Techno-Environmental Assaults on Childhood in America

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Increasingly over the past decade, scholars, educators, and parents have become deeply disturbed by the myriad ways in which both American culture and contemporary socioeconomic realities are undermining childhood—whether by undermining children’s ability to develop their minds, psyches, and spirits directly, or by compromising the ability of parents and schools to give children what they need for such development to unfold. Yet another urgent dimension to this cultural and socioeconomic picture is the techno-environmental assault on childhood. Techno refers to the deployment of industrial technologies developed to bring us the “miracles of modern living” that are at the root of the problem of undermining childhood; and environmental is used because the byproducts of these technologies diffuse into the biosphere—the air, the water, the soil—and are then directly assimilated by children or are picked up and “bioaccumulated” in living organisms such as the crops and animals we and our children eat.

We contend that without the basic physiological integrity of the growing child’s body—from gestation through adolescence—emotional and mental development are fundamentally compromised and cannot be diagnosed or remedied by purely cultural or pharmacological forms of intervention. Many people, particularly scholars and educators, are aware that environmental toxins can have an impact on children. But very few people know the quantity
or quality of the dangers to which children are exposed. Even fewer people understand the cumulative and synergistic nature of such problems.

The immune system is able to handle only so much. Think of it as a rain barrel that works to contain water, but only as long as it doesn’t overflow or leak. The more environmental problems a child’s immune system must handle, the more likely it is that the child will develop pathological symptoms—that its barrel will overflow or spring holes. A healthy child with a healthy immune system will be able to handle more; a child whose immunity was already compromised in gestation or infancy or later in childhood will be able to handle less. Genetics play a role, but in the majority of cases, nothing like the role that the great promoters of the geneticization of illness and psychology would have us believe. Finally, because the body experiences all stressors in similar biochemical ways, children who are socially and emotionally stressed will have a harder time dealing with physical stress, because their rain barrel is already brimming over, and vice versa. The grim realities of poverty place less-privileged children in the highest risk categories of all.

The technologies and pollutants we discuss below are bad for everyone, yes; but they have particularly devastating effects on children. This is the rule of thumb: children are, by far, the most vulnerable to environmental hazards. Pound for pound, children eat more food, drink more water, and breathe more air than adults do. Because they are smaller and closer to the ground, because they play outdoors more and don’t practice the same level of hygiene as adults, their exposure to all environmental pollutants is greater than that of adults. In addition, their bodies are still works in progress, incomplete and more susceptible to developmental disruptions.

Considering how fundamental many of the substances we will be discussing are to the existing industrial economy, and to the huge companies whose billions of dollars of profit are vested in them, it should come as no surprise that the charges of serious health damage laid against these pollutants have been contested on every front. Finally, to set the stage, we want to draw your attention to the views and actions of the current federal administration. In February 2004, the Union of Concerned Scientists (UCS) released a report that documented what many of us feared over the last few years: in effect, the Bush Administration has rejected the methods by which we normally measure environmental dangers and seek solutions to them—scientific testing, evaluation, extrapolation, epidemiology, and biostatistics. The UCS reports at length on serious incidents involving the suppression of scientific evidence and the appointment of unqualified persons with gross conflicts of interest to regulatory positions in government. The combined result of these problems is to make it impossible for the United States, as a nation, to come to grips with pressing environmental problems, despite many knowledgeable and dedicated people within the Food and Drug Administration (FDA), the Environmental Protection Agency (EPA), and the Department of Agriculture.

Although by no means an exhaustive list, in this chapter we discuss four of the most damaging types of techno-environmental dangers—or byproducts of the manufacturing and agricultural industries—facing our children today. These include persistent organic pollutants such as pesticides and pseudo-estrogens; agricultural hormones in the food chain, including recombinant bovine growth hormone (BGH); antibiotics in the food chain; and heavy metals such as mercury and lead.

PERSISTENT ORGANIC POLLUTANTS

We will begin with a brief overview of the toxins known as persistent organic pollutants, or POPs. Since the 1950s we have introduced more than 100,000 man-made chemicals into the biosphere. At the turn of the twenty-first century, 400 million tons of 70,000 different chemicals were being manufactured annually on a global basis and were being absorbed—or not—in a variety of ways by the environment. We are speaking here of industrial chemicals such as polychlorinated biphenyls (PCBs) and hexachlorobenzene; by-products such as dioxins and furans; and a host of pesticides such as aldrin, chlordane, DDT, and endrin, among many, many others. These toxic substances are now present in our air, water, soil, food, household products, and work environments. Children take in more of these substances, pound for pound, than adults.

The Great Lakes and St. Lawrence River regions of North America, especially places like Sarnia and Detroit with their huge petrochemical processing plants, carry an especially heavy burden of these chemicals on this continent. People who live near the sites of production exhibit much higher rates of cancer, and this has been documented for decades. But the other diabolical feature of POPs is that they migrate: from plastic pacifiers and toys to the babies who use them, and from areas of past or present industrialization to all parts of the world. Plumes of wind carry airborne...
particles hundreds, indeed thousands of miles from their place of origin. Hence, poisons from the industrial heartland affect bald eagles on the Florida coast, where wind adds them to the high concentrations of POPs the birds ingest when they eat fish that live in pesticide-laced lakes. POPs bio-accumulate in ever-larger concentrations in the tissues of fish, birds, and mammals that humans consume as food. Humans are highest on the food chain. The concentrations of toxic substances in Inuit women’s breast milk—women who are as far as it is possible to be from industrial production sites—are as high or higher as those of many women in the Great Lakes areas.

Organic pollutants from pesticides, plastics, and other chemical-dependent industries persist in the environment even after some of them (e.g., DDT) have been removed from the market and considerable environmental clean-ups have been achieved. Because they persist, they are seriously eroding, in the words of the 1996 path-breaking book Our Stolen Future, our “fertility, intelligence, and survival.” While almost all existing public health standards set for the levels of such pollutants have been based on concern about cancer among adults, many studies by distinguished scientists and epidemiologists since the 1990s have suggested or concluded that the gravest damage these chemicals do is related not to this disease, but to the disruption of the developing endocrine and neurological systems in children.

