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Air and Water

Henry's History

Henry is 41 with four children. They use special filters on their vents. The children are fed well, the house is clean, and all chemicals locked up. They drink distilled water.

Mounting evidence suggests that our environment contains many carcinogens. The air we breathe, the water we drink, the radiation to which we are exposed, and the power lines that supply us with energy pose threats to our health. As with many carcinogens, the time between exposure to environmental carcinogens and actual development of cancer may be quite long. Therefore, the cause of a cancer initiated by trace amounts of either airborne or waterborne carcinogens years before may be attributed to an unrelated or unknown factor at the time of diagnosis. This is why we must constantly clean our environment of carcinogens.

OUTDOOR AIR POLLUTION costs \$50 billion a year.

- Cancer rate is increased in cities due to: (1) more cigarette smoking; (2) more involuntary inhalation of tobacco smoke (3) occupational exposures.¹⁻³
- Workers exposed to air pollutants have an increased risk for lung cancer – gas production workers (coal carbonization); steel workers at coke ovens; and roofers exposed to hot pitch
- City air pollution has more than 100 particulate carcinogens that come from the burning of any material containing carbon and hydrogen, including petroleum, gasoline, and diesel

fuel.⁴ Many studies indicated that tiny particulate air pollution in cities is linked to higher mortality rates.⁵⁻⁷

- Gas phase of the air also has carcinogens: benzene, carbon tetrachloride, chloroform, and vinyl chloride, among others.⁸ These carcinogens are derived from car emissions, industrial activity, burning of solid waste, forest fires, and evaporation of solvents.⁹
- Asbestos is a potent carcinogen for lung cancer and is found in roofing and flooring, car brakes and clutches, dry walls, home heating and plumbing. Family members of persons who work with asbestos or asbestos products are exposed to very high levels of asbestos also. Cigarette smoking acts synergistically with asbestos to greatly enhance the risk of lung cancer. It is *extremely* rare for lung cancer to develop in an asbestos worker in the absence of exposure to tobacco smoke.
- Diesel exhaust increases risk of lung cancer for workers exposed to diesel engine emissions.¹⁰

ACID RAIN is made when sulfur dioxide and nitrogen oxide are released into the atmosphere and converted into sulfuric acid and nitric acid from fossil fuel combustion and power plant emissions.

- Affects soil: releases toxic metals – aluminum, mercury, lead, nickel, cadmium, and manganese that get into the water supply adversely affecting aquatic life in 10% of Eastern lakes and streams. Reduces selenium content in soil.
- Decreases the number of red spruce at high elevations, and contributes to the corrosion of buildings and materials.
- To control acid rain – use fossil fuel with low sulfur content.

DEPLETION OF NATURAL UPPER ATMOSPHERIC OZONE INCREASES RISK FOR SKIN CANCER

The naturally occurring ozone layer in the upper atmosphere is crucial to the protection of living organisms because it absorbs harmful ultraviolet radiation. About 3 percent of the sun's

electromagnetic output is emitted as ultraviolet radiation, but only a fraction of this reaches the surface of the Earth.

- Ultraviolet exposure is associated with melanoma, basal cell, and squamous cell cancer of the skin. People with fair skin, blond hair, and blue eyes who also sunburn easily are at highest risk for the development of these skin cancers. The US Environmental Protection Agency calculates that a 1 percent decrease in the ozone concentration will increase the incidence of most skin cancers by 3-5 percent.
- Ultraviolet exposure causes skin damage and skin aging
- Phytoplankton, zooplankton, and the larval stages of fish, are very sensitive to small increases in ultraviolet exposure. The resultant decrease in the food chain and in the oxygen output from the oceans' plants will have serious and dramatic repercussions on all human life.

