have toxic flame retardants in their blood. Deeply poisonous, and linked to cancer, genetic damage, and behavioral and learning difficulties, the prevalence of flame retardants, here and around the world, owes to the fact that these chemicals have been placed in many of the objects of daily life—in our homes, automobiles,

and workplaces, even in our beds.



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While the flame-retardant business has grown explosively and with tragic consequences, the world has yet to reckon with this morally challenged industry, which started taking off more than 40 years ago. Nor has the US government held manufacturers accountable for the original evil that spawned the proliferation of flame retardants: the monumentally unsafe business of adding lead to gasoline. Now, new research undertaken by The Nation reveals the startling connection between these two scourges to public health and the environment.

Meet the Gottwalds of Virginia, one of the 100 richest families in America and the most powerful shareholders in the Albemarle chemical company, based in Charlotte, North Carolina. In September 2016, Floyd Gottwald Jr. gave \$50,000 to Trump Victory, a joint fund-raising committee for Donald Trump's presidential campaign, continuing a family tradition of Republican funding that goes back decades. Yet you've probably never heard of them. The Gottwalds keep a low profile—perhaps understandably, given that they've built their wealth by blanketing the planet in lead and flame retardants.

A deadly neurotoxin that never biodegrades, lead assaulted the public health throughout the 20th century, largely through its role as an additive to gasoline. When the United States began phasing out leaded gas in the 1970s, the Gottwalds pivoted to flame retardants. Often manufactured with the chemical element bromine, flame retardants are also extremely toxic products. But they have never been effectively regulated, much less banned, as lead eventually was—even though the banning of lead was scandalously delayed, as its manufacturers fought off regulation for decades with a mixture of outright lying, deceptive advertising, and the financial lubrication of elected officials (as I documented in an investigation for The Nation back in 2000).

Flame retardants have been identified not only as carcinogens, but as mutagens (i.e., agents that mutate genetic material). Many are now understood as first-class endocrine disruptors, implicated in a growing variety of learning difficulties, IQ deficits, and behavioral disorders, especially among the young, including hyperactivity and behaviors consistent with autism and, among the older set, diminished fertility, miscarriages, premature births, obesity, advanced puberty, thyroid hormonal problems in postmenopausal women, and an increased risk of ALS.

Traces of flame retardants are now found virtually everywhere on earth, including in the water and dust inside our homes. According to the Chicago Tribune, the level of certain flame retardants doubled in the blood of adults every two to five years between 1970 and 2004. In a 2014 study of California day-care centers, researchers found flame retardants in 100 percent of the dust samples. A recent Chinese study revealed their presence in e-



cigarettes. Remote locations aren't safe either; the chemicals have been consistently found in the blubber of Arctic sea mammals.

It's no wonder. The global consumption of flame-retardant chemicals is projected to top 7 billion pounds by 2022—a staggering amount, especially when you consider the most incredible fact of all: In the quantities in which they're typically employed, flame retardants don't retard flame very much.

These compounds became ubiquitous starting in the 1970s, as governments around the world were persuaded by corporate campaigns that flame retardants were essential fire-safety tools. Much of this campaigning was hysterical and dishonest; almost all of it was underwritten by the products' manufacturers, including the Gottwalds' Albemarle Corporation and the chemical industry of which it was a part. Working in concert with the tobacco industry, these manufacturers mounted aggressive scare campaigns to create a perceived need for their products: They crafted regulations and lobbied legislatures to adopt them; attacked scientific findings they didn't like; ridiculed public-health advocates; spun journalists; and bought political access with millions of dollars in campaign contributions. This anti-public-health offensive explains why flame retardants are now embedded in an astonishing array of consumer products, including furniture, bedding, electrical equipment, and—most despicable of all—children's clothing and car seats.

