

# Death by Faucet

A Scientific Detective Story



Unprecedented and Undeniable Truths about our Current  
Water and Food Crisis

Science has been prostituted to do the bidding of politics and greedy business people. This is what got us in to our present environmental and health problems. *John V. Milewski, Ph.D.*

*Glen Caulkins*

***Synergism*** is the interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects.

Toxicological synergy is of concern because many elements individually considered safe often pose unacceptable health and/or ecological risk when exposure is to a combination.

Denial is not a shield—ignorance is not a sanctuary.

This manuscript was gleaned from thousands of books, websites, and other media sources over a period of twenty years. I basically, connected the dots—then filled in the blanks.

The Internet has become a data free-for-all. There is duplicated data plastered all over cyberspace without references and/or footnotes; therefore, it is impossible to reference and/or footnote all of the resources that make up this manuscript.

Any mistakes are unintentional—we are human. If you find any material that is incorrect or controversial, please bring it to our attention. Your help is appreciated.

Stealing from one source is plagiarism—stealing from many is research.

*Glen Caulkins*

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## THE CHEMISTRY OF NON-PRISTINE WATER

Our environment is changed, new pathogens are emerging, drinking-water systems are aging, and governments seem more interested in ensuring business in the global marketplace than in ensuring the safety and health of our citizens.

Clean drinking water is something that the public has pretty much taken for granted for the past hundred years. The public has little idea—perhaps understandably—just how contaminated our drinking water has become.

In the past century, one of the greatest threats to North America's water system has been the widespread of acid rain, pesticides, insecticides, herbicides, fungicides, molluscicides, microbiocides, fertilizers, and chemicals spread through thousands of waterways. These pollutants affect the rates of decomposition and the accumulation of organic and inorganic matter in water.

There are scores heavy metals, trace elements, and chemicals are discharged into the environment by a number of industries including mining, nuclear, and electronic industries; hundreds of other pollutants are discharged such as plasticizers, solvents, and propellants. Copper, lead, and galvanized pipes along with chemicals and minerals added to aid in the coagulation of water can be of great concern to drinking water pollution.

More than 65 different heavy metals, trace elements, and toxic organic compounds affect human health. Accumulation within the body can lead to a decline in the mental, cognitive, and physical health of the individual. Many of these pollutants are carcinogenic, teratogenic, mutagenic, reproductive toxins, and/or neurological toxins.

Below is a partial list of heavy metals and other trace elements (solid forms) in fossil fuel:

Aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, bromine, cadmium, calcium, carbon, cesium, cerium, chlorine, chromium, cobalt, copper, dysprosium, europium, fluorine, gadolinium, gallium, germanium, hafnium, hydrogen, iron, lanthanum, lead, lithium, lutetium, magnesium, manganese, mercury, molybdenum, neodymium, nickel, niobium, nitrogen, phosphorus, potassium, platinum, potassium, rubidium, scandium, selenium, silicon, silver, sodium, strontium, sulfur, tantalum, tellurium, terbium, thallium, thorium, thulium, tin, titanium, tungsten, uranium, vanadium, ytterbium, zinc, and zirconium pose serious health threats. Ingesting, inhaling, or absorbing (through the skin) metals can be toxic.

When numerous metals are present in the body, they have a “synergistic toxicity.” Dr. Boyd Haley, professor and chair of the chemistry department at the University of Kentucky, performed a study on rats and found that the mortality rate of rats exposed

to a small dose of mercury or aluminum killed only one rat in one hundred. However, when the rats were exposed to both mercury and aluminum at the same time, all one hundred rats died—a 100% mortality rate.

A National Assessment of Tap Water Quality found 260 contaminants in our nation's tap water; 141 of these contaminants have no enforceable safety limits, therefore, despite the potential health risks, any concentration of these chemicals in tap water is legal, no matter how high. Of the 141 unregulated contaminants utilities detected in water supplies between 1998 and 2003, 52 are linked to cancer, 41 to reproductive toxicity, 36 to developmental toxicity, and 16 to immune system damage, according to chemical listings in seven standard government and industry toxicity references.

However, the EPA's own scientists have identified 600 chemicals in tap water formed as by-products of disinfection—they tracked 220 million pounds of 650 industrial chemicals discharged to rivers and streams annually. They also spearheaded research on emerging contaminants after the U.S. Geological Survey found 82 unregulated pharmaceuticals, hormones, medications, and residues of consumer products in rivers and streams across the country. Intensive use of antibiotics in human and veterinarian medicine and in industrial farming (as food additives) has resulted in the transport of significant quantities of the active ingredients to environmental waters. That is  $600 + 650 + 82 = 1332$  chemicals in water. All told, EPA has set safety standards for fewer than 20 percent of the many hundreds of chemicals that it has identified in tap water.

Some of the worst pollutants are synthetic chemicals. Some 70,000 different chemical substances are in regular use throughout the world. Every year an estimated 1,000 new compounds are introduced. Many of them find their way into rivers, lakes, and groundwater aquifers.

Unknown hazardous chemicals in everyday products are accumulating in human tissue and persisting in the environment without breaking down. That is the gloomy picture emerging from a report authored by Michael Wilson, a UC Santa Cruz graduate and Berkeley research scientist.

Of 80,000 synthetic chemicals that have been registered in the country, less than 10 percent have been tested for their effect on human health. Wilson calls it a "chemical data gap."

Wilson's report asserts the pace and scale of the chemicals produced every day in the United States is already staggering. Each day, the United States produces or imports 42 billion pounds of chemicals – that is the equivalent of 623,000 gasoline trucks each carrying 8,000 gallons, which, if lined up end-to-end, would stretch from San Francisco to Washington and back, the report states. "That's projected to grow four-fold with California expected to grow 50 percent by 2050," Wilson said. "If you think we have problems today, just wait."

By failing to clean up rivers and reservoirs that provide drinking water for hundreds of millions of Americans, EPA and the Congress have forced water utility companies to decontaminate water that is polluted with industrial chemicals, factory farm waste, sewage, pesticides, fertilizer, and sediment. In its most recent national Water Quality Inventory, EPA found that 45 percent of lakes and 39 percent of streams and rivers are "impaired"—unsafe for drinking, fishing, or even swimming, in some cases. Even after water suppliers filter and disinfect the water, scores of contaminants remain, with conventional treatment regimens removing less than 20 percent of some contaminants. By failing to set tap water safety standards expeditiously or require and fund comprehensive testing, EPA allows widespread exposures to chemical mixtures posing known risks to human health.

Companies like Weather Modification Inc. utilize aircraft equipped with spraying equipment, such as pyrotechnic flares or wingtip-mounted burners called 'generators,' to spray the atmosphere from altitudes of about 4,000 feet. The flares are manufactured by companies, such as "Ice Crystal Engineering," which have been developed by a "team of atmospheric research chemists and engineers who collectively have over 60 years of experience in the weather modification industry." Imagine having 60 years of experience in something that is supposed to be a conspiracy theory, such as weather modification!

There are, of course, many types of aircraft involved in aerosol spraying, including military and government airplanes. According to many eyewitness reports and photographic evidence, some of those aircraft are as big as passenger airliners.

The pyrotechnic flares are apparently made of chemical compounds designed to melt hail or ice, such as calcium chloride and silver iodide. How many people out there know that the air they breathe contains aerosols and heavy metals? The sprayed chemicals accelerate the formation of clouds by increasing the size of the cloud moisture droplets.

The health hazards--besides the calcium chloride and silver iodide, there have been independent reports about high levels of radioactive barium and a form of aluminum discovered by researchers like Clifford Carnicom. Other reports have indicated the presence of high levels of metallic particles in rainwater, which eventually end up in our rivers, reservoirs, and the food we eat. In addition to chemicals, there have been reports of biological material found after chemtrail spraying operations. In some instances, there have been samples collected by researchers containing molds—a serious respiratory hazard.

The human body is about two-thirds water. It is important to drink pristine water with the proper pH. The pH of water varies according to amounts of acids, bicarbonate, and minerals. Pure water (without minerals or acids) has a pH of 7.0.

Acid rain is produced when nitrous oxide, sulphur dioxide, and carbon dioxide gas in

the upper atmosphere react with water particles to produce nitric acid, sulphuric acid, and carbonic acid respectively. Unpolluted rainfall normally has an acidic pH of about 6.5 to 6.8, while acid rain has a pH that varies from 4.1 to 5.5.

Acid rain can contain abnormally high levels of carbonic acid (from the excessive amounts of carbon dioxide released in the atmosphere from burning fossil fuel).

The word equation is:

Carbon dioxide + water = carbonic acid

When we burn fossil fuels (especially coal), sulphur dioxide is made and released into the air. When sulphur dioxide dissolves in rainwater, it makes sulphuric acid.

Sulphur dioxide + water = sulfuric acid

Sulphur dioxide reacts with a wide range of substances found in food, including various essential vitamins, minerals, enzymes, and essential fatty acids.

Sulfuric acid is actually a mixture of acids in high concentrations. Sulfuric acid is much stronger than carbonic acid. It is extremely corrosive and it causes damage to rocks, soil, animals, and plants.

Sulfuric acid can cause severe burns to all body tissue and may be fatal if swallowed or contacted with skin. It is harmful if inhaled; it affects teeth; it is a cancer hazard. Strong inorganic acid mists containing sulfuric acid can cause cancer.

Nitrous oxides react with water vapor to form nitric acid. Nitric acid is a highly corrosive and toxic acid that can cause severe burns.

Nitrous oxides + water = nitric acid

Nitric acid is a cancer-causing agent. It is also a powerful dehydrating agent, so powerful that much of the damage it does to the human body is because it pulls water even out of other molecules in chemical reactions.

Apart from emissions of sulphur dioxide and nitrogen oxides from the combustion of fossil fuels, there are also other substances that contribute to acid rain formation. These include hydrochloric acid and organic carboxylic acids. These acids include acetic acid and formic acid, which are formed when volatile organic compounds are oxidized in the air.

Formic acid is readily metabolized and eliminated by the body. Nonetheless, some chronic effects have been documented. Some animal experiments have demonstrated it to be a mutagen, and chronic exposure may cause liver or kidney damage. Another possibility with chronic exposure is development of a skin allergy that manifests upon re-exposure to the chemical.



When acid rain falls onto the soil, it is taken up into plants and trees. This can cause some plants to die, as they cannot live in acidic conditions. Acid rain can wipe out large areas of forest. When it falls into lakes, it causes the acidity of the lake water to increase; this can cause some fish and other animals to die.

Acid rain can also cause damage to certain building materials and historical monuments. Acid rain can cause erosion on ancient and valuable statues and has caused considerable damage. This is because the sulfuric acid in the rain chemically reacts with the calcium in the stones (limestone, sandstone, marble, and granite) to create gypsum, which then flakes off. Acid rain also causes an increased rate of oxidation for iron.

One of the many serious impacts of acid rain is on forests and soils. A lot of harm is caused when sulfuric acid and nitric acid falls to the earth as rain. Nutrients in the soil, which plants and animals need to survive, are washed away.

All of the sulphur dioxide and nitric oxide in the air are not turned into acids, and in fact, lots of them can float in the atmosphere, move over to another area, and return to the soil, still as sulphur dioxide and nitric oxide; these gases can then clog up the leaves of the plants and stop them from making their own food using sunlight (photosynthesis).

Soil biology can be seriously damaged by acid rain. Some tropical microbes can quickly consume acids, but other types of microbe are unable to tolerate a low pH and are killed. The enzymes of these microbes are denatured (changed in shape so they no longer function) by the acid. The hydronium ions of acid rain also mobilize toxins and leach away essential nutrients and minerals from the soil.

Most rain as well as purified, spring, and bottled waters now have a pH of 5.5 to 4.2 (when you remove the minerals that mask the acids in the water). When we consume these acids—we are consuming poison.

Bottled water gives consumers the illusion of “buying themselves out” of acid rain or dirty water. Despite what water marketers would have us believe, bottled water faces less stringent regulation than tap water.

Normal adult humans eating Western diets already have chronic, low-grade metabolic acidosis, the severity of which is compounded in part by the consumption of acid rain. To prevent or reverse age-related consequences of such acidosis (e.g., bone and muscle loss), methods are needed for regulating pH. Because these high levels of nitric acid and sulphuric acids change the pH of the human body, we must eliminate them from the water we drink. Distilling water or running it through reverse osmosis will not remove the acid from the water.

There are recent studies that point out that drinking distilled water, water run through



reverse osmosis, or any water containing unnatural levels of acids and minerals over long periods is harmful to our health. Consumption of these acids and disproportioned levels of minerals in water is not natural.

There are many bogus claims about ionized water machines producing healthy high pH water. Pure water has a pH of 7.0. Water ionizers do remove the acids; however, you get a high pH reading from high bicarbonate and contaminated sludge in the water (hard water).

## HARD WATER

For millions of years prior to the burning of fossil fuel, rain falling from clouds would encounter natural levels of carbon dioxide, which created a small amount of carbonic acid. Rainwater naturally had a pH of 6.5 to 6.8. This precise amount of carbonic acid made the rainwater a mild solvent, which would make an ionic solution of the minerals it encountered in rocks and soil.

Carbonic acid in rainwater exists in natural healthy water as long as the temperature remains at 4 degrees C. As the temperature of the water rises, the carbonic acid dissociates to form hydrogen ions and bicarbonate ions.

Alkalinity of natural waters is due primarily to the presence of hydroxides, bicarbonates, carbonates, and occasionally borates, silicates and phosphates. Bicarbonate is the principal alkaline constituent in almost all water supplies. Natural mineral or spring waters have various contents of bicarbonates, from some tens to thousands of mg/liter.

Obviously, the amount of bicarbonate in water is in equilibrium with amount of carbon dioxide in air. Our water supplies are now saturated with excessive amounts of bicarbonate, sulfuric acid, and nitric acid. High levels of bicarbonate mask the acid content of the water. This harsh acidic water unrelentlessly erodes everything in its path.

Here is the equation: Total Dissolved Solids (TDS) and Total Suspended Solids (TSS)—acidic water exponentially erodes rock, manmade items, and other compounds from the earth. TDS and TSS consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, calcium, magnesium, sodium, potassium, iron, manganese, aluminum, mercury, molybdenum, cadmium, lead, cement, asphalt, zinc, iron, pesticides, paint, and hundreds of other chemicals. Turbidity (dirt and sediment)—acidic waters contain unusually high amounts of suspended particles, which may consist of fine sand, clay, soil, and precipitated salts. Turbidity is unpleasant to look at, can be a source of food and lodging for bacteria, and can interfere with effective disinfection. The presence of unnaturally high levels of acids, turbidity, TDS, TSS, volatile organic compounds, persistent organic pollutants, chemicals, and other toxic elements in water pose a major threat to human health.

Eighty-five percent of the water in the United States is hard. Water with higher TDS and TSS are considered by most health advocates to have a poor cleansing effect in the body. Highly mineralized alkaline water also causes excessive drying of the skin because they tend to remove normal skin oils.

Dr. Charles Mayo of the Mayo Clinic: "Water hardness (inorganic minerals in solution) is the underlying cause of many, if not all, of the diseases resulting from poisons in the

intestinal tract. These (hard minerals) pass from the intestinal walls and get into the lymphatic system, which delivers all of its products to the blood, which in turn, distributes to all parts of the body. This is the cause of much human disease."

Here are a few more ways that acid deposition has altered and continues to alter our soils and water supplies:

- Acid deposition (dry and wet) depletes calcium, magnesium, and other base cations from the soil—this depletion of base cations fundamentally alters soil processes, compromises the nutrition of crops, and hinders the capacity for sensitive soils to recover.
- Acid deposition facilitates the mobilization of dissolved inorganic minerals into soil water—the increased acidity of rain releases many minerals that do not naturally occur or do not belong in water at these disproportionate levels, thus producing what is called hard water—as a result, they are consumed in drinking water or are ingested by plants, animals, or aquatic life, which are then eaten by humans.
- Acid deposition increases the accumulation of sulfur and nitrogen in the soil.
- Acid deposition kills alkaline microbes and mutates acidic microbes in our soils.
- The sterile soil conditions brought about by acid deposition, the overuse of chemical fertilizers, pesticides, insecticides, herbicides, fungicides, molluscicides, microbiocides, and erosion prohibit microbial activity and the formation of Humic Acid and Fulvic Acid. Without microbial activity and Fulvic Acid and Humic Acid, plants and crops are deprived of over 92 essential minerals needed for healthy growth. This translates into contaminated vegetables with little or no nutritional value and sick plants. Sick soils and poisonous water produce sick plants; sick plants and poisonous water make people sick.