**Herbicides and Pesticides**

Herbicides and pesticides are enormous reservoirs of POPs. On April 24, 2004, the Ontario College of Family Physicians released a comprehensive report on the chronic effects of pesticide exposure at home and at work. The report was a meta-analysis of hundreds of reputable studies worldwide. Despite decades of protest and denial from the chemical industry, this comprehensive and careful study established a link between common household pesticides and fetal defects, neurological damage, and cancers strong enough that they called on citizens to avoid the chemicals in any form and called on governments to ban their use in all households and even municipal settings. The report named brain cancer, prostate cancer, kidney cancer, pancreatic cancer, and leukemia among many other acute illnesses linked to pesticide use. As well, there were consistent links between parents’ exposure to certain agricultural pesticides at their jobs and effects on growing fetuses, ranging from various forms of developmental damage to death. The Globe and Mail, Canada’s leading newspaper, reported on the findings of the study as follows:

after examining 12,000 studies conducted from 1990 to 2003 around the world, and winnowing that down to the most sound 250, the researchers said there is no evidence that some pesticides are less dangerous than others, just that they have different effects on health that take different periods to show up. They said they are preparing brochures for patients and education material for family doctors to fill them in on the findings. The risks of pesticide use, concluded the Family Physicians, can come even from residue on food, ant spray and the tick collar on the family cat.

The Canadian Cancer Society, the Learning Disabilities Association of Canada, the Registered Nurses Association of Canada, and the Ontario Public Health Association have called for these bans as well.

**Pseudo Sex Hormones**

We will now turn our focus to POPs in the form of chemicals that cause hormonal disruption that have come to be known, variously, as “pseudo-hormones” or hormonal acting agents (HAAs). One key thing must be understood about hormones: their biochemical composition and effects are similar throughout the animal kingdom. Estrogen is estrogen, and testosterone is testosterone, from locusts and boll weevils all the way up to humans. If you use a chemical to disrupt the reproductive abilities of an insect—say a tent caterpillar or a cockroach—that chemical, in sufficient quantity, is going to have similar effects on us.

Without knowing it, just by using products in the course of our normal everyday lives, we are exposing ourselves and the environment to hormone-disrupting chemicals. These products include soaps, cleaning materials, plastic wrappers, toys, PVC siding, paints and varnishes, garden pesticides and herbicides, and electric and automotive machines. We ingest these chemicals as they migrate from their points of production through the air and into our water, soil, and food. We absorb the chemicals when we make direct contact as we use them. The chemicals that disrupt the development of our own glands have been called pseudo-estrogens and anti-androgens. These chemicals mimic the biochemistry of our own hormones, and our hormone receptors lock onto them
and assimilate them into our bodies as though they were the real things. What this means is that we are accumulating much higher levels of hormone-like substances than we were ever meant to have.

The research on animals is conclusive. Male animals such as frogs, birds, crocodiles, and fish exposed to the most common endocrine disrupters show signs of hermaphroditism; tiny penises incapable of mating; damaged testicles and low sperm count, motility, and health; enlarged breasts (in mammals); and the like. Female animals also display symptoms of too much estrogen, including premature sexual maturation and disrupted fertility, leading to a series of reproductive and health problems.

In humans, tragically, the greatest concentration of POPs is in the umbilical cord and breast milk of mothers. Indeed, an adult woman can effectively detoxify herself by carrying a baby to term and breastfeeding for a few months, as the POPs will migrate from her body to that of her child. In this way, tiny fetuses and babies take on adult loads of toxicity. Hence it is no surprise that their delicate reproductive tracts are often affected. In recent years, alarms have been raised about the apparently precipitous drop in the onset of puberty among American girls. Many have been developing breast buds and pubic hair as early as five and six years of age, some even earlier. In POP-saturated areas of India, authorities have noted girls who have developed these characteristics as early as three years of age. We’ll see soon what other factors are bound to affect delicate young reproductive systems. But the presence of pseudo-hormones is certainly a crucial factor. Exposure to excessive estrogens, pseudo or otherwise, seriously predisposes women to breast cancer, which is of epidemic proportions. It is also associated with fibroid tumors, endometriosis, and disrupted ovulation, all of which are implicated in problems with fertility. Further, as we will see, sex hormones affect neuro- and immunological functions, and damage there is also evident.

For males, the story is also very disturbing. Male babies and young boys are exposed to pseudo-estrogens and to androgen-blockers—chemicals that undermine the function of male hormones. Many of the chemicals involved are based on chlorine—the basis of almost half the world’s chemical industries—and these are thought to disrupt key sexual developmental stages in the fetus and baby. There have been many studies that strongly suggest that the human sperm count has been falling in industrialized locations by as much as 50 percent over the last fifty years. As with most of

the pathologies we are writing about, we tend to think that there are multiple causes involved. But the exposure to gender-bending chemicals seems to us to merit the most serious consideration as a prime factor.

Recently, scientists have been looking at these chemicals as possible risk factors in the obesity epidemic in the United States. Currently, 59 million Americans are obese, and 300,000 are dying each year from related causes, making this disorder the second-leading cause of death in the United States, after smoking. At a February 2004 symposium titled Obesity: Developmental Origins and Environmental Influences, co-sponsored by the National Institute of Environmental Health Sciences (NIEHS) and the Duke University Integrated Toxicology Program, presenters discussed data that "support the hypothesis that in utero or neonatal exposures to environmental chemicals, notably endocrine disrupters, play a role in the etiology of obesity." Estrogens regulate the size of adipocytes (fat cells) in adult humans and animals. Hence Retha Newbold, a developmental biologist with the NIEHS Environmental Toxicology Program, says, "There is compelling evidence that exposure to endocrine disrupters during critical phases of cell differentiation may have long-lasting consequences. These exposures likely alter mechanisms involved in weight homeostasis. We’re still trying to determine if it’s a direct effect on the adipose cells and how they differentiate or proliferate, or whether it’s a disruption of the endocrine feedback loops."

Other Endocrine and Neurological Effects of POPs

The endocrine system, including the sex glands and hormones they produce, affects every other system and organ in the body. We know now that sex hormones affect the development of the fetal brain—hence, there is a neurological impact when sex hormones are disrupted. In addition, however, scientists have shown that some chemicals directly disrupt the development and functioning of other glands as well. Evidence of withering of the thymus gland, known as the master gland of the immune system, on exposure to PCBs has been found in lab animals and animals in the wild. Harm to the lymph system has been found, too. For some time now, scientists have drawn a lot of attention to thyroid function. The thyroid plays a crucial role in fetal, neo-natal, and childhood neurological and psychological development, and, of course, in the regulation of metabolism.
The neurological damage created by POPs' thyroid disruption has been directly linked to a variety of learning and attention deficit disorders, to a decreased ability to withstand stress among children, and to a lowering of average intelligence by 5-6 percent. Some experts have begun to suggest that despite the other benefits of breastfeeding, women in heavily industrialized regions or in regions where POPs are deposited should forego it for the developmental health of their children. The scientific evidence linking many of these chemicals to a variety of harms has existed for some time among specialists, and in the late 1990s finally began to receive official attention. The United Nations organized a conference in 1998 to devise a treaty to ban the twelve worst offenders ("the dirty dozen"), a task that remains uncompleted.