Although they were launched more than 50 years apart, flame retardants and leaded gasoline share a common corporate pedigree. The story begins with the addition of lead to the gasoline supply, an act of breathtaking greed and deceit on the part of four blue-chip companies: General Motors, DuPont, Standard Oil of New Jersey (these days known as ExxonMobil), and, later, Dow Chemical. The story continues for nearly a century, as the mass production of leaded gas gave way to the mass production of flame retardants.

While certain flame retardants have been phased out over time, others have been phased in; the Gottwalds and other manufacturers are not going quietly into the night. Notwithstanding the proven health and environmental harms that their products inflict, the suppliers of flame retardants intend to sell increasing amounts of this toxic product for years to come. The Gottwalds have made that clear enough, as their Albemarle Corporation has expanded its bromine-production capacity and its partnerships around the world, recently with a 2014 linkup with Israel Chemicals, Ltd.

Like other makers of dangerous chemicals, Albemarle has stayed one step ahead of the law and public outrage by perfecting a cynical version of the classic bait-and-switch scam. When regulators ban one flame retardant because of its undeniable health impacts, the manufacturers simply tweak a molecule here and there to produce a similar but legally distinct product. Then they give that product a new name and hustle it back onto the market.



Albemarle declined interview requests for this article and did not respond to a detailed list of questions about its activities.

The roots of today's scandal extend back to 1923, when three of the world's biggest companies combined to introduce leaded gasoline in the United States, the fastest-growing market for automobiles. General Motors came up with the idea; Standard Oil of New Jersey had the technical smarts to move it into mass production, along with the market share and distribution muscle to reach huge numbers of customers around the world; and the chemical giant DuPont contributed factories, additional capital, and scientific expertise.

The business opportunity for these three companies arose from the fact that the automotive fuel of the day was lousy and getting lousier. But GM researchers had discovered that adding lead increased the fuel's octane level and reduced engine "knock," an unpleasant metallic sound heard when the engine accelerated. With Standard Oil of New Jersey, GM created a joint venture, the Ethyl Gasoline Corporation (later shortened to the Ethyl Corporation), to organize the mass manufacture, distribution, sales, and marketing of this new gasoline additive.

Over the next 50 years, leaded gasoline would erode public health so grievously—in the form of hundreds of millions of cases of heart attacks, strokes, cancer, renal failure, learning disabilities, behavioral difficulties, and more—that the removal of lead from most modern gasoline, which started in the 1980s, has been hailed as one of the greatest public-health triumphs of the last century.

The health impacts of leaded gas could have been avoided if corporate greed hadn't trumped human decency. Many of lead's hazards were already known, and some had been suspected for thousands of years. (The ancient Greek physician Pedanius Dioscorides warned that "Lead makes the mind give way.") Safer methods of increasing octane, such as adding ethanol, were also known in the 1920s, and they were cost-competitive. But ethanol, known at the time as "farm alcohol," could not be patented—a fatal flaw in the eyes of the Ethyl Corporation's owners, who preferred their proprietary, if deadly, product.

GM, DuPont, and Standard Oil of New Jersey soon confronted a new problem: It turned out that lead wrecked car engines. Senior GM executives Alfred Sloan and Charles Kettering were informed by associates inside and outside the company that lead deposits dramatically shortened the lives of engines, spark plugs, and other vital components. "[I]n the course of a few thousand miles [of driving with leaded gasoline] it becomes necessary to replace spark plugs," Thomas Midgley Jr., GM's top scientist, told Kettering, the company's director of research, in a November 1922 memo. Midgley's report, now housed in the Richard P. Scharchburg Archives at Kettering University (the former General Motors Institute) in Flint, Michigan, added: "The exhaust valve stems and seats suffer in a slightly different way when they become hot enough to melt the litharge [lead]." Other internal



documents suggest that engineers in GM's Buick division were seeing engines fail within 1,500 miles of driving.

Far from retreating, however, Sloan and Kettering turned this unanticipated lemon of a business problem into the lemonade of bigger profits by making leaded gas part of GM's new push for "planned obsolescence." For some years, GM and the rest of the US auto industry had confronted a structural problem: Their productive capacity was outstripping consumer demand for their products. Americans didn't need, or didn't think they needed, as many cars as the industry could build. Sloan, GM's future president and CEO, who championed the concept of planned obsolescence, set out to change their minds.