Acid deposition penetrates deeply into the fabric of an ecosystem, changing the chemistry of the soil as well as the chemistry of the streams and narrowing, sometimes to nothing, the space where certain plants and animals can survive.

Pure acid water extracted from drinking water will burn holes in the outer membranes of microbes like parasites, bacteria, viruses, and microscopic worms. Pure acid water will destroy or kill parasites and their eggs, bacteria, germs, and viruses. Pure acid water has a strong oxidation potential (a shortage of electrons) giving it the ability to oxidize and sterilize. When extracted from drinking water about one third of the water is acid water. Think of the effects it has on the human body.

In conclusion, acid rain causes a cascade of effects that harm or kill individual fish,

reduce fish population numbers, completely eliminate fish species from a body of water, and decrease biodiversity. Damages also show up in land animals, affecting their behavior and feeding patterns. Acid rain kills trees, crops, and other vegetation. Acid rain accelerates the decay of building materials and paints, buildings, statues, and sculptures; it, corrodes copper, galvanized steel and lead piping; it damages such manufactured things as automobiles, and reduces soil fertility. Acid rain raises the level of heavy metals in water, many of which are carcinogenic, teratogenic, mutagenic, and encourages reproductive toxins and neurological toxins in drinking water supplies.

# POISONING BY CHLORINATED WATER

Joseph G. Hattersley

## CHLORINE THE PARADOX

Barrie Carlsen

Let's explore this. When chlorinated water is run through a hose or carried in a pail followed by milk as in a dairy, what happens? *"Very tenacious, yellowish deposits chemically similar to arterial plaque" form*; with unchlorinated water this does not happen.

CBS' "Sixty Minutes" show July 11, 1992, displayed two laboratory rats, both of them eating standard rat chow and drinking chlorinated water. One rat had clear arteries. The other was also drinking pasteurized, homogenized milk. When the animals were sacrificed and cut open, the *arteries of its milk-drinking companions were clogged*. A scientist in a white coat winked at the camera and said, "He [the rat he was holding] is the only one doing research on that." The researcher didn't say why, but the powerful dairy and chemical lobbies come to mind.

*Dairy buckets and hoses, and rats' arteries resist the arterial-wall damage known as atherosclerosis*. But what can chlorinated water and milk, particularly homogenized milk, do to the far more susceptible arteries of humans? The arteries of young chickens are about as susceptible to such damage as people's arteries. Therefore, as a first approximation, J.M. Price, MD gave cockerels (roosters less than a year old) only chlorinated water. They rapidly developed arterial plaques; and the stronger the concentration of chlorine, the faster, and worse the damage. Other cockerels given unchlorinated water developed no such damage.<sup>2</sup>

The residents of the small town of Roseto, Pennsylvania, had no heart attacks despite a diet rich in *saturated animal fats* and *milk*--until they moved away from Roseto's mountain spring water and drank chlorinated water. After that, consuming the same diet, they had heart attacks.<sup>2</sup> The Roseto example is dramatic enough, but the needed detailed comparisons and follow-up are not likely to be done.

What is going on here? Highly reactive chlorine is one of the industrial waste products profitably disposed of into us Americans like garbage cans, then on into the environment. Chlorine oxidizes lipid (fatty) contaminants in the water. It thus creates free radicals (highly reactive sub-atomic particles lacking an electron) and oxysterols (formed when lipid molecules combine with oxygen molecules).

We require moderate numbers of both free radicals and oxysterols. The immune system employs free radicals to kill cells that its cellular immune mechanism cannot handle. A second mechanism using free radicals initiates programmed cell death known as *apoptosis*. Moreover, moderate quantities of oxysterols, like cholesterol itself, serve a protective function. But excess free radicals and excess oxysterols damage arteries and initiate cancer, among many other kinds of harm.

How well does the incidence of heart attacks match the areas where, and times when water is/was chlorinated? Chlorination spread throughout America in the second and third decades of this century, about 20 years before the mushrooming of heart attacks. Light chlorination, we will recall, yielded slow growth of plaques in Price's cockerels; and so chlorination of people's drinking water at the usual low concentration would have been expected to take at least 10-20 years to produce clinical manifestations of atherosclerosis. The timing fits, and the Roseto example fits.

A physician team led by William F. Enos autopsied three hundred GIs who had died in battle in the Korean War. These men, who had passed induction examination as healthy, averaged 22.1 years of age; the doctors wondered what they would find. To their shock and amazement, in seventy-seven percent of the 300 they found "gross evidence of arteriosclerosis in the coronary arteries." In several, one or more heart arteries were partly or completely blocked.

Although Dr. Enos did not try to explain his grisly discovery, he assumed arterial clogging had developed gradually. Seeming to support that assumption, almost 20 years later advanced arterial damage was discovered in ninety-six percent of nearly 200 consecutive babies who had died in their first month outside the womb. Two of those babies' coronary arteries were blocked, causing infantile heart attacks.

But did arterial damage in fact develop slowly? The water American soldiers had to drink in Korea was so heavily chlorinated that many could hardly tolerate it. In Vietnam too, autopsies of American soldiers found heart-artery damage. Again, water supplied to them had been heavily chlorinated. Did much of these soldiers' arterial damage develop, not gradually but quickly as in Dr. Price's cockerels? The truth—slow or rapid development of clogging—may never be known.

Industrial chemist J.P. Bercz, PhD, showed in 1992 that chlorinated water alters and destroys *unsaturated essential fatty acids (EFAs)*, the building blocks of people's brains and central nervous systems. The compound hypochlorite, created when chlorine mixes with water, generates excess free radicals; these oxidize EFAs, turning them rancid.

**SIDEBAR:** Most Western diets already contain very little of critically needed omega-3 EFAs. These are found in fish oil, better, in flaxseed oil; also in moderate quantity in first-virgin olive oil. These EFAs (except in olive oil) go rancid quickly. Therefore, to extend their products' shelf life food processors remove all health-promoting EFAs while destroying or discarding most needed micronutrients.

Processors substitute either saturated fats or, now, partially hydrogenated *trans*, transformed fats. Found in all boxed and packaged foods that have long lists of hard-to-pronounce chemical names on the side, *trans* fatty acids consumed in large quantity can cause heart attacks and many other degenerative diseases.

Cancer-fighting nutrients become deadly when combined with chlorinated tap water. It has been discovered that some of the most valuable nutrients and essential anti-

disease phytochemicals form cancer-causing substances when combined with chlorinated tap water. This includes familiar foods like soy, fruits, vegetables, tea, many health products, and even some vitamins.

In addition, chlorine reacts with organic compounds in water to produce *trihalomethanes* (THMs) such as carcinogenic (cancer originating) chloroform and carbon tetrachloride. It is the combination of chlorine and organic materials already in the water that produces cancer-causing byproducts. The more organic matter in the water, the greater is the accumulation of THMs.

In a study of more than 5,000 pregnant women in the Fontana, Walnut Creek and Santa Clara areas of California, researchers from the state health department found that women who drank more than five glasses a day of tap water that contained over 75 parts per billion of THMs had a 9.5 percent risk of spontaneous abortions, i.e. *miscarriage*. Women with lower exposure to the contaminants showed 5.7 percent risk. No comparison was given for women who ingested *no* THMs.

Taking a warm shower or lounging in a hot tub filled with chlorinated water, one inhales chloroform. And worse, warm water opens the pores, causing the skin to act like a sponge, and so one will absorb and inhale more chlorine in a 10-minute shower than by drinking eight glasses of the same water. This irritates the eyes, the sinuses, throat, skin and lungs, makes the hair and scalp dry, worsening dandruff. It can weaken immunity.

A window from the shower room open to the outdoors removes chloroform from the shower room air. But to prevent absorption of chlorine through the skin, a shower-head that removes chlorine from shower water is *a must*.

SIDEBAR: Chlorine in swimming pools reacts with organic matter such as sweat, urine, blood, feces, mucus, and skin cells to form *chloramines*. Chloroform risk can be 70 to 240 times higher in the air over indoor pools than over outdoor pools. If the pool smells very much of chlorine, do not go into it.

Canadian researchers found that after swimming for an hour in a chlorinated pool, chloroform concentrations in the swimmers' blood ranged from *100 to 1,093 parts per billion (ppb)*. Researchers even recorded increases in chloroform concentration in bathers' lungs of about 2.7 ppb after a 10-minute shower in chlorinated water. For many people the intake through those routes is much greater than in water taken orally.

Another issue: There is evidence that adding chlorine, a common process in conventional drinking water treatment plants, makes some pharmaceuticals more toxic.

Studies in Belgium have related development of deadly *malignant melanoma* to consumption of chlorinated water. Franz H. Rampen, et al., of the Netherlands, state that the worldwide pollution of rivers and oceans and the chlorination of swimming



pool water have led to an increase in melanoma. That disease is not associated with exposure to ultraviolet light. People who work *indoors* all the time, exposed to fluorescent lights, have the highest incidence of melanoma.

Long-term risks of consuming chlorinated water include excessive free radical formation, which accelerates aging, increases vulnerability to genetic mutation and cancer development, causes difficulty metabolizing cholesterol, and promotes hardening of arteries.

Excess free radicals created by chlorinated water also create dangerous toxins in the body. These have been directly linked to liver malfunction, weakening of the immune system and pre-arteriosclerotic changes in arteries (which, as we saw, struck Dr. Price's cockerels and may have happened to American soldiers in Korea and Vietnam). Excess free radicals have been linked also to alterations of cellular DNA, the stuff of inheritance.

Chlorine also destroys antioxidant vitamin E, which is needed to counteract excess oxysterols/free radicals for cardiac and anti-cancer protection.

Other harm from chlorination. A study in the late 1970s found that chlorinated water appears to increase the risk of gastrointestinal cancer over a person's lifetime by 50 to 100 percent. This study analyzed thousands of cancer deaths in North Carolina, Illinois, Wisconsin and Louisiana. Risk of such cancers results from use of water containing chlorine at or below the E.P.A. (Environmental Protection Agency) standard and "is going to make the E.P.A. standard look ridiculous," stated Dr. Robert Harris, lead scientist in the study.

Later, a meta-analysis found chlorinated water is associated each year in America with about 4,200 cases of *bladder cancer* and 6,500 cases of *rectal cancer*. Chlorine is estimated to account for 9 percent of bladder cancer cases and 18% of rectal cancers. Those cancers develop because the bladder and rectum store waste products for periods of time. (Keeping the bowels moving regularly will minimize such risk.) Chlorinated water is also associated with higher total risk of combined cancers. Chlorine in treated water can cause allergic symptoms ranging from skin rash to intestinal symptoms to arthritis, headaches, and on and on.

Why does chlorine in water cause these problems? It destroys protective acidophilus, which nourishes and cooperates with the immunity-strengthening "friendly" organisms lining the colon. In addition, as mentioned earlier, chlorine combines with organic impurities in the water to make trihalomethanes (THMs), or chloramines. The more organic matter, the more THMs; and like excess oxysterols they are carcinogens.

Recently, a joint study was undertaken in Japan by research scientists at the National Institute of Health Sciences and Shizuoka Prefectural University. They determined that natural substances originating from these foods react with chlorinated tap water, forming dangerous compounds, named MX, which stands for "unknown mutagen". They are similar to well-known and more easily detected cancer-causing THMs

(trihalomethanes).

In 1997, scientists in Finland determined that MX was 170 times more deadly than other known toxic byproducts of chlorination, and was shown in laboratory studies to damage the thyroid gland as well as to cause cancerous tumors.

The Japanese scientists specifically mentioned that MX is created by the reaction of chlorine with plant phytochemicals such as catechins, which are contained in tea and flavonoids (found in fruit). To make things worse, it is certain that the fresh plant foods we eat react even with the chlorinated tap water we drink with our meals. This means that fresh fruits, cooked and raw vegetables, green tea, black tea, herb teas, soy products, vitamin pills, various health supplements, and even some pharmaceutical drugs, in combination with chlorinated water can all be implicated in cancer. These foods contain a significant amount of phytochemicals including hormones, sterols, fatty acids, polyphenols, and ketones—the subgroups that include flavins, flavonoids, flavones, tannins, catechins, quinones, isoflavones and tocopherols.

These compounds are some of the most valuable and promising anti-cancer nutrients found in our foods and health supplements. Coenzyme Q10 is a quinone, vitamin B-2 is a flavin, vitamin E is a tocopherol, citrus fruit bioflavonoids like hesperidin, quercetin, and rutin are all flavonoids. Green tea contains catechins, phenols, tannins, and isoflavones. Potentially all of these substances, and many more, are subverted by chlorination.

The deadly cancer-causing agents that are produced are extremely toxic in infinitesimal amounts, so small and obscure that they are extremely difficult to detect. Very little chlorine is required. When the concentrations of phytochemicals are high, such as in health supplements or even fruits and vegetables coming from more fertile soil, the deadly combination with chlorination intensifies.

As this message spreads, it will no doubt shake the very foundations of the chlorine and water treatment industries, let alone the government agencies that are implicated along with them. There certainly should be cause for serious alarm within the nutritional supplement and food industries, as well as those segments of the medical industry that might awaken to the problem.

This message is of utmost importance to the public, because chlorine, acid rain, hard water, heavy metals, chemicals, fertilizers, and depleted dead soil will be exposed as major causes and contributors to cancer and degenerative disease; they will also be found to be responsible for damaging the body's immune and hormonal systems by mutating the food-based plant estrogens and phytochemicals that support those systems.

Cancer is the second leading cause of death in the US, exceeded only by heart disease. According to the National Cancer Institute, about 1,228,600 new cancer cases were expected to be diagnosed in the year 2000. Since 1990, approximately 11 million new cancer cases have been diagnosed, and about 564,000 Americans were

expected to die of cancer in 2,000, more than 1,500 people a day.

In the year 2000, about 564,800 Americans were expected to die of cancer, more than 1,500 people a day. Cancer is the second leading cause of death in the U.S., exceeded only by heart disease.

Breast cancer is epidemic in this country. One in every nine American women will face breast cancer. Every three minutes, a woman is diagnosed, and every 13 minutes, a woman dies from the disease. The American Cancer Society estimated more than 200,000 women would be diagnosed with breast cancer in 2006, and more than 40,000 would die from the disease. In addition to invasive breast cancer, 61,980 new cases of in situ breast cancer were expected to occur among women during 2006.

It has been known by the water treatment and chemical industries for many years that chlorine reacts negatively with natural organic compounds. These industries call the compounds DBPs (disinfection by-products) and they are known to cause cancer in populations whose drinking water contains them. THM, the most commonly known DBP, causes a high incidence of bladder cancer and causes spontaneous abortion of fetuses.

Chlorine, fluorine, and fluoride are chemically related to iodine and compete with it for assimilation, blocking iodine receptors in the thyroid gland. Dioxin, a dangerous chlorine-related compound found throughout the food chain, is one cause of low thyroid. Rather than feeding the body's endocrine glands, including the thyroid, as nature intended, the hormone-like nutrients found in food are altered by chlorine and turned into mutagens that do permanent damage to the glands. Also, the serious deficiency of valuable phytochemicals in modern diets may be responsible for undernourished hormonal functions in those with otherwise healthy glands.

To help rid yourself of the chlorine in your system and get the intended benefit from your food and nutritional supplements, you may want to try humic extracts (especially fulvic acids), that are said to provide natural chelation properties. Chelation means that the chemicals actually bond with or "pick up" the toxins. They detoxify the liver and the digestive tract by attaching to toxic build-up, including heavy metals and chlorination byproducts, and then disarm, neutralize, and remove these toxins as waste products. Fulvic acids also work as nature's most powerful antioxidants, neutralizing dangerous free radicals, and supplying hormone-stimulating micronutrients.

The chlorine issue should come as no real surprise to any biochemist. Chlorine has been combined with many other normally safe organic substances to form some of the most powerful deadly toxins known, such as dioxin, DDT, and PCBs. The bottom line is that chlorine is the one of the major culprits in disintegrating health, not the substances with which it reacts.

Is there a better substitute for chlorine in water treatment: Yes. Hydrogen peroxide ( $H_2O_2$ ) destroys infectious organisms and impurities in water 4,000 times better than

chlorine. Ozone (O<sub>3</sub>) treatment is equally effective. Eleven hundred cities, worldwide, treat their drinking water with ozone; many have done so since as early as 1901.

