

Chlorine: The Everywhere Element

The battle over chlorinated compounds heats up

By Charlie Cray

Chlorine keeps our water safe, helps farmers bring an abundant and nutritious yield to market, helps doctors combat infectious diseases with modern pharmaceuticals, and creates many essential products of modern living, like plastics. Chlorine is such an essential element that it's hard to imagine 20th century life without it. Sound like a familiar argument? It should; it cost the chlorine industry \$150 million dollars to spread it around. Meanwhile, the real story about chlorine is emerging in a variety of scientific journals which link chlorine to a range of modern illnesses, including a variety of cancers, birth defects, immune system suppression, endometriosis, declining sperm counts, and male reproductive failure.

A battle is escalating around the use of chlorine in industry, and public understanding about a public health crisis linked to the products of commercial chlorine chemistry is catching up with the propaganda campaign waged by the industry. A few years ago Dow (the world's largest maker of chlorine), Occidental (number two in the U.S.) and other companies formed a subgroup of the Chemical Manufacturers' Association called the Chlorine Chemistry Council (CCC). The CCC has since coordinated the lobbying efforts of the chlorine-producers and their major customers to deflect criticisms and delay action on phasing out the chlorine industry's arsenal of toxic products, including polyvinyl chloride (PVC), chlorinated solvents used in dry cleaning and other industries, pesticides, and chlorinated bleaching agents used in the manufacture of pulp and paper. According to *Chemical and Engineering News*, by the end of 1995 alone the CCC will have spent over \$15 million on a

public relations campaign aimed at consumers, the media, sympathetic scientists, and elected officials. Individual company expenditures are much higher: according to Occidental Chemical's CEO J. Roger Hirl, "these figures are just the 'tip of the iceberg';" individual companies contribute people and resources equal to "at least ten times that amount."

This accounts for all the screaming in stories planted by the trade association about how plans to phase out chlorine would devastate our economy and how policy-makers should instead heed the call for "sound science" (i.e. let's study the issue some more before taking any action). Meanwhile, the CCC has worked tirelessly behind the scenes to take advantage of a zealous Congress to make sure such studies can't be funded (because Congress closed down its Office of Technology Assessment) and to ensure that specific regulations proposed to reduce emissions of dioxin and other chemicals cannot be proposed or enforced by the EPA, the FDA or other agencies.

It's Only Natural

The CCC, and its allies, has invested a lot in spreading confusion. One of their favorite cards is that chlorine is a "natural" compound. Proposals to phase out chlorine are thus irrational attempts to "wipe an element off the periodic table." (Lead is also an element on the periodic table, but we've phased it out of gasoline, paint, and other uses.) This argument blithely obscures the fact that most natural chlorine found in the environment is in-ertly bound up as salt. The chemical industry invests

huge amounts of energy to split salt molecules to produce caustic soda and highly reactive chlorine gas, most of which is directed to form downstream products called organochlorines (carbon-bonded chlorine compounds). Nearly all organochlorines are toxic, persistent or liable to bioaccumulate in the food web once released into the environment.

The chlorine industry's products and byproducts have saturated the planet, from the Baltic to Antarctica, from the milk of Inuit women living above the Arctic circle to the Beluga Whales in the St. Lawrence (which are verging on extinction because they carry high levels of PCBs and other toxic chemicals in their bodies). Concerns about the global spread of these chemicals has grown to the point that at the end of October, the U.S. State Department will host a UN-sponsored meeting on the troublesome global spread of Persistent Organic Pollutants (POPs), most of which are chlorine-based, including toxaphene, DDT, dioxin, PCBs, dieldrin, heptachlor and chlordane.

The CCC, and its allies, are quick to point out that there are naturally-produced organochlorines found in abundance around the world. Recently, The American Council on Science and Health (an entrenched beltway corporate front group whose President, Elizabeth Whelan, once declared "there is no such thing as junk food") published a report which highlighted the prevalence of "natural" organochlorines in order to obscure industry's role in upsetting the balance of these chemicals in nature.

