

PUBLIC HEALTH

Poison Fills the Silent Sky

A gray, poisonous blanket of smog is creeping over our land, stunting our green crops, corroding our buildings, and endangering the lives of countless people and animals.

By **BARBARA TUFTY**

See **Front Cover**

► **IT COMES QUIETLY**, this shadowy murky smog. It creeps silently around the tall buildings of the cities, and drifts over the verdant valleys of the country with hardly a whisper except from the breeze that carries it.

We cannot hear it, yet we can see it, that gray pall of smoke and smog hanging lazily over the land, hiding the sun as seen over New York City on this week's front cover. We can smell and feel it, a bitter pungent odor that stings our noses, burns our eyes and irritates our throats and lungs.

A fresh wind may scatter this shroud, dissipate it and carry it away, leaving a clear blue sky with rays of the sun shining through once again.

Yet deep scars are left behind, traces of the passage of this latest monster of modern industrial civilization—polluted air.

Plants lie wilted, laundry is soiled, paint is peeled from the houses, and the cough that lingers in our throats makes us wonder when it all will end.

This dirty chemical air makes our livestock ill—and so our meat and dairy production suffers. It glazes, silvers and coats the lower surfaces of plant leaves and damages our lettuce, beans, sugar beets, alfalfa and other crops. The smog eats away stone, paint and mortar from our buildings, monuments and bridges; it corrodes our metal structures. When the black, gritty blanket settles low over the ground, it reduces our visibility, creates traffic hazards for automobiles on earth and airplanes in the sky.

Worst of all, the acrid smoke we inhale with 6,000 gallons of air each day into our lungs causes health problems and even death. Medical scientists feel that polluted air can aggravate heart conditions and respiratory diseases such as asthma, chronic bronchitis, lung cancer, emphysema with difficulty in breathing, and even colds—particularly among older people.

Gray Monster

Just what is this monster from the sky? It is a blanket of air laden with smoke, soot, dust, ash, fumes, gases and odors of mankind. The mixture varies from city to city, from place to place, but essentially the basic materials are the same. Solid particles, some so tiny they cannot be seen with the naked eye, are wafted through the air on the most gentle of breaths—bits of pulverized rock, ground metal filings, residues of carbon, ash, lead and carbohydrates. Microscopic droplets of oil, grease and tar drift suspended in air currents. Then there

are the gases—the dangerous oxides of sulfur, nitrogen and carbon, such as sulfur dioxide and sulfur oxide, nitrogen dioxide, carbon monoxide and ozone.

Some of these minute bits of solids, liquids and gases are visible and some are not. Some are odorous and some are poisonous—and some are merely messy as they stick to our clothes, put a thin scum over our cars and windows, crack our rubber boots and eat holes in nylon stockings.

Man himself is responsible for this anarchy. Although nature contributes substantial pollutants in the air from her belching volcanoes, smoking forest fires, and the slow decay of vegetation—man with his growing arsenal of industry and mechanics is throwing an extraordinary amount of filth into the sky.

Industrial Sources

Sources of this contamination read like a roster of modern man's activities. One large source comes from huge industrial plants which consume volumes of oil and coal in their furnaces. Often the fuel is insufficiently burned, and half-baked particles ride through smokestacks in billowing clouds of black smoke. Fumes from steel mills, power plants, petroleum refineries and chemical plants can spread a pall over dozens of square miles around the area.

Smaller productions contribute their share—the dry-cleaning plants, vulcanizing shops, smoldering dumps, city incinerators and sewage plants, as well as antique heating plants in schools and large buildings.

Each householder can be guilty of adding to the junk pile of the air. Inadequate furnaces may burn only a part of the fuel, raising household costs as well as filling the lungs of their own children on their way to school. The smoldering trash heap or pile of leaves in the back yard sends streamers of smoking pollutants into the atmosphere.

Then there are exhaust fumes from cars and trucks, diesels, buses and other motor vehicles. Even the ships at sea and locomotives speeding across the land contribute their ash to the sky.

Radioactive fallout from nuclear explosions adds dangerous materials throughout the world.

The real danger from this air-borne residue can be intensified or decreased by another factor—the weather.

A brisk wind can blow this refuse of man's varied activities up into the air, over the mountains, across the sea, over the empty stretches of this earth where it becomes harmlessly diffused. Snow, rain or other precipitation can wash the air clean, dragging down the dirty particles from the air to earth.

Yet sometimes there is no wind. Or worse, an upper blanket of air hems in the smoke close to the ground. Normally the higher levels of air are colder than the air near the earth.

But sometimes this condition is reversed, and a layer of warm air lies above the lower cooler air. This situation is called "air inversion," with the warm air acting as a lid that traps sooty air beneath it. Sometimes this inversion lasts only a few hours, sometimes a few days, sometimes even longer before the right wind can unlock the upper mass and blow away the smog.