To entice people to buy more cars, GM began changing its cars' designs, colors, and capabilities year in and year out. Provocative advertising was introduced, and customers were allowed to pay in installments. Cars became status symbols as much as transportation machines.

Though unintended, the propensity of leaded gasoline to wear out engines and their components amounted to a supercharged form of planned obsolescence. The business logic was as simple as it was cold and calculating: GM profited directly from every vehicle it sold. Then it earned an additional royalty, through its joint stake in the Ethyl Corporation, on every gallon of leaded gas sold—whose damage to engines and components in turn generated additional earnings when GM supplied the replacement parts or, better yet, a whole new car. For GM's leadership, it was what you might call a win-win-win.

But what was good for GM wasn't so good for its customers, some of whom were powerful enough to make their displeasure felt. Before long, representatives of the US Army and Navy and the British and Canadian air forces were informing GM and Ethyl executives that leaded gasoline was wreaking havoc on their airplane engines. "I am bringing this matter to your attention as some action must be taken on the part of the Ethyl Gas Corporation or they will lose the foot-hold which they are just now getting with the [US] Navy," a high-level executive of the airplane-engine maker Pratt & Whitney wrote to Kettering on November 11, 1927.

The commercial risks posed by leaded gas were so worrying that they triggered dissension within GM's ranks, the company's internal files reveal. The heads of Buick and Cadillac, GM's luxury-car divisions, were initially reluctant to recommend leaded gas to their customers because of its destructive properties. Letters of concern from the two division heads led CEO Sloan to fire a terse missive back to Buick's general manager, H.H. Bassett, on May 2, 1924: "[I]f it continues as it looks now, [leaded gasoline will] be a very big earning power [for the corporation] competing with our Car Divisions, all without the employment of hardly any capital at all." Translation: You don't understand. We're going



to make more money selling this stuff than we do selling cars. Before long, the Buick and Cadillac divisions fell in line.

Still, a new engine failing after just 1,500 miles proved to be a bit much, even for cutthroat businessmen like Sloan and Kettering. They needed to find a way to expel more of the lead from engines. A quick fix was found with the discovery of ethylene dibromide. Often known by the acronym EDB, it's produced by the reaction of the hydrocarbon ethylene with bromine. Manufactured by Dow Chemical engineers, EDB worked as a chemical "scavenger": It turned lead into lead bromide, making it less prone to build up in engines and more likely to be expelled with the exhaust into the air.

Problem solved—except for the people breathing that air, because elemental bromine is no day at the beach. With a name derived from the ancient Greek word bromos, for "stench," bromine is the only nonmetal element that is a liquid. It's most readily found in mineral halide salts or dissolved in salt lakes and brine pools. And, as will be detailed below, it is definitely not good for you.

If leaded gasoline was to come into widespread use, huge additional quantities of bromine had to be found. After a few false starts, the Ethyl Corporation's scientists hit upon the answer: the ocean. Seawater contains about 67 parts of bromine per 1 million parts of seawater. In 1934, a huge plant opened at Kure Beach, North Carolina. The plant sucked in millions of gallons of seawater each day, removed the bromine from the water, and then expelled the wastewater back into the sea.

After additional extraction plants were built, the worldwide production of bromine reached 40,000 tons in 1941, 90 percent of which found its way into leaded gasoline. By 1970, global production had increased by a factor of eight to reach 320,000 tons. A reckoning, however, was fast approaching.

In the 1960s, airborne lead was increasingly seen as an urgent public-health issue, as scientific certainty overturned decades of specious corporate-funded research. In 1974, the US government required that unleaded gasoline be put on the market to permit the use of catalytic converters. These were essential to meeting the terms of the Clean Air Act of 1970; placed in a car's exhaust system, the catalytic converter dramatically reduced air pollution, slashing nitrogen-oxide emissions by 98 percent, according to the US Environmental Protection Agency. But there was a catch: Catalytic converters were incompatible with the use of leaded gasoline, because the lead contaminated the component's catalyst. As a result, leaded gas had to go.