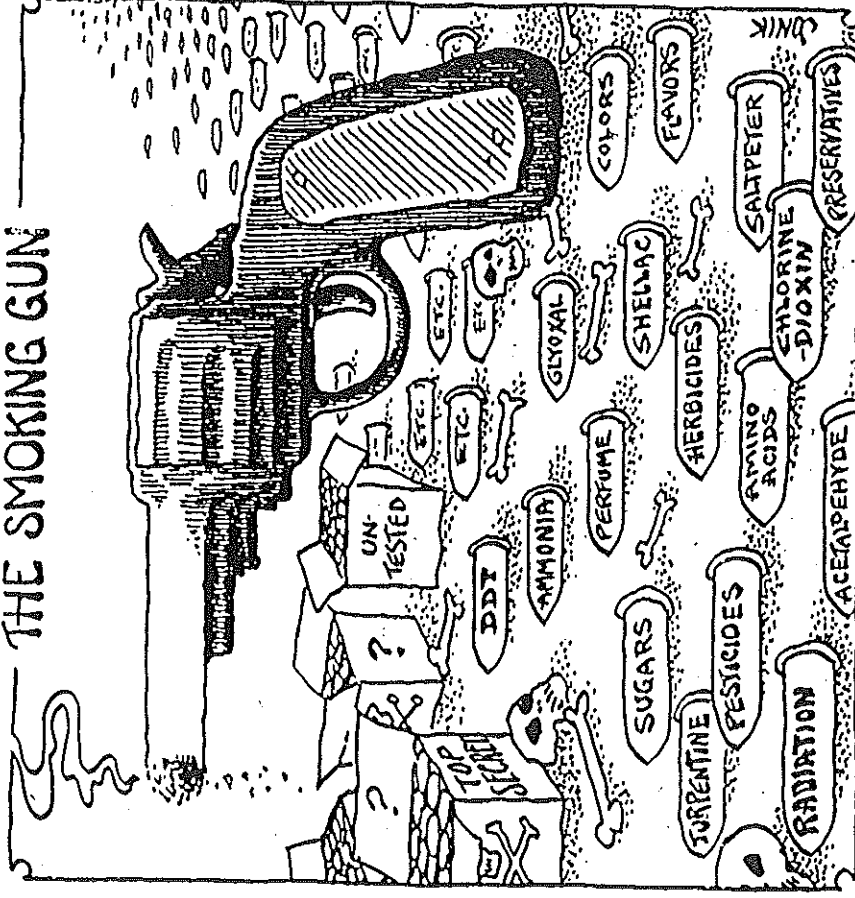
Simple organochlorines like methyl chloride, for instance, are produced in large quantities by ocean-living microorganisms. Some scientists surmise that methyl chloride has had a role in the natural regulation of the world's protective ozone layer. If that is true, there is no doubt that the homeostatic balance has been upset in the last few decades by the drift of ozone-depleting volatile organochlorines such as CFCs into the stratosphere. In 1991, EPA calculated that as a result of ozone-depletion over the next 50 years 12 million Americans will develop skin cancer, and that more than 200,000 of them will die.

In its zest to scour the planet for the thousand of so organochlorines with specific functions in natural processes, such as the particular organochlorine used by Ecuadorian tree frogs as a natural defense poison, the chlorine industry would have us forget how it has periled entire ecosystems in just half a century.

Of course the industry really couldn't care less about the frogs in Ecuador, but they get nervous about the potentially huge alliance that could be organized by concerns of occupational health specialists, environmentalists, competing industries, and many of the chlorine industry's victims. These victims include the coalitions that form downwind of dioxin-spewing incinerators, Vietnam veterans exposed to Agent Orange (and a history of cover-up and corrupt science), the 10 to 15 percent of the population that *Chemical and Engineering News* says suffers from multiple chemical sensitivity (MCS), the many farmworkers and chemical plant workers who have been sterilized by DBCP and other pesticides; subsistence fishermen whose lifestyle has been destroyed by dioxin and other toxic chemicals from paper mills, and others such as firefighters, who must be especially careful because of the toxic gases created when polyvinyl chloride (PVC) burns in building fires.

