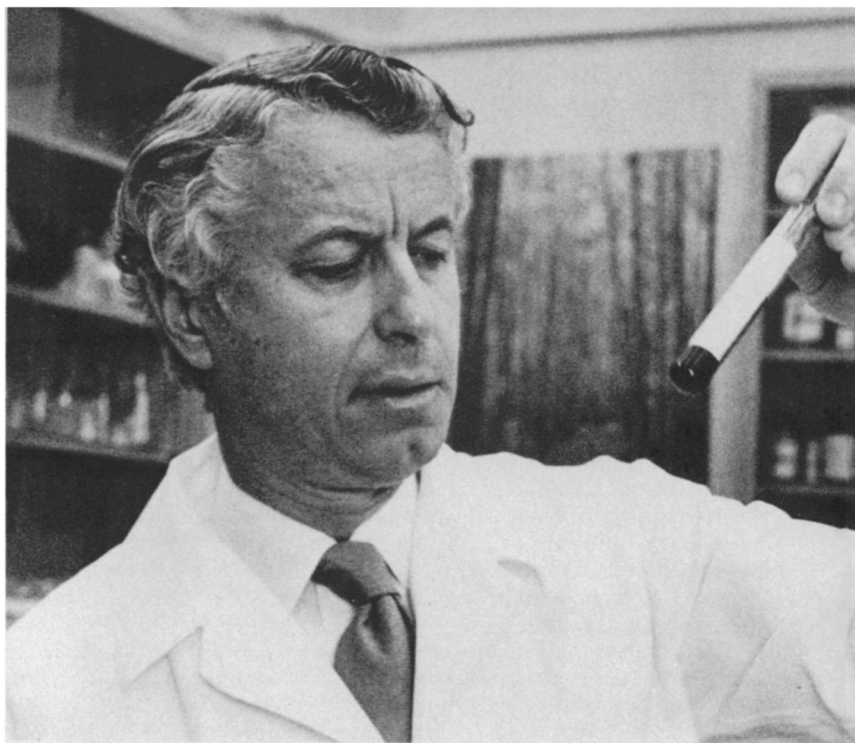




Horvath



WILL DIRTY AIR DO YOU IN?

Maybe. But

by Joan Arehart-Treichel

We've come a long way since Carl Sandburg's time, when "the fog comes on little cat feet. It sits looking over the harbor and city on silent haunches and then moves on." Now smog, with feline cunning, stalks harbors and cities, streaks down highways, pounces on city streets. The word is out: You'd better watch it, or dirty air will devour you.

During smog alerts in Los Angeles, children and young adults are warned to avoid sports and other physical activities. Older people with emphysema and heart disease are advised to stay indoors or take to their beds. Carbon monoxide has reached 300 parts per million at Oxford Circus in London (a level known to kill people if they're exposed to it for six or eight hours). Carbon monoxide has reached 100 ppm on streets in downtown Chicago. Air pollution has the Japanese and Swiss so worried they've installed fresh air booths on street corners. For a yen or franc you can gulp down a few draughts of fresh air.

But actually how much does dirty air threaten your health? Congress based the Clean Air Act of 1970 on the premise that air pollution poses a serious threat to human health. But because the standards require drastic and costly changes in transportation, and hamper energy exploitation, the Administration, automakers, other industries and cities are pressuring Congress to relax the standards (SN: 8/4/73, p. 71; 9/15/73, p. 163). So advocates

of clean air, like Sen. Edmund S. Muskie (D-Me.), and his Subcommittee on Air and Water Pollution, buttonholed the National Academy of Sciences into rallying the nation's air pollution scientists for a three-day conference in early October. (The subcommittee picked up the tab for the conference.) The scientists presented more or less the latest scientific data about the health effects of air pollutants. Full conference proceedings were made available to the subcommittee in late October. Whether the proceedings will help the subcommittee defend current air-pollution standards remains to be seen. But one thing is sure: the conference underscored the many unanswered questions about the health effects of air pollutants.