To generate ozone, dry air or oxygen is passed through a high-voltage electrical field. Ozone drinking-water treatment in Andover, Massachusetts successfully controlled the effects of algae blooms and eliminated water quality problems. Potential THM formation was reduced by an average of 75 percent.

But H<sub>2</sub>O<sub>2</sub> and O<sub>3</sub> are relatively cheap; moreover, the only byproducts are pure oxygen and hydrogen, so no one can make a big immediate profit on them. (Hydrogen is a potential major energy source for electricity generation and for zero-emission vehicles, and so it could be important in future years.) France and Germany, wiser and less controlled by the chemical industry, chlorinate water only in emergencies.

*The chemical companies pulled off a huge coup when they bamboozled America and Canada into chlorination.* They make big profits disposing of excess chlorine into our drinking water; otherwise, they would have to pay to destroy it. So now, we know why American water is not treated with safe, cheaper, more effective ozone. Now, we know why Dr. Price's revealing studies with cockerels were never followed up.

SIDEBAR: Swimming in chlorinated water. Drinking and swimming in chlorinated water can cause malignant melanoma. Sodium hypochlorite, used in chlorination of water for swimming pools, is mutagenic in the Ames test and other mutagenicity tests. Redheads and blonds are disproportionately melanoma-prone; their skin contains a relative excess of pheomelanins compared to darker people.

Environmental Protection Administration (EPA) tests have shown that "in the water we drink, over 2,100 organic and inorganic chemicals [including pesticides, heavy metals, radon, radioactive particles] and parasitic organisms including *cryptosporidium* have been identified; 156 of them are pure carcinogens. (In 1993, *cryptosporidium* killed more than 100 and infected over 400,000.) Of those, 26 are tumor *promoting* [they can make an existing tumor grow]. Exposure to *cryptosporidium* in people with lowered gastrointestinal immune function could lead to chronic GI infection. Other examples include recurring cases of Legionnaire's disease, a pneumonia caused by *Legionella pneumophila*, which may lurk in hot water supplies.

A public notice recently issued in Washington, D.C. warned that a high level of bacteria in the [chlorinated, fluoridated city system] water made it unsafe for dialysis patients, AIDS patients, organ transplant patients, the elderly, and infants. Water contamination is the worst in small communities that cannot afford proper treatment; the EPA has not released this information.

And hearings before the House Committee on Government Reform and Oversight discussed *Pfiesteria* outbreaks among people drinking chlorinated water. The organism, which kills fish, sickens some people; they get sick from drinking the water, not from eating infected seafood. The EPA's Robert Perciasepe said, in written testimony that "Any new public health policy on this issue needs to consider reduction

of nitrogen and phosphorus pollution in our waters." A bill passed by the U.S. House of Representatives would require managers of municipal water systems to tell customers what contaminants have been found in local drinking water. But with present crude test methods, that would offer little help.

Sherry Rogers, MD, pioneer in and authority on environmental medicine (EM), raises the number of chemicals in drinking water to 5,000. And 85 percent of American aquifers supplying wells below 8,000 feet altitude are contaminated with heavy metals; a recent federal report says the water you drink may have been recycled from sewage waste back to drinking water five times. As the late Kevin Treacy, MD of Australia said, "If municipal water were introduced now, it would not be allowed."

SIDEBAR: Plants do not thrive as well on chlorinated as on unchlorinated water; wild animals do not develop atherosclerosis until they drink chlorinated water in American zoos. Although their food, selected by people, is not the same as what they caught, plucked or dug up in the wilds, evidence suggests chlorinated water, together with its thousands of other chemicals, is the worst culprit in their arterial clogging.

*Scientists in Minnesota grew embryos from healthy frogs in plain tap water. Some of the frogs had no legs or other had six legs or an eye in the middle of the throat. Earlier, deformed frogs were found in the U.S., Canada and Japan. And we are drinking and growing our food in it.*

The EPA called 129 of the contaminants found in water supplies "dangerous" singly, let alone in combination. Pesticides and other toxic wastes run off farmlands and pastures or are dumped by factories, pollute rivers and seep into underground aquifers. Aptly called "biocides" by Russell Jaffe, MD, PhD, pesticides are designed to end life; few have been shown to be safe. The EPA depends on producers of pesticides to test their safety: the wolf guards the hen house. It should be no surprise that the tests take a long time, and many have been fraudulent.

Further, one poison is tested at a time; synergistic effects of combinations, potentially far worse, are ignored. Besides, many of the so-called "inert" substances in pesticide combinations are more toxic than the "active;" one of the "inerts" is DDT, prohibited for American farm use since 1973.

Are these contaminants dangerous in such minute quantities? Yes! In a laboratory, healthy living cells weakened, malfunctioned and some died within seconds or minutes when exposed to toxins commonly detected in American drinking water such as mercury, nickel, cadmium and lead at the extremely low concentration of only one part per billion (ppb).

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## **FLUORIDE IS ADDED TO U.S. WATER SUPPLIES!**

Fluorine is a univalent poisonous gaseous halogen and it is the most chemically reactive and electronegative of all the elements. Fluoride is the ionic, or electrically charged form of the element fluorine. In aqueous solution, fluorine commonly occurs as the fluoride ion. It is reactive and strongly attaches itself to other elements, making them hard and brittle.

Fluorine is a trace mineral. Fluorine sources are not at all common and the fluorine mineral was not found in many of the foods that we ate a hundred years ago. Many fluorine compounds come from the combustion of fossil fuel, certain industrial processes, and irresponsible agricultural practices. Currently 66% of United States residents on public water supplies receive fluoridated water. Furthermore, all of our food is now contaminated with fluorine compounds.

Hydrofluosilicic acid is one of the most corrosive chemical agents known to man. It is derived from toxic gases produced in the manufacture of phosphoric acid and phosphate fertilizers; it contains lead, mercury, arsenic, and high concentrations of radionuclides. It is also the chemical agent most used for water fluoridation in the United States. In essence it is a protoplasmic poison that is more toxic than lead.

Fluoride was first added to water by Hitler during the Second World War. He had discovered that fluoride tames animals and keeps people passive, docile, suggestible, and thus more easily controlled. He discovered that odorless fluoride slowly poisons the pineal gland. In large doses, fluoride causes paralysis and death.

During the late 1960s, fluorine (fluorosilicic acid) emissions were damaging crops, killing fish, and causing crippling skeletal fluorosis in livestock. The EPA became concerned and enforced regulations requiring manufacturers to install pollution scrubbers.

Recovered fluorosilicic acid minimizes hydrogen fluoride and other hazardous air pollutants from being released into the atmosphere. It is a fact that the release of fluorosilicic acid, lead, mercury, arsenic, and high concentrations of radionuclides into the atmosphere via the chimneystacks are hazardous to every living thing in their path. So why would the EPA add these toxins to our water supplies? Now, instead of breathing large quantities of these poisons and watching them kill everything in their path, we are now silently given water to drink and food to eat that has been grown in and prepared with substances that are known to kill everything in their path.

The EPA's position on the use of industrial grade fluosilicic acid for the fluoridation of municipal water supplies is: the use of the industrial grade product is the ideal solution to the long-standing dilemma of disposing of the hazardous waste by-product produced from the manufacture of phosphate fertilizers. By recovering fluosilicic acid,

water and air pollution are minimized and water utilities are afforded a low-cost source of fluoride. Food Grade fluoride is not used in the water fluoridation process because the cost factors would be prohibitive.

The aluminum industry, which previously supplied sodium fluoride for water fluoridation, was facing a shortage of fluorspar used in smelting aluminum. Consequently, there was a shortage of sodium fluoride to fluoridate drinking water.

For the phosphate fertilizer industry, the shortage of sodium fluoride was the key to turning red ink into black and an environmental liability into a perceived asset. With the help of the EPA, fluorosilicic acid was transformed from a concentrated toxic waste and a liability into a "proven cavity fighter."

Our government tells us that fluoride is added to our drinking water for the purpose of medication (to prevent tooth decay). However, fluoride is a cumulative toxin that can alter accretion and resorption of bone tissue; it also affects the homeostasis of bone mineral metabolism; it has been tied to bone cancer and osteoporosis. Babies exposed to fluoride are at high risk of developing dental fluorosis—a permanent tooth defect caused by fluoride damaging the cells that form the teeth. Other tissues in the body may also be affected by early-life exposures to fluoride. According to a recent study, fluoride may damage the developing brain, causing learning deficits and other problems. It has also been suggested that high fluoride doses can cause secondary hyperparathyroidism and subsequent calcium deficiency. Exposure to this powerful caustic irritant can cause conjunctivitis and skin irritation.

A March, 2006, report from the National Academy of Sciences/National Research Council (NAS/NRC) identified fluoride as a potent hormone disruptor that may affect normal thyroid function. Fluoride's potential to impair thyroid function is most clearly illustrated by the fact that until the 1970s, European doctors used fluoride as a thyroid-suppressing medication for patients with hyperthyroidism. Today, many people living in communities with fluoridated tap water are ingesting doses of fluoride that fall within the range of doses once used by doctors to reduce thyroid activity in hyperthyroid patients (NRC 2006).

According to The Lancet, a leading English medical journal, sodium fluoride accumulates in brain tissue; it inhibits or destroys the crucial neurotransmitter acetylcholine, which is imperative for the process of learning and memory. This data confirms a correlation between fluoride exposure/accumulation and diminished intelligence quotients.

The mean IQ of 60 children, aged 10 to 12 years, in an area with a high level of fluoride in drinking water was significantly lower (92.27 [+ or -] 20.45) than that of 58 children in a low-fluoride area (103.05 [+ or -] 13.86). The high-fluoride area also had more children (21.6%) in the retardation or borderline categories of IQ than did the low-fluoride area (3.4%). In addition to studies on intelligence, other research on



humans has associated fluoride with problems in brain functioning.

It has been proven that fluoride has an adverse impact on pineal gland, which regulates sleep cycles, the onset of puberty, and other functions. Work from Dr. Jennifer Luke indicates that fluoride reaches one very important gland in the body, the pineal gland, at very much higher concentrations than 1 ppm. This small gland is almost at the geometrical center of the brain, between the two hemispheres. However, it is outside the blood brain barrier. It also has a very high supply of blood (a perfusion rate second only to the kidney) and it is a calcifying tissue, laying down crystals of calcium hydroxyapatite like the teeth and the bone. Because of these observations, Luke argued that one would expect the pineal gland to concentrate fluoride. When she had the pineal gland from 11 human corpses analyzed, she indeed found this to be the case. The levels of fluoride in the apatite crystals averaged about 9,000 ppm (and went as high as 21,000 ppm). The average level is as high as you would expect in the bones of someone afflicted with skeletal fluorosis. The average projected by Luke for the whole tissue was 300 ppm, well over the 1 ppm found to inhibit many enzymes. Fluoride inhibits some enzymes involved in free-radical metabolism and membrane functioning in the brain and in muscle. High concentration of fluoride and fluoride/iodine combined in drinking water can cause significant changes in the fatty acid composition of brain cells, with a significant decrease in the proportion of unsaturated fatty acid and an obvious increase in saturated fatty acid.

Luke next examined the effect of dosing Mongolian gerbils (the animal of choice for studying the pineal gland) with fluoride. She found that animals fed higher doses of fluoride had a significant decrease in their excretion of melatonin metabolite in their urine. She also found that the high dose fluoride animals took a shorter time to reach puberty. This is exactly what you would expect if melatonin production were lowered. If this result were confirmed by others it would make fluoride an environmental hormone or endocrine disrupter, a topic of intense discussion and review by regulatory agencies in the US and around the world.

Fluoride's effect on the human brain also extends to the fetus. An examination of 15 therapeutically aborted fetuses in the fifth to eighth month of gestation from a high-fluoride area documented a number of changes in the neurons, undifferentiated neuroblasts and mitochondria. The study concluded that chronic high-fluoride exposure during intrauterine life "may produce certain harmful effects on the developing brain of the fetus."

A number of animal studies also have linked fluoride to neurotoxic effects, such as impaired learning and memory abilities, suppression of spontaneous motor activity and poor performance in motor coordination and maze tests.

There is no dispute that too much fluoride damages teeth, actually making them more decay-prone. If fluoride is absorbed too frequently, it can cause teeth decay, osteoporosis, and harm to kidneys, bones, brain, nerves, and muscles.

The Safe Drinking Water Act (SDWA) regulates the amount of fluoride in the water supply, either ambient (organic calcium fluoride) or industrial fluoride (inorganic fluosilicic acid, sodium fluoride, etc.). EPA/SDWA regulations require industrial fluoridated water supplies to be monitored daily with ion selective electrodes, calorimetric (hydrogen titration), or complexion tests. These only determine the amount of fluorine contained in the water and not the accompanying contaminants; they do not take into consideration the bioaccumulation of fluorine/fluoride in plants, animals, and humans.

Approximately half of each day's fluoride intake will be retained by a healthy adult. This includes intake from all sources: food, air, water, dental products, etc. The fact that fluorides bioaccumulate in the body is the reason that US law requires the Surgeon General to set a *Maximum Contaminant Level* for fluoride content in public water supplies as determined by the EPA.

This requirement is specifically aimed at avoiding a condition known as Crippling Skeletal Fluorosis, a disease known to progress through three stages. The Maximum Contaminant Level, designed to prevent only the third and crippling stage of this disease, is set at 4ppm or 4mg per liter. It is assumed that people will retain half of this amount (2mg), and therefore 4mg per liter is deemed "safe". Yet a daily dose of 2-8mg is known to cause the third and crippling stage of Crippling Skeletal Fluorosis within 40 years. Furthermore, it has been proven that as little as 1 ppm of fluoride interferes with biological functions such as DNA repair enzyme activity and cause genetic and chromosomal damage.

In 1998, EPA scientists whose job and legal duty it is to set the *Maximum Contaminant Level* declared that this 4ppm level was set fraudulently by "outside forces" in a decision that omitted 90 percent of the data showing the mutagenic properties of fluoride.

All sides agree to the fact that healthy kidneys can eliminate only about 50% of daily fluoride intake. The rest gets stored mainly in calcified tissues, like bones and teeth, but also in soft tissue.

EPA/SDWA regulations do not take into consideration, that many research projects have highlighted how easy it is to absorb toxins through the skin. One study done in the 1980s, suggests that 64% of waterborne contaminants are taken in through the skin. It has been proven that we get 600 to 1000 times more chemical exposure from showering in hot contaminated water—than we do from all the contaminated water we drink each day.

The EPA/SDWA regulations do not incorporate the fluorine contamination (from the combustion of fossil fuel, certain industrial processes, and phosphate fertilizer) in our food supplies and exposure from bathing and swimming.

For instance, the long-continued application of phosphate fertilizers can also raise the toxic elements concentrations in irrigation runoff/drainage from fertilized lands, and, then, their application in agricultural soils constitute another source for workers and members of the public. One ounce @ 5.0% fluoride (about the amount used to fertilize one organic tomato plant as recommended by some organic growers) contains about 1.4 grams of fluoride, which is enough to kill a small child.

Additionally, fluorine/fluoride that is located in soils, fertilizers, and in irrigation water accumulates in many plants. The amount of uptake by plants depends upon the type of plant and the type of soil and the amount and type of fluorine/fluoride compounds found in the soil and water. With plants that are sensitive to fluorine/fluoride exposure, even low concentrations of fluorine/fluoride can cause leaf damage and a decline in growth. Too much fluorine/fluoride, whether taken in from the soil by roots, or absorbed from the atmosphere by leaves, retards the growth of plants, and reduces crop yields. Fluorine also attaches to fine ash particles, coats grass, and pollutes streams and lakes.

Tea leaves accumulate more fluoride (from pollution of water, soil, and air) than any other edible plant. Some seafood and fresh water fish have been found to have high levels of fluorides. In addition, water from fluoridated areas makes its way into processed foods and beverages. It is then consumed by people in fluoridated areas, as well as nonfluoridated ones.

Animals and humans that eat food that is high in fluorine/fluoride-containing animals, plants, and grasses bioaccumulate large amounts of these minerals in their bodies. Consequently, everyone in the United States is being exposed to potentially lethal concentrations of fluorine/fluoride.

Humans are constantly being exposed to aluminum via food, air, and water. Aluminum is also used in many drugs and public water treatment processes (as coagulants). Now add a little aluminum from antiperspirant deodorant, aluminum cookware, beverages from aluminum cans, baking powders, bleached flour, processed cheese, some table salts, some antacids, and breathing in dust when sanding with aluminum oxide sandpaper

The average adult probably takes in about 9 to 14 milligrams of aluminum each day from all exposure routes, but primarily (90 percent) from food, including food processed with aluminum-containing additives, food cooked in aluminum pans and food packaged in aluminum containers. In general, exposure to aluminum from drinking water is very low (below 3 percent).