Lead was gradually phased out of the gasoline sold in the United States and finally banned outright in 1986. The European Union did the same, albeit more slowly; its ban became official in 2000, the same year that bans also took effect in India and China. Other nations followed suit, but even more slowly; as of March 2017, the UN Environment Programme



reports that only three countries (Algeria, Yemen, and Iraq) still permit the sale of leaded gasoline.

The phaseout created an obvious problem for the makers of leaded gas: How could they keep the profits rolling in? GM, however, had seen that problem coming years earlier and had taken steps to protect its interests. Along with its partners, GM arranged to dump the Ethyl joint venture. Which is how the Gottwalds enter this tale.

In one of the strangest transactions in US corporate history, the Ethyl Corporation was unloaded in 1962 by its creators—GM and Standard Oil of New Jersey—onto the Albemarle Corporation. At the time, the Ethyl Corporation was 13 times larger than Albemarle; its purchase price of \$200 million was 100 times greater than Albemarle's annual profits. "It was like a Mom and Pop grocery buying the A&P [supermarket chain]!" Monroe Jackson Rathbone, the president of Standard Oil of New Jersey, exclaimed at the time. The deal was so unlikely that it made the front page of *The New York Times*, and was covered by *The Wall Street Journal* in an article headlined *Jonah Swallows the Whale*.

The inside story of this deal wasn't revealed until Ethyl's official history was published decades later—and even that history left out a key detail that the Gottwalds might not have known. At the time, Ethyl's purchase ranked as the largest leveraged buyout that Wall Street had ever seen. And it took place only because of extraordinary backroom muscling on the part of Ethyl's corporate founders. The company's official history recounted that GM and Standard Oil of New Jersey applied intense pressure on Chase Bank and a handful of leading insurance companies to lend the Gottwalds the \$200 million they needed to buy Ethyl. Rathbone acknowledged that his company and GM "really guaranteed the banks that they would not lose anything if loans were made to Albemarle for the purchase of Ethyl," according to the official history.

Why did GM and its partners want to unload Ethyl so urgently, selling the joint venture for a fire-sale price? The answer may lie in something that the public didn't know: GM was quietly working on a solution to curb automotive air pollution. But that discovery wasn't announced until 1970—eight years after the sale of Ethyl—when GM president Ed Cole stunned the automotive world by announcing that the industry could meet the standards of the Clean Air Act by introducing catalytic converters. In short, GM had vociferously opposed tighter pollution standards throughout the 1960s—from the original Clean Air Act of 1963 through its 1970 amendment—even though it and others were actively working toward a new technology that would meet those standards. The question that GM has never been forced to answer is: Why did you fight emissions regulations—and during those years of secrecy, how many people were sickened or killed as a result of the delayed pollution standards? Contacted by *The Nation*, representatives of GM, DuPont, ExxonMobil, Dow Chemical and the Albemarle Corporation all declined to comment.



In any case, the subsequent phaseout of leaded gas became the Gottwalds' problem—a risk they then blamed GM and the other sellers of Ethyl for failing to disclose. Yet the new owners of the Ethyl Corporation were a resourceful bunch with no apparent moral compass, and so they managed to turn this situation to their advantage. First, Ethyl tried to sell EDB as a fumigant, a quick-acting pesticide to spray on soil and post-harvest crops. EDB killed fungi, rodents, insects, and other vermin with aplomb, but shortly after its arrival on the market, its residues started turning up in breakfast cereals and cake mixes. By 1981, the EPA had concluded that EDB was a “potent mutagen, which should be removed from the food chain.” The EPA also linked EDB to damage to the liver, stomach, adrenal glands, and reproductive systems, especially the testes. And when burned, EDB creates methyl bromide, a major contributor to the hole in the earth's ozone layer, which increases skin cancers and respiratory problems.