Certainly there is ample, although not always uncontested, clinical, epidemiological and animal evidence that air pollutants present health hazards. Carbon monoxide competes with oxygen for hemoglobin molecules in the blood. So if there is enough CO in the body, it can impair cells with high oxygen needs—in the heart, skeletal muscle and central nervous system. Various studies suggest that CO can aggravate heart disease; impair vision, work performance or exercise; reduce the liver's ability to metabolize drugs.

Sulfur dioxides and their breakdown products appear to aggravate asthma, emphysema, bronchitis and heart disease. The nitrogen oxides have been linked with eye and nasal irritations,

bronchitis, bronchial pneumonia, high blood pressure and possibly heart disease. The NO₂'s appear to lower immune protection in the lungs by knocking out macrophages (cells that kill bacteria), and they also appear to act synergistically with viral infections (make them worse than usual).

Oxidants, particularly ozone, appear capable of impairing breathing, causing chest pains, affecting vision, lowering immune protection and weakening the membranes of red blood cells. A vitamin E deficiency may make you more vulnerable to ozone.

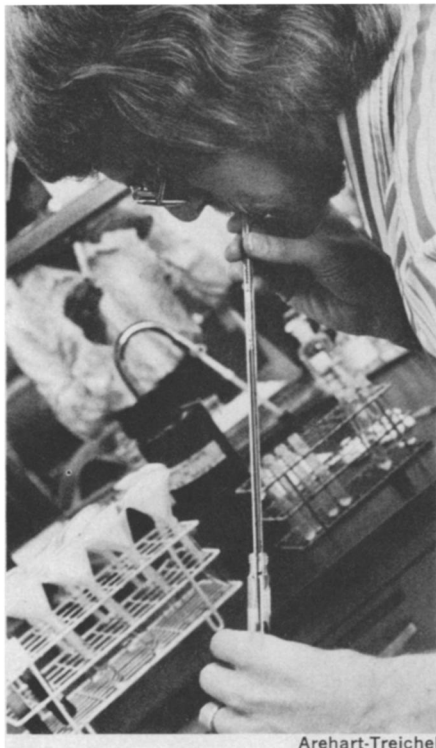
Yet at present, even after the hundreds of air pollution and health studies that have been conducted during the past 30 years, a lot of crucial questions remain unanswered. Results are not clear-cut because they are based on exposures to various levels of pollutants for various lengths of time. Few studies have zeroed in on the long-term effects of air pollutants at low concentrations, which is what most of us are exposed to. Studies have concerned limited segments of the population, not necessarily those most in jeopardy from air pollution. For example, the effects of CO on behavior "have been limited to young men, with an occasional female thrown in for spice," reports Steven M. Horvath of the University of California at Santa Barbara.

Whether results obtained with a pollutant can be extrapolated to a real-life situation is questionable. Carbon monoxide may well impair vision in the

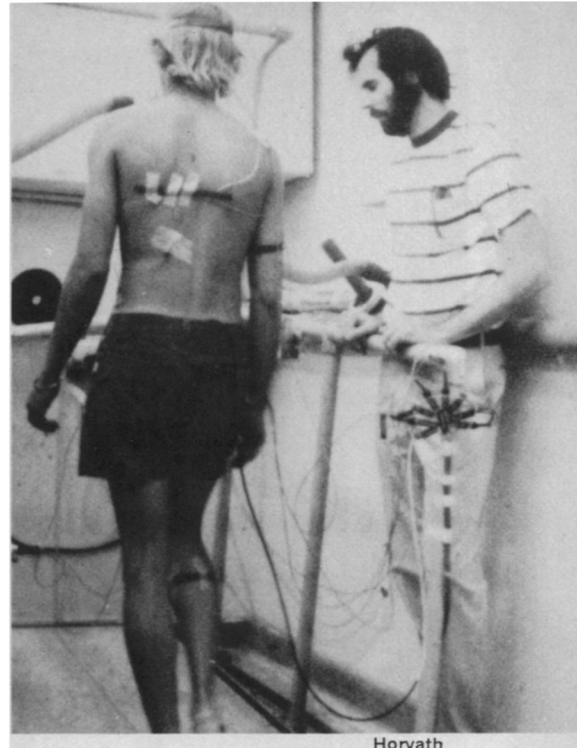


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(1 to r): fresh air booths used in Japan and Switzerland; Radford: "Measurements were totally unreliable in the Baltimore area"; technician drawing blood sample containing CO; testing the effects of CO on exercise.



