Fact or Fiction?

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Air Quality

"Most people in rich countries believe their environment is continuing to deteriorate."

"Public unaware of air quality gains."

"Manufacturing facilities emitting fewer chemicals."

The Clean Air Act has substantially reduced air pollution over the past 25 years. Overall air quality has improved 42 percent since 1980, and water quality by 27 percent. Yet most people believe air quality (we inhale about 20,000 liters of air in a day) has gotten worse and will continue to deteriorate into the foreseeable future, even though they don't consider breathing dirty air to be especially risky.

One poll after another shows that U.S. citizens are unaware of the improvements that have been made in environmental issues. In a 1993 poll, for example, 75 percent of those contacted believed that problems regarding pollution and the environment would get significantly worse during their lifetimes. More recently, a 1997 poll result showed that 58 percent believed air quality had worsened over the past 10 years.

As already stated, there have been significant improvements in air quality. So, why don't people know and appreciate this? One reason is because media coverage concentrates on issues such as Times Beach, Alar, oil spills, tainted Perrier water, etc. (See the March issue of this column in *P&SF* for more on this.) The point is that while bad news receives heavy coverage, important information about the environment is either underreported or not reported at all.

When San Francisco met the federal ozone standard in 1992, for example, *The San Francisco Chronicle* reported the news on page 16.

Another reason is the mentality of many people regarding environmental issues. The Nuclear Energy Institute in Washington, DC, reported that a freshman at Eagle Rock Junior High in Idaho urged fellow students to sign a petition demanding strict control or total elimination of the chemical "dihydrogen monoxide," which causes excessive sweating and vomiting; is a major component in acid rain; can cause severe burns in the gaseous state; can cause death when accidentally inhaled; contributes to erosion; decreases the effectiveness of automobile brakes and has been found in the tumors of terminal cancer patients. A total of 50 students were asked if they supported a ban of the chemical—43 said yes, six were undecided, and only one knew that the chemical was water. So clearly, most of them did not know high school chemistry nomenclature. More importantly, most of them believed it was their right to support this restriction of technological freedom even though they knew nothing about the subject.

If this experiment had been tried on an older population, I'm sure at least as many would want to ban elimination of the strange-sounding chemical. This type of thinking is all too pervasive with environmental issues. If it sounds strange, it must be bad!

Recent Results on Air Quality

A recent comprehensive report published by the Pacific Research Institute disputes popular perceptions about the environment, finding sharp declines in water pollution, toxic chemicals in the environment and residues of harmful chemicals in fish and fowl. This report is divided into three parts:

1. Primary environmental indicators, including air and water quality, natural resource use, land use and condition. These are "primary" because they have the most direct effect on environmental quality. Six air pollutants that regulations target are analyzed: Sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), carbon monoxide (CO), total suspended particulates (TSPS) and lead (Pb).
2. Secondary indicators including carbon dioxide emissions, oil spills, pesticide and toxic releases, and wildlife.
3. An index of four major environmental indicators—air quality, water quality, natural resources, and solid waste, and a composite index of all four indicators.

A quick summary for six air pollutants can be found in Table 1. Figures 1 to 3 show changes in sulfur dioxide, suspended particulates and

Air Emission Changes Between the 1970s & 1990s[1]

Pollutant	Change, % Drop
Sulfur dioxide	50.3
Nitrogen dioxide	33.8
Ozone	18.5
Volatile organic compounds	24.4
Carbon monoxide	60.5
Lead	97.1

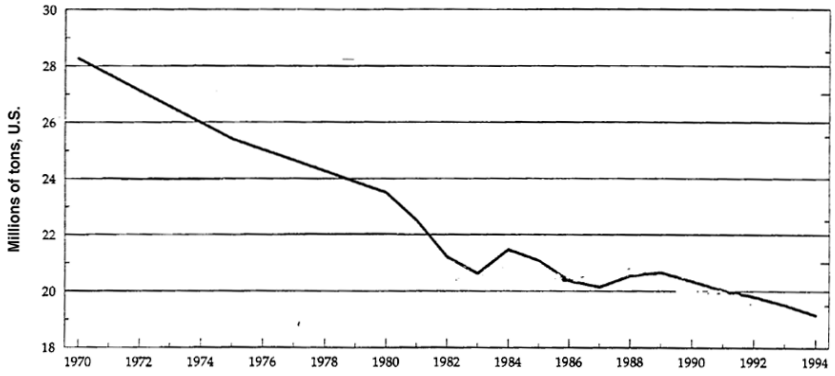

Fig. 1—Sulfur dioxide emissions estimates for the U.S. Adapted from DeWeil et al. *(ref. 1).*