Addressing the Problem

Chlorofluorocarbons, commonly known as CFCs, are chemical compounds that cause holes in the protective ozone layer. CFCs are in aerosols, foam blowers for items such as hamburger cartons and drinking cups, refrigerants and cooling systems, and solvents for computer circuits. In most instances, nonchlorinated substitutes are available or can be developed. Some CFCs remain in the air for over a century. For every 2.5 percent increase per year of chlorofluorocarbon, an additional million skin cancers and 20,000 deaths will occur over the lifetime of the existing United States population.

If pentane is used instead of chlorofluorocarbons as the blowing agent to produce foam products, *ozone is produced* both in the stratosphere and at the ground level. These products are less costly than paper products. A paper cup costs more to make: raw materials (wood, bark, petroleum fractions), finished weight, wholesale price, utilities needed to produce it (steam, power, cooling water), waste products produced, and air emissions (chlorine, chlorine dioxide, reduced sulfides).¹¹ The polystyrene cup is easier to recycle and ultimately to dispose. Here again, we have the proper technology to solve this problem.

OZONE AT GROUND LEVEL CAUSES DISEASES

- Ozone at ground level is harmful to us whereas the naturally occurring protective ozone layer in the upper atmosphere shields us from harmful ultraviolet rays. Ozone at ground level is the most widespread air pollutant in any industrialized country and is formed when car exhaust and other industrial emissions react with sunlight.
- Smog is derived predominantly from ozone as well as from carbon monoxides, nitrogen oxides, sulfur oxides, particulates, and volatile organic compounds. These compounds are derived from bakeries during fermentation; dry cleaning chemicals; paints; wood-burning stoves and starter fluid used to ignite charcoal; industries and motor vehicles using fossil fuels.
- Cities with the highest ozone: Los Angeles, New York, Philadelphia, Trenton, Baltimore, Hartford, Chicago, and Houston. Some national parks like Acadia, Shenandoah, and Sequoia national parks have higher ozone levels than some cities because of their proximity to the major cities with smog and/or the air currents around them.
- Ozone at ground level has been linked to cancer, lung and heart disease, impaired immunity, and other illnesses.
- Ozone impairs oxygen absorption.
- Ozone causes lung damage similar to that seen from smoking
- When ozone levels are high, asthmatics, cardiac patients, and older people who have respiratory illnesses do poorly.

ULTRAVIOLET SUNLIGHT has two forms: ultraviolet A (UVA) and ultraviolet B (UVB). The UVB is the more harmful causing sunburn and skin cancer. It has wavelengths between 290 and 320 nanometers. UVA causes skin cancer, skin damage, and premature aging of the skin. UVA has wavelengths between 320 and 400 nanometers, which is where the visible light spectrum begins.

Sunglasses should be used to protect your eyes from the harmful ultraviolet rays of the sun. Regardless of cost, most sunglasses filter all UVB, but not necessarily all UVA.¹²

INDOOR AIR pollution causes illnesses and the “sick building syndrome” symptoms.¹³ Ventilation can eliminate this.

- **Radon** is implicated in up to 20,000 deaths from lung cancer in the United States.¹⁴ A person living in a house with an indoor radon level of 4 pica Curies/liter has the same risk of developing lung cancer as a person who smokes half a pack of cigarettes per day.¹⁵ Coal miners who are exposed to radon and also smoke have a higher risk of lung cancer.¹⁶

- **Involuntary inhalation of tobacco smoke** doubles the lung cancer rate.¹⁷ Seventeen percent of all lung cancers are found in people who never smoked but who inhaled smoke between ages of 3 and 15. There should be no smoking in public places.

- **Stoves** without chimneys and kerosene stoves produce many pollutants, several of which are carcinogenic.

- **Heat exchangers, cooling towers, and leaky showerheads** provide favorable culture media for many microorganisms. These bacteria and other organisms disperse in droplets and remain airborne via mechanical or thermal air movements. *Legionella pneumophila* (Legionnaires' disease) and many other organisms have been detected airborne in closed indoor situations.