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find a medical examiner who'll substantiate it.

lab, Bertram D. Dinman, medical director of Aluminum Company of America, concedes. But the impact of CO on automobile-driving performance would probably be minimal, he says, since driving involves multiple signals. These include road surface, noise, steering wheel vibrations and the smell of burning brakes.

Few studies have examined the possible influence of nutrition, stress, alcohol, smoking or other factors on air pollutants and health. Yet such co-factors must surely have a bearing, Bertram W. Carnow of the University of Illinois College of Medicine believes. Nor has anyone examined the susceptibility of people to pollutants at various altitudes. Yet CO is bound to be more hazardous at high altitudes, as in Denver, says James L. Whittenberger of the Harvard School of Public Health.

Might one's heredity, socioeconomic standing or residential location in the city alter susceptibility to air pollutants? Here again there is inadequate information. However Edward Radford and his co-workers at Johns Hopkins University did try to see whether heart attacks in Baltimore could be linked with air levels of CO, socioeconomic standing or whether people lived downtown or on the edge of the city. The only link they could make was between heart attacks and race. Whites, both in and on the outskirts of the city, had more heart attacks than blacks did.

Heart attacks in Los Angeles have been associated with high temperatures

compounded by smog. But whether air pollution or heat contributes more to heart attacks is uncertain. Heat is probably the greater danger, says Donald Bartlett Jr. of the Dartmouth Medical School. While Radford and his team did not link CO to heart attacks, they did note a cluster of heart attacks during a summer heat wave.

During smog episodes, a New Jersey college football team complained of chest pains. So did Dutch people riding home on their bikes for lunch. So did several thousand Japanese children. Scientists suspect that all these symptoms were triggered by ozone and sulfur dioxide acting together. Yet they have only started to look at the impact on health of combinations of air pollutants—which is what we are being exposed to. Air pollutants must be considered as a unit, insists J. G. Calvert, chemist at Ohio State University. "If we set standards for any of these components, we must look at the whole complement . . ." says Mary O. Amdur of the Harvard School of Public Health. "Anyone who talks about standards for one pollutant is making a serious mistake," says Horvath.

Probably the most pressing question, underscored time and again at the NAS conference, is whether air pollution levels reported by various American cities are accurate. There is ample reason to suspect they may not be. After Radford and his team could not link heart attacks to levels of CO over Baltimore, they learned that the levels

of CO reported by the city were probably not accurate. "We think they were plain wrong," Radford admits. So if this is the case, the results of Radford's studies fall on their face.

Still other scientists argue that even if pollution levels are accurately reported, they may not be the levels people are really exposed to. As a New York physician observes, "Air pollution in Manhattan is monitored on Herald Square. But who lives on the square besides pigeons?"

So, as things now stand, air pollution investigators differ radically in their views of which air pollutants threaten whom. Asserts Bartlett, "Clearly people with coronary heart disease are severely affected by low concentrations of CO." "There are more pervasive, persuasive reasons to control auto traffic than air pollution," says Leslie A. Chambers of the University of Texas School of Public Health. As far as CO is concerned, a number of researchers are convinced that smoking is a worse insult than air pollution. If you ride a bike behind truck exhaust, you may get 75 to 100 ppm of CO in the face, says Horvath. But if you smoke one cigarette, he says, you're exposing yourself to 200 ppm of CO. Scientists also differ on whether current air standards should be retained, raised or lowered.

Air pollutants may be doing you in. But the medical examiner probably won't confirm it. Air pollution as a cause of death is underreported on death certificates, says Bartlett. □