The thyroid gland is also crucial to regulating the metabolism of energy, food, and fat. When the thyroid gland is functioning at sub-optimal levels, people feel tired and have difficulty exercising and meeting work commitments; they are more prone to a variety of infections; and, what is better known, they are also more prone to becoming seriously overweight. We know that American children have problems in all of these areas. We don't at all discount the cultural factors that have been cited in the etiology of this problem. A mammoth fast food industry, too much screen culture, not enough exercise, a sport culture that includes only the high performers and excludes the low performers, not enough physical activity and education in school—all these are important without question. But it would be very unwise to stop with this list and ignore the way in which children's bodies are being affected by toxins in the environment.

**AGRICULTURAL HORMONES IN THE FOOD CHAIN**

In addition to the "pseudo-hormones" inadvertently created by industrial production, every day most of us, simply by consuming meat and dairy products, are ingesting substances purposely created to simulate real hormones.

**Recombinant Bovine Growth Hormone**

A special danger for children is the use of recombinant bovine growth hormone (rBGH or rBST)—a product of the Monsanto chemical company. The milk industry uses it to increase milk output by as much as 25 percent, according to Monsanto claims. Between 5 and 30 percent of the cows in the United States are injected with it. The Food and Drug Administration approved the hormone for use in 1994, but Canada and Europe have not. Many advocacy groups—for example, the Consumers Union and the Cancer Prevention Coalition—oppose the use of bovine growth hormone.

In addition to the increased risk of cancer in humans, numerous studies have shown that this hormone undermines the health of cows and increases disease agents in the milk, including bacteria, viruses, and pus. Indeed, this was the reason officially cited by Canada's Health and Safety Branch for refusing to approve its use in 1999. In Europe, the use of bovine growth hormone is banned, and the European Union's Scientific Veterinary Measures has stated that all six hormones used in the United States could pose a risk of cancer. Further they state, and we quote, "children are most at risk."

Because hormones tend to have the same biochemical makeup throughout the animal kingdom, one consequence of bovine growth hormone in cattle is growth in humans. We return now to the obesity epidemic among Americans, both adults and children. As serious as the problem may be in adults, it is worse when it begins in childhood because of the predisposition to adult onset diabetes, heart disease, and arthritis—indeed a host of miseries and premature deaths—that comes along with childhood obesity. And there is strong anecdotal evidence to suggest that this bovine growth hormone may play a significant part in premature puberty for girls, as well.

**Other Hormones in the Food Chain**

There are other hormones in the food chain, too. In fact, more than 90 percent of U.S. cows are given one or more of six FDA-approved hormones, including anabolic steroids (derived from or mimicking estrogen and testosterone). Cows and humans produce three of these hormones naturally; the others are purely synthetic. The National Toxicology Program and the National Institutes of Health consider two of them probable carcinogens. The USDA does no testing for natural hormones and only sporadic testing for synthetically produced hormones in beef. This is highly unfortunate because Swiss inspectors, for example, have detected diethylstilbestrol (DES) in two different shipments of American beef. DES is an infamous fertility-destroying, cancer-causing, antimiscarriage drug long banned for human use in the United States.
and its import in any form has been banned in Europe. DES’s worst effects were on fetuses, and without question its worst effects in the food chain will be on the very young—whether in the womb or already born.19

It is almost unbelievable, but there have been virtually no American studies of the long-term effects of using hormones in beef cattle—a practice that has been going on for twenty years. Producers, particularly the large industrial concerns, have no interest in looking for problems, and regulators haven’t told them to look. The good news is that hormones aren’t approved for use in chickens or pigs—though antibiotics have been, as we shall see.

Finally, new evidence is emerging that our groundwater is increasingly contaminated with a variety of pharmaceutical substances, including hormones from agricultural animals and from human hormone replacement therapy—until recently, the most successful pharmaceutical products ever made. Now that the synthetic estrogen and progesterone replacement hormones have been linked to increased predispositions to breast cancer and heart disease in women, their use is beginning to slacken. But we still have to contend with the larger problem of hormone pollution in the environment.

Let’s stop for a moment in this bleak landscape to deliver a little good news: the Burgerville chain—a Northwest-based fast food chain—announced in February 2004 that it would eliminate generic ground beef from its burgers and instead make them from range-fed, hormone-free cattle raised on Oregon ranches.20 The switch means Burgerville will have to pay at least 30 percent more for its beef, and for the time being, this means a costlier hamburger. But it is worth it to parents, and very good news, because it will reward organic ranchers, and ranchers as a sector need to get the message that they will do well—indeed better—economically by growing healthy, drug-free animals.

ANTIBIOTICS IN THE FOOD CHAIN

We now turn our attention to pharmaceutical pollution: specifically the massive use of antibiotics in raising farm animals. Massive and continuous in-feed use of antibiotics in agriculture began in the early 1950s. Today antibiotics are used in the raising of pigs, chickens, cattle, and in aquaculture. Many people have increased their fish consumption, thinking they have found a drug-free alternative to beef, pork, and chicken; but unless the fish is caught in the wild, this is an illusion. Farmed fish, unless organically raised, are loaded up with antibiotics as well.

There have been several serious results from this widespread use of antibiotics. The best known—though not well-enough known, apparently, to stop the practice in the United States—has been a large increase in the development of bacteria that are highly resistant to antibiotics in both animals and humans. The problem is that when antibiotics are used wrongly or abused, they have the effect of increasing the strength and virulence of bacteria. Many people have heard of the so-called superbugs—virulent E. coli in manure-contaminated water or in hamburgers, vancomycin-resistant enterococcus (VRE), and salmonella. But the list is longer. There are resistant staphylococcus and streptococcus bacteria and indeed mycobacteria, which are very trenchant fungal/bacterial hybrids, on the rise. Many of these superbugs can spread via the food chain, and increased international travel allows them to ride along on airplanes just like people do. One virtually unknown source of these drug-resistant bugs is the air around and significantly downwind of factory farms where antibiotics are in use. The reason that this is unknown is that the evidence for it has been suppressed. One particularly dramatic and well-documented case of suppression of scientific evidence reported by the Union of Concerned Scientists involved Dr. James Zahn, a research microbiologist at the USDA. Zahn asserted that he was prohibited on no fewer than eleven occasions from publicizing his research on the potential hazards to human health posed by airborne bacteria resulting from farm wastes.

Zahn’s research had uncovered significant levels of antibiotic-resistant bacteria in the air near hog confinement operations in Iowa and Missouri. But, as Zahn recounts, he was repeatedly barred by his superiors from presenting his research at scientific conferences in 2002. Zahn had accidentally stumbled on the issue of airborne antibiotic resistance while researching a related topic and, prior to the start of the Bush Administration, was initially encouraged by his supervisors to pursue the work. But he says that with the change in administration, he soon came to feel that his research was being suppressed because it was perceived to be politically unpalatable.

