

Orthodox Ecological Perspectives

Air Pollution and Human Health

by Fred Krueger

For humans to contaminate the Earth's waters, land, air and life with poisonous substances, these things are sins.

- His All-Holiness Ecumenical Patriarch Bartholomew

The Orthodox Church, aware of her responsibility for the fate of the world, is deeply concerned about the problems generated by contemporary civilization. Today the face of the Earth has been distorted on a global scale. Its bowels are being damaged as are its soil, water, air, fauna and flora. Nature which surrounds us serves as the life support system for humanity.

- His Beatitude +Patriarch Alexiy, Russia

The commitment of our Orthodox Church to protecting our environment must also be a part of the local ministry of our parishes.... We are challenged to behold with sensitivity the state of the natural world and to respond decisively when we witness the degradation of natural resources and the problems of increasing air and water pollution in our cities.

- His Eminence Archbishop Demetrios

AS ORTHODOX CHRISTIANS WE ARE CALLED TO LOVE OUR NEIGHBORS AS ourselves. We are to think in terms of the good of the community as well as our own good.

When we examine the problem of air pollution, the health effects of poor air quality are far reaching and a significant cause of sickness and health problems. Air pollution principally affects the body's respiratory and cardiovascular systems. Individual reactions to air pollutants depend on the type of pollutant, the degree of exposure, and the health of the individual. People who exercise outdoors, for example, on hot, smoggy days increase their exposure to pollutants in the atmosphere.

The specific health effects of air pollutants range from subtle biochemical and physiological changes to difficulty breathing, coughing, and the aggravation of existing respiratory and cardiac conditions. These effects can result in increased medication use, increased doctor or emergency room visits, more hospital admissions, and in some cases even premature death.

Unhealthy levels of air pollution harm the health of urban residents, especially those who suffer from asthma. Although clean air laws regulate industrial smokestacks, most car and truck engines and other causes of pollution, major unregulated sources of air pollution remain. Among the largest unregulated sources are coal-fired electric power plants that were built prior to the clean air laws that were passed in the 1970s. These power plants release thousands of tons of sulfur dioxide, nitrous oxide, and mercury into the air each year, putting the health of millions of Americans at risk.

Air pollution is no small matter. Across America, pollution of the air causes between 50,000 and 100,000 premature deaths each year. For perspective far more people die every year from air pollution than from all of our war deaths, homicides, and automobile accidents combined. Soot and fine particles account for a majority of these deaths. According to the California Air Resources Board, diesel engine soot accounts for 70 percent of the cancer risk from toxic air pollution. Worldwide over three million people die annually because of air pollution.

The American Lung Association adds a further consideration. By 2020 asthma, primarily caused by air pollution, will affect 1 out of every 14 Americans and 1 in 5 families. Asthma is already the leading serious chronic illness in children. Approximately 25 percent of children between the ages of 14 and 18 have their activities limited because of asthma. Medical studies in 2010 by the California Environmental Protection Agency show that air pollution plays the largest role in triggering asthma attacks. Exposure to air pollution is linked to increased use of asthma medications and an increased rate of emergency room visits and hospitalizations.

The health of our lungs and respiratory system, of our heart, and the entire cardiovascular system is affected by the quality of the air we breathe. In response to air pollutants, lung cells release chemical mediators that affect the function of other organs. This may cause lung inflammation and impair breathing. Even the heart is affected by air pollution. The absorption of air pollutants into the bloodstream transports those chemicals to the heart. A wide spectrum of chemical and biological substances interact with the cardiovascular system to cause structural changes, such as inflammation and degenerative necrosis. Some air pollutants may cause alterations to the rhythms of the heart. If severe enough, these changes may lead to lethal arrhythmias (i.e., heart attacks).

Besides these conditions, the following are the most prevalent diseases that result from air pollution:

- Lung infections, including bronchitis and pneumonia, chills and shortness of breath.
- Asthma is on the rise in both children and adults. It causes shortness of breath and coughing, wheezing or whistling in the chest. Asthma attacks can be triggered by a variety of factors, including infection, pollen, allergies and stress, or excessive exercise, and it can also be triggered by sensitivity to pollutants present in the air such as smog.
- Chronic obstructive pulmonary disease (COPD) encompasses emphysema and chronic bronchitis. Smoking is responsible for about 80% of COPD cases while other forms of air pollution may influence the development of these diseases. It is important to note that no cure exists for people suffering from COPD although clean air, a healthy lifestyle, and medication can help.
- Minor lung illnesses, including sore throat, stuffy or runny nose, coughing and sometimes irritation of the eyes.
- Lung cancer, primarily caused by cigarette smoke, is also linked to air pollution. This is the most common form of cancer.