Despite the industry's lobbying efforts, various regional intergovernmental conventions and agreements have highlighted the role of organochlorines in eco-

THE SMOKING GUN



system-wide epidemics among wildlife and humans. In a bold report issued in 1992, *The International Joint Commission (UC)* on the Great Lakes recommended to the U.S. and Canadian governments that "if a chemical or group of chemicals is persistent, toxic or bioaccumulative, we should immediately begin a process to eliminate it. Since it seems impossible to eliminate discharges of these chemicals through other means, a policy of banning or sunsetting their manufacture, distribution, storage, use and disposal seems to be the only alternative."

"...In practice, the mix and exact nature of [organochlorine] compounds cannot be precisely predicted or controlled in production processes. Thus it is prudent, sensible and indeed necessary to treat these substances as a class rather than as a series of isolated, individual chemicals... We know that when chlorine is used as a feedstock in a manufacturing process, one cannot necessarily predict or control which chlorinated organics will result, and in what quantity. Accordingly the Commission concludes that the use of chlorine and its compounds should be avoided in the manufacturing process."

This statement brought the UC out of obscurity into the center of a policy debate that EPA officials believe could become a "wicked battle" in the next few years, as the Agency gets whipsawed between the demands of industry (and its shills in Congress) and an increasingly sophisticated movement that attributes a variety of environmental and public health epidemics to the products of the chlorine industry.

On the heels of the UC's recommendation, the Clinton administration proposed in its 1993 Clean Water Act reauthorization package to study ways to reduce and eliminate the use of chlorine and chlorinated products. The CCC, led by Dow and others, responded hysterically to this proposal, which seemed to match their call for "sound science." A huge industry "grassroots" (more like astroturf) lobbying campaign generated over a million letters to Congress, most repeatedly denouncing EPA's silly attempt to "ban an element from the periodic chart."

The industry's "outrage" over the potential economic impacts of phasing out chlorine was outlined in a report the Chlorine Institute commissioned from Charles River Associates (CRA), an American consulting company. CRA claimed the UC's recommendation would cost the U.S. and Canadian economies \$102 billion (U.S.) per year, would impact 1.4 million jobs, and would severely disrupt local and regional economies. The CRA's estimates of the costs of phasing out chlorine drastically overestimated the actual costs of a chlorine phase-out, largely because CRA assumed the transition would occur instantaneously by bureaucratic fiat, without any intelligent thought or planning. (Which is why the Clinton ad-

ministration actually proposed a study of the uses of chlorine, rather than an outright ban). Though CRA admitted that alternatives are available for virtually all uses of chlorine, often they picked expensive alternatives when cheaper options were available for comparison. CRA also forgot to balance the costs with potential benefits, including reduced Superfund cleanup costs (which the industry is currently working with Congress to pass along to the taxpayer public), reduced health costs, and potential job creation in the alternatives.

Dioxin: The Watergate of Molecules

Nowhere has the battle over chlorinated compounds been more heated in the U.S. than in the evolution of EPA's ongoing extensive study of dioxin.

Industry has invested much in influencing and interpreting this important scientific study since it has huge implications for regulatory policy. In 1994, Greenpeace was leaked a copy of a focus group study conducted for the CCC which concluded that the public doesn't understand the problems with chlorine (which they associate more with water than PVC, paper production, and the other products which dominate industrial chlorine chemistry) as much as they react strongly to the word "dioxin." The task for the CCC, the pollsters concluded, was to ensure the connection is not made in the public's mind. Preventing EPA from making the connection in its Dioxin Reassessment was therefore crucial, as it would open the door to new regulations that would potentially prioritize the phase-out of certain chlorine sectors.

