

To Breathe or Not To Breathe...

By Ryan N. Harrison, MA

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Air: It's everywhere, you can't escape it. Resistance is futile: you have to breathe to live. No element of the natural world is more essential to life than air, that element which is so ubiquitous that we are often unaware of it, much like the proverbial fish that when asked to describe water replied, "What's water?" Air is such an integral part of our lives, something we cannot live even ten minutes without. And lately, it's also become one of the most effective ways we poison ourselves.

Did you know that millions of people live in areas where air pollution can cause serious health problems? That air can be polluted in both the city and the country? That the air in your home may be more dangerous than the air outside? That, because of the very nature of air and its currents, a source of pollution may be in one place but its impact may be felt elsewhere? You might not have known or considered these things. Let's face it: we are not "air-smart" people. Many of us believe that if the sky is clear, if we can see the mountains or the granary on the horizon, and if we haven't heard about air pollution in the news lately, that everything is okay.

Unfortunately, nothing could be further from the truth.

It's Not Just a Lot of Hot Air

A recent landmark study called for by the United Nations Secretary-General was conducted by 1,360 experts in 95 nations. Entitled the "Millennium Ecosystem Assessment," this study produced a shocking report for the whole world, warning that much of the Earth's natural resources – everything from fresh water and clean air to productive soils and genetic resources – have been depleted at an unprecedented rate in the past 50 years. Among the findings, scientists concluded that one of the greatest concerns "is the chemical experiment humans have been conducting on the atmosphere for the past century and a half."¹ The dominant use of coal, oil, and natural gas as our sources of energy has released large quantities of carbon previously locked underground and has substantially increased the amount of carbon dioxide in the air. This, in turn, has changed global weather systems, trapping more of the Sun's heat within the Earth's atmosphere, and further complicating the problem of air pollution.

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It's true that air pollution is a concern of global proportions. What's more, the ways in which we are contributing to the pollution problem here in the United States are many and varied, and there doesn't seem to be a "quick and easy" solution available to either the problem at large, or the problem at home. The truth is, we carry some responsibility for this planetary pollution burden in more ways than we realize.

But what exactly is air pollution?

One of the formal definitions of air pollution given by The Energy and Resources Institute is “the presence in the atmosphere of one or more contaminants in such quality and for such duration as is injurious, or tends to be injurious, to human health or welfare, animal or plant life.”² In general, it is contamination of the air to the degree that it causes health problems and damages the environment.

Air pollutants consist of gaseous pollutants, odors, and what is called “suspended particulate matter” or SPM, such as smoke, dust, fumes, and mist. In total, air pollution results from a variety of causes, not all of which are human controlled. For example, volcanic activity, dust storms and smoke from natural forest and grass fires contribute to chemical and particulate pollution in the air.

But as a species, humans are certainly not helping the situation. The largest source of human-caused air pollution can be pinned to energy generation. Electric power plants are the “single largest industrial source of some of the worst air pollutants.”³ The cost of energy production is high, as we continue to pump sulfur dioxide, nitrogen oxides, carbon dioxide and mercury into the atmosphere. Additional pollution results from cars, buses and airplanes, as well as from industry and construction.

Another thing to consider is that air pollution doesn’t stop at your front door. Indoor air pollution is just as insidious as its outdoor counterpart, and sometimes even more difficult to detect. The physical, chemical and biological characteristics of indoor air pollutants are such that they do not always produce easily recognized impacts on a person’s health.

It sounds bleak: Wherever you are, there’s a good chance that you are breathing unclean, impure, unsafe air.

Health Impacts of Air Pollution

The effects of air pollution on health are quite complex, because there are many different sources and their individual effects vary from one to the other. Additionally, not all people respond to pollutants the same way. Trying to categorize which pollutants produce which symptoms is therefore problematic. In fact, this is precisely one of the things that make air pollution so insidious. Think back to the “London Fog of December 1952” in which over 4000 people unexpectedly died due to industrialization-related air pollution.⁴ It looked like fog to them, but was something much more lethal. It happened then, and it is still happening today. How are we to recognize this “invisible” enemy?

While we may not be able to see the individual pollutants that are often abundant in the air, we do know that many of the known pollutants of outdoor air are clearly toxic to our systems. For example, carbon monoxide (CO), which is produced by the incomplete burning of carbon-based

Common Pollutants of Outside Air

Each of the following toxic pollutants can be easily found in air all across the nation and the world. Each is considered dangerous by the Environmental Protection Agency (EPA) and the World Health Organization.