The implication from these conditions is that everyone is at risk from air pollution. Certain populations however are more susceptible, primarily children and the elderly. Individual reactions depend on the type of pollutant, the degree of exposure, and how much of the pollutant is present. Age, health, and vigor are additional factors.

Children and newborns are more vulnerable to the health effects of air pollution because they take in more air than adults for their body weight. The consequence is that they absorb a higher level of pollutants. People who exercise outdoors on hot, smoggy days are also at greater risk due to their increased exposure to pollutants in the air.

Air pollution affects health in other ways. Short-term effects include irritation to the eyes, nose and throat, and upper respiratory infections such as bronchitis and pneumonia. Other symptoms include headaches, nausea, and allergic reactions. It can also aggravate the conditions of individuals with asthma and emphysema.

Long-term effects can include chronic respiratory disease, heart disease, damage to the brain, central nervous system, liver, kidneys, and even lung cancer. Continual exposure to air pollution affects the lungs of growing

children and may aggravate or complicate medical conditions in those who are infirm or elderly. No one is immune from the effects of air pollution.

Cigarette smoking represents a uniquely personalized form of air pollution. It is estimated that half a million people die prematurely every year in the United States as a direct result of smoking. Significantly, secondhand smoke presents health hazards comparable to smoking. High in toxic chemicals, secondhand smoke plays a role in causing or contributing to a number of health problems, from cardiovascular disease to cancer. The Surgeon General reports that scientific evidence shows there is no safe level of exposure to secondhand smoke.

According to the 2006 Surgeon General's report on secondhand smoke, exposure to smoke at home or work increases the nonsmokers' risk of developing heart disease by 25 to 30 percent and lung cancer by 20 to 30 percent. It is especially dangerous for children living with smokers and it is known to cause sudden infant death syndrome, respiratory problems, ear infections, and asthma attacks in infants and children.

Medical conditions arising from air pollution can be hugely expensive. Health care costs, lost productivity in the workplace, and human welfare impacts cost tens of billions of dollars each year.

The health problems that arise from air pollution are not merely the unfortunate by-products of our industrial system and the price of our fast-paced way of living. They are the evidence of a society out of harmony with God and creation. These health issues demonstrate direct connections between the exhaust from coal fired power plants, from trucks and cars, and the health of people in urban and suburban neighborhoods. There is no escaping the cause and effect relationship between what we do to the air and the consequences for the health of communities and the people in our parishes.

While we have little choice but to breathe the air around us, we do have choices that can help us stay healthy. People can choose to stay indoors when the air is most polluted, or they can be less active on poor air quality days. They can avoid high-traffic and highly industrialized areas whenever possible, and they can take action to support the reduction of air pollution. Such actions are a positive response to a problem that can literally steal one's health away.

Scientists identify many layers to the effects of air pollution. There are local problems close to the sources of pollution. These include the negative impacts on human health, including coughs, burning eyes, breathing problems, and even death. They also include atmospheric haze, smog which reduces visibility, and acid rain from chemical emissions that pollutes water resources, damages property, and harms forests, wildlife, and agriculture.

Some air pollutants harm plants and animals directly. Other pollutants harm the habitat, food or water that plants and animals need to survive.

- Acid rain harms living things

When acidic air pollutants combine with water droplets in clouds, the water becomes acidic. When those droplets fall to the ground, the resulting acid rain can damage the environment. Damage due to acid rain kills trees and harms animals, fish, and other wildlife. Acid rain can destroy the leaves of plants. When acid rain soaks into the ground, the acidity can make the soil unfit for living things. Acid rain also changes the chemistry of the water in lakes and streams, harming fish and aquatic life.

- A thinning ozone layer harms living things

Air pollutants called chlorofluorocarbons (or CFCs) have destroyed parts of the ozone layer. The ozone layer, located in the stratosphere layer of Earth's atmosphere, shields our planet from the Sun's ultraviolet radiation. When the ozone layer is damaged, ozone holes result. These allow more ultraviolet radiation to enter the atmosphere which contributes to skin cancer and damages plants and wildlife.