It took time and a few dead ends, but the Gottwalds eventually found a profitable solution: brominated fire retardants. Although these fire retardants had been in use since the 1950s, they didn't become huge sellers until the 1970s. What changed?

As the 1970s unfolded, a purported epidemic of house fires began attracting attention in the United States. Fingers were pointed at the tobacco industry, which had been adding chemicals to cigarettes that caused them to stay lit for 10 minutes or more. People smoking in bed would nod off, and before they knew it the bedroom was in flames. Government regulators and legislators began calling on manufacturers to develop cigarettes less likely to start fires.

The tobacco industry wasted no time in deflecting suggestions that it come up with a safer cigarette. Instead, as the Chicago Tribune revealed in an award-winning investigation in 2012, Big Tobacco worked to shift the public focus from its product to the risk of household objects that might burn, including foam-filled, upholstered furniture.

Remarkably, the State of California seemed to agree. In 1975, a state agency enacted a regulation that proved to be a godsend for the manufacturers of flame retardants. Known as the California Furniture Flammability Standard Technical Bulletin 117, the rule mandated that all furniture offered for sale in the state pass an open-flame test: The foam inside upholstered products was required to withstand 12 seconds of exposure to an open candle flame.

The Ethyl Corporation rushed to satisfy the demand for flame retardants created by California's regulation. The potential market was enormous, because other states and even foreign countries would go on to adopt California's approach, much as they had a decade earlier with automobile seat belts and air-pollution standards. Flame retardants soon found their way into a dizzying array of household items: not just furniture but carpeting and flooring materials, bedding, baby products, computers, televisions, and other electronic equipment, as well as cars, boats, and aircraft. Like lead in gasoline, flame



retardants became pervasive, spreading on a sea of clever marketing, strategic half-truths, and lies.

However well-intentioned, the far-reaching California regulation proved to be scientifically unfounded. When scientists with the US Consumer Product Safety Commission applied flame to two upholstered chairs—one with flame retardant in its foam, the other untreated—both chairs were consumed by fire in less than four minutes. “We did not find flame retardants in foam to provide any significant protection,” said Dale Ray, a commission official who oversaw the tests, in 2009.

But such studies only emerged decades after the California regulation took effect. Meanwhile, Albemarle and its fellow manufacturers joined with the tobacco industry to convince the public, the press, and government officials that flame retardants were the necessary cure for all things fire-related. This propaganda campaign was assisted by Burson-Marsteller, a public-relations giant that boasted a Hall of Shame client list: not only the tobacco barons, but also Union Carbide (after the Bhopal gas leak in India that killed 15,000 people); the company responsible for the Three Mile Island nuclear-power-plant disaster; and the military junta that prosecuted Argentina’s “dirty war” in the late 1970s. As Burson-Marsteller founder Harold Burson said in 2008, “We are in the business of helping companies through difficult situations.”

Retained by the flame-retardant makers in 1997, Burson-Marsteller urged the creation of the Bromine Science and Environmental Forum, a group less interested in science and the environment than in weakening the US ban on methyl bromide. Along with industry associations like the Methyl Bromide Working Group and the Methyl Bromide Global Coalition, the forum lobbied state and federal legislatures and fought the Montreal Protocol, the international community’s effort to repair the ozone layer.

“Burson-Marsteller has helped the bromine industry advocate on how flame retardants enable manufacturers to increase the ignition resistance of materials used in a wide range of applications including in the automotive sector,” a Burson-Marsteller representative told *The Nation*.

Peter Sparber, a former tobacco-industry executive, recruited the National Association of State Fire Marshals, the organization representing the top fire officials in all 50 states, to propose federal rules mandating flame retardants in furniture. Sparber attended meetings with the US Consumer Product Safety Commission on behalf of the marshals for years, sometimes offering the scientifically bogus claim that the foam inside furniture was “solid gasoline” that needed to be treated. Marshals claimed not to have known that Sparber was billing the industry-funded Tobacco Institute \$200 an hour for his work with them.