Ironically, EPA undertook the dioxin reassessment because of pressure from industry. In 1991, various members of the paper industry, under attack for high emissions of dioxin and related chlorine-based chemicals, began pressuring the EPA (then headed by William Reilly, a Bush-appointed official who later left to join the board of DuPont) to reexamine the toxicity of dioxin, which they believed the EPA would find was overrated. After considerable study, EPA issued its long-awaited draft conclusions in September 1994. Despite industry's expectations, after consulting with over 100 (mostly external) scientists the Agency issued a nine-volume report which concluded that dioxin is even more toxic than previously supposed. One lead scientist on the EPA reassessment team, Dr. Linda Birnbaum, said she and her colleagues now consider dioxin an "environmental hormone" capable of disrupting a large number of bodily processes in fish, birds, and mammals, including humans. Dioxin, EPA said, is especially powerful in its effects on the unborn and the newly-born. Startling new evidence

has revealed dioxin may have a role in a society-wide epidemic of cancer, endometriosis, impaired child development, suppression of the immune system, and a variety of male reproductive problems.

Industry spin doctors went on the offensive as the EPA's Science Advisory Board reviewed the draft document. Examination of giant industrial dioxin sources (such as PVC manufacture) became a secondary question as EPA staff spent much time defending the report's conclusions about the toxicity of different dioxin-like molecules, subcellular toxicological mechanisms, and assumptions about how much dioxin we carry in our cells and are exposed to through our daily diet.

While industry's hired scientists poked holes in all the minutiae in EPA's draft document, the CCC's spin doctors promoted bogus scientific theories to confuse the media and elected officials, resurrecting the widely discredited theory (first proposed by Dow in 1979) that dioxin occurs principally from natural events such as forest fires. No credible scientist would back the industry on this issue: EPA and its advisors concluded that dioxin is largely a 20th-century industrial product. Very low levels of dioxin in ancient mummies and the precipitous rise of dioxin levels in lake sediments after 1930 make this clear.

The EPA's Science Advisory Board issued its review of the Draft Reassessment this fall, finding that:

- The agency was correct in finding that dioxin is properly classified as a probable human carcinogen, according to data from both animal and human studies. This designation is more serious than the current EPA classification for dioxin.
- As EPA concluded last September, dioxin can cause serious harmful effects on the immune, nervous, and reproductive systems of humans. In fact, these non-cancer effects may be more serious than dioxin's ability to cause cancer.
- Dioxin, as EPA outlined, does have adverse effects on animals at levels of exposure far below those previously believed to be safe.

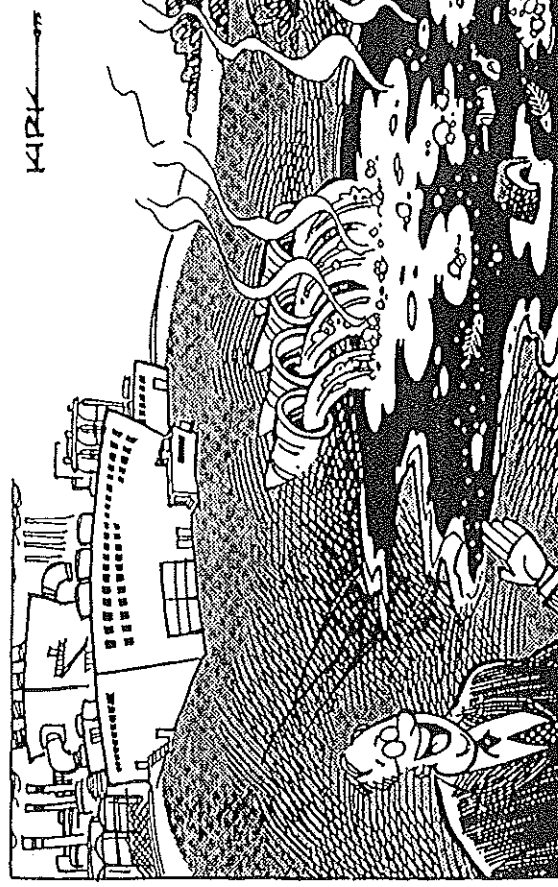
If there is a weakness in EPA's Dioxin Reassessment, it is its lack of a clear prescription for action. This is because EPA's inventory of dioxin sources failed to reveal that

dioxin is formed as an accidental by-product in scores of industrial processes involving chlorine. If this were made clear EPA might have availed itself of a range of opportunities to get beyond the balkanized old end-of-pipe regulatory approaches to dioxin established in such statutes as the Clean Water Act and the Clean Air Act, whose administration has illustrated what the IJC had to say about the futility of managing toxic pollution.