Antibiotic-resistant bugs are an enormous problem in other sites as well. Notoriously, hospitals are extremely dangerous places, especially for the young and the elderly who are there because of other problems that have placed a load on their immune systems. Antibiotic-resistant strep and staph infections lurking in
hospitals that have not invested sufficient money in cleaning (this has been shown to be the key factor in fighting these infections) kill ever-larger numbers of people. Tuberculosis is making a comeback. Especially vulnerable are poor children. Of course, while tuberculosis is rising most dramatically in prisons and low-income neighborhoods, it travels out of these locales and puts everyone at risk. This illustrates a basic population health axiom: the health of the lowest socioeconomic stratum of society affects the health of the highest, so equity and redistributive measures to reduce the gap between the rich and the poor are health measures par excellence.

Most of our older stores of antibiotics work poorly for these so-called superbugs, and long courses and high doses are often prescribed; or perhaps one of the very few “new” antibiotics may be prescribed. Or, in ever-greater numbers, no antibiotic is effective. If a person’s immune system cannot fight the bug on its own, death results. We have been seeing very large numbers of such deaths in the past few decades.

Even when antibiotic treatment appears to work in the short run, coming as it does on top of long-term exposure to antibiotics in the food chain as well as physician overuse of antibiotics for other purposes, in many cases it may have a cascade of serious consequences: the health and integrity of the mucous membranes of the body, especially those of the gut, are compromised. The gut is crucial to a healthy immune system. Antibiotics destroy the healthy bacterial flora of the gut, permit unhealthy fungi and bacteria flora to proliferate. This sets up what will, in untold numbers of children, be a lifelong struggle with a variety of auto-immune disorders ranging from trenchant fungal infections (thrush and vaginal yeast infections are epidemic) and food allergies to lupus and multiple sclerosis, as well as colitis, inflammatory bowel disease, and the like. Further, when the gut is compromised, a person’s ability to deal with the other chemical assaults in the environment—the POPs we have mentioned already, and the food additives, sugars, and fats so present in the American diet—is undermined. Some very powerful negative synergies are launched or accelerated.

Why are antibiotics being used in this way in agriculture, even when the evidence of their harmful effects has been in for well over twenty years? Primarily because of the power of two industries—pharmaceuticals and agribusiness. Current industrial (factory farming) practices raise animals in conditions that undermine their health and promote disease. Hence, the rhetoric goes, we need loads of antibiotics to keep these animals going. This has become an important and highly controversial issue for both health and animal-welfare reformers in recent years. Guidelines being developed at the World Health Organization strongly suggest there is little economic benefit to be gained from the widespread use of in-feed antibiotics, and many harmful consequences. Yet the practice persists. The two industries—often fused into the same corporate structures—have incredible weight and power. They buy politicians and public officials, and they saturate farming publications with their advertising.

Once again, let us relieve the bleak landscape with a piece of better, if not yet great, news: in a move similar to Burgerville’s, the much-larger McDonald’s Corporation announced in June 2003 a phasing out of the use of antibiotics from its global supply chain. The move is part of a set of “guiding principles for sustainable use” by McDonald’s direct suppliers. The policy results from negotiations between the management of McDonald’s and a group of stakeholders called the Antibiotics Coalition. However, a shareholder resolution co-filed by Trillium Asset Management (the oldest and largest independent investment advisor devoted exclusively to socially responsible investing) asking shareholder approval to apply the new standards it set on animal welfare in the United States and the United Kingdom to all of its global operations and supply chain failed, receiving only 4.8 percent of the general shareholders’ vote. What is good is that McDonald’s move does affect 2.5 billion pounds of chicken, beef, and pork purchased annually. What is bad is that the billions of pounds of these meats that are produced in other jurisdictions are unaffected. As Trillium’s Senior Social Research Analyst, Steve Lippman, pointed out, McDonald’s by its very existence is predicated on getting people to eat higher on the food chain. Beef in particular is inherently unsustainable as a staple. Lippman also denounced the McDonald’s advertising campaigns “that get kids to be obese.” Lippman concluded that, therefore, “who cares if they have 100 percent recycled paper wrappers or whatever.” Indeed.

**MERCUY, LEAD, AND OTHER HEAVY METALS**

Many heavy metals are present in toxic levels in our environment. The list includes mercury, lead, cadmium, aluminum, arsenic, copper, and many others. We have chosen to concentrate on three
that are present in the largest concentrations and are known to do grave damage.

Mercury

Mercury is one of the most dangerous chemical pollutants found in the environment and belongs to a dangerous class of chemicals known as persistent, bio-accumulative toxins (PBTs). This means that once mercury is released into the environment, it never goes away. It may combine with other compounds and assume different chemical forms, but it never breaks down into harmless byproducts. Mercury attacks the central nervous system and hurts the ability to learn, remember, and pay attention. In large-enough concentrations, it may also damage many other tissues and organ systems in the body, including those in the gut. In addition to the direct neurological damage it does, it can also directly affect the immune system itself.

The fetus is the most vulnerable to the effects of mercury. Recent research has shown that the umbilical cord can have an average mercury concentration almost twice that of the bloodstream. In February 2004, the EPA put the number of children at risk for developmental disorders at birth at more than one in six, a rate equivalent to 630,000 of the 4 million babies born each year in the United States. As reported in the New York Times, the Centers for Disease Control and Prevention estimates that one woman in twelve of childbearing age has a mercury blood level in the danger range. But blood levels only poorly reflect true levels, since the body tends to sequester mercury in tissues, so the number must be much higher. The EPA has estimated that as many as 3 million American children have elevated levels of mercury in their blood, and about 7 million women and children regularly eat fish that is tainted with unsafe levels of mercury. The situation is so critical that Consumers Union (publisher of Consumer Reports magazine) recommends that a forty-four-pound child eat not more than one six-ounce can of white tuna or two cans of light tuna per week.

The main source of ingested mercury appears to be contaminated fish that ingest mercury. Mercury in the water comes from the emissions of power plants that burn coal and other fossil fuels and subsequently falls from the sky in rain or snow, then travels in water runoff and accumulates in virtually all bodies of water. Once in the water, mercury changes into methylmercury—a bioavailable and toxic material—and is absorbed by fish as they feed on aquatic organisms. Through bio-accumulation, mercury is then passed up the marine food chain. Figures released by the FDA in 2003 showed that mercury contamination in four important species of fish had increased to levels higher than those used to establish its health advisory guidelines. These species are canned albacore tuna, grouper, sea bass, and bluefish. Canned albacore, known as white tuna, had mercury levels twice as high as previous FDA estimates for canned tuna and three times the levels in light tuna. Incidentally, the FDA data was not volunteered. The Environmental Working Group (EWG) obtained it through the Freedom of Information Act.