- Sulphur dioxide (SO₂)
- Nitrogen oxide (NOX)
- Suspended Particulate Matter (SPM)
- Lead
- Carbon monoxide (CO)
- Respirable Particulate Matter (RPM)
- Carbon dioxide (CO₂)
- Chlorofluorocarbons (CFC)
- Ground Ozone
- Mercury

fuels including gasoline and wood, lowers the amount of oxygen that enters the blood. This can slow our reflexes, making us confused and lethargic while simultaneously starving our bodies of the oxygen needed to maintain health. Lead in the air, present as a result of petrol, diesel, lead batteries, paints, etc., can cause nervous system damage and digestive problems as well as cancer. Lead affects children in particular. What we call “smog” is actually “ground ozone” (not to be confused with the “good” ozone that is miles up in the atmosphere and which protects us from the Sun’s rays). Ground ozone is largely the product of industries and motor vehicles and it causes our eyes to itch, burn and water. It also lowers our resistance to colds and pneumonia and is directly related to asthma and other upper respiratory ailments.^{5, 6}

All these pollutants and many more are virtually impossible to avoid. The fact that they are in the air means they are easily spread far and wide. Does it surprise you that pesticides have been discovered in Antarctica, where they have never been used? Scientists speculate that is the effect of aerial transport – what is released in one place may very well end up in another. So it’s easy to surmise that there really isn’t anywhere out of the house where you are breathing pollution-free air.

Of course, the air *inside* your home or office may not be much better, and in view of the fact that many of us spend more time indoors than out, that is something to seriously consider. Have you

Common Pollutants of Indoor Air

The following toxic pollutants are commonly found in indoor air. Each is considered dangerous by the Environmental Protection Agency (EPA) and the World Health Organization.

- Tobacco smoke
- Pesticides
- Biological pollutants (e.g. pollen, mites, parasites, bacteria, etc.)
- Volatile organic compounds (e.g. solvents and chemicals from perfumes, hair sprays, glues, air fresheners, etc.)
- Formaldehyde
- Asbestos
- Radon
- Lead

ever found yourself feeling mysteriously worse when inside a certain room or building than when outside? Or have you actually become sick because of “something in the air” at work or a similar setting? These are both relatively common experiences, especially in the workplace and in older buildings. Health professionals relate the first scenario with what has become called “Sick Building Syndrome” (SBS) – a situation in which building occupants experience acute symptoms of ill-health that appear to be linked to time spent in a building, but which cannot be pinned to a specific illness or other cause. In contrast, the second scenario would be deemed a “Building Related Illness”

(BRI) as symptoms of diagnosable illness are identified and can be attributed directly to airborne building contaminants.⁷

In either circumstance, people experience poor health and disease-related symptoms because of poor indoor air quality. If this sounds too far-fetched or unconvincing to you, consider this: In 1992 the World Bank (an internationally-assisted development bank which exists to fight poverty and improve the living standards of people in the developing world) designated indoor air pollution in the developing countries as one of the four most critical global environmental problems.⁸ Indoor air pollution is a real threat, especially considering the fact that many children, elderly, and sick people spend the majority of their time indoors.

According to The Energy and Resources Institute, “although many hundreds of separate chemical agents have been identified [as contributing to indoor air pollution], the four most serious pollutants are particulates, carbon monoxide, polycyclic organic matter, and formaldehyde.”⁹ In addition to these four, pollutants such as nitrogen oxide, lead, asbestos, and radon are also commonly found indoor air pollutants that can be quite harmful to our health.

Where does it come from? Other than the obvious answer – from outside – some of our cultural tendencies make a bad situation worse. Tobacco smoke, for example, “generates a wide range of harmful chemicals and is a major cause of ill health, as it is known to cause cancer, not only to the smoker, but affecting passive smokers too.”¹⁰ Radon, a radioactive gas that can accumulate inside a home, usually originates from the rocks and soil under the house. If not “piped out” from under the house, it can leak inside, increasing the risk of lung cancer. Other pollutants are released more or less continually by everyday things like new or damp carpet, furniture, household cleaning supplies, and air fresheners. When you add such a collection of toxic elements to the fact that many buildings and homes are inadequately ventilated, you have a recipe for serious trouble. The EPA suggests that “if too little air enters a home, pollutants can accumulate to levels that can pose health and comfort problems...homes that are designed and constructed to minimize the amount of outdoor air that can ‘leak’ into and out of the home may have higher pollutant levels than other homes.”¹¹

Are You A Sufferer?