Had EPA made the role of chlorine in dioxin formation central to its discussion of dioxin sources, it might not have missed potentially major dioxin sources such as accidental building fires involving PVC. More importantly, the Agency could have solved the dioxin crisis by promoting an orderly phase-out of chlorine as an industrial feedstock, an approach to toxic pollution potentially cheaper than the expensive regulations that Congress is raving about.

Congressional attacks on EPA have skillfully pointed out the symptomatic failures of the current regulatory approach without promoting the new vision proposed by the IJC and other groups such as the American Public Health Association, which has also called for a chlorine phase-out.

Unfortunately, most of the beltway environmental groups have responded in a short-sighted way to the wholesale attack on the EPA. Liberal environmentalists have sent out numerous alerts about measures such as the House Appropriations bill (which would gut EPA's ability to issue new dioxin-reducing measures to control dioxin from incinerators and paper mills or enforce existing statutes like Superfund) without making use of the fact that the Republicans



"IT'S THE SAME AGE-OLD QUESTION: IS THE LAKE HALF-POLLUTED, OR HALF-PROSTINE?"

(who designed many of the rules to begin with, during the Nixon era) fail to offer a coherent program which might replace the major environmental statutes (and all their expensive pollution control requirements). Simply put, if EPA were to promote chlorine-free alternatives, the costs of implementing complex regulations to control chlorine-based processes would be avoided. (EPA's office of Pollution Prevention has actually done this, in one exceptional case: EPA funded a "Design for the Environment" project to demonstrate the viability of water-based "wet cleaning" as an alternative to perchloroethylene-based dry cleaning)

One Republican understands this. Gordon Durnil, ex-chair of the Indiana Republican Party, was appointed by George Bush to be the lead commissioner of the IJC before it recommended the chlorine phase-out. Durnil describes the economic and public health benefits of the chlorine phase-out in his new book, *The Making of a Conservative Environmentalist*. Durnil's approach contrasts sharply with that of his old Republican colleagues now dominating Congress.

At one point in his book Durnil describes what amounts to a zero tolerance philosophy on life-threatening toxic chemicals: "When a child molester molest again, we ask, 'Why was he out on the streets? Why didn't people keep him away from our kids?' But when the executive of some large conglomerate violates the laws by discharging some noxious substance into the water, or air, or onto the ground, we pay little attention. We don't ask why he wasn't kept away from chemicals. We don't ask why he wasn't required to keep those unmanageable substances away from our kids."

Of course he knows why: We don't do this because our elected officials, who make these decisions, are instead carrying out the agenda of their paymasters, who they view as their real constituents. According to the Center for Responsible Politics, Dow corporate PACs alone gave \$322,800 to members of Congress in 1993-1994. Some of the biggest recipients of this largesse include Tom DeLay (R-Tx; \$5,050), a former exterminator who has openly advocated reversing the ban on DDT, Newt Gingrich (\$4,000); and Greg Laughlin (D-Tx; \$12,050), whose district includes Dow's massive chlorine-production plant in Freeport.

Greenpeace recently issued a report, "Dow Brand Dioxin ... Makes You Poison Great Things," which outlines how Dow has manipulated the Congressional assault on EPA to its own ends. Dow has gone so far as to "loan" Dale Humbert, a regional lobbyist, to the staff of the U.S. House of Representatives Commerce Committee. It's hard to whisper in someone's ear from across the room.

A direct attack on the EPA came from the House Subcommittee on Energy and the Environment of the

Committee on Science when the committee decided to hold a public hearing to investigate "whether sound science is being distorted for preconceived policy ends, and the potential economic impact of future mandates based on" EPA's Dioxin Reassessment. The which hunt was canceled before its scheduled mid-September date, most likely because it appeared improper to attack EPA before the Science Advisory Board had a chance to conclude its review of the re-assessment.