A second major source of mercury—and one that is virtually unknown to the vast majority of people—comes from automobile ignition switches. Between 1974 and 2003, an estimated 217 million switches were installed in American cars and contained up to 493,000 pounds of mercury. Over 50 percent of this mercury has already been released into the environment during end-of-life-processing. In the last three years, over 54,000 pounds of mercury have been released into the environment from these switches. More than eleven tons of mercury are still put into new cars each year. In January 2001, the Clean Car Campaign issued a report called "Toxics in Vehicles: Mercury" and called for the establishment of a mercury recovery program by automakers. We suggest that an alternative to mercury be found, and soon.

Mercury is also present in thermometers, fluorescent light bulbs, many batteries, light switches, and many "silver" (more accurately, silver-mercury amalgam) dental fillings. In Sweden, such fillings have been banned. Despite the self-protective denials of the American Dental Association, which is terrified of an avalanche of lawsuits, many enlightened dentists will no longer place such fillings. Mercury is a component of thimerosal, a compound widely used as a preservative and an antiseptic. In the guise of thimerosal, mercury shows up in some eyedrops, nasal sprays, contact lens cleaners, and even childhood and flu vaccines, where its purpose is to keep the medicine uninfected by bacteria. But, as we are learning, if a substance is lethal to one form of life, it is bound to be toxic to other forms as well—including us.

In the last ten years, a number of researchers have suggested that mercury is a major culprit in the dramatic increase in reported instances of autism in children. Autism is an extremely serious disorder, a true life-disrupting disability that creates terrible problems for the children who have it and extraordinary financial, practical, and emotional challenges for their families. Mercury's implication in autism is
controversial, both because autism is a complex disorder or set of disorders that are not yet fully understood, and because mercury-using and mercury-producing industries fund scientists and organizations to contest findings of harm with their own counterclaims.\textsuperscript{27}

The FDA under President George W. Bush suppressed its own report detailing the hazards of mercury toxicity, particularly to pregnant women and children, until an anonymous official finally leaked it to the \textit{Wall Street Journal} on February 23, 2004. Had this leak not occurred, the report may never have surfaced. Even more recently, the Union of Concerned Scientists reported that the new rules the EPA finally proposed for regulating power plants' mercury emissions were discovered to have no fewer than twelve paragraphs lifted, sometimes verbatim, from a legal document prepared by industry lawyers, a flagrant violation of FDA norms in which regulations are to be drafted by staff.\textsuperscript{28}

Thankfully, some Congressmen are attempting to halt the most dangerous forms of air pollution, which include mercury. The Clean Power Act and the Clean Smokestacks Act, reintroduced into the House of Representatives in February 2004, would require polluting power plants to reduce emissions of nitrogen oxide, sulfur dioxide, carbon dioxide, and mercury in a manner that is "feasible"—a problematic term, unfortunately. This legislation supports the 1990 Clean Air Act and would provide some protection from the Administration's new, so-called "Clear Skies Initiative." The term \textit{clear skies} is truly disinformation because the initiative would allow at least 36 percent more nitrogen, 50 percent more sulfur dioxide, and \textit{three times} the amount of mercury allowed under current regulations. Calculations based on EPA analysis show that the Clear Skies Initiative will result in 54,000 deaths over the next sixteen years from power plant pollution that would be avoided if the current law were simply enforced. EPA experts say that new technology could reduce mercury pollution by 90 percent or more, but the Clear Skies Initiative would permit power plants to delay implementation of the new technology through the year 2018. Legislation following the president's plan was introduced to the House and Senate in February also.

On a more positive note, the National Wildlife Federation reports that public health agencies in forty-three states have issued formal advisories warning people against eating certain fish because of mercury contamination. In 2003 in California, the state attorney general filed suit against five grocery chains for failing to properly warn consumers about the risk of mercury in fish.\textsuperscript{29}

\textbf{Lead and Arsenic}

While we're speaking of heavy metals, let us not forget our old friends lead and arsenic. According to the Natural Resources Defense Council, lead is now recognized as the single most significant environmental health threat to American children. The good news is that the average blood-lead level in the United States has fallen by more than 80 percent since 1976. This is mainly due to the ban on using leaded gasoline, leaded paint, and lead-soldered food cans. The bad news is that we now know that blood-lead levels once thought to be safe are really quite hazardous—especially to children. Children readily absorb lead from their intestinal tracts. Playing in the dust and engaging in hand-to-mouth behavior facilitate exposure to lead as well as many other contaminants.\textsuperscript{30}

The effects of lead poisoning are chronic and debilitating. Severe exposure (blood-lead levels greater than 80 µg/dl) can cause comas, convulsions, or death. More common levels of exposure (around 10 µg/dl) may not cause distinctive or acute symptoms, but rather decrease stature or growth, hearing acuity, and the ability to maintain steady posture. Such blood-lead levels have also been associated with decreased intelligence and impaired neuro-behavioral development.

A major source of lead poisoning has been the paint used in schools. If a school was built before 1978, it is likely to contain paint having a lead content in excess of 0.06 percent. Paint produced after 1992 should be lead-free. Paint that is peeling or chipping poses a safety hazard because eating even one lead-paint chip can poison a child. As lead paint deteriorates it can release lead dust, and removing it from school walls can sometimes release higher levels of lead than leaving it in place. Simply painting over an older lead-based surface is not an effective way of protecting children, either. Proper removal and disposal are and will continue to be expensive and time-consuming processes. But consider the alternatives.

The other serious, but still not fully assessed, source of lead in the United States is from deteriorating water pipes; at present, the United States has 700,000 miles of aging pipes, some more than a hundred years old, many made of lead. For example, in January 2004, the \textit{Washington Post} revealed that lead levels in Washington, DC had been exceeding the allowable norm for the first time since the late 1980s, when monitoring started. "It's shocking," said Charles Eason, a resident of Georgetown, where the water registered \textit{thirty-six times} the EPA's lead limit. "It's a particular risk for young
people, and I have a 4-year-old grandson in my house regularly.”

The District does not offer a screening program for adults or for children six and older, so most parents couldn’t even find out if their children had been harmed. A detailed description of this situation cannot be repeated here, but we urge readers to consult the lengthy Washington Post articles on the subject.