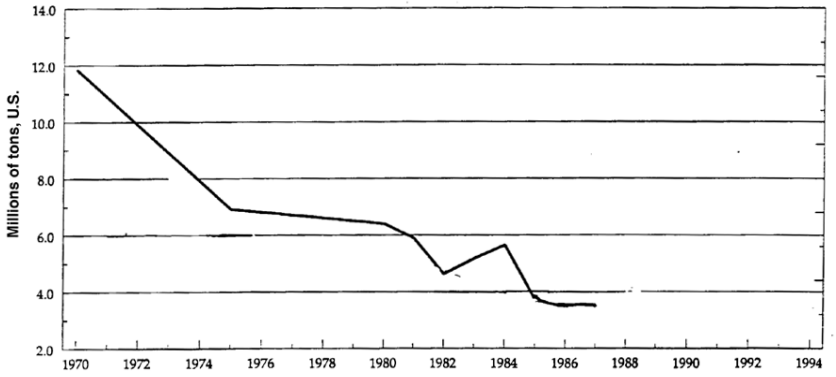

Fig. 2—Suspended particulates emissions estimates for the U.S. Adapted from DeWeil et al. *(ref. 1).*

lead, respectively. Some key findings from this report and others include the following:

- The ambient levels of sulfur dioxide decreased by 50.3 percent between 1975 and 1993. Emissions of sulfur dioxide fell 32.3 percent between 1970 and 1994.
- The ambient level of NO_2 shows a 33.8 percent decrease between 1977 and 1993.
- The level of ambient ozone decreased 18.5 percent between 1979 and 1993.
- VOC (volatile organic compound) emissions declined 24.4 percent from 1970 to 1994.
- Ambient CO concentrations in 1993 were 60.5 percent lower than in 1975. CO emissions declined 14.9 percent between 1975 and 1994.
- Total suspended particulates declined 23.6 percent from 1975 to 1991.
- Lead presents the greatest success story. Ambient lead concentration fell 97.1 percent between 1975 and 1992 and emissions fell 97.7 percent between 1970 and 1994. Most of these dramatic reductions were a result of the introduction of unleaded gasoline and the elimination of lead compounds in paints and coatings.
- Ozone levels are improving even in Los Angeles, where the ozone standard fell 36.3 percent between 1985 and 1994. Houston, which follows Los Angeles with the second-worst record, also improved 54.7 percent between 1985 and 1994. California's air during the summer of 1997 was the cleanest it has been since pollution officials began keeping records in the 1950s. In fact, air quality is so improved in the Los Angeles Basin that the nation's smog capital is in danger of losing its title to Houston.

Los Angeles has not violated federal standards for sulfur dioxide emissions, the primary cause of acid rain, since the early 1970s. In 1992, the state of California passed a year without a carbon monoxide violation for the first time. National air pollution emissions have been declining on an almost uninterrupted basis since the 1970s, even though the population increases, more cars are driven more miles, and the economy grows. The modern American automobile is the cleanest system of transportation ever devised. Cleaner, certainly than cars sold in the Western European nations that U.S. environmentalists depict as models of ecological enlightenment.

In Southern California, automobile emissions have been cut in half since 1965, despite a doubling of the number of cars. Tailpipe emissions from new cars are said to be so minuscule that if a person spills a tablespoon of gasoline, the emissions are greater than those produced by driving the car for about a day and a half.