London Hard Hit

It is this concentration of stagnant pollutants that causes the most damage. London felt it hardest in December, 1962, when the city was entombed in a gray-brown fog that slowed traffic, dimmed visibility, and darkened the sun. When winds finally moved the air blanket four days later, the death toll was estimated at more than 700 lives.

New York also has felt the shroud of death in November, 1953, when a layer of warm air hovered over the city for ten days, leaving more than 240 people dead.

The small but heavily industrialized town of Donora, Pa., in October, 1948, suffered five days of dense smog that sickened 43% of the community and killed 20 people.

Many cities in the United States are afflicted with this serious problem. Los Angeles has long felt the impact, and has been making heroic efforts to control it.

Other vulnerable areas feeling the growing darkness include Philadelphia, Cincinnati, St. Louis, Chicago, the Kanawha Valley of West Virginia, the Niagara area, Pennsylvania's Allegheny County, Detroit, Birmingham, Ala., and the Ohio River Valley.

Control Measures

Even Washington, D. C., which is not an industrial area but has an ample supply of cars, homes and office buildings, is experiencing difficulties from the unclean air.

Naturally the question arises on what are we doing to control this air monster. Many industries, cities and states already are doing much to clean the atmosphere. The Division of Air Pollution of the U.S. Public Health Service, part of the Department of Health, Education and Welfare in Washington, D. C., is active in setting up research, analysis and methods of setting standards and controls. Congress is holding hearings for passage of a bill to conserve our precious resource, the air.

The problem, like a thousand-armed octopus, has been approached in several ways. One method is to reduce the amount of pollutant-creating materials that go into factories, furnaces, cars and other vehicles. This means substituting the pollutant-producing fuels for material with less residue. Plants can and have switched from oil-

burning to gas-burning operations, or from soft to hard coal.

Another method is to install equipment that either filters the dangerous material from escaping fumes, or returns the fumes to be burned again. More and more industries are being required to establish equipment that cuts down on smoke, gases and chemicals thrown through their smokestacks. At enormous costs, industry has been cleaning up, and several refineries stand triumphant today, almost odorless and smokeless.

Los Angeles now requires filters over exhausts from dry-cleaning shops, coffee-roasting plants, restaurants, printing presses and other fume-creating industries. All new cars throughout the nation are now required to have a crankcase device which turns back partly burned fumes for re-burning.

Another method of reducing the sewer in the sky is to ban certain activities completely. In Los Angeles you cannot burn refuse or trash in back yard incinerators, nor can you let gasoline vapors escape from storage tanks. In New York City, the nostalgic custom of burning autumn leaves is banned.

Methods of Relief

Some doctors and public health workers feel the need of more immediate relief from the poisonous fumes. Ampules or a spray of spirits of ammonia could be carried in your pocket for quick inhalation to counteract the poisons of polluted air, suggests Dr. Alvan L. Barach, consultant in medicine at Presbyterian Hospital, New York City.

Believing that better methods should be worked out for immediate relief in the home, Dr. Barach also advised the use of an air purifier to be installed in the house or office, much like an air conditioner.

Another important step to combat the menace from the air is the National Air Stagnation Alert System, operated by the U.S. Weather Bureau and the Public Health Service. This recently installed network of installations throughout the nation operates automatically on a 24-hour around-the-clock

basis, recording every five minutes weather conditions favoring accumulation of air pollutants. The results are then analyzed and warnings sent to specific areas which possibly would be in danger.

Using modern methods of analysis, control and warning, agencies throughout the nation hope to halt the deadly assault of air pollution upon our land, homes and lives—one of the most serious environmental and social problems facing the United States today.

• Science News Letter, 86:26 July 11, 1964

Do You Know?

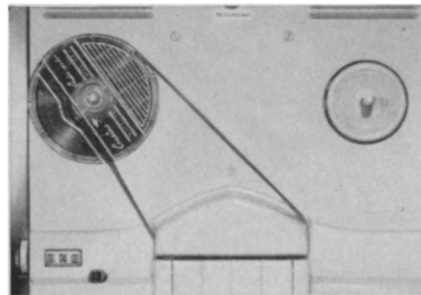
More than 40 million of the 100 million persons in the United States who use water for recreation would drown if they had to swim 50 feet to save their lives.

A dangerous buildup of static charges that could cause explosions and fires if lethal gas-air or dust-air mixtures are present can occur on clothing in low temperatures.

Although there are more than 250,000 plant species in the world, we cultivate only 300 of them, and 90% of the world's food supply comes from only 12.

Prehistoric cave drawings indicate that some early men shaved with the aid of clam shells, shark's teeth and sharpened flint.

• Science News Letter, 86:27 July 11, 1964



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