Burson-Marsteller helped run the Alliance for Consumer Fire Safety in Europe, which is similarly bankrolled by flame-retardant manufacturers. The alliance’s front man was a



British firefighter named Robert Graham, a high-strung individual whose tactics included setting furniture alight outside the European Parliament to make his point. An Alliance for Consumer Fire Safety website, now removed, solicited memberships with horror stories of combustible consumer products, including allowing viewers to watch sofas from a selection of countries being burned.

As with leaded gasoline, the manufacturers of flame retardants knew early on that their product wasn't safe. In 1977, Arlene Blum and Bruce Ames, two chemists at the University of California, Berkeley, published a report in *Science* magazine whose damning subtitle plainly stated: "The main flame retardant in children's pajamas is a mutagen and should not be used." The authors explained that tris(2,3-dibromopropyl) phosphate, or Tris-BP, a frontline flame retardant of the day, was a likely carcinogen that caused sterility in animal tests. With a chemical composition alarmingly similar to EDB, the lead scavenger, Tris-BP was certain to pose disturbing health impacts.

Blum and Ames further observed that Tris-BP inevitably entered the ecosystem through wastewater from laundry. Six bedsheets treated with Tris-BP and washed in 30 gallons of water resulted in six parts per million of the poison in the wash water, when only 1 ppm was needed to kill goldfish. Like all flame retardants before and after, Tris-BP was seen to leach readily into the bodies of people wearing treated fabrics. "We found a child who'd never worn Tris-treated pajamas," Blum recalled in an interview. "We had the child wear Tris-treated pajamas for one night, and we found Tris breakdown products in her urine" soon after. It was easily picked up, Blum added, and "screamingly mutagenic."

Three months after the Blum and Ames paper was published, the Consumer Product Safety Commission banned brominated Tris in children's clothing. But in a response that set the stage for the next 40 years, flame-retardant manufacturers simply rolled out a related product: chlorinated Tris. No matter that chlorinated Tris was also a known carcinogen.

In another round of chemical whack-a-mole, when EDB was banned in 1984, the world's bromine makers rallied around a substitute known as tetrabromobisphenol-A. TBBPA's most widespread application has been as a fire retardant in electronic equipment, a market that expanded dramatically thanks to the growth of the Asian economies and the rapid obsolescence of electronic goods.

Today, TBBPA is the world's most-produced brominated flame retardant, with millions of pounds sold each year. Like all flame retardants, TBBPA will escape in time from wherever it's placed and enter the homes, offices, and bodies of people, as well as pets, livestock, wildlife, plants, streams, and rivers. Once in the human body, it can cause cancers, mutations, learning disabilities, behavioral issues, fertility issues, and reduced IQs. A 2014 study by the National Toxicology Program found that TBBPA caused cancers of the uterus in female rats and cancers of the liver in male mice.



None of this unsavory health news seemed to bother the Gottwalds; a resolute willingness to pollute has been central to Albemarle's strategy from the beginning. So has the company's management by family members—indeed, family control appears to be key to the Gottwalds' financial success, shielding them from the opprobrium of outsiders who might recoil from the nasty end of the chemical business in which Albemarle has dwelled.

Forbes recently estimated the Gottwald family's net worth at \$3.1 billion, but their rise to fortune began humbly enough. In 1918, young Floyd D. Gottwald found work as a clerk at the Albemarle Paper Manufacturing Company, a small paper concern located in Richmond, Virginia. Floyd rose through the ranks, becoming president in 1941, before purchasing the business after the Second World War.

Gottwald served as the Ethyl Corporation's CEO until 1968 and remained an active board member until his death in 1982. His son, Floyd Jr., ran Ethyl after 1968, frequently swapping titles—CEO, chairman, president—with relatives as Ethyl's holdings grew and were reorganized. Floyd Jr.'s brother, Bruce, has also served as CEO. Today, Bruce's personal wealth is estimated at \$580 million. Floyd Jr. isn't far off.