Immediate effects from indoor air pollutants may show up after a single exposure or repeated exposures and include:

- Irritation of eyes, nose and throat
- Headaches
- Dizziness
- Fatigue

Long-term effects may show up either years after exposure or only after long or repeated periods of exposure and include:

- Respiratory diseases
- Heart disease
- Cancer

From <http://www.epa.gov/iaq/ia-intro.htm>

A Breath of Fresh Air

Taking steps to help reduce outside air pollution is a socially, fiscally, and environmentally responsible approach to this worldwide problem. Many organizations exist that can give you expert advice on how to do your part. Some ideas that are easy to adopt include: walking or bicycling when possible, rather than driving; using public transportation; purchasing a hybrid motor vehicle; looking after and tending for the trees in your neighborhood; switching off lights and fans when they are not needed; composting leaves rather than burning them; and using only unleaded gasoline. For more information on how you can help clean the Earth’s air, visit the EPA online at <http://www.epa.gov/air/actions/> and the National Resources Defense Council at <http://www.nrdc.org/air/default.asp>. These two sites offer a wealth of information including practical, political and economical suggestions for becoming part of the air pollution solution.

It has been stated that a pollutant released *indoors* is many times more likely to reach a person’s lungs than one released *outdoors*.¹² Considering the fact that we raise our children, care for our sick and elderly, and eat, sleep, and relax all in our homes, it seems rational to suggest that in order to protect the health and wellbeing of our families and loved ones, a crucial step is keeping indoor air clean and clear of as many pollutants as possible. How do we accomplish such a

monumental task when so many everyday items that we own or use in our homes are potential pollutants?

Perhaps unsurprisingly, one of the ways to improve the air quality in your home is by inviting nature's purifier indoors. According to a two-year study conducted by NASA and the Associated Landscape Contractors of America, keeping healthy houseplants can effectively clean up a large percentage (up to 87%) of indoor pollutants.¹³ Some of the most active and effective plants for this use include: Dracaenas, palms, ferns, English ivy, peace lilies, mums, daisies and spider plants. Obviously, the more plants the better, so this is a recommendation best suited for those who have a green thumb. After all, plants can only clean the air if they are healthy, themselves.

For those with less botanical tendencies, the best way that you can ensure the air in your home is as pollutant free as possible is by purchasing and using a high quality air purifier. A good rule of thumb where air purifiers are concerned is that you get what you pay for. Beyond that, keep in mind that the best devices will have several features, including:

- **Energy efficiency** – it should only cost a few pennies a day to run your air purifier.
- **Quiet operation** – you should not substitute air pollution with sound pollution or you'll be less likely to use your purifier.
- **Easy filter replacement** – if it is difficult to change the filters, chances are you won't do so as often as directed, and that defeats the whole purpose.
- **Long filter life** – if the filters have to be replaced frequently, you may meet with unexpected expenses.
- **High-quality fan** – if the fan is poorly made or inadequate for the job, you may risk costly repairs or poor performance.
- **Warranty** – be sure that your purifier is covered by at least a two-year warranty in the event that it needs to be replaced or repaired.

Using a high quality air purifier can dramatically affect your health in a short period of time. Some report breathing and feeling better within hours. When combined with lifestyle choices that espouse the use of natural, chemical-free personal care products, household cleansers and pesticides, indoor air quality is dramatically improved, resulting in fewer colds, illnesses and long-term diseases. As important as clean air is to a person's overall wellbeing, implementing such changes could very well be one of the best things you do for yourself and your loved ones.

¹ *Millennium Ecosystem Assessment*, "Living Beyond Our Means" Statement from the Board, March 2005, pg. 11

² <http://edugreen.teri.res.in/explore/air/major.htm>

³ <http://www.nrdc.org/media/pressreleases/050210.asp>

⁴ <http://www.bopcris.ac.uk/bopall/ref9517.html>

⁵ <http://edugreen.teri.res.in/explore/air/major.htm>

⁶ <http://cfpub.edp.gov/airnow/index.cfm?action=static.health>

⁷ Global College of Natural Medicine, Segment 3, Lesson 9, "Environmental Medicine," pg. 25

⁸ <http://edugreen.teri.res.in/explore/air/indoor.htm>

⁹ Ibid.

¹⁰ <http://edugreen.teri.res.in/explore/air/health.htm>

¹¹ <http://www.epa.gov/iaq/ia-intro.htm>

¹² <http://edugreen.teri.res.in/explore/air/health.htm>

¹³ <http://frugalliving.about.com/cs/cleaning/a/050404.htm>