- Ground level ozone harms living things

Ozone molecules also gather near the Earth's surface as a part of air pollution. Ground level ozone damages the lung tissues of humans and animals and prevents plant respiration. Without respiration, a plant is not able to photosynthesize at a high rate and so it will not be able to grow.

- Global warming harms living things

Our planet is currently warming because of human activity, primarily the use of fossil fuels, which release carbon dioxide and other heat-trapping greenhouse gases into the atmosphere. This form of air pollution is affecting the entire planet. It is causing changes to the climate, an intensification of storms, the melting of the polar ice caps, and a relentless rise in sea levels which could flood coastal cities. Trees through the process of photosynthesis normally convert carbon dioxide into oxygen while retaining the carbon to grow larger. However, the amount of carbon dioxide released by the burning of fossil fuels is now far greater than forests are able to metabolize.

Global warming is now causing major changes to many locations around the world. For example:

- Near the poles, ice and tundra (frozen ground) are rapidly melting. This is causing drastic alterations to the habitat and resources for people in the Far North as well as the plants and animals living there.

- Ocean warming, rising sea levels, and increasing acidity levels directly contribute to coral bleaching and death. These are now causing changes in shallow marine environments such as coral reefs.

- Global warming is causing less rain to fall in the middle of continents. This is making these areas drier and reducing water availability for plants and animals. Droughts will become more frequent and will impact agriculture, and thus the food supply, for many countries.

Cars stuck in traffic pollute more. The latest research shows that the closer you live to a busy road, the higher the risk to your health.

The Perspective of the Orthodox Church

His All-Holiness Ecumenical Patriarch Bartholomew observes that air pollution represents the degradation of a basic requirement for human life and is the result of humans failing to recognize that there are limits to what we can do.

We are saddened to see the suffering of a great number of people from violence, starvation, poverty and disease. We are also concerned about the negative consequences for humanity and for all creation resulting from the degradation of basic natural resources such as water, air and land, brought about by an economic and technological progress which does not recognize and take into account its limits. (Venice, Italy, June 10, 2002)

Air pollution harms those who breathe the dirty air. It should be understood as a failure of human responsibility to care for the earth and to respect its life and the life of our neighbors. We have been placed by God in the world in order to cooperate with Him in realizing the divine purpose for creation.

His All-Holiness tells us that we are repeating the original sin of Adam and Eve in the Garden because of our refusal to obey the commands of God which require us to respect His creation and take good care of it. He writes:

At the beginning of history, man and woman sinned by disobeying God and rejecting His design for creation. Among the results of this first sin was the destruction of the original harmony of

creation. If we examine carefully the social and environmental crisis which the world community is facing, we must conclude that we are still betraying the mandate God has given us: to be stewards called to collaborate with God in watching over creation in holiness and wisdom.

Society must progress in harmony with God's creation; it must avoid whatever harms the life of people or the creation. Our goal must be to integrate human society into the ecosystem of the planet. Whenever there are side-effects from our way of living that harms the creation or hurts our neighbors or ourselves, this is evidence that we must make corrections in our lifestyle. Financial efficiency or convenience are not valid excuses for a system that harms the health and well being of its citizens.

His Eminence Archbishop Demetrios, addressing the parishes of the Greek Orthodox Archdiocese in America in 2002, explains why we must be observant in protecting the environment – God's good creation.

The commitment of our Orthodox Church to protecting our environment must be a part of the local ministry of our parishes. On this day, September 1, we are called, as members of the Body of Christ, to address the needs of our own communities concerning the environment. We are challenged to behold with sensitivity the state of the natural world and to respond decisively when we witness the degradation of natural resources and the problems of increasing air and water pollution in our cities.

A similar message comes to us from His Eminence Archbishop Lazar from the Orthodox Church in America (in Canada).

God gave man a clear responsibility for the condition of the earth. If Orthodox Christians are the most exact followers of God and His commandments, then Orthodox Christians have the greatest responsibility for their attitudes and actions with regard to the condition of the earth and its atmosphere.