Fluoride ions in the presence of trace amounts of aluminum are apparently able to act with powerful pharmacological effects.

Aluminum-induced impairment of mineralization has been related to a reduced extent

of active bone-forming surface. Aluminum toxicity in the presence of fluoride may involve physical-chemical inhibition of mineralization or altered cellular activity of osteoblasts. Fluoride exacerbates aluminum's inhibition of mineralization.

There are also several studies linking aluminum with fluoride, showing that the bioavailability of aluminum is increased in the presence of fluorides, causing aluminum in the brain to double in treated animals, neural injury, and increased deposits of [beta]-amyloid protein in the brain.

The fluoride/aluminum association is of particular importance as it relates to Alzheimer's disease. Aluminum by itself is not readily absorbed by the body. However, in the presence of fluoride ions, the fluoride ions combine with the aluminum to form aluminum fluoride, which is absorbed by the body. In the body, the aluminum eventually combines with oxygen to form aluminum oxide or alumina. Alumina is the compound of aluminum that is found in the brains of Alzheimer's disease.

Similar deposits have been associated with Alzheimer's disease, according to a report in Chemical & Engineering News. The researchers stated that while the small amount of fluoroaluminum complex needed to produce neurotoxic effects was surprising, "perhaps even more surprising" was the amount of sodium fluoride needed--2.1 ppm.

According to an October 28, 1992 Wall Street Journal Article about a study conducted by Varnier JA, et al.: "Rats fed the highest doses developed irregular mincing steps characteristic of senile animals. Post mortem examination of the rat brains disclosed 'substantial cell loss in structures associated with dementia -- the neo-cortex and hippocampus'." (Note: Alzheimer's disease, first diagnosed by Dr. Alois Alzheimer in 1907, is now the #4 killer for every person over 60 in the US. Every second person over 70 will develop Alzheimer's disease.)

All of the fluoride products used in the artificial fluoridation of water is contaminated with lead, arsenic, and radium:

- Lead is one of the most toxic elements naturally occurring on Earth. The chemical most commonly used to fluoridate America's drinking water is associated with an increase in children's blood lead levels, according to research being presented to the 17th International Neurotoxicology Conference. High concentrations of lead can cause irreversible brain damage, seizure, coma, and death.
- Arsenic in drinking water causes bladder, lung, and skin cancer, and may cause kidney and liver cancer; it harms the central and peripheral nervous systems, as well as heart and blood vessels, and causes serious skin problems; it can cause birth defects and reproductive problems.
- Exposure to high levels of radium may result in health effects, such as teeth

fracture, anemia, and cataract. When the exposure lasts for a long period of time radium may even cause cancer and the exposure can eventually lead to death.

Large numbers of U.S. young people—up to 80 percent in some cities—now have dental fluorosis, the first visible sign of excessive fluoride exposure, according to the U.S. National Research Council. The teeth are windows to what is happening in the bones. In recent years, pediatric bone specialists have expressed alarm about an increase in stress fractures among U.S. young people. Studies have found an association between fluoride and the rate of hip fractures among the elderly.

Osteosarcoma (malignant bone tumor), while rare, is the third most common form of cancer in children. The five-year mortality rate is around 50 percent, and nearly all survivors have limbs amputated, usually legs.

The overall weight of the evidence strongly supports the conclusion that exposure to fluoride in tap water during the mid-childhood growth spurt between ages 5 and 10 increases the incidence of osteosarcoma in boys ages 10 through 19. Fifty percent of ingested fluoride is deposited in bones, and fluoride stimulates bone growth in the growing ends of the bones where the osteosarcoma occurs. Fluoride is also a confirmed mutagenic agent in humans, which suggests that fluoride can cause genetic damage in bone cells where it is actively deposited, in this case precisely where the osteosarcoma arises.

High doses of fluoride have repeatedly been found to interfere with the reproductive system of animals. Commonly observed effects in fluoride-exposed animals include oxidative stress, damaged sperm, reduced sperm count, and reduced fertility.

Fluoride is a systemic poison. It diminishes the oxygen-carrying capacity of the blood, blocks enzyme activity, destroys bone growth, and poisons the bone marrow. As it settles into the lymph nodes, it cannot escape without a vigorous increase in circulation.

Some forms of fluoride are used in high concentrations to kill rats and crop-eating insects. Municipal employees who add fluoridation chemicals to public water systems must wear protective clothing and respirators. Industrial workers regularly exposed to fluorine, the gas form of fluoride, have suffered skin, lung, and gastrointestinal problems; it has even been fatal for some.

Children, women in childbearing age, the elderly, and any person with impaired liver or kidney function are in the high-risk group for fluoride poisoning and must be warned to monitor their fluoride intake. Also at high risk are people with immunodeficiency's, diabetes, and heart ailments, as well as anyone with iodine, calcium, magnesium, selenium, Vitamin C, and A deficiencies.

When dissolved in water, both chlorine and fluorine bind with other metal ions and pollutants. This forms yet another group of toxic chemicals called tri-halo-methanes, or

THMs. When you take that nice hot shower, you release these lethal chemicals as gases. This process is known as hydrolysis, meaning the chemical bonds have been broken or released by the water. Then as you breathe these gases, these poisons are free to form new bonds in your blood and lymph nodes.

Excess fluorine is a significant cause of death and injury. Acute fluoride poisonings have occurred at doses of 0.1 to 0.8 mg F/kg of body weight in the USA. Think of the trauma to our bodies from the synergistic affect of the fluoride in our food, fruit and vegetable juices, drinking water, and bathing water, and inhaling the fumes of the chemical fluoride as we shower.

Chlorine and fluoride are industrial waste products profitably disposed of into our water supply by the EPA, the Alkali Industry, and the International Fertilizer Industry Association. They bioaccumulate in the crops and animals we eat, they drug us down, they make us sick, now we are so sedated and brainwashed that we believe the their poisonous drugs will make us better, and the pharmaceutical companies get rich.

What do chemtrails, water pollution, food, and some toothpaste have in common? You guessed it. In fact, the exposure to the metal is reaching epidemic proportions. Chemtrails contain Aluminum (a metal associated with Alzheimer's disease) and Barium (a radioactive substance). Aluminum compounds are frequently added to the water supply as clarifying agents.

Don't worry, unless you are bothered by genocide or feeling fat, fuzzy, frazzled, fatigued, forgetful, depressed, ignorant, beset by intolerance to heat or cold, annoyed by problems with skin-hair-nails, or suffering with severe arthritis, osteopenia, osteoarthritis, constipation, low libido, infertility, or uncomfortable menopause.



## **SEDATED & DOCILE**

Lithium is an element that is a product of mining. Lithium occurs naturally in soil and rock. Lithium is used in many products such as batteries, glass, ceramic, greases, lubricants, concrete and cementitious systems, in pesticides, insecticides, herbicides, fungicides, molluscicides, and microbiocides. It is also used as an initiator and catalyst for polymer applications. The chemical, lithium, is a sedative used to treat bipolar disorders. Its potential impact on human health includes kidney toxicity and neurotoxicity.

The United States is the greatest world producer and consumer of lithium, but the U.S. does not publicize its statistics of production and consumption so these statistics are unavailable. (Of the lithium produced globally in 2004, perhaps 254,000 metric tones, the United States' apparent consumption was about 50 %.)

Lithium is not an essential nutrient. It has been proven effective in reducing overaggressive behaviors when provided at massive pharmacologic dosages. However, even a relatively tiny daily lithium intake from municipal water supplies and food has been found to be negatively correlated with measures of the aggressive behavioral syndrome. There is also some evidence that overaggressive behaviors may be promoted by the joint toxic effects of aluminum, cadmium, and lead.

Lithium appears to play an especially important role in early fetal development as evidenced by the high lithium contents of the embryo during the early gestational period. The biochemical mechanisms of lithium appear to be multifaceted; they are correlated with the functions of several enzymes, hormones and vitamins, as well as with growth and transforming factors.

As with many salts, lithium accumulates in produce and plants. Moreover, lithium accumulates in marine animals, algae, vegetables, fruit, and tobacco leaves. Water, fish, seaweed, grains, fruit, and vegetables are the primary dietary sources of lithium exposure for humans.

Lithium accumulates in cerebral white matter. Acute lithium neurotoxicity has various clinical manifestations such as delirium with disorientation, fluctuating levels of consciousness, and hallucinations (visual, auditory, tactile), extrapyramidal syndromes with rigidity and other Parkinsonian features, corticospinal dysfunction with weakness, increased tone, hyperreflexia, and extensor plantar responses.

The Environmental Working Group's analysis of lithium tests reported by 10 public water suppliers in two states shows that between 1998 and 2003, 21.1 million people in five communities drank water contaminated with Lithium. No health-based limit has been established by the federal government. Lithium remains unregulated in tap water, without a maximum legal limit. Lithium was found in water up to 296.97 ppb.



Water suppliers reporting tests for lithium (1998-2003): 10 of 39,751.

Bromine is a heavy, volatile, corrosive, reddish-brown, nonmetallic liquid element, which has a highly irritating vapor. It is used in producing gasoline antiknock mixtures, fumigants, dyes, and photographic chemicals. Bromide is a binary compound of bromine with another element, i.e. potassium, silver, lithium, etc. Bromide and bromine are sedatives.

Lithium bromide (lithium and bromine) is mainly used as an absorbent, a refrigerant, an organic fiber sweller, a coolant in air conditioning systems, a dehydrochlorinating agent, as a catalyst in medical use, and in the manufacturing of pesticides. Lithium bromide was also used as a sedative beginning in the early 1900's, but it fell into disfavor in the 1940's when some heart patients died after using it as a salt substitute.

Bromacil Lithium Salt is one of a group of compounds called substituted uracils. These materials are broad-spectrum herbicides used for nonselective weed and brush control on non-cropland, as well as for selective weed control on a limited number of crops, such as citrus fruit and pineapple. The herbicide is preferably sprayed or spread dry on the soil surface just before, or during, a period of active weed growth. In plants, Bromacil is taken up rapidly by the roots and slightly absorbed through the leaves.

The 2005, data for the use of Bromacil Lithium Salt for Ventura County, California, was incomplete, but it was estimated that the total 2005 use for Ventura County was underreported by 500,000 pounds.

The Environmental Working Group is a non-profit organization which tests for toxic contaminants. The mission of the Environmental Working Group is to use the power of public information to protect public health and the environment.

An Environmental Working Group analysis of tests reported by 2,555 public water suppliers in 4 states shows that between 1998 and 2003, 3,812 people in 9 communities drank water contaminated with Bromacil. Bromacil remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for Bromacil (1998-2003): 2,555 of 39,751, which translates to 37,196 water suppliers failed to report any Bromacil tests at all. Bromacil was found in water up to 2.27 ppb.

Bromate is a byproduct of drinking water disinfection. Bromide is found in most water supplies. It contributes to the formation of toxic tap water byproducts when used to remove chlorine from water. It is also a component of crude oil extraction brines, and is used in making fumigants, flame proofing agents, dyes, and sanitizers. Bromate is a sedative.

Methyl bromide, the fumigant now widely used in agriculture throughout the world, has been declared to deplete the ozone layer. Exposure to methyl bromide may cause one

or more of the following symptoms: dizziness, headache, blurred vision, a general tiredness in body or mind, staggering gait (behaving like a drunken person), slurred speech, nausea, vomiting, loss of appetite, and abdominal pains. Bromide accumulates in crops, plants, animals, and humans. Methyl bromide is a sedative.

The scientific community decided in the 1960s that we have been consuming too much iodine. Subsequently, they advised the baking industry to replace the iodinate with bromate. For over 75 years, doctors have known this bromine is toxic. This is why Broma-Seltzer and Dr. Miles' Nervine that were used as sedatives are no longer available. However, we are still invaded by bromine for it is used as an antibacterial in pools and hot tubs, pesticides, and as a fire retardant (rugs, drapes, upholstery).

Potassium bromate is typically used as a flour improver, strengthening the dough and allowing higher rising. It is an oxidizing agent, and under the right conditions, will be completely used up in the baking of bread. However, if too much bromate is added or if the bread is not cooked long enough or not at a high enough temperature, then a residual amount will remain, which may be harmful if consumed.

Potassium bromate may also be used in the production of malt barley where the United States FDA has prescribed certain conditions where it may be used safely, which includes labeling standards for the finished malt barley product. Potassium bromate is a very powerful oxidizer. Bromate is considered a category 2B (possibly carcinogenic to humans) carcinogen. It competes with iodine on their common receptor.

Brominated vegetable oil (BVO) is vegetable oil that has had atoms of the element bromine bonded to it. Brominated vegetable oil is used as an emulsifier in Mountain Dew, Pepsi, Gatorade, Sundrop, Squirt, Fresca, and many other citrus-flavored drinks to help natural citrus flavors stay suspended in the drink and produce a cloudy appearance.

A Pepsi product website notes that BVO has been used by the soft drink industry since 1931. Brominated vegetable oil is a widely used food additive that has been extensively tested and approved by the U.S. Food & Drug Administration. Despite the fact that in test animals, BVO consumption has caused damage to the heart and kidneys in addition to increasing fat deposits in these organs. In extreme cases, BVO has caused testicular damage, stunted growth, and produced lethargy and fatigue.

Even after human consumption of BVO is stopped, traces remain in the body fat. Bromine is a halogen that displaces iodine and may well be a significant contributor to teenage obesity and psychosis, given the rate of consumption by teenagers. *More than 100 countries ban BVO for its adverse health effects.*

Bromism: A disease caused by chronic exposure to bromine or one of its compounds. Bromism may cause protean symptoms, particularly mental dullness, confusion,

impairment of memory and concentration, disinhibition, self-neglect, depression, a transitory state, hallucinations, seizures, cerebral atrophy, tremors, ataxia, blurring of vision, loss of peripheral vision, slurred speech, stupor, tendon reflex changes, muscular weakness, extensor plantar responses, skin eruptions, acute irritability, violent tendencies (especially at night), and possibly endocrine effects.

The Environmental Working Group's analysis of Bromide tests reported by 147 public water suppliers in nine states shows that between 1998 and 2003, 31.3 million people in 115 communities drank water contaminated with Bromide. No health-based limit has been established by the federal government. Bromide remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for Bromide (1998-2003): 147 of 39,751. Bromide was found in water up to 40000 ppb.

The Environmental Working Group analysis of Bromate tests reported by 73 public water suppliers in 16 states shows that between 1998 and 2003, 3.9 million people in 20 communities drank water contaminated with Bromate. In 11 of these communities, tap water was contaminated at levels above health-based thresholds. Water suppliers reporting tests for Bromate (1998-2003): 73 of 39,751. Bromate was found in water up to 19 ppb.

Bromodichloromethane is a disinfection by-product. Potential health impacts associated with Bromodichloromethane include cancer, cardiovascular or blood toxicity, gastrointestinal or liver toxicity, kidney toxicity, and neurotoxicity.

An Environmental Working Group analysis of Bromodichloromethane tests reported by 26,868 public water suppliers in 41 states shows that between 1998 and 2003, 147 million people in 9,966 communities drank water contaminated with Bromodichloromethane. In 7,298 of these communities, tap water was contaminated at levels above 1600 ppb. Water suppliers reporting tests for Bromodichloromethane (1998-2003): 26,868 of 39,751. Bromodichloromethane is a sedative.

Chlorine was originally a waste product of alkali manufacture, but as the 20th century progressed, it found many new uses. Chloral hydrate is formed when drinking water is disinfected with chlorine. The major route of exposure to the public is from drinking water. Chloral hydrate is also formed when chlorine reacts with humic acids. Humic Acid is also referred to as "humic substances" and is used as soil conditioners, soil supplements, and fertilizer amendments. A typical concentration of chloral hydrate in a public water supply in the USA is 5 µg/litre.

Chloral hydrate has been widely used as a sedative and hypnotic drug in adult and pediatric medicine. Chloral hydrate is used as an intermediate in the synthesis of the insecticides DDT, methoxychlor, naled, trichlorfon, and dichlorvos and the herbicide trichloroacetic acid.

In 1991, Newman & Wackett reported the transformation of chloral hydrate to trichloroethanol and trichloroacetic acid by methanotrophic bacteria. These

investigators also reported the abiotic breakdown of chloral hydrate to chloroform and formic acid. Chloroform is also a sedative.

