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## Air-Pollution and Its Control, by Dr. Wayne T. Sproull

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AIR-POLLUTION AND ITS CONTROL: By Dr. Wayne T. Sproull, New York: Exposition Press. 1970. Pp. 102. Cloth: \$4.00.

Concern for the environment became a matter of national priority in 1970. Responding to the grave and mounting evidence of environmental degradation, the Nixon administration formed the Environmental Protection Agency,<sup>1</sup> a federal structure charged with broad responsibilities and authority in the area of pollution control.

In testimony before a recent committee hearing of the Indiana legislature, the administrator of EPA, Mr. William D. Ruckelshaus, stated:

We have been timid and indecisive as our air, water and soil was abused; we have overlooked the birthright of every American to a clean and healthy environment.

It seems evident that the federal response to this newly magnified social ill will be comparable to that in many other federally occupied areas affecting interstate commerce. Much as civil rights was the dominant social issue of the '60s, man's relationship to his natural surroundings promises to become one of the prevailing domestic issues of the '70s—seemingly transcending, however, even traditional partisan interests.

The relatively brief work by Dr. Wayne T. Sproull, a consulting physicist, makes an important contribution to lay understanding of the nature of air pollution. The book's value lies in its direct, clinical analysis of air contaminants. Although it seems principally designed as a primer for those interested in acquiring a basic working knowledge of the ecology of the air-shed, the author explores the chemistry and physics of the matter in sufficient technical depth to satisfy even more sophisticated readers.

Explanation of such primary physical reactions as photosynthesis wherein the chlorophyl properties of plant life and solar energy combine to expend carbon dioxide and produce oxygen, and the synergistic effect of certain combinations of air contaminants, relatively harmless in individual quantity yet quite harmful in catalytic combination, provide the foundation of the author's main thrust