One of the more pressing ecological problems of our day is the destruction of the ozone layer in our atmosphere. The ozone layer was placed around the atmosphere by God to regulate the sun's rays. It blocks harmful radiation that can cause skin cancer and lets in only as much of this "ultra-violet radiation" as the earth needs. Now scientists have discovered that we are destroying this ozone layer, allowing dangerous radiation to come through to the earth's surface. Man is attacking and destroying something that God created especially to protect us – and Orthodox Christians are just as guilty as everyone else in this terrible sin.

What is destroying the ozone? We are, or rather, the “convenience” chemicals that we use are. These chemicals are called “chlorofluorocarbons” and “halons.” When we use these chemicals or things made from them, they drift up into the upper level of our atmosphere and destroy the precious ozone which God, in His wisdom, placed there....

These chemicals are released into the air from foam egg cartons, the styrofoam cups and dishes we use on picnics or which are used for coffee and food in fast-food restaurants, or anything made of styrofoam.

What can we do? We can, and must, do our part in fighting this problem. If everyone leaves the action to “someone else,” then nobody will do anything, and we will be joining in a mass suicide caused by greed, selfishness and indifference. We will be committing a great sin against God and His creation. What can we do?

It is not just the Orthodox Church in the United States that is addressing air pollution. The problem is global. His Beatitude Patriarch + Alexiy along with the entire Holy Synod of the Russian Orthodox Church issued the following statement in 2000 for Russians.

Today the face of the Earth has been distorted on a global scale. Its bowels are being damaged as are its soil, water, air, fauna and flora. Nature which surrounds us serves as the life support system for humanity. Man however is no longer satisfied with its diverse gifts, but exploits whole ecosystems without restraint.

The hierarchs of the Orthodox Church repeatedly tell us that we must do our part to maintain clear air. This is a responsibility that we all share.

What You Can Do Solutions to Air Pollution

There is much that you can do to help clean the air. The following are some recommendations on actions that you can take.

- ◆ Refrain from unnecessary vehicle travel. As much as possible, reduce your use of fossil fuels which are a primary culprit in air pollution.
- ◆ Walk, bicycle or use public transportation whenever possible
- ◆ Drive a car that gets at least 35 miles per gallon. As much as possible, avoid traffic jams and areas where vehicles are stalled on the road.

- ◆ Make your home more energy efficient; buy only energy efficient appliances.
- ◆ Replace incandescent light bulbs with energy efficient compact fluorescent bulbs or the new LED lighting.
- ◆ Recycle aluminum, newspapers, and other materials. The production of new aluminum or new paper uses a lot of energy which pollutes the air.
- ◆ Plant trees and avoid purchasing styrofoam products that contain CFCs.
- ◆ Eliminate wood burning in urban areas as a means of heating. Wood smoke is a major cause of air pollution – and also illness – in many cities
- ◆ Support stricter clean air laws for your city and state.
- ◆ Work to eliminate diesel exhaust which is especially polluting in urban areas and particularly culpable for asthma in children.
- ◆ Stop using aerosol cans and replace them with cleaning liquids sold in spray bottles. Aerosol cans contain chemical propellants that pollute the air.
- ◆ Replace coal-fired heating and any system that still uses coal. Coal is one of the major causes of air pollution and pollution related health problems.
- ◆ Use paper products in place of styrofoam. Purchase eggs in cardboard cartons and tell your grocer that you do not want eggs that are packaged in styrofoam.
- ◆ Avoid wood stoves, trash burning outdoors, or the creation of any unnecessary smoke or other fumes.
- ◆ Tell restaurants that you prefer cardboard take-out containers, not styrofoam. Avoid those places that will not change their policies on take-out food.
- ◆ Become as well informed as possible about the problem of air pollution and discuss it in the parish hall over coffee, or at parish meetings.

There are many sources of additional information about air quality. These include federal agencies such as the U.S. Environmental Protection Agency, state and local air quality officials, the American Lung Association, and even local news sources, which often provide reports on air quality as part of the daily weather report.

If you want to get more involved, or even take on a parish youth project, consider some of the following actions:

◆ Write or call your elected officials and ask them to strengthen clean air laws to reduce air pollution from coal-burning power plants. Tell them that this is a moral responsibility. Your local Congressional representatives have the ability to pass laws and require dirty power plants to clean up their exhaust. Local elected officials can also pressure federal officials to pass stronger clean air laws.

◆ Sponsor an asthma awareness event for your community. Possible resources for an event of this type can include local hospitals or health clinics, your local chapter of the American Lung Association, or other local public health agencies.