Other key findings from the Pacific Research Institute report include:

- In 1990, 82 percent of the lakes tested met swimmable objectives.
- Forests are increasing as growth exceeds the harvesting of trees both in Canada and in the U. S.
- The amount of land set aside for parks, wilderness, and wildlife is increasing in both the U.S. and Canada.
- The amount of toxic chemicals exposed to the environment is decreasing.
- Critical wetland habitat is not declining.

Releases of Hazardous Chemicals

Hazardous chemicals released into the environment by manufacturing companies declined for the eighth straight year in 1995, according to the latest data from the EPA's Toxics Release Inventory. The data cover emissions of 286 chemicals new to the inventory, which now encompasses 643 chemicals. From 1994 to 1995, the amount of chemicals released into the environment was down nearly five percent. Since 1988, when industrial facilities were required to report their toxic releases, emissions have been reduced by 46 percent.

New Standards For Ozone & Particulates

All of the previous information in this article leads one to ask the question: Do we really need to go in the direction of new standards that would place tighter restrictions on ozone and particulate matter? (B.J. Mason has an excellent analysis on this in the November issue, p. 122, of *P&SF*.)

One of the claims supporting EPA's new standards is that these

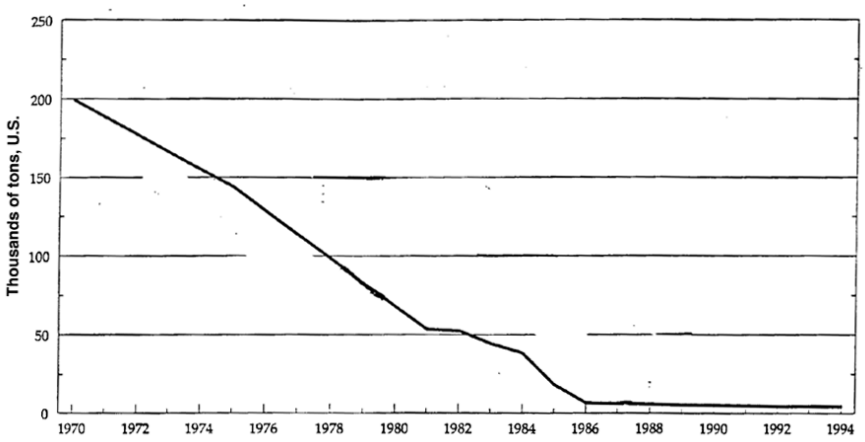

Fig. 3—Lead emissions estimates for the U.S. Adapted from DeWeil et al., *ref. 1.*

regulations would benefit children by reducing asthma rates. A recently completed study, however, attributes the rising asthma rates among children in inner cities not to particulate matter and ground level ozone, but to cockroaches. This study found that the most important cause of childhood asthma in U.S. inner cities may be allergies to cockroach droppings and debris. Allergies to cockroaches provoke an unusually severe form of asthma that is probably the source of the disproportionately high incidence of asthma in urban neighborhoods. More than one-third of asthmatic children were allergic to cockroaches. Half of these children were found to have high levels of cockroach droppings and debris in their bedrooms, where the children spend most of the time.

Another study showed an association of illness with larger particles but not with smaller ones. R.F. Phalen, one of the nation's leading experts on air pollution, has urged policymakers to "wait for the necessary science and bypass political expediency." He claims that the new standards are not only premature but may even be harmful to public health, because the scientific knowledge in this area is incomplete.

A *Wall Street Journal* article reported that the EPA's own analysis shows the new ozone regulations will cost more than the economic value of the benefits. The authors calculate that human deaths caused by the regulations would exceed human lives saved because of financial costs of implementation.

Conclusion

The environment is cleaner and safer than at any time in the past 50 years. The average American in 1998 is exposed to fewer potentially harmful pollutants than at any time since the 1930s. Air and water pollution, which had risen during the 1940s and 1950s, have fallen constantly and considerably since that time. Today, pollution of all kinds is responsible for less than one percent of cancer deaths.

There is no longer any reason to be afraid of the environment. Based on all of this, do the new standards on ozone and particulate matter make sense? My answer is that with the information currently available, they certainly do not. **P&SF**

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