In 1992, scientists exposed four female CD-1 mice to chloral hydrate for 6 hours at a concentration of 100 ppm (603 mg/m<sup>3</sup>). This exposure by inhalation induced deep anesthesia in all four mice.

The *Maximum Contaminant Level* of trihalomethanes including chloroform is 300 ppb. Trihalomethanes are chemical compound containing three halogen atoms substituted for the three hydrogen atoms normally present in a methane molecule. It can occur in chlorinated water as a result of reaction between organic materials in the water and chlorine added as a disinfectant.

Lithium, bromine compounds, chloral hydrate, and chloroform may be habit-forming. Prolonged use may result in psychic and physical dependence. Tolerance and psychological dependence may develop by the second week of continued administration.

Benzene is a chemical from factory pollution, leaching landfills, and gas storage tanks. The substituted benzene pesticides are a group of fungicides with a wide range of uses. Applications are made as treatments to seed, soil, and the foliage of vegetables and field crops, flowers, bulbs, and turf grass. Potential health impacts associated with Benzene include cancer, cardiovascular or blood toxicity, developmental toxicity, endocrine toxicity, gastrointestinal or liver toxicity, immunotoxicity, neurotoxicity, reproductive toxicity, respiratory toxicity, and skin sensitivity.

An Environmental Working Group analysis of Benzene tests reported by 31,920 public water suppliers in 42 states shows that between 1998 and 2003, 1.7 million people in 200 communities drank water contaminated with Benzene. In 116 of these communities, tap water was contaminated at levels above health-based thresholds. Water suppliers reporting tests for Benzene (1998-2003); 31,920 of 39,751. In 7,298 of these communities, tap water was contaminated at levels up to 86 ppb.

Benzene soluble alkaloid fraction showed sedative activity at very low doses. Benzene reacts with chlorine, which creates chlorobenzene. Chlorobenzene is a sedative and a hypnotic.

To add insult to injury, the Food and Drug Administration (FDA) learned that popular soft drinks contained two types of ingredients, ascorbic acid (Vitamin C) and benzoate preservatives (sodium benzoate and potassium benzoate), which when combined, form the potent sedative and carcinogenic benzene. Many soft drinks, fruit juices, water beverages, etc. contain benzene at levels higher than safe limits set for drinking water. Benzene was found up to 17 times the EPA Drinking Water Standard at 87.9 ppb.

In spite of this knowledge and the clear health threat presented by benzene in popular

beverages, the agency did not inform the public of its findings, instead, the Agency suppressed the information and asked soft drink manufacturers to solve the problem on their own (which has not been done).

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, Arsenic is combined with oxygen, chlorine, and sulfur to form inorganic Arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic Arsenic compounds. A small dose of arsenic has a sedative effect; a large dose acts as a stimulant.

Arsenic was one of the primary ingredients in pesticides before synthetic organic pesticides were available. Chickens are fed organic arsenic compounds to control infections and increase weight gain. Consequently, arsenic ends up in the chicken litter, which contaminates ground water and the chicken litter is often spread on fields as a fertilizer. Arsenic is put in fertilizer products and potting soils. The main sources of arsenic are coal burning atmospheric disposition, sewage sludge disposal into soil, animal manure application, and fertilizer application.

Data compiled by the U.S. Environmental Protection Agency on arsenic in drinking water in 25 states found conservative estimates indicate that more than 34 million Americans drink tap water supplied by systems containing average levels of arsenic that pose unacceptable cancer risks. We consider it likely that as many as 56 million people in those 25 states have been drinking water with arsenic at unsafe levels—and that is just the 25 states that reported arsenic information to the EPA.

Arsenic poisoning kills by allosteric inhibition of essential metabolic enzymes, leading to death from multi-system organ failure. It particularly affects the brain, causing neurological disturbances and death.

Additionally, lithium, bromate, bromine, bromide, chlorine, chloral hydrate, chloroform, arsenic, benzene, chlorobenzene, fluoride that is located in soils, phosphate fertilizer, pesticides, insecticides, herbicides, fungicides, molluscicides, and microbiocides bioaccumulate in plants and water.

We have also identified over 100 Neurotoxins found in water in the United States. Many of these are also sedatives alone or in combinations with other chemicals in which we are exposed. Animals and humans that drink this water, bathe in this water, and eat toxin-containing animals, plants, and grasses bioaccumulate large amounts of these toxins in their bodies. Consequently, everyone in the United States is being exposed to highly sedating and potentially lethal concentrations of these toxins.

Perfluoroalkyl sulfonate (PFAS) is a generic term used to describe any fully fluorinated carbon chain length sulfonate. The insecticide, lithium perfluorooctane sulfonate, is highly toxic to honey bees. It appears that Colony Collapse Disorder (which is killing the bees) is caused by acute lithium, bromate, bromine, bromate, chloral hydrate,



arsenic, benzene, and fluoride poisoning which induces delirium and disorientation in the bees.

Putting chlorine, bromine, and fluoride in the water supply means the intentional poisoning of peoples' bodies and minds. Dumping scores of sedating chemicals all over the world is a way to dumb down the entire world into accepting without question all human-rights-eroding political changes.

A German concern, Bayer Pharmaceuticals, commercially developed heroin, and from 1898 to 1910 marketed heroin as a non-addictive morphine substitute and cough medicine for children. Bayer, with the help of Justus von Liebig, a chemist known as the *Father of the Fertilizer Industry* and the *Chemical Gatekeeper*, is now the world leader in producing insecticides. Bayer also makes health care products, (prescription pharmaceuticals), OTC drugs, agricultural products, and plastics. This Bayer name is inseparably associated with the Polycarbonates Business Unit (BU PCS). The BU PCS contributes a quarter of Bayer Material Science's total sales, and ranks second on the world market in the production of polycarbonates.

Who among us has not taken a Bayer aspirin for pain? Aspirin, like all other drugs, is a poison. At the end of the 19th century, aspirin started being produced on an industrial scale by Bayer and aspirin soon became a widely used painkiller. In the late 1960s, it was found that a single dose of aspirin irreversibly inhibits the normal aggregation of platelets by suppressing the cyclooxygenase mediated synthesis of thromboxane A<sub>2</sub>. The effect of aspirin persists until newly formed platelets have been released; their biological lifespan is about nine days.

In 1954, Bayer joined Monsanto chemical Company to form Mobay to market polyurethanes. The Monsanto Company is a multinational agricultural biotechnology corporation. It is the world's leading producer of the herbicide glyphosate. Monsanto is also by far the leading producer of genetically engineered (GE) seed, holding 70%–100% market share for various crops. In March 2005, it finalized the purchase of Seminis Inc, making it also the largest conventional seed company in the world. In 2000, Monsanto merged with Pharmacia and Upjohn.

The end of the Cold War has not brought about world peace; we have seen only the end of one conflict and the beginning of a new one. This new conflict is a global economic war in which spies and new technologies play an important role in determining the final victor. Our very lives are in the hands of scientists, chemists, and multinational corporations.

As Nikita Khrushchev once said,  
“What the scientists have in their briefcases is terrifying.”

## **A FRACTIONAL DAMAGE ASSESSMENT**

Severe health problems arising from human contact with toxic or hazardous wastes are increasingly common. The seriousness of this problem cannot be underestimated in light of findings from the World Health Organization (WHO) who revealed that 60-80% of heavy metal toxins found in human bodies in urban industrial areas were the result of consuming contaminated foods and water rather than through air pollution. Many of these hazardous materials are a result of acid rain excessively releasing minerals from soils and rocks; others are industrial byproducts.

### MERCURY

Mercury occurs primarily in two forms: organic mercury and inorganic mercury. Inorganic mercury and elemental mercury are both toxins that can produce a wide range of adverse health effects. Inorganic mercury is used in thermometers, barometers, dental fillings, batteries, electrical wiring and switches, fluorescent light bulbs, pesticides, fungicides, vaccines, paint, skin-tightening creams, antiseptic creams, pharmaceutical drugs, and other ointments.

Humans have the ability to convert this inorganic mercury to an organic form once it has become absorbed into the bloodstream. Organic mercury is known to bioaccumulate due to the body's inability to process and eliminate it. Rain is contaminated with mercury from coal-fired electric plants and the burning of fossil fuel. Mercury is one of the heavy metals that cause dangerous inflammation in body tissues. Acidification increases bioconversion of mercury to methylmercury; methylmercury is a neurotoxin, and the form of mercury that is most easily bioaccumulated in organisms.

Methyl mercury compounds, such as dimethyl mercury, are among the most dangerous. Mercury salts released into the environment may frequently be converted by anaerobic bacteria into such compounds, which can then be carried through the food chain to humans. Methylmercury exposure via food most often occurs when seafood-containing mercury is eaten, or when mercury-containing plants, such as rice, leafy vegetables, non-leafy vegetables, and pasture grasses are consumed. Organic mercury is often found in produce, farm animals, processed grains, dairy products, and surface water sources.

Potential health impacts associated with mercury include cancer, cardiovascular or blood toxicity, developmental toxicity, endocrine toxicity, gastrointestinal or liver toxicity, immunotoxicity, kidney toxicity, neurotoxicity, reproductive toxicity, respiratory toxicity, and skin sensitivity.

Occupational exposure to mercury containing compounds presents a significant health risk to individuals. Dentists, painters, fishermen, electricians, farmers, factory workers,



miners, chemists, beauticians, and pharmaceutical/laboratories workers, are just some of the professions chronically exposed to mercury compounds.

An Environmental Working Group analysis of mercury tests reported by 28,299 public water suppliers in 40 states shows that between 1998 and 2003, 18.5 million people in 1,298 communities drank water contaminated with mercury. In 37 of these communities, tap water was contaminated at levels above health-based thresholds. California, Wisconsin, Florida, and Michigan were the worst.

Environmental Health Perspectives found that 89 percent of their female patients had mercury levels above what most scientists consider safe, and that high mercury levels in adults correlated with memory loss, fatigue, and muscle aches. Another preliminary study this year found that mothers who delivered prematurely were more likely to have high mercury levels.

Unborn babies are at the greatest risk. Babies developing in the womb seem to be most vulnerable to the effects of mercury on their brains and nervous systems. Mercury is poisoning an entire generation of our nation's children.

People with amalgam are exposed to from tens to several hundreds of micrograms of mercury per day depending on how many fillings are in their mouth, how old the fillings are, how much a person brushes their teeth, chews and eats, the bacteria count in the mouth, and even the temperature of the body. Mercury from amalgam fillings has been shown to be neurotoxic, embryotoxic, mutagenic, teratogenic, immunotoxic, and clastogenic. It is capable of causing immune dysfunction and autoimmune diseases.

## CADMIUM

The poisonous heavy metal cadmium has no constructive purpose in the human body. It, and its compounds, are extremely toxic even in low concentrations, and will bioaccumulate in organisms and ecosystems.

Cadmium emissions arise from two major source categories, natural sources and anthropogenic (man-made) sources. Emissions occur to the three major compartments of the environment—air, water, and soil, but there may be considerable transfer between the three compartments after initial deposition.

Man-made cadmium emissions arise either from the manufacture, use and disposal of products intentionally utilizing cadmium, or from the presence of cadmium as a natural but not functional impurity in non-cadmium containing products. Cadmium (for industrial use) is produced in large quantities, over 8 million metric tons in 1999. Cadmium generated by metal smelters/refiners is cemented and buried, stored for future use, or disposed of in landfills as hazardous waste. Cadmium is also found in galvanized pipe corrosion, natural deposits, batteries, and paints.

Some sources of phosphate in fertilizers contain rather high concentrations of cadmium, which leads to increased concentration of cadmium in soils and water supplies.

Cadmium poses a major concern to food safety because it is taken up relatively easily by crops. What makes cadmium unique is that it is not toxic to plants at concentrations of concern to human health. Consumption of crops is the main source of human exposure at approximately 75%. Grains, leafy greens, and root crops are associated with elevated levels of cadmium.

Cadmium accumulates in the body. Although a person's daily intake may be as little as 0.05 milligrams, he or she will have stored, on average, about 50 milligrams. Cadmium is a poison and is known to cause birth defects, cancer, and kidney damage. Cadmium can also settle into arteries, raising blood pressure and resulting in atherosclerosis. It can stay in one's body for years and can change forms within the body.

Cadmium accumulates in the thyroid, kidney, liver, and pancreas--all areas that seem to be involved in thyroid disease.

Not only does cadmium appear to play a very pivotal role in thyroid disease, it is a very unique mineral. It is extremely toxic and has toxic biological effects at concentrations smaller than almost any commonly found mineral.

Cadmium appears to be the largest single contributor to autoimmune thyroid disease. Cadmium antagonizes copper—decreasing copper levels—copper is essential for the conversion of progesterone to estrogen.

Alcohol increases cadmium uptake into the body and have a combined stronger effect in decreasing copper and zinc levels. This demonstrates the danger of combined smoking and drinking in damaging the thyroid.

Exposure to heavy metals such as cadmium and mercury is of immediate environmental concern. Evidence indicates that acute heavy metal lethality of cadmium and mercury will induce immediate hyperthyroidism.

Cadmium interferes with the metabolism of copper, iron, calcium, zinc, and vitamin D. An Environmental Working Group analysis of cadmium tests reported by 28,944 public water suppliers in 41 states shows that between 1998 and 2003, 9.5 million people in 1,364 communities drank water contaminated with cadmium. In 1,040 of these communities, tap water was contaminated at levels above health-based thresholds.

Other sources of cadmium that should be restricted to lower cadmium levels are: all green leafy vegetables such as lettuce and spinach, carrots, liver and kidney, milled flour, rice, sugar, milk and other dairy products (contact with galvanized milk cans which contain cadmium), dried fruits (often dried on galvanized chicken wire, which contains zinc and cadmium), coffee, and tea.

## ARSENIC

According to a 1999 study by the National Academy of Sciences, arsenic in drinking water causes bladder, lung, and skin cancer, and may cause kidney and liver cancer. The study also found that arsenic harms the central and peripheral nervous systems, as well as heart and blood vessels, and causes serious skin problems. It can cause birth defects and reproductive problems.

Arsenic is a natural element of the earth's crust. It is used in industry and agriculture, and for other purposes. It also is a byproduct of copper smelting, mining, and coal burning. U.S. industries release thousands of pounds of arsenic into the environment every year.

The use of this toxic element in numerous industrial processes has resulted in its presence in many biological and ecological systems. Ground, surface, and drinking water are susceptible to arsenic poisoning from the use of arsenic in smelting, refining, galvanizing, and power plants; environmental contaminants like pesticides, herbicides, insecticides, fungicides, desiccants, wood preservatives, and animal feed additives; and human made hazardous waste sites, chemical wastes, and antibiotics.

Arsenic suppresses iodine and selenium. It is a carcinogen that inactivates sulfhydryl groups in enzymes leading to cell death, increases bleeding time, reduces thyroid hormone production by interfering with iodine metabolism, and depresses bone marrow involved in methionine metabolism. Low serum arsenic is correlated with central nervous system disorders, vascular disease, and cancer.

Some plants are arsenic-resistant or can block arsenic uptake by their root systems. Still other food crops bioaccumulate arsenic at levels that raise human health concerns. Since plants take up arsenic primarily by their roots, the highest level of arsenic accumulation is usually in roots and tubers, such as carrots and potatoes.

Studies have shown close associations between both inhaled and ingested arsenic and cancer rates. Cancers of the skin, liver, respiratory tract, and gastrointestinal tract are well documented in regards to arsenic exposure.

Arsenic poisoning kills by allosteric inhibition of essential metabolic enzymes, leading to death from multi-system organ failure. It primarily inhibits enzymes that require lipoic acid as a cofactor, such as pyruvate and alpha-ketoglutarate dehydrogenase. Because of this, substrates before the dehydrogenase steps accumulate, such as pyruvate (and lactate). It particularly affects the brain, causing neurological disturbances and death.

## LEAD

Lead is the fifth most utilized metal in the U.S. Human exposure to lead occurs

primarily through drinking water, airborne lead-containing particulates, and lead-based paints. The primary source of lead in drinking water is from lead-based plumbing materials. The corrosion of such materials will continue to increase concentrations of lead in municipal drinking water. The EPA actually allows small amounts of lead to be present in our tap water due to this insurmountable problem. Grounding of household electrical systems to plumbing may also exacerbate corrosion. Corrosion of plumbing is by far the greatest cause for concern. All water is corrosive to metal plumbing materials to some degree.