The attack on EPA is a dangerous game; not only because industry science doesn't hold up to scrutiny, but also because as one consultant warned by *Chemical Week*, "the pendulum of public opinion can swing wildly," and politicians should not underestimate the public's understanding of who the real "special interest groups" are that have been manipulating politics at the expense of public health and the environment.

A growing network of environmental justice and public health activists is coming to understand all this and is bent on organizing a long-range campaign to phase-out chlorine, especially in its most harmful and unnecessary uses. The Citizens Clearinghouse for Hazardous Wastes, whose Executive Director Lois Gibbs was once a Love Canal homeowner, just issued a new book called *Dying from Dioxin* (South End Press) which outlines grassroots strategies to eliminate dioxin. Numerous other groups, including Greenpeace (the leading promoter of a chlorine phase-out), Great Lakes United, the Institute for Agriculture and Trade Policy, the Public Interest Research Groups and various environmental justice and health activists are all making the chlorine phase-out a priority for environmental activism.

With or without EPA and the Congress, the transition to a chlorine-free society has begun:

- In 1989, the National Academy of Science published *Alternative Agriculture*, which outlined a series of measures which would save taxpayers and farmers alike money by replacing pesticide-dependent practices with alternatives, including mechanical and crop-rotational methods. NAS describes the barriers to alternative agriculture, which are more bureaucratic than technical. Nevertheless, the organic produce market and farming movement continues to grow each year, demonstrating the practicality of NAS's vision.

- In the past few years neighborhood multiprocess wet cleaners ("green cleaners") have set up shop in places like New York and Chicago to demonstrate that alternatives to perchloroethylenebased dry cleaning are practical, effective and profitable. Demonstrations of this alternative process, which

saves neighborhood dry cleaners the cost of increased chemical-control equipment and avoids potential groundwater cleanup liability (a major industry concern) has proven to a once chemically-dependent industry that there are safer, cheaper alternatives.

- Over 25 mills in Europe and a few in North America have been producing high-quality totally chlorine-free paper. With the help of major chlorine-free paper procurement policies (especially at corporations like Time, which has yet to uphold a pledge to go chlorine-free) the market could swing further in that direction as mills overcome short-term cost considerations to take advantage of this emerging market.

- In Europe bans and restrictions on the use of PVC in packaging and public building construction are spreading. Auto companies, appliance manufacturers, flooring makers and others have also begun phasing out PVC. In the U.S., concerns about high levels of dioxin from medical waste incinerators has quietly shaken the hospital industry. Supply manufacturers are beginning to market products like IV bags made of alternative resins while hospitals are looking at alternative waste treatment methods and ways to substitute durables for disposable items.

The transition to a chlorine-free economy will eventually cause the major chlorine manufacturers like Dow to reorient their product lines. Dow has already quietly hedged its bet by offering alternatives to many chlorinated products, including a chelating agent that can be used in totally chlorine-free paper production, solvent-free cleaning products, polyolefin resins which company officials have suggested are in part able to replace PVC for many applications, and biological "crop protection" products which, though warranting their own scrutiny, can substitute for chlorinated pesticides. For the most part, however, Dow's policy seems to be to publicly deny any problems with chlorine, a stance that makes its

critics wonder if chlorine won't evolve into the next major corporate public relations crisis after silicone breast implants.

The ultimate phase-out of chlorine will impact on customer businesses, workers, and the communities where chlorine manufacturing facilities are located. The industry's campaign of denial only makes the consequences of an abrupt transition more likely and more dangerous. While industry buries its head in the sand, organizations like Greenpeace and the Oil, Chemical and Atomic Workers (OCAW) have promoted an orderly and just transition process, and begun to explore economic mechanisms that will facilitate the transition. For instance, OCAW has proposed a tax on chlorine and related chemicals; the revenue would be used to encourage reinvestment in affected communities and provide income protection, continued health care, and meaningful opportunities for higher education and re-employment for workers and their families. Such a measure can only be effective if it is part of a larger transition plan, however, a possibility only in a society that takes the need for a chlorine phase-out seriously.

For more information: Greenpeace: 1436 U St., NW, Washington, DC (202) 462-1177; Citizens Clearing House on Hazardous Wastes: (703) 237-2249.



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