Arsenic is a naturally occurring substance that can be deadly in large doses in the short term and a dangerous carcinogen in small doses in the long term. It is found in insecticides, herbicides, paints, dyes, rat poison, and wood preservatives. It is used in mining. Wood treated with arsenic-based preservatives can cause chronic arsenic poisoning. Arsenic easily rubs off such wood, and at levels found in lumber obtained from popular outlets could be expected to cause cancer in one out of 500 children playing on equipment made from such wood. Arsenic remains the only known human carcinogen still approved for use as a pesticide (though this begs the standards and definitions of carcinogens. For example, pesticides commonly used to kill mosquitoes break down into carcinogenic components).³²

CONCLUSIONS AND REFLECTIONS

From this review of industrial byproducts that constitute techno-environmental hazards, we can draw a number of conclusions. The first is that whatever we do to nature—whatever chemicals we put into the environment, whatever hormonal manipulation we attempt on animals, whatever effluents and drugs we dump in our soil, water, or air—comes back to affect us. We live in a closed system. As we used to say in the 1960s, there is no “away.” But there is “blowback,” and this blowback differentially affects and harms children. Thus, fighting for an agenda of environmental remediation and democratic, environmentally sound technological control is the sine qua non of achieving a way of life that assures childhood health, normal development, and the integrity of coming generations.

We must face the empirical verdict that materials foreign to nature will cause problems in nature. From there we need to understand that, on the one hand, we must clean up the toxins that industry has generated and, on the other, begin a massive campaign to substitute old technologies and methods with those that are benign.

All this amounts to an understanding, and a declaration, that we are going to rapidly bring to an end the heroic period of techno-industrialism that is based on the idea that the biosphere is infinitely malleable and we can do anything we want to it without consequence for us. This may seem like an obvious conclusion, but in fact, it has not been understood or adopted by the vast majority of the world’s industries or governments or, indeed, populations. Today’s White House ranks among those regimes in the industrialized world that are most ignorant of this premise and most hostile to taking the necessary steps to address it.

We must also admit that while there are many separate and frightening problems that have already been identified, the unspoken negative synergies of these problems are even more disturbing. For it is often in the accumulation of problems that children’s systems are overloaded and break down, and children’s abilities to support their children are overwhelmed. Further, the presence of these synergies puts a serious limit on what we might call “individual solutions.” This is especially true for less-privileged families, who are also those most at risk for environmental harms—although at least some of these harms spread across the socio-economic scale. This is not to say that parents and educators cannot take important steps to protect children—they can, and they must. Rather it is to underline that in many cases, collective action to address problems, and, indeed, to create social services to help damaged children and exhausted parents, is necessary for meaningful results.

To move forward on these points and to protect our children, we also urgently need to restore science to its rightful place in policymaking and address the destructive practices of appointing industry leaders to regulatory positions.³³ This will undoubtedly require a “regime change” in the United States, which in turn requires cultural and political shifts in how we understand the place and importance of technological and environmental issues—as central, not peripheral; as urgent, not postponable. In line with this, we must pursue a larger agenda that seeks to recreate a public sector capable of protecting the common weal, including the environment and children; and which is capable of controlling the environmentally and socially murderous behavior of major corporations.

We use the word murderous advisedly. A wonderful documentary film entitled The Corporation, based on the book of the same name by Joel Bakan, has been cleaning up awards at documentary film festivals this spring and making the rounds of repertory cinemas.³⁴ It is a smash hit with a simple thesis, brilliantly supported: if corporations were persons—which they are, in law, and in fact they have rights far surpassing those of mere human persons—what kind of people would they be? Using psychiatric manuals and
internationally accepted guidelines, the filmmakers suggest that corporations are clinically equivalent to psychopaths: constitutionally incapable of perceiving any interest other than their own short-term gain, and willing and able to pursue deadly strategies to gain advantage for themselves. Economists have more polite ways of saying the same thing—speaking of people and the environment as "externalities" that are not corporate responsibilities. Corporate public relations have a doublethink rhetoric that tells us that this behavior is actually good for us and our kids.

In any case, the implications are clear: unless corporations are compelled to be good citizens, in their drive for profits they will bring all of us down. Good corporate citizenship in this context means a wholesale "greening" of technology. A full green economic strategy is far beyond the scope of this paper. But we can advance one basic guiding approach that can be adapted in almost infinite ways: costs and profits are the raison d'etre of corporations. If public policy subsidizes healthy technologies and products, and creates negative incentives for harmful ones—the opposite of the situation that now obtains—change can be remarkably rapid and effective. If plastic bottles and harmful cleaning agents are heavily taxed, likewise coal emissions and mercury car starters, corporate directives will quickly replace these with other products. If we took away tax breaks to Monsanto and gave them to organic farmers, and if we taxed meat raised with bovine growth hormone but featured (by law) organic produce in restaurants along our interstate highways, we would see the agrochemical-biotech companies developing safe agricultural methods and products faster than you could say "sustainable agriculture." Again, this approach requires cultural and political will, as well as technological and environmental understanding—and those are up to the citizens of this country to exercise.

The amount of learning and the investment of time, emotional commitment, and funds required for individual families to address the harms we have written about are very considerable, even when children are healthy. With children who have been harmed and have chronic problems, that investment rises qualitatively, to a point that is often profoundly stressful and destructive of family health in its own right. As such, collective and government supports and actions are also essential.

We have listed a number of specific actions for each of our four "techno-environmental assaults," for parents and educators on the one hand and for communities and governments on the other, in an appendix at the end of this chapter. Keep in mind that we can only briefly sketch certain measures, but a great deal of information is more generally available and can be traced through our reference list as well as other sources. Our Toxic World, by allergist and pediatrician Doris J. Rapp, is an excellent compendium of toxic dangers, the symptoms they produce, and many different approaches to treatment.

As Joe Hill famously said of his own death: Don't mourn. Organize! Elect politicians and officials who understand the issues and the availability of alternatives. Never separate environmental issues from economic or health issues and say, "We'll deal with those later." Instead, put environmental issues at the top of the political agenda and at the center of economic strategizing. Make school boards leaders in the fight to save our environment, and hence our children. Make sure that public policy always factors environmental and health costs into public accounting, tax, and other economic policy, and that it rejects the approach that looks at them as "externalities"—the approach of business schools and traditional economics, which are single-handedly responsible for mass delusions about environmental harms and necessities. Finally, work to create public programs and services that acknowledge the impact on our children and on our families of already existing environmental problems, so that parents can have the resources to both care for families and be responsible citizens rebuilding a living planet.