Lead from water and airborne sources have been shown to bioaccumulate in agricultural areas leading to increased concentrations in agricultural produce and farm animals. Cigarette smoke is also a significant source of lead exposure.

A certain amount of lead is always in our bodies because of the background presence of lead in food, water, and sources in the soil. The EPA estimates that drinking water can make up 20 percent or more of a person's total exposure to lead. Atmospherically derived lead is a widely distributed contaminant that can inhibit a range of essential ecosystem processes in soils. Lead has made its way into food, animals, and humans.

Because of the possibility of permanent impairment, lead poisoning is particularly dangerous during the critical development periods of infants and young children under the age of 7 years. Young children, those 6 years and younger, are at particular risk for lead exposure because they have frequent hand-to-mouth activity and absorb lead more easily than do adults. Children's nervous systems are still undergoing development—they are more susceptible to the effects of toxic agents. Lead is also harmful to the developing fetuses of pregnant women.

Lead in drinking water is a significant contributor to overall exposure to lead, particularly for infants whose diet consists of liquids made with water, such as baby food or formula.

Lead is one of the most toxic elements naturally occurring on Earth. High concentrations of lead can cause irreversible brain damage, seizure, coma, and death if not treated immediately. Evidence suggests that lead may cause fatigue, irritability, memory problems, reduction in sensory and motor reaction times, decision-making impairment, and lapses in concentration. In adults, lead is very detrimental to the cardiovascular system. Occupationally exposed individuals tend to have higher blood pressure and are at an increased risk for cardiovascular disease, myocardial infarction, and stroke. The kidneys are targets of lead toxicity and prone to impairment at moderate to high levels of lead concentrations. Other signs/symptoms of lead toxicity include gastrointestinal disturbances, abdominal pain, cramps, constipation, anorexia and weight loss, immunosuppression, and some liver impairment. Lead can affect almost every organ and system in our body.

No safe blood lead level in children has been determined. Children absorb lead much more efficiently than adults do after exposure and are susceptible to the most

damaging effects of lead toxicity. Lead not only appears to affect cognitive development of young children but also other areas of neuropsychological function. Low levels of lead in blood have been associated with reduced IQ and attention span, learning disabilities, poor classroom performance, hyperactivity, behavioral problems, impaired growth, and hearing loss. Very high blood lead levels can cause severe neurological problems such as mental retardation, coma, convulsions, and even death. Lead has been determined by many health experts to be the #1 threat to developing children in our industrial societies.

The most sensitive is the central nervous system (brain), particularly in children. Lead also damages kidneys and the reproductive system. The effects are the same whether it is breathed or swallowed.

An Environmental Working Group analysis of lead tests reported by 21,997 public water suppliers in 35 states shows that between 1998 and 2003, 50.4 million people in 7,942 communities drank water contaminated with lead. In 2,275 of these communities, tap water was contaminated at levels above health-based thresholds.

## IRON

Inorganic iron is one of the most troublesome elements in water supplies. Making up at least 5 percent of the earth's crust, iron is one of the earth's most plentiful resources. Acidic rainwater as it infiltrates the soil and underlying geologic formations excessively dissolves and oxidizes iron, causing it to seep into aquifers that serve as sources of groundwater for wells. This is one reason that there is a high prevalence of increased iron stores in the general population of western countries.

Inorganic iron is almost indigestible. When people suffering from anemia are given supplements of inorganic iron, these supplements are poorly absorbed in the gut and can have many unpleasant side effects.

Iron in the diet comes either from water and plant sources inorganic iron (non-haem iron) or organic iron (haem iron) found in the flesh of animals, shellfish, and fish. Haem iron is absorbed around five times more efficiently than inorganic iron and this is why red meat is better at preventing anemia than inorganic iron from plant sources.

Excess iron accumulates in the pancreas and causes tissue injury. Iron affects glucose metabolism. Iron stores are associated with insulin sensitivity, insulin secretion, and insulin resistance. High iron causes excessive sodium retention. Tissue iron excess contributes to produce and amplify the injury caused by free radicals as well as to modulate various steps involved in the inflammatory lesion. It should not be ignored that chronic inflammation could contribute, to some extent, to increased ferritin concentration. Cobalt competes effectively with iron for uptake.

## CHROMIUM

Chromium is abundant in the earth's crust and is widely dispersed in the environment. It is used extensively in refractory materials and chemicals, as a plating to produce hard and smooth surfaces, to prevent corrosion, and in manufacturing stainless and alloy steels. Major atmospheric emissions of chromium arise from metal producing industries, coal-fired plants, municipal incinerators, and cooling towers.

Chromium-6 or Hexavalent chromium is an inorganic chemical that can be toxic. Chromium-6 has been in the news lately because it has been found in groundwater due to industrial contamination. It was the focus of the popular movie Erin Brockovich.

Hexavalent chromium in the workplace is suspected of being carcinogenic. Excessive exposure to dusts or mists of hexavalent chromium compounds produces dermatitis, skin lesions, and ulceration and perforation of the nasal septum, as well as liver and kidney damage. With long-term exposure to hexavalent chromium compounds, incidence of human lung cancer increases.

An Environmental Working Group analysis of hexavalent chromium tests reported by 1,111 public water suppliers in 3 states shows that between 1998 and 2003, 33.4 million people in 519 communities drank water contaminated with hexavalent chromium.

## BARIUM

Barium is a heavy metal released into the air by human activities, mainly barium mines, metal production facilities, and industrial boilers that burn coal and oil. When coal and oil are burned to generate electricity, an ash is produced which contains more than 99% of their barium content. Barium released into the soil and water comes from copper smelters and oil drilling waste disposal sites. Industries reporting to the U.S. Environmental Protection Agency (EPA) released 159 tons of barium into the environment in 1995. More than half was released to the soil. Some foods, such as Brazil nuts, seaweed, fish, and certain vegetables, may contain high amounts of barium.

Barium and barium compounds are used for many commercial processes. Barium sulfate is mined and used in oil and gas production, medical procedures, and the manufacture of paints, bricks, tiles, glass, and rubber. Other barium compounds are used in the manufacture of ceramics, pesticides, and oil and fuel additives. In addition, physicians often instruct their patients to swallow a barium compound solution as part of certain medical test procedures.

An Environmental Working Group analysis of barium tests reported by 29,280 public water suppliers in 41 states shows that between 1998 and 2003, 147 million people in 20,626 communities drank water contaminated with barium.



Barium interferes with natural immune system functioning. Barium compounds are extremely poisonous. At low doses, barium acts as a muscle stimulant, while higher doses affect the nervous system, causing cardiac irregularities, tremors, weakness, anxiety, dyspnea, and paralysis. This may be due to its ability to block potassium ion channels that are critical to the proper function of the nervous system.

*As barium weakens the immune systems of the masses, we should expect to see statistically significant increases in various diseases that might normally be minimally occurring in a population with a fully activated immune system.*

## BERYLLIUM

Beryllium is a metal from metal refineries, coal burning, and pollution from electrical, aerospace and defense industries. Potential health impacts associated with beryllium include cancer, cardiovascular or blood toxicity, gastrointestinal or liver toxicity, immunotoxicity, kidney toxicity, reproductive toxicity, respiratory toxicity, and skin sensitivity.

An Environmental Working Group analysis of beryllium tests reported by 29,913 public water suppliers in 41 states shows that between 1998 and 2003, 6.9 million people in 720 communities drank water contaminated with beryllium.

## MOLYBDENUM

Molybdenum is a by-product of copper and tungsten mining. It is used as an alloy for various metals, and it occurs naturally in soil and rock. It is mobile in plants and in soil. It is less available in soils with a lower pH. Acid-leached forest and sandstone soils are generally low in molybdenum. Acid rain causes molybdenum to be released from the soil, which contaminates our water and food supply.

Plants can, under certain conditions bioaccumulate large concentrations of molybdenum. Molybdenum uptake by plants increases with increased soil pH. Potential health impacts associated with molybdenum include neurotoxicity and reproductive toxicity. *Molybdenum can cause acute clinical disease and subsequent death by interfering with copper metabolism.*

An Environmental Working Group analysis of molybdenum tests reported by 1,183 public water suppliers in nine states shows that between 1998 and 2003, 24.6 million people in 134 communities drank water contaminated with molybdenum. In 84 of these communities, tap water was contaminated at levels above health-based thresholds. Molybdenum remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for molybdenum (1998-2003): 1,183 of 39,751.

## PHOSPHOROUS

Phosphorus is a component of fertilizer and manure, and a pollutant in municipal wastewater discharges. Potential health impacts associated with phosphorus include cardiovascular or blood toxicity, gastrointestinal or liver toxicity, kidney toxicity, musculoskeletal toxicity, neurotoxicity, reproductive toxicity, respiratory toxicity, and skin sensitivity. Organic phosphate fertilizers contain radionuclides (such as radium, radon, radioactive lead, polonium, thorium, etc), toxic metals, and fluorine.

Phosphate in organic phosphate fertilizers is manufactured from phosphate rocks and, according to their origin, may contain various heavy metal micronutrients (cobalt, copper, iron, manganese, molybdenum, nickel, zinc), fluorine, and heavy metals considered toxic (arsenic, aluminum, beryllium cadmium, lead, mercury, and vanadium) (Camelo et al., 1997 and Mirlean et al., 2001). The build up of toxic heavy metals and fluorine in soils as a result of continuous application of phosphate fertilizers has never been mentioned to the general public.

Depending on geographic location where the phosphate rock is mined, it can contain from 50 - 200 ppm of uranium. Phosphate rock is the major source of 'yellow cake' (uranium oxide) for nuclear weapons and the nuclear power industry. Where there is uranium in natural rock formations, there will also be all its carcinogenic decay rate products; such as radium, radon, radioactive lead, polonium, thorium, etc.

The tailings from phosphoric acid production (phosphate fertilizer), and phosphogypsum, are so radioactive that they are not allowed to be used for wall-board or road beds, in the US and Canada, because they are considered a radiation hazard. However, organic growers are allowed to treat their fields with the raw, unprocessed product once every six years, with none of the contaminants processed out.

Taking a closer look at this 'natural' phosphate rock mix, we find for example polonium-210. One particle of polonium-210 gives off 5,000 times more alpha radiation than the same amount of radium. Damage occurs in the body from complete tissue absorption of the energy of the alpha particle. Polonium-210 can be carcinogenic to people exposed to more than 0.03 microcuries (6.8 trillionths of a gram). There are also high levels of Radium and Polonium-210 in granite dust, which is used by organic farmers, in some parts of the world as a soil conditioner.

Polonium is carried throughout the body in the blood. It has been linked to more soft-tissue cancers than bone cancers; typical sites are the liver, spleen, and kidney. The most important pathway for radionuclide contamination of the food is the uptake by plant from the ground through the roots. Once the contaminated foods have been ingested by man or animals, the radionuclides produce an internal radiation dose in the specific organs where they accumulate.

Polonium is found in tobacco grown with phosphate fertilizers. Studies have suggested that radioactive polonium may be the primary cause of smoking-related cancers.

Our water supplies are being flooded with radioactive elements, especially radon. It is important to note that these do not simply dissipate in a few days, months, or years—these radioactive elements will emit radon for many thousands of years.

The long-continued application of phosphate fertilizers and their by-products can redistribute and elevate heavy metal and fluorine concentrations in soil profiles, and, consequently, their availability for plants and subsequent transfer to the human food chain, mainly in acid soils.

Phytates are phosphorus compounds. Phytates bind with minerals such as iron, calcium, and zinc and interfere with their absorption in the body. NPK fertilizer is high in phytates. Phytates bioaccumulate in produce, cereal grains, legumes, and nuts grown in NPK fertilizer. Eating food grown in NPK fertilizer will lead to a shortage of crucial minerals.

Not only are our soils and food deficient in almost every mineral and trace mineral, additionally, the American diet is rich in Phosphorus, which is found in just about everything we eat (NPK fertilizer and food additives). Ideally, the Calcium to Phosphorus ratio in our daily diet should be 2:1; however, this idyllic ratio is not possible (you would have to eat 25 lbs of NPK broccoli every time you ate a 16 oz steak). The only possible way to approach the 2:1 ideal is to avoid as much as possible the high Phosphorus containing items and supplement with plant derived organic minerals.

An Environmental Working Group analysis of phosphorus tests reported by 162 public water suppliers in 7 states shows that between 1998 and 2003, 3.3 million people in 113 communities drank water contaminated with phosphorus. In all of these communities, tap water was contaminated at levels above health-based thresholds. Phosphorus remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for Phosphate (1998-2003): 258 of 39,751.

## ASBESTOS

Asbestos is a mineral fiber from decay of asbestos cement in water mains. Much of it comes from an estimated 400,000 miles of asbestos cement water pipe. This is enough to circle the globe sixteen times. It is buried beneath hundreds of North American cities. Acidic water can cause the cement to disintegrate, which can result in the release of asbestos fibers. Potential health impacts associated with asbestos include cancer, immunotoxicity, and respiratory toxicity.

An Environmental Working Group analysis of asbestos tests reported by 2,533 public

water suppliers in 26 states shows that between 1998 and 2003, 8.6 million people in 147 communities drank water contaminated with Asbestos. In two of these communities, tap water was contaminated at levels above health-based thresholds. Water suppliers reporting tests for Asbestos (1998-2003): 2,533 of 39,751.

## PERCHLORATE

Since April 2007, Congress has been considering a bill to set national safety standards for toxic rocket fuel perchlorate, found in drinking water supplies in more than 20 states. However, perchlorate is currently an unregulated contaminant. Officials found the rocket fuel ingredient perchlorate at up to 1,300 parts per million in the fall—roughly 166 times higher than acceptable limits. Perchlorate is a toxic chemical from military–industrial activities and the use of Chilean nitrate fertilizer.

Production and use estimates of perchlorate are hard to come by—the military considers the numbers secret, and fertilizer producers will not share them, saying they are proprietary information.

Perchlorate can affect thyroid function—because perchlorate is an ion that inhibits the transport of iodide into the thyroid. Scientists have found that a significant number of people are at risk of thyroid hormone depression from perchlorate exposure. Extensive data indicate that thyroid-pituitary disruption is the sole mode of action for the observed thyroid tumors caused by perchlorate in rodents.

A series of critical new studies by scientists at the Centers for Disease Control and Prevention show that the EPA's proposed safe exposure level for the contaminant “perchlorate” is not protective of public health. To add insult to injury, the California Environmental Protection Agency recently raised the limit on the amount of perchlorate allowed in drinking water by 50%. Currently there are no enforceable perchlorate safety standards, but Environmental Working Group (EWG) argues that a national safety standard should be no higher than one-tenth the EPA's currently recommended level.

Preliminary data from the Centers for Disease Control and Prevention show that the amount of perchlorate in urine is too high to be from drinking water alone. Studies have found perchlorate in rainwater and common foods produced in the U.S., such as dairy products and produce. Perchlorate is also found in produce worldwide.

In the first-ever tests of perchlorate in off-the-shelf supermarket produce, EWG found contamination averaging 4 times more than what the EPA says is safe in drinking water. The chemical has also been found in prenatal vitamins and seaweed. Perchlorate can remain in food even after it is cooked.

Blast from the past: billions of kilograms of Chilean nitrate fertilizer contaminated with perchlorate left a lasting impression. Between 1909 and 1929, the U.S. imported an

estimated 19 million tons of Chilean nitrate. The United States still uses 75000 short tons of Chilean nitrate annually.

Overall, fresh fruits and vegetables from California and Central and South America had the highest levels of perchlorate. Just one serving of some fruits can contain enough perchlorate to exceed the National Academy of Sciences safe daily dose by 25%, and wines and beers pack a bigger perchlorate punch than waters, according to a new study that measures perchlorate concentrations in fruits, wines, and beers from around the world.

The food contribution to daily perchlorate exposure looks to be a horrendous disaster attributed to intensive farming, irresponsible agricultural practices, and military-industrial activities.

Perchlorate's interference with iodide uptake by the thyroid gland can decrease production of thyroid hormones, which are needed for prenatal and postnatal growth and development, as well as for normal metabolism and mental function in the adult.

Perchlorate is present in virtually all milk samples; the average concentration in breast milk is five times higher than in dairy milk. Studies testify that high levels of perchlorate in breast milk put the nation's infants at risk for developmental problems. Thyroid hormones are critical for development of the fetal and neonatal brain, as well as for many other aspects of fetal growth. The high levels of perchlorate in breast milk are cause for serious concern and should lead to immediate government action to protect the public health.