The Gottwalds are regular donors to the state and national Republican Party. The Gottwalds have collectively gifted more than \$1 million to GOP causes over the last 10 years, including to a fund-raising committee for Donald Trump's presidential campaign. All of this may help explain why, in March 2017, Trump's EPA declined to conduct further testing on TBBPA.

Questions for the Gottwalds went unanswered by the Albemarle Corporation's press office.

Over time, as one scientific study after another found that flame-retardant chemicals were carcinogenic and mutagenic, California came to see the error of its ways, and state officials sought to limit their use. Between 2007 and 2012, four bills were introduced in the California Legislature to update TB 117, the regulation that had given rise to the proliferation of flame retardants.

All four bills failed, thanks in part to the muscle of the chemical industry, which spent at least \$23 million on lobbying and campaign donations aimed at resisting tighter regulation. Joining the industry were deceptive front groups like Citizens for Fire Safety, which was exposed in the 2012 investigation by the Chicago Tribune. Founded by Albemarle and other flame-retardant manufacturers, the group described itself as "a coalition of fire professionals, educators, community activists, burn centers, doctors, fire departments and industry leaders, united to ensure that our country is protected by the highest standards of fire safety." But the group's only funding came from three different chemical companies.



To defeat the California bills, Citizens for Fire Safety spent tens of millions of dollars on a variety of underhanded tactics. For example, the group paid a retired burn surgeon who falsely testified about burn victims and misled lawmakers about the effectiveness of flame retardants. (He later surrendered his license to practice medicine.) The group also falsely claimed to work with a federal agency, an international firefighters' association, and the American Burn Association, all of which denied any connection with Citizens for Fire Safety when contacted. And seeking that last refuge of contemporary scoundrels, the group rolled out a phony social-justice argument, maintaining that poor children would experience the most harm if flame retardants were removed from household items. The group summoned witnesses to repeat this bogus assertion at hearings, including a 10-year-old boy who told California legislators, "I just want you to imagine a child crying for help in a burning building, dying, when there was a person who only had to vote to save their life."

The Chicago Tribune's exposé of the industry's skullduggery had an impact, however. Shortly after its publication, Albermarle and other flame-retardant manufacturers announced that they would defund Citizens for Fire Safety. The lobbying on the industry's behalf would be now undertaken by the American Chemistry Council's newly formed North American Flame Retardant Alliance. Just as it had retooled banned products with new names and slightly different chemical profiles, the flame-retardant industry slapped a fresh coat of paint on its lobbying efforts and got back to work resisting regulation.

Nevertheless, California lawmakers voted in 2013 to amend TB 117 in a subtle but important way: Now the materials covering the furniture, rather than the underlying foam, needed to deter fire. To the industry's chagrin, this new standard could be met with smolder-resistant materials—leather, wool, or synthetic weaves—rather than with flame retardants. And in 2015, a new labeling law took effect in California, requiring that furniture that contained flame retardants be identified as such.

Alas, none of these changes spelled an end to their use. As other states began taking note of the hazards posed by flame retardants, the American Chemistry Council stepped in again, taking the fight to state legislatures. In its 2010 tax returns, the council told the IRS that it had "helped defeat, amend or postpone the passage of more than 300 flawed bills dealing with chemicals and plastics in 44 states," many of which concerned flame retardants.

Despite the industry's best efforts, 16 states were actively considering legislation to ban certain flame retardants as of March of this year, according to the Pew Charitable Trust. Often, the states have been motivated by a lack of regulation at the federal level. A shocking fact: The EPA maintains a database of some 85,000 chemicals that have been manufactured or processed in the United States, but it has subjected less than 300 of these to rigorous testing under the Toxic Substances Control Act and has banned only five (including PCBs.) Crucially, some of the pending state legislation would prohibit manufacturers from substituting other hazardous chemicals in place of the flame



retardants that the legislation restricts. Provisions like this, which strike at the heart of the industry's modus operandi—"You don't like that flame retardant? Try this one!"—are particularly reviled by these companies.