APPENDIX: RECOMMENDATIONS FOR PARENTS, EDUCATORS, COMMUNITIES, AND GOVERNMENTS

Endocrine Disruptors/Hormone Acting Agents, Neurological Disrupters, and Heavy Metals

Parents and Educators

For parents, to the extent possible—and this is often not a very flexible factor—choose a place to live that does not have a heavy load of pesticides, other petroleum by-products, and heavy metals. Eat organic when possible. When you can’t, eat "low on the food chain"—as larger animals tend to bio-accumulate toxins. Use environmentally friendly household cleaners, paints, and products, thus protecting your family and adding your own financial disincentive to the makers of toxic products. Do not let your children play with PVC plastic toys, and don't give them to your infants. Don't use PVC siding or windows in your house. Do not use pesticides. There are environmentally friendly solutions that don't
require chemicals, even if they are more time-consuming. In general, with these issues as with all the others addressed here, use your power as a consumer to vote for products and technologies that are human- and environment-friendly. Do not, to the extent you are able, contribute to the deadly economy. Greenpeace often makes available lists of environment-friendly consumer products; and several books are available, such as _Clean House, Clean Planet_ (see note 8 for more information).

Don’t let the dentist place silver-mercury fillings into your children’s teeth. Insist on porcelain or composite fillings. If you have sick children, you will need to find out whether they have been poisoned by chemicals and/or heavy metals. The majority of family physicians and pediatricians don’t know very much about this yet, but holistic practitioners, whether medical doctors, naturopaths, and/or nutritionists, lists of whom are available by locale on the Internet, do. There are de-toxification treatments that can be pursued, ranging from special diets to forms of pharmaceutical chelation, to pull heavy metals from the body. Many forms of neurological damage can be greatly relieved by the avoidance and purge of toxins on the one hand, and special nutritional supplementation to help rebuild the brain and nervous system on the other.

For educators, make all of the above a part of the health and environmental education children receive. As with all the issues we have addressed, work to make your school and school boards leading agents of environmental education and change. Get together parents and schools and make a list of your most important merchants. Demand organic food and environmentally friendly products; educate your community and ask them to buy those products—think globally, act locally, as the old green saying goes.

Communities/Governments

POPs and endocrine disruption are environmental and technological problems that respect no regional, state, or national borders. While working class people are much more at risk for direct exposures, the patterns of migration of POPs, and their presence in so many products, mean that everyone is vulnerable. If there are local deposits of persistent organic pollutants, they have to be cleaned up. This has become harder in recent years, because there is so little public money for such cleanups. The Superfund program stopped “making the polluter pay” in 1995, and, at the federal level, this has made cleanups less frequent and less effective. Hence direct action to remediate must often pass through indirect action—elections and political pressure—to ensure politicians and officials capable of prioritizing and acting on these problems.

Like other persistent organic pollutants that, once released into the environment, go on doing harm forever, mercury pollution needs to be cleaned up and eliminated at the source. We need to correct problems at dirty power plants, redesign mercury-containing consumer products, including car switches, and carefully monitor our fish stocks. At the national level in the United States, responsibility for regulating mercury is shared by two federal agencies: the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). The FDA is charged with regulating commercially sold fish and seafood. The EPA monitors concentrations in the environment and regulates releases of mercury to surface water and air. FDA and EPA guidelines can be read on the Web at www.fda.gov and www.epa.gov.

Likewise, as a nation, we must develop the technical, social, and political means to test for other heavy metals, such as lead, arsenic, and cadmium, and find ways to eliminate these at toxic levels in the same manner that we approach mercury.

Hormone and Antibiotic Pollution in Food

Parents and Educators

The first point is to be aware of and to understand the problems and challenges involved. While we urge parents to educate themselves on the issues we have detailed, we also believe that school boards need to assimilate the information on the problems with our food supply into curriculum for kids, into the food and drink they provide, and into support programs for parents; and to proactively promote this knowledge.

Clearly, the best way to preserve children from the poisonous products in the food chain is to make sure that they ingest as few of them as possible. Once again, shopping and eating organic is the best possible strategy. When dealing with hormones and antibiotics in the food chain, as long as you are buying products that originate in the United States (for example, New Zealand lamb does not contain antibiotics or hormones), only organic meats and dairy will give you food that is not contaminated with these pollutants. One extremely important measure to take is to fight antibiotics with good bacteria—with “probiotics.” We are speaking here of
high-quality acidophilus and bifidus bacteria, available at drugstores and health food stores—to be taken during and after every course of antibiotics, and to be incorporated into the daily diet of any children with chronic health, especially digestive, problems.

Teachers and school boards, take note, too! Schools should offer only healthy foods. In addition to the well-known admonition to get schools to throw soft drinks and fast foods out of school cafeterias, schools should be places where children get healthy food—and that means meat, fish, and poultry free of chemical, hormonal, and pharmaceutical pollution. If we made the preparation of fresh, organic meals mandatory in schools, we would create a huge market for organic foods. Agribusiness would go green as it scrambled to take advantage of it.

For parents with sick children: find holistic physicians, nutritionists, and naturopaths who can diagnose food-related disorders, who can help design therapeutic diets, and who understand that it is essential to find alternatives to antibiotics and other heavy pharmaceuticals whenever possible, because these have negative long-term consequences on the immune system.

Communities and Governments

Population health is profoundly dependent on the food we eat. If we want healthy children, we will have to find a way to provide them with healthy food and clean water. So it is time to clean up agriculture and food processing via appropriate public policy, public agencies, and enforcement. A few guidelines here: antibiotics should be reserved only for individual illness in animals, never for mass in-feed use. Animals should be raised in conditions that do not require the use of these substances. The same goes for hormones, which should be banned outright for agricultural use. If such processes point to a reorganization of agriculture and a return to smaller, more people- and animal-friendly farms, then public policy, turning on economic incentives and disincentives and enforcement agencies with teeth, should be enacted to make them so. In fact, given the extraordinary levels of so many different kinds of pollutants because of industrial agriculture, we need, as a society, to go back to the drawing board and redesign how we feed ourselves, so that we are not poisoning ourselves at the same time.

The biosphere cannot sustain us if we do not protect its integrity. We have learned that many of our older technologies and products have infirmal consequences. But we are an ingenious species, and there are many among us who have already devised new technologies and products capable of putting a stop to the damage we’re doing, and, at least in large measure, eventually remediating it. From wind turbines and solar panels, to herbal anti-infectives and probiotics, to scientifically enhanced methods of organic farming, to filtration systems that use plants to produce pure drinking water without depositing one ounce of sewage in our waterways, we can do things to help our biosphere to survive and to protect our children and their children after them. The technology—the appropriate technology—to make fundamental improvements in all the areas we have written about here, and more, already exists. There is hope. To the extent possible, we urge individual families and schools to adopt helpful and appropriate technologies and products. But we also know that many of the big solutions—or the ability to take advantage of such solutions—are largely determined at the community, governmental, and societal levels.