An Environmental Working Group analysis of perchlorate tests reported by 982 public water suppliers in 7 states shows that between 1998 and 2003, 26.2 million people in 86 communities drank water contaminated with perchlorate. In 8 of these communities, tap water was contaminated at levels above health-based thresholds. Perchlorate remains unregulated in tap water, without a maximum legal limit. Perchlorate, a known endocrine disruptor, remains unregulated in tap water.

## MANGANESE

Manganese is an element from natural deposits; it can enter the air from iron, steel, and power plants, coke ovens, dust from mining operations, and from auto, diesel, and jet fuel exhaust. Manganese is also present in many fertilizers, pesticides, insecticides, herbicides, fungicides, molluscicides, and microbiocides.

Manganese is an essential trace mineral. Massive overexposure produces "manganese madness" which may initially be marked by violence, criminal acts, and a state of mental excitement; later, neurological impairment slowly develops, with signs and symptoms that resemble Parkinson's disease.

An Environmental Working Group analysis of manganese tests reported by 16,939 public water suppliers in 33 states shows that between 1998 and 2003, 60.2 million people in 8,184 communities drank water contaminated with Manganese. Manganese was found up to 16300 ppb. Water suppliers reporting tests for manganese (1998-2003): 16,939 of 39,751. EPA has established a non-enforceable manganese guideline called a "secondary standard," regulating it for aesthetic or cosmetic concerns (taste, odor, tooth discoloration, etc.)

Everyone is exposed to potentially harmful levels of manganese in air, water, soil, and food. Compounding matters manganese bioaccumulates in plants, produce, livestock, and humans. Animal studies indicate that exposure to high levels of manganese can cause birth defects in the unborn.

Potential health impacts associated with manganese include gastrointestinal or liver toxicity, neurotoxicity, reproductive toxicity, and respiratory toxicity. Exposure to excess levels of manganese may occur from breathing air, particularly where manganese is used in manufacturing. Additional exposure comes from bath water, drinking water, and eating food with excess levels of manganese.

Although manganese levels in public water supplies are monitored, regulators have not considered the long-term effects of inhaling vaporized manganese while showering.

Regular showers may cause brain damage. A US study suggests taking regular showers poses a major health risk and it can even result in permanent brain damage. Scientists believe that breathing in small amounts of manganese dissolved in the water may harm the nervous system. The damage may occur even at levels of the naturally occurring metal normally considered safe, say the US researchers.

Dr. John Spangler, from Wake Forest University school of Medicine, says, "If our results are confirmed, they could have profound implications for the nation and the world." Dr. Spangler has found that inhaling manganese, rather than eating or drinking it, is far more efficient at delivering manganese to the brain. The nerve cells involved in smell are a direct pathway for toxins to enter the brain. Once inside these small nerves, manganese can travel throughout the brain.

Spangler's team calculated from animal studies the amount of manganese people would absorb by showering for 10 minutes a day. After 10 years of showering in manganese-contaminated water, children would be exposed to levels of the metal three times higher than the doses needed to leave deposits in rats' brains, the researchers found. Adults with a longer history of showering could be exposed to doses 50 per cent higher.

Children, pregnant women, the elderly, and patients with liver disease were at the highest risk from manganese. "Some of these groups have suffered from manganese



poisoning even at low doses in their water supplies”, said Spangler.

Everyone is exposed to excessive amounts of manganese, which is found in food and rocks, and enters the air, soil, and water. Continued exposure at these levels will eventually damage the brain and spinal cord, leading to learning and coordination disabilities, behavioral changes, and a tremor condition similar to Parkinson's disease.

The Environmental Protection Agency (EPA) in the US has set an upper limit for manganese in water supplies of 0.5 milligrams per litre. The European Union has adopted the same limit. However, according to Dr. Spangler, this limit does not take account of the risk of manganese accumulating in the brain through showering. His analysis indicates that levels well below 0.5 milligrams might lead to brain injury. Another potential danger highlighted by the scientists was the addition of manganese to petrol to protect vehicle engines. Dr. Spangler says, “Manganese, as it settles from car exhaust onto streets and highways, may enter the water supply, increasing manganese levels in the water we drink and bathe in.”

Regulatory agencies need to re-think existing drinking water standards for manganese. Unmonitored wells and private water supplies contain the highest levels of manganese.

Another potential danger highlighted by the scientists was the addition of manganese to petrol to protect vehicle engines. “The manganese, as it settles from car exhaust onto streets and highways, may enter the water supply, increasing manganese levels in the water we drink and bathe in,” said Spangler.

## FLUORENE

Fluorene is a pollutant from the incomplete combustion of fossil fuels, certain manufacturing processes, fertilizer, and the production of dyes and other chemicals.

An Environmental Working Group analysis of Fluorene tests reported by 2,986 public water suppliers in 13 states shows that between 1998 and 2003, 31 thousand people in 10 communities drank water contaminated with Fluorene. Fluorene remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for Fluorene (1998-2003): 2,986 of 39,751.

## RADIOACTIVE MATERIALS

Fossil fuel combustion also contains naturally occurring radioactive materials, mainly uranium and thorium that are released into the atmosphere. In 2000, about 12,000 metric tons of thorium and 5,000 metric tons of uranium were released worldwide from burning coal. It was estimated that during 1982, US coal burning released 155 times as much radioactivity into the atmosphere as the Three Mile Island incident. The latest “BIER” study (BIER VII) agrees that there is no safe dose, no threshold, below which

radiation is not harmful and cannot cause cancer, leukemia, heart problems, birth defects, and literally hundreds of other ailments.

## **TOXICOLOGICAL SYNERGY**

Every mineral has its own signature pH level that permits assimilation by our body. If we look at an atomic scale chart of elements, those at the higher end (lower number) are capable of assimilation over a broader pH range. Those lower (higher number) on the chart need a progressively narrower pH range to be assimilated.

Sodium (11) and magnesium (12) have wide pH assimilation ranges. It narrows somewhat for potassium (19) and calcium (20); more for manganese (25) and iron (26); more for copper (29) and zinc (30); more for iodine (53).

To summarize, if we are not balanced, our body will simply reject most minerals. Why is this relevant? Let us look at iodine as an example. Lower on the atomic scale, it requires near perfect pH for its assimilation into the body. Iodine is required for a healthy thyroid gland. However, our thyroid will receive virtually no iodine unless the body pH is almost perfect.

Thyroid disease has been connected to arthritis, heart attacks, diabetes, cancer, depression, obesity, fatigue, confusion, constipation, and vision problems. Even a slightly under active thyroid—too mild for symptoms—during pregnancy might trigger premature birth and babies born with lower IQs.

Now let us look at copper and zinc this time an example. Copper and zinc are lower down (higher number) on the atomic scale and they require a near perfect pH for assimilation into the body.

Zinc is a fundamental mineral that the human body needs in small amounts on a regular basis. We are exposed to zinc compounds in food, water, and air. Zinc can enter the body through the bloodstream, often from digesting foods or drinking contaminated water. Zinc also can enter the bloodstream through the lungs. During respiration, zinc can be absorbed from dust or fumes. Zinc also can be absorbed across mucus membranes or pass directly through skin.

Although naturally occurring in the environment, most concentrations of zinc are a result of man's activity. Most zinc traces enter the atmosphere through mining, purifying of zinc & lead, steel manufacturing, and coal burning. Acid rain corrodes zinc and cadmium (galvanized surface) from galvanized pipe systems.

Another large source of zinc contamination easily pinpointed is that of urban runoff from roadway surfaces. Zinc used in vehicle brakes and zinc added to tires wears off vehicles and creates a fine dust. Brake pads also emit asbestos, carbon fibers, metallic particles and polymer adhesives. Tire rubber also contains heavy metals like cadmium, hydrocarbons, latex, and sulfur-containing compounds. Every month, Americans wear over 100 million pounds of rubber off their tires, enough to make

more than six million new tires from scratch. The dust enters the air and eventually settles on the roadway surface and the area immediately surrounding the roadway. When precipitation reaches the dust, it carries the contaminants into waterways. Zinc and cadmium bioaccumulate within the flesh of fish; they are also taken up by many crops. Some plants absorb and retain certain metals at higher rates than others.

Many people are exposed to more than the recommended daily amount of zinc through the regular use of supplements containing zinc and excess zinc in our water and food. An acute overdose of zinc can cause symptoms such as vomiting, stomach pain, diarrhea, and fever. Excess zinc in one's body can also lead to the development of a copper deficiency as a result of the interactions within the body.

Cadmium competes with zinc and thereby prevents the stimulating effect that the zinc would have on the thyroid. Organs affected by severe zinc deficiency include epidermal, gastrointestinal, central nervous, immune, skeletal, and reproductive systems. In view of what is now known about the biology of zinc, it is obvious that zinc-dependent metabolic functions are impaired in all tissues. Studies show that poor maternal zinc status in pregnancy can have adverse effects on fetal brain function.

Copper and zinc absorption are also closely related, although copper is needed in relatively small amounts. If large amounts of copper are present, then zinc and vitamin C are reduced in the body, and vice versa. The absorption of large amounts of vitamin C and/or zinc can negatively influence the level of copper in the body, while fructose can make a copper deficiency worse. Low tissue copper and/or elevated zinc/copper can cause vitamin C to act as a pro-oxidant instead of an anti-oxidant.

Copper can be stored in the body, and daily presence in the diet is therefore not necessary. If copper is deficient in the body, ferritin is also normally in short supply, leading to anemia as well as the likelihood for infections, osteoporosis, thinning of bones, thyroid gland dysfunction, heart disease, as well as nervous system problems. A lack of copper may also lead to increased blood fat levels. It is also necessary for the manufacture of the neurotransmitter noradrenaline as well as for the pigmentation of your hair.

Copper is essential in the proper development of the central nervous system. Copper is required in the formation of hemoglobin, red blood cells, and bones, while it helps with the formation of elastin as well as collagen—making it necessary for wound healing.

Copper deficiency can be the result of low levels of the mineral in the soil and in forages raised on the soil—this is primary copper deficiency. However, even if the pH of the human body is correct and both food and soil have adequate balanced copper, absorption can be interfered with by minerals or dietary elements known as copper antagonists: cadmium, lead, molybdenum, manganese, iron, various sulfates, fructose, and vitamin C. This is secondary copper deficiency. In other words, it is

possible to have high copper levels in the body and a copper deficiency at the same time, due to mineral, nutritional, and pH aberrations. Copper antagonists reduce copper absorption and/or utilization; potassium deficiency also increases copper demand. Copper deficiency is usually related to copper antagonists.

Copper deficiency interferes with normal glucose utilization; it results in glucose intolerance, decreased insulin response, and increased glucose response. Losses of chromium can be caused by elevated glucose. Low tissue copper is also associated with low calcium/potassium and sodium/potassium ratios. Copper is an anabolic mineral and has a calcium raising effect, which in turn increases insulin release. You will therefore, notice that in individuals with copper deficiency corresponding low tissue calcium will be present.

Copper deficiency is associated with hypercholesterolemia and atherosclerosis. A copper deficit has also been associated with enhanced Glycation, the deleterious binding of sugars to protein. *A copper deficiency causes elevation of early and Advanced Glycation End Products*—Advanced Glycation End Products induce crosslinking of collagen.

More than 90% of Americans are deficient in the trace mineral chromium. High iron and phosphate levels in our drinking water and high phosphate (P) levels in food (N-P-K fertilizer) antagonize chromium assimilation. Chromium is essential for the normal activity of insulin. A deficiency of chromium can result in elevated glucose. Chromium is essential for normal glucose tolerance, and chromium deficiency can result in diabetes-like symptom. *Chromium deficiency causes elevation of early and Advanced Glycation End Products*. Scientists have also found a link between a chromium deficiency and depression.

Toxic substances are of concern now that the entire planet is saturated with pollution and toxic wastes. Persistent organic compounds, persistent organic pollutants, volatile organic compounds, heavy metals, chemicals, perchlorate, bisphenol A, monochlorobenzene (chlorobenzene), and hundreds of other toxic wastes have contaminated water supplies, crops, and overall food production. These substances are major concerns; the synergistic effect of these in the food chain means that many crops can cause health problems, and may be almost unmarketable (conveniently, most of these substances have no enforceable safety limits). Many toxins exist in solid-phase and solution forms that can vary greatly in terms of their bioavailability.

## **PERSISTENT ORGANIC POLLUTANTS**

Persistent Organic Pollutants (POPs) are toxic substances that adversely affect human health and the environment around the world. Because they can be transported by wind and water, most POPs generated in one country can affect people and wildlife far from where they are used and released. They persist for long periods in the environment, which means they are substances that resist photolytic, chemical, and biological degradation and can bioaccumulate and pass from one species to the next through the food chain.

Persistent Organic Pollutants (POP's) are composed of organic chemical compounds and mixtures. POPs generally have low water solubility and high lipid (fat) solubility, which means they tend to bioaccumulate in fatty tissues of living organisms. These substances magnify by factors of many thousands as they move up the food chain.

POPs are so highly toxic, that they have the potential to injure human health and the environment at very low concentrations.

Most of them are really nasty and we usually speak about three different groups: industrial chemical products like PCBs, combustion, ion, and by-products like dioxins, and pesticides like DDT. However, of course, there are hundreds of compounds in these groups and what we are focusing on right now is the "Dirty Dozen"—12 really nasty POPs. They are so nasty that many, like DDT, have already been banned in some countries.

The dozen toxic chemicals comprise eight pesticides: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene); two industrial compounds: polychlorinated biphenols (PCBs) and hexachlorobenzene (which is also a pesticide); and two byproducts of combustion and industrial processes: dioxins and furans.

Everyone has persistent organic pollutants in his or her body. People who eat fat are even worse off. In the United States, for example, a recent study by the National Academy of Sciences estimates that pesticide abuse accounts for some 20,000 cases of cancer a year. Furthermore, there is increasing evidence of the estrogen effect of POPs. Many scientists believe that toxic agents in the environment have reduced the average sperm count in men by 42% in the past 50 years. It has even been claimed that in certain communities boys have been born without or with distorted sexual organs and with limited or no reproductive capacity.

Although scientists have more to learn about POPs chemicals, decades of scientific research have greatly increased our knowledge of POPs' impacts on people and wildlife. For example, laboratory studies have shown that low doses of certain POPs adversely affect some organ systems and aspects of development. Studies also have shown that chronic exposure to low doses of certain POPs can result in reproductive



and immune system deficits. Exposure to high levels of certain POPs chemicals can cause serious damage or death.

POPs do not break down easily under natural processes and thus tend to bioaccumulate up the biological food chain, until they pose risks to human health. For example, Beluga whales swimming in the highly polluted St. Lawrence River, which connects the Atlantic Ocean to North America's Great Lakes, have such high levels of PCBs in their blubber that, under Canadian law, they now qualify as "toxic waste dumps."

## CONTAMINANTS INDEX (FRACTIONAL)

Drinking water, including most bottled, ionized, reverse osmosis, and distilled water may reasonably be expected to contain some contaminants. U.S. EPA sets standards for approximately 90 contaminants in drinking water.

The following are common contaminants found in public water, their potential health effects, and the type of water filters that are capable of removing them.

2,4,5TP: This is an herbicide that is used on crops and right-of-way areas. It can cause liver and kidney damage. The *Maximum Contaminant Level* is 0.05mg/L. A water filter that removes Volatile organic chemicals (VOCs) will remove this compound. NSF standard 53.

2,4-D: This is an herbicide used on wheat, corn, range lands and lawns. The maximum amount allowed in public water is 0.07mg/L. Like the above herbicide it causes liver and kidney damage. A charcoal/carbon filter (Standard 53) that removes VOCs will remove this contaminant.

Alachor: This is an herbicide used on corn, soybeans, and other crops. The maximum amount allowed in public water is 0.002 mg/L. It is a carcinogen (i.e. it causes cancer). A carbon/ charcoal filter Standard 53, that removes VOCs will remove this contaminant

Arsenic: This is a heavy metal. It comes from smelters, glass and electronic wastes as well as from orchards and natural deposits. The *Maximum Contaminant Level* for arsenic is 0.010 mg/L. Its potential health hazards include skin and nervous system toxicity. Arsenic is found in water in two different forms: pentavalent (also known as Arsenic 5 or arsenate) and Trivalent (Arsenic 3 or Arsenite). Chlorine converts trivalent to pentvalent arsenic. Carbon/charcoal, reverse osmosis filters as well as distillation will remove this contaminant. Distillation will remove trivalent and pentvalent arsenic, while reverse osmosis will remove pentvalent only. Look for Standards 53, 58, or 62.