- **Other indoor pollutants** come from materials that are used in the construction of modern buildings, such as formaldehyde (associated with human cancer), isocyanates, solvents, and volatile synthetic organic compounds.

WATER POLLUTION

- **Synthetic organic chemicals** amount to over 700 in our drinking water.¹⁸ Forty of these are carcinogens, and three (benzene, chloromethyl ether, and vinyl chloride) are associated with human cancer.¹⁹ Drinking polluted water is said by the EPA to be one of the top four health hazards in America. The EPA allows municipalities to average their water toxicities over a year. For example, much more chlorine is added to water during summer months to hold down microorganisms. In some cities, the tap water level of chlorine carcinogens exceeds the standard by 20 percent during these months. The same

spike of toxicity holds true for nitrates and pesticides, both used seasonally for lawn beautification and farming.

Chlorination produces trihalomethanes – chloroform and bromohalomethane – that double the risk for gastrointestinal and urinary bladder cancers.¹⁹⁻²⁴ The EPA's safety limit of chlorine and its harmful associated carcinogens is based on the consumption of two liters of water a day, and this does not take into account increased consumption in summer, or the fact that these compounds can be absorbed during bathing.

- **Inorganic chemicals** like arsenic, chromium (certain chemical form), nickel, and lead are toxic. Lead impairs children's IQ and attention span. One in six people in the United States drinks water with higher than acceptable levels of lead.

The amount of calcium and magnesium in water determines water “hardness.” It appears that soft water, water containing lesser amounts of calcium and particularly magnesium, is correlated with a higher incidence of all cardiovascular diseases, osteoporosis, hypertension, and breast and colon cancer.

- **Radioactive materials** in water varies with geography, geology, industrial wastes, pharmaceutical use, and nuclear power generation.²⁵

- **Living organisms** – bacteria, viruses, and protozoa – can resist water purification, and these are responsible for 33 percent of all gastrointestinal infections in the United States.

- **Solid particulates** include clays, asbestos particles, and organic particulates.

WHO IS TO BLAME FOR THE SHAMBLES OF THE WATER SUPPLY? Probably everyone. Most states do not comply with existing standards, or comply by way of loopholes. For example, a loophole permits water suppliers to flush lead-filled water out of plumbing before testing tap water. The EPA has been lax because it only recently has imposed restrictions for radon in the drinking water.

Eighty percent of the top 1,000 superfund sites, that is, those designated as containing toxic waste and chemical contaminants, are leaching these toxic substances into the ground wa-

ter. In many geographic sites in the United States, well water has been contaminated. About 10 percent of all underground tanks, which store gasoline or other hazardous chemicals, leak. Too many pesticides and fertilizers are used by farmers and homeowners. Industries dump chemicals and other harmful pollutants into our water supply, and homeowners dump chemicals into household drains.

Addressing the Problem. One of the major obstacles to clean up America's underground toxic wastes is the unrealistic requirement that has been set by government authorities throughout the nation. The problem is that the objectives are simply too difficult to be accomplished by existing technologies. If the requirement had been to reduce the contaminants from 2,000 parts per billion to, say, 10 parts, it would be possible to reduce the health hazard by 99.5 percent and leave limited funds available for twenty or thirty more of the same type of clean-up projects. It is better to clean up all the toxic sites by a significant factor like 99.5 percent than only a few sites by a factor of 99.99 percent and thereby propagate endless litigation.

A number of cities refuse to build costly processing plants and instead choose to pay less expensive fines. The EPA observes that small utilities tend to violate regulations the most, falsify documents, and even wash away evidence because of a thirty-day window given them by the state.

WATER DERIVED FROM DISTILLATION OR REVERSE OSMOSIS IS MORE PURE THAN TAP OR SPRING OR "BOTTLED"

CONCLUSION

There are documented airborne and waterborne carcinogens. It is essential for us to detect and clean our environment of as many carcinogens as possible.

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| <p>Henry is doing all the right things that now include the use of sunscreens and sunglasses.</p> |
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