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Progress toward Abatement of Air Pollution

For many years air pollution steadily grew more severe. Photochemical smog of the type so prevalent in Los Angeles was noted with increasing frequency in many states. In some metropolitan areas such as New York a different kind of pollution problem arose from interactions involving particulate matter and SO_2. Primary sources of SO_2 are coal and residual oil, both of which often have a sulfur content higher than 2 percent.

During November 1966 an unusual weather condition led to very heavy pollution around New York City. Excessive morbidity and mortality were attributed to the episode. At the urging of Mayor Lindsay the major local electric power utility, Consolidated Edison, agreed to limit the sulfur content of the fuel it burned. Beginning in October 1967 the utility started to use residual oil having a sulfur content of no more than 1 percent. A federally sponsored abatement council recommended that by October 1969 the sulfur content of fuel oil for space heating should be limited to 0.37 percent. However, it was realized that sufficient fuel oil with this low sulfur content would not be available in time. The deadline was accordingly abandoned, but a new one will be set soon.

Standards in neighboring New Jersey are more definite. By May 1968 no fuel oil containing more than 1.0 percent of sulfur may be purchased for use, and the allowable content drops to 0.3 percent by 1 October 1971. The new standards will have sizable economic consequences. Unless desulfurization of flue gas becomes fairly cheap and effective, the use of oil in New York will be curtailed. The cleaner fuel oil will be more expensive, and the oil companies will be forced to build new refining facilities costing hundreds of millions of dollars.

The efforts of the mayor and his pollution control administration have been successful in eliciting the cooperation of other large consumers of fuel besides Consolidated Edison. As a result SO_2 emissions in New York City have already fallen by 25 percent.

Another major area in which progress has been made is that of the control of emissions from automobiles. The principal pollutants from this source are hydrocarbons, CO, and NO. A complex interaction between sunlight, the hydrocarbons, and nitrogen oxides leads to photochemical smog.

As J. K. Patterson has said,* "The unwonted automotive emissions are not the inevitable result of the gasoline engine combustion process." The combustion of gasoline to form $CO_2 + H_2O$ can be carried out, in an automobile, to give very little CO and unburned hydrocarbons. However, "the simplest, lowest cost, most foolproof way of providing flexible engine performance is to supply a little more fuel . . . under some operating modes than would be necessary if the engine combustion conditions were ideal." The automobile manufacturers, under federal pressure, have been finding ways to improve combustion efficiency and ways to suppress the emission of hydrocarbons. Thus the vehicle of 1960, before emission was subject to control, emitted an exhaust containing 3.5 percent of CO and 900 parts of hydrocarbons per million. The 1968 models must meet standards of no more than 1.5 percent of CO and 275 parts of hydrocarbons per million.

If the momentum for abatement of pollution is to be maintained, the public must continue to demand improvements. However, where significant progress is being made, the pollution control agencies and the companies involved merit more recognition and commendation than they have received thus far.—PHILIP H. ABELSON

* J. K. Patterson, "Progress in Conserving the Air," address presented 9 March 1968 in Houston, Texas, before the National Wildlife Federation. Dr. Patterson is Coordinator for Conservation Technology, Esso Research & Engineering Company.