Indeed, it may have been the fear of aggressive state regulation that led the chemical industry to endorse a major overhaul in the federal regulation of chemicals that was passed by Congress in 2016. The Frank R. Lautenberg Chemical Safety in the 21st Century Act is generally considered a compromise between the industry and the environmental and public-health communities. The latter liked the fact that, for the first time, the law gave the EPA the right to regulate chemicals based on their health effects alone, without reference to economic costs and benefits. (A previous EPA ban on asbestos had been thrown out by a court and watered down on the grounds that it failed to weigh the ban's cost to industry.) Health and environmental advocates also liked that the act mandated a safety review of many previously untested chemicals and expanded the EPA's ability to require testing of new and existing ones.

Despite this, the American Chemistry Council lobbied strenuously on behalf of the bill, presumably because it limits the ability of states to pass their own laws regulating chemicals. If the EPA rules that a chemical is safe, that decision preempts a state's ability to say otherwise. Even if a state compiled clear evidence that a given chemical was poisoning its residents or waterways, it would have to wait for the EPA or Congress to take action. History teaches that the odds of such a federal interruption of the chemical industry's business practices are slim. The moral: In a post-*Citizens United* environment, where corporations and the wealthy can flood electoral campaigns with unlimited amounts of untraceable money, it is easier to buy Congress than to buy 50 statehouses.

Flame retardants are more prevalent in 2018 than they've ever been, as the industry continues to promote the venerable falsehood that all of its products are safe and effective. On its website, the American Chemistry Council boasts that the EPA has identified more than four dozen safe flame retardants, but it fails to note that many of those now in widespread use are not featured on that EPA list. Old fear tactics continue to proliferate as well. "Every 23 seconds, a fire department responds to a fire in the U.S.," the council has warned ominously. This fact cynically elides the actual effectiveness of flame retardants. Indeed, most of the fires that a department responds to are, by definition, ones in which a flame retardant has failed to prevent the fire.

In "The Facts Behind Misconceptions of Brominated Flame Retardants," the industry revs up its fog machine one more time. This slippery document, featured on the website of the Bromine Science and Environmental Forum, decorously concedes that not all flame retardants have been good for people, but then assures readers that "one flame retardant



does not represent the entire family.... It is very difficult to attribute properties or findings from one small group or sub-group of substances to an entire family of chemical substances.”

As the industry supposedly continues its search for new and safer materials, it has refined its bait-and-switch scam, even pretending to embrace environmental consciousness by recasting out-of-favor products with green-sounding names. Thus, in 2016, Albemarle retired its HBCD flame retardant in favor of an allegedly more sustainable product with the moniker GreenCrest, while Afton Chemical, another Gottwald-headed/controlled company, calls one of its gasoline additives “Greenburn.”

Albemarle is also stepping up its export efforts. As the company enthused in a quarterly report last year, “[W]e continue to believe that improving global standards of living, widespread digitization, increasing demand for data management capacity and the potential for increasingly stringent fire safety regulations in developing markets are likely to drive continued demand for fire safety products.” The global demand for flame retardants has skyrocketed—from 526 million pounds in 1983 to 3.4 billion pounds in 2009—with the demand projected to top 7 billion pounds by 2022. Market analysts have predicted that global sales, around \$6 billion in 2015, could reach \$10 billion per year by 2020.

With products like the appealingly named GreenCrest and Saytex coming to market, the manufacturers of flame retardants continue to march ahead, spreading disease and death with every step. Consider it a gift from the Gottwald family to you. All of you.

[Jamie Lincoln Kitman](#), New York bureau chief for *Automobile Magazine*, won an investigative reporting award from Investigative Reporters and Editors for his *Nation* article on leaded gasoline. A member of the Society of Automotive Historians, Jamie Lincoln Kitman drives a 1966 Lancia Fulvia and a 1969 Ford Lotus-Cortina, both of which run fine on unleaded.

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