◆ Find out about the quality of the air in your area. If it is dirty or fails to meet health standards, tell your elected officials about the importance of clean air. You could attend town hall meetings or write letters. You can also look for information from national and state groups that track the environmental voting records of elected officials such as the League of Conservation Voters or your state conservation voter league.

◆ Register to vote and support the candidates who will protect the health of your community from air and other forms of pollution. The good health of your family and neighbors may be at stake!

Reflection

The problem of air pollution and other environmental ills raises serious questions for Orthodox Christians. Our theology teaches us how to understand issues such as air pollution and the defilement of God's creation. The saints provide a key insight here. They tell us of a principle of correspondence. Through this principle we learn that creation reflects the Creator and His handiwork. Thus we discern the beauty, power and glory of God by the beauty, intricacy and magnificence of Creation.

Following this logical mode of discernment, the pollution and decay of our environment becomes a mirror, corresponding to and reflecting the decay and corruption of our inner human attitudes. This is why efforts to mobilize more resources or further applications of new technology can never completely solve social or ecological problems. These problems are evidence that in our actions we have forgotten God. The only lasting solution is a change of heart and repentance. This happens only when we change how we perceive the world. Instead of a material world separated from God, we need to realize that we continually live and move in God and must behave in a reverent and sacred manner consistent with a world that is everywhere filled with God's holy presence.

It may be helpful to remember that as we submit to the cultural suppositions of a materialistic, consumer-oriented society, we also submit to hidden sins embedded in its worldview and behavior. This submission causes us to slide into a “cultural captivity,” a captivity different from the historical “yokes” under which the Orthodox Church suffered.

The captivity this time is different because it is a voluntary captivity; it is a captivity through allurements in which we are seduced by the glamor and glitz of society and the lure of luxury and abundance of what are mostly ultimately meaningless and empty things. This might be considered “the wide road” that Jesus points out is easy, but that leads to destruction. He contrasts this with the narrow way in the Gospel of Matthew when He says, “*narrow is the way which leads unto life*” (7:14).

The world today is different from the world of the Bible. Nevertheless the teachings of Jesus Christ provide timeless principles and keys to assess right and wrong, even in new circumstances. The implication is that we are faced with the task of applying our theology to these modern issues so that we can live lives of integrity. One of the challenges before us is whether Christ’s healing presence will remain bound up within the walls of the parish, or whether the parish will extend the healing insights of the Church into our homes and onto the streets of our cities and towns.

The simple actions that are listed here as solutions to air pollution are not difficult. Their implementation is primarily a matter of sufficient will and intentionality. The challenge for Orthodox Christians, if we will be faithful to Jesus Christ and the Gospel, is to extend the life of the Church into the life of the world.

HAH Ecumenical Patriarch Bartholomew reminds us that cancer and other diseases which our abuse of the environment causes are an offense to God’s creation.

It is becoming widely accepted that the overthrow of the natural order by human beings produces ill reactions to the human organism, such as the contemporary plagues of cancer, heart diseases, anxieties and a multitude of other diseases.

His Beatitude Patriarch Ignatius IV of Antioch describes how we can address these problems.

Asceticism is indispensable if we are to achieve that limitation of desires which will make it possible for us to respect better the earth and the life which belongs to it, and to bring into operation sharing on a planetary scale.

His Beatitude continues and declares,

Christians will act by example, showing the cultural, social and ecological richness of traditional ascetic values....

With this goal in mind, Patriarch Ignatius presents us with a further challenge that we might also see as unprecedented opportunity.

Let us call humanity to a common task, drawn by the love of man as the image of God and of the universe as the creation of God. It will be a common task if all Christians take part and share their experience and their hope, those of the West and those of the East, those of the North and those of the South....

This joint effort of revitalization will provoke a spiritual revolution, the repercussions of which will gradually be inscribed in social and economic life. We who belong to the end of the second millennium, who are so often orphans without hearth or home, shall find our dwelling place in Christ. For it is Christ Who unites heaven and earth, and it is the Church which in its depths is the world on its way to deification.

- Lucerne, Switzerland
March 12, 1989

Since clean air and the preservation of the natural environment... are necessary for the healthy existence of each person, each person is morally obliged to refrain from pollution and destruction of the environment.

- HAH Ecumenical Patriarch Bartholomew
May 24, 1999