Asbestos: This contaminant comes from natural deposits and asbestos cement used in water systems. The *Maximum Contaminant Level* is 7 million fibers per liter. It is a serious carcinogen. Carbon/charcoal and reverse osmosis remove this contaminant.

Atrazine: This is an herbicide used on corn and on non-cropland. It can cause mammary gland tumors. Its *Maximum Contaminant Level* is 0.003 mg/L. Carbon/charcoal standard 53 filters will remove this contaminant. It is part of the VOC category.

Bacteria: Bacteria are not supposed to be found in our public waters. However,

occasionally they may contaminate the water we drink. Sources are naturally occurring or from human or animal wastes. Most of them cause gastrointestinal disorders. Ultraviolet treatment is usually necessary for removal of these contaminants, or look for NSF standard 55 filters. Class A inactivates or removes microorganisms from contaminated water (not raw sewage) and class B disinfection systems remove naturally occurring organisms found in public waters that are deemed non-pathogenic.

Barium: This is found in natural deposits, epoxy sealants, pigments and spent coal. Its *Maximum Contaminant Level* is 2 mg/L. It can potentially affect the circulatory system. Cation exchange softeners, reverse osmosis, and distillation will remove barium. Look for standards 44, 58 and 62.

Cadmium: This is found in galvanized pipe corrosion, natural deposits, batteries and paints. It primarily affects the kidneys. Its *Maximum Contaminant Level* is 0.005 mg/L. Reverse osmosis, distillation remove it. Standards 58 and 62

Carbufuran: This is a soil fumigant used on corn and cotton. It affects the nervous reproductive systems. Its *Maximum Contaminant Level* is 0.04 mg/L. Carbon/charcoal standard 53 remove this. It is part of the VOC category.

Chloramine: The effects of this contaminant are unknown. It is used as a disinfectant. The maximum recommended usage level is 4 mg/L. Carbon/charcoal filters, standard 42 remove this contaminant. Systems certified for reduction of chlorine will not necessarily be effective against chloramines.

Chlordane: This is used for treating termites. *Maximum Contaminant Level* is 0.002. It can cause cancer. Carbon/charcoal filters, Standard 53 will remove this contaminant.

Chlorides: Cause water to taste salty. *Maximum Contaminant Level* is 250 mg/L. These come from natural deposits. Reverse osmosis and distillation may remove these.

Chromium: This is a by-product of mining, electroplating, pigments and from natural deposits. It can be present in water in forms: hexavalent (chromium 6) and trivalent (chromium 3). It can cause liver, kidney and circulatory disorders. Reverse osmosis and distillation Standards 53,58 and 62 remove chromium.

Copper: From natural and industrial deposits, wood preservatives, and plumbing. It may leach from residential plumbing. The *Maximum Contaminant Level* is 1.3 mg/L. It can cause gastrointestinal irritation. Charcoal/carbon, reverse osmosis, and distillation, Standards 42, 58 and 62 remove this contaminant.

Cryptosporidium: This is a parasite that is found in food or water contaminated with human or animal waste. It can cause gastrointestinal illness. Although public water should not have any cryptosporidium in it, it is not uncommon to see people in the

Portland area test positive on stool test for it. Standard 53, 58 and 55 water filters should remove it. Look for a filter capable of removing spores < 1 micron.

-dichlorobenzene: part of the VOC category. From paints, engine cleaning compounds, dyes, chemical wastes. Causes liver, kidney and blood cell damage. Carbon block standard 53 removes.

Hepatochlor Epoxide: A degradation product of heptachlor which is used in insecticides, particularly for termite eradication. It is a carcinogen. Allowable amount is 0.0002 mg/L. Carbon block, standard 53 removes this. This contaminant is part of the VOC category.

Hydrogen sulfide: causes the rotten egg odor in water. It is a naturally occurring chemical in water. Carbon block, standard 42 filters remove it.

Iron: Maximum allowable amount is 0.3mg/L. It can stain laundry, plumbing, and appliances. It is from natural deposits in the water. Carbon/charcoal filter, standard 42 will remove it.

MTBE: From gasoline spills, underground gas tank leakages. The potential health effects include cancer, developmental toxicity, gastrointestinal or liver toxicity, kidney toxicity, neurotoxicity, and skin sensitivity. Carbon block, standard 53 will remove it..

Nitrite: Can cause methemoglobinemia (blue baby syndrome). From animal waste, fertilizer, natural deposits, septic tanks, sewage. Maximum allowable level is 1 mg/L. It rapidly converts to nitrate. Reverse osmosis, standard 53, 58, 62 remove this contaminant.

PCBs: from the coolants used in electrical transformers and plasticizers. PCBs are known carcinogens. Maximum allowable amount is 0.0005 mg/L. Carbon block filters, standard 53 remove this contaminant.

Radium: This is a naturally occurring carcinogen. It can cause bone cancer. Filters that remove it are reverse osmosis and cation exchange softeners, standard 44 and 58.

Radon: Another naturally occurring contaminant, it is also a carcinogen and is a risk factor for lung cancer. Carbon/charcoal and aeration devices remove it. Look for a standard 53.

Selenium: *Maximum Contaminant Level* is 0.05 mg/L. It is from natural deposits, mining, smelting, coal/oil combustion. Too much selenium can cause liver damage. Standard 58, 62 reverse osmosis filters will reduce selenium.

Sulfates: can cause gastrointestinal irritation. They are naturally occurring. Reverse

osmosis or distillation may be effective at removing.

Sulfuric acid and nitric acid: acid rain occurs when sulfur dioxide and nitrogen oxides are emitted into the atmosphere, undergo chemical transformations. Reverse osmosis, distillation, carbon/charcoal filters will not remove them—the water needs to be ionized.

Styrene: Maximum allowable amount 0.10 mg/L. Styrene is from plastic, rubber, resin and drug industries. It also can leach from landfills into the ground water. It causes liver and nervous system damage. Taste and odor from natural sources and additives. Carbon/charcoal standard 42.

Total dissolved solids: Come from the erosion of naturally occurring mineral deposits. TDS's antagonize the assimilation of other minerals and causes secondary mineral deficiencies. They can also cause gastrointestinal irritation in some people. Maximum level should not exceed 500 mg/L. Standard 42, 58, 62 distillation, reverse osmosis remove these.

Toxaphene: A carcinogenic insecticide that was used on cattle, cotton, and soybeans. Standard 53, carbon/charcoal filter to remove it.

Trichloroethylene: A carcinogen found in textile, metal and adhesive degreasers. Carbon/charcoal standard 53 removes it. This is part of the VOC category.

Turbidity: from soil run off, it can interfere with disinfection and filtration. Charcoal/carbon; reverse osmosis standards 53, 58 can remove.

Uranium: Causes kidney problems, cancer. Maximum allowable amount is 0.03 mg/L. Filtration systems are not currently certified to remove uranium although reverse osmosis, distillation or anion exchange resins may.

#### Microbes:

Coliform bacteria are common in the environment and are generally not harmful. However, the presence of these bacteria in drinking water is usually a result of a problem with the treatment system or the pipes which distribute water, and indicates that the water may be contaminated with germs that can cause disease.

Fecal Coliform and E coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms.

Turbidity has no health effects. However, turbidity can interfere with disinfection and provide a medium for microbial growth. Turbidity may indicate the presence of disease causing organisms. These organisms include bacteria, viruses, and parasites that can cause symptoms such as nausea, cramps, diarrhea, and associated headaches.

Cryptosporidium is a parasite that enters lakes and rivers through sewage and animal

waste. It causes cryptosporidiosis, a mild gastrointestinal disease. However, the disease can be severe or fatal for people with severely weakened immune systems. EPA and CDC have prepared advice for those with severely compromised immune systems who are concerned about *Cryptosporidium*.

*Giardia lamblia* is a parasite that enters lakes and rivers through sewage and animal waste. It causes gastrointestinal illness (e.g. diarrhea, vomiting, cramps).

## Radionuclides

Alpha emitters.

Certain minerals are radioactive and may emit a form of radiation known as alpha radiation. Some people who drink water containing alpha emitters in excess of EPA's standard over many years may have an increased risk of getting cancer.

Beta/photon emitters. Certain minerals are radioactive and may emit forms of radiation known as photons and beta radiation. Some people who drink water containing beta and photon emitters in excess of EPA's standard over many years may have an increased risk of getting cancer.

Combined Radium 226/228. Some people who drink water containing radium 226 or 228 in excess of EPA's standard over many years may have an increased risk of getting cancer.

Radon gas can dissolve and accumulate in underground water sources, such as wells, and in the air in your home. Breathing radon can cause lung cancer. Drinking water containing radon presents a risk of developing cancer. Radon in air is more dangerous than radon in water.

A few more inorganic contaminants: antimony, beryllium, cyanide, and thallium

Lead typically leaches into water from plumbing in older buildings. Lead pipes and plumbing fittings have been banned since August 1998. Children and pregnant women are most susceptible to lead health risks. For advice on avoiding lead, see the how to remove lead in your drinking water fact sheet prepared by EPA.

Volatile Organic Contaminants (VOCs) benzene, carbon tetrachloride, chlorobenzene, o-Dichlorobenzene, p-Dichlorobenzene, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, trans-1,2-Dichloroethylene, Dichloromethane, 1,2-Dichloroethane, 1,2-Dichloropropane, Ethylbenzene, Styrene, Tetrachloroethylene, 1,2,4-Trichlorobenzene, 1,1,1,-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethylene, Toluene, Vinyl Chloride, and Xylenes.

## Disinfectants:

Many water suppliers add a disinfectant to drinking water to kill germs such as giardia and e coli. Especially after heavy rainstorms, your water system may add more



disinfectant to guarantee that these germs are killed.

**Chlorine:** Some people who use drinking water containing chlorine well in excess of EPA's standard could experience irritating effects to their eyes and nose. Some people who drink water containing chlorine well in excess of EPA's standard could experience stomach discomfort.

**Chloramine:** Some people who use drinking water containing chloramines well in excess of EPA's standard could experience irritating effects to their eyes and nose. Some people who drink water containing chloramines well in excess of EPA's standard could experience stomach discomfort or anemia.

**Chlorine Dioxide:** Some infants and young children who drink water containing chlorine dioxide in excess of EPA's standard could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water containing chlorine dioxide in excess of EPA's standard. Some people may experience anemia.

#### Disinfection Byproducts:

Disinfection byproducts form when disinfectants added to drinking water to kill germs react with naturally-occurring organic matter in water.

**Total Trihalomethanes:** Some people who drink water containing trihalomethanes in excess of EPA's standard over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

**Haloacetic Acids:** Some people who drink water containing haloacetic acids in excess of EPA's standard over many years may have an increased risk of getting cancer.

**Bromate:** Some people who drink water-containing bromate in excess of EPA's standard. Bromate is a disinfection by-product of ozonation. Potential health impacts associated with Bromate include cancer and kidney toxicity.

**Chlorite:** Some infants and young children who drink water-containing chlorite in excess of EPA's standard could experience nervous system effects. Similar effects may occur in fetuses of pregnant women who drink water-containing chlorite in excess of EPA's standard. Some people may experience anemia.

MTBE is a fuel additive, commonly used in the United States to reduce carbon monoxide and ozone levels caused by auto emissions. Due to its widespread use, reports of MTBE detections in the nation's ground and surface water supplies are increasing. The Office of Water and other EPA offices are working with a panel of leading experts to focus on issues posed by the continued use of MTBE and other

oxygenates in gasoline. EPA is currently studying the implications of setting a drinking water standard for MTBE.

Potential health impacts associated with MTBE include cancer, developmental toxicity, gastrointestinal or liver toxicity, kidney toxicity, neurotoxicity, and skin sensitivity.

An Environmental Working Group analysis of MTBE tests reported by 16,866 public water suppliers in 30 states shows that between 1998 and 2003, 32.7 million people in 632 communities drank water contaminated with MTBE. MTBE remains unregulated in tap water, without a maximum legal limit. Water suppliers reporting tests for MTBE (1998-2003): 16,866 of 39,751.

As part of the Drinking Water and Health pages, this fact sheet is part of a larger U.S. EPA publication: EPA National Primary Drinking Water Regulations.

Yes, every thing we eat and drink is saturated in the new designer liquid that was once called water. Now, go peacefully to the sedating shower.

## **AN URGENT WAKE-UP CALL TO ALL CONSUMERS**

We need to take care of this world and its inhabitants. It is that simple. We need to reexamine our priorities in this world. These priorities should not be centered on money or profit, but on love, wisdom, reason, and responsibility.

Unfortunately, it has been proven beyond doubt that almost everyone in the United States suffers from malnutrition and the effects of pollution. Obtaining pristine water and uncontaminated food that contains balanced levels of vitamins, minerals, and enzymes is virtually impossible to the everyday consumer.

Some of the most unthinkable tragedies in history are taking place at a tremendous expense to our health. Billions of people are in jeopardy, and many are suffering and dying needlessly. The time has come to expose these deadly injustices, and provide immediate and concrete solutions. Anyone willing to carefully read, study, and ponder the facts presented throughout this research compilation will awaken to this terrible situation and realize that our health and the health of future generations have been put on a perilous course for disaster.

Astonishing parallels exist that point to inter-related common causes, most of which will become obvious even to the casual reader. The answers are relatively simple, yet a valiant new breed of advocate will be required to champion the cause because ignorance, greed, malnutrition, and power have seriously corrupted conventional institutions and agencies.

Many of us grew up with a limited understanding of health. We tend to view health as a phenomenon of the body, disconnected from mental or spiritual events; as such, many people pay little attention to their physical health while focusing on other areas of human experience.

We now know that physical health helps control the state of our mind, emotions, and spirit; this has a direct impact on both our health and our spirituality.

You can get cars, cigars, and candy bars; anti-depressants and stimulants; Botox injections, hormone replacement and plastic surgery; chemotherapy, dialysis, and brain surgery; exotic lures and pacifiers; airplanes, helicopters, and million-dollar mansions. You can travel around the world or go to outer space if you have enough money. All the while, no matter how much money you have, it is impossible to get uncontaminated nutrient-dense and nutrient-balanced food, pristine water, or ample amounts of oxygen. Go figure—our cells need, nutrients, water, and oxygen for regeneration.

You can trace almost every sickness, every disease, and every ailment to nutritional and pH aberrations, and a lack of oxygen at the cellular level—which is compounded

by over-indulging, sloth, pollution, and unhealthy choices.

We spend billions, and 100's of billions of dollars on medical breakthroughs and mindless things that pollute the earth and almost nothing on prevention or regeneration. Simultaneously, our bodies and respiratory systems struggle from the same assault from toxic amounts of tar, acid, smoke, rubber, carbon, hydrocarbons, toxic heavy metals, and bacteria and viruses that thrive in a low oxygen environment.

Drugs, chemicals, carbon monoxide, and high nitrogen content in our food and water supply reduce the oxygen-carrying capacity of the blood.

Chronic metabolic acidosis can require up to 50% of our oxygen to be utilized in defense rather than energy production. A diet of processed food (i.e. junk foods) requires copious amounts of oxygen for metabolism. An ounce of alcohol coursing through the bloodstream further impedes the blood's ability to carry oxygen. When our pH is off, oxygen delivery to cells suffers.

Try to perceive the synergetic effects of contaminated acidic, chlorinated, fluoridated and un-oxygenated hard water; nutritional and pH aberrations (from intensive farming, irresponsible agricultural practices, and pollution); oxygen aberrations (a few decades ago, we had 35 percent environmental oxygen in the atmosphere to breathe—oxygen in our atmosphere has diminished to as little as 12-13% in some large cities—an average of 19 to 21% by volume overall); 60 million metric tons of carbon monoxide that the United States alone dumps into the air each year; anaerobic microorganisms that can attack and infiltrate cells restricting blood and oxygen supply.

To carry the point a step further, consider the twin impact of lower oxygen and exposure to a higher level of carbon dioxide and carbon monoxide. Aggressive behavior can be one of the side effects of breathing air with a higher than normal level of carbon dioxide.

Everyone's judgment, memory, and thought processes have been degraded significantly. Yet the masses are unaware of the impairment, feeling fine in both judgment and performance.

## **'We are in a valley of death.'**

We are being farmed for pharmaceuticals.

*A person, who is truly wise, will not be satisfied until they have pristine water and food—that which God intended—only then will they stay within God's protection.*

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