NOTES

1. See Union of Concerned Scientists, Scientific Integrity in Policymaking: An Investigation into the Bush Administration’s Misuse of Science, February 2004. Cambridge, MA. Roger G. Kennedy, a former director of the National Park Service, said, “Tinkering with scientific information, either striking it from reports or altering it, is becoming a pattern of behavior. It represents the politicizing of a scientific process, which at once manifests a disdain for professional scientists working for our government and a willingness to be less than candid with the American people.”

2. Ibid.


4. For studies reporting that “much of the precipitation in Europe contains such high levels of dissolved pesticides that it would be illegal to supply it as drinking water.” Also, for links between pesticides and rising cancer rates, see Fred Pearce and Debora Mackenzie, “It’s raining pesticides,” New Scientist, April 3, 1999.

5. Colborn et al., Our Stolen Future.


7. For a discussion of sperm damage, see Colborn et al., Our Stolen Future, pp. 68–86. There have been many reports of deformed and hermaphroditic fish and frogs in the Great Lakes region. In January 1999, it was reported that “female mollusks in a Lisbon lagoon are developing male characteristics apparently caused by pollution.” The Gazette, January 16, 1999. J8. See also “Canadian study ties birth defect to solvents,” Reuters/Yahoo News, March 24, 1999.

8. For a comprehensive, easy-to-read and -understand list of the toxic ingredients in most commercial household cleaning products, as well as for easy to use, inexpensive, benign alternatives, see Logan, Karen, Clean House, Clean Planet, Pocket Books/Simon and Schuster, New York, 1997.

9. Colborn et al., Our Stolen Future.


11. “Chemical Obesity,” Environmental Health Perspectives 112(6), May 2004 (online).

12. The meeting also considered other environmental factors in causing obesity, and the meeting presentations are available online at www.niehs.nih.gov/multimedia/qt/dert/obesity/agenda.htm.

13. Commission on Life Sciences (CLS), Hormonally Active Agents in the Environment, National Academies Press, 1999, p. 188.

14. Ibid.


16. Colborn et al., Our Stolen Future.


19. Stemming from a very different cultural pressures and a different branch of pharmaceutical production, ingested and injected hormones such as anabolic steroids and testosterone have also become a health hazard to young people, largely but not only teenagers. In the mid 1990s, 1,084,000 Americans (0.5 percent of the population) admitted to having used anabolic steroids, and that rate was double for the eighteen-to-thirty-four age group. There is good impressionistic evidence to suggest that such use has increased, not decreased, as these drugs have moved progressively from the high-performance sports arena to the local gym. Whereas women take these drugs to increase athletic performance only, more and more teenaged boys and young men take them for cosmetic purposes as well. Possession of anabolic steroids and prescription testosterone is illegal for non-medical uses, but there is a thriving black market and clearly a steady supply made by companies who are well aware of the illicit use to which their products are being put. Anabolic steroids function to increase muscle mass and help rapid recovery from training in the short run. Testosterone, now common in the treatment of AIDS patients, helps to resist muscle withering and boost energy. But the long-term effects of abuse of these hormones are often shrunken testicles, reduced sperm count, impotence, baldness, development of breasts in men (and hirsutism and deepening of the voice in women), difficulty or pain in urinating, and an enlarged prostate.


27. We have not included opposing views in this article, but couldn’t resist this one. The Cato Institute’s Steven Milloy published a piece in January 2004 that cited a study done in the Seychelles Islands. According to Milloy, the study contained “a surprising finding in the results of the examination of children at 66 months of age... several [intelligence] tests scores improved as either pre- or postnatal mercury levels increased.” Surprise. Mercury is good for you!


29. "California sues five grocers over mercury warnings," Reuters/Yahoo Science Wire, Friday, January 17, 2003. In Sacramento, CA, the state attorney general filed suit against five grocery chains including supermarket giants Kroger Co. and Albertson’s Inc. for failing to properly warn consumers about the risk of mercury in fish. Attorney General Bill Lockyer’s lawsuit in state court seeks to force the grocers, who also include Safeway Inc., Whole Foods Inc., and Trader Joe’s, to warn customers that tuna, swordfish, and shark sold in their markets contain the metallic element linked to cancer and birth defects. Lockyer argues the markets have violated Proposition 65, a California ballot initiative approved in 1986 that requires businesses to provide “clear and reasonable” warnings before exposing people to known carcinogens and reproductive toxins. "Public health agencies have advised pregnant women not to eat swordfish and shark because those fish contain relatively high levels of mercury," the attorney-general said, explaining the reasoning behind the suit.


32. Cathy Vaskill of the Family Medicine Centre at Queen’s University in Kingston and one of the authors of the Ontario College of Family Physicians report cited above, noted that the pesticides used in Toronto’s 200,000 storm sewers to kill mosquito larvae emit a product as they break down that is a retinoid, a family of chemicals known to cause limb deformities in fetuses. That chemical then washes into Lake Ontario and in turn into the drinking water of the greater Toronto area.

33. In February 2004, the Union of Concerned Scientists summed up the situation as follows: “There is a well-established pattern of suppression and distortion of scientific findings by high-ranking Bush administration political appointees across numerous federal agencies. These actions have consequences for human health, public safety, and community well-being. [Cited] incidents involve air pollutants, heat-trapping emissions, reproductive health, drug resistant bacteria, endangered species, forest health, and military intelligence. There is strong documentation of a wide-ranging effort to manipulate the government’s scientific advisory system to prevent the appearance of advice that might run counter to the administration’s political agenda. These actions include: appointing underqualified individuals to important advisory roles including childhood lead poisoning prevention and reproductive health; applying political litmus tests that have no bearing on a nominee’s expertise or advisory role; appointing a non-scientist to a senior position in the president’s scientific advisory staff; and dismissing highly qualified scientific advisors. There is evidence that the administration often imposes restrictions on what government scientists can say or write about “sensitive” topics. In this context, sensitive applies to issues that might provoke opposition from the administration’s political and ideological supporters. There is significant evidence that the scope and scale of the manipulation, suppression, and misrepresentation of science by the Bush administration is unprecedented.” Scientific Integrity in Policymaking: An Investigation into the Bush Administration’s Misuse of Science, Union of Concerned Scientists, February 2004, Cambridge, MA.


35. "Policies relevant to fundamental causes of disease form a major part of the national agenda, whether this involves the minimum wage, housing for homeless people, capital-gains taxes, parenting leave, head start programs, or other initiatives of this type. Such policy initiatives often lie outside the realm of influence and expertise of health policy experts. Yet if fundamental causes are potent determinants of the disease, the potential health impact of these broad policies needs to be thoroughly understood," said Bruce G. Link and Jo Phelan in "Social Conditions as Fundamental Causes of Disease," Journal of Health and Social Behaviour, extra issues, 1995, pp. 80–84. These crucial points are all the more true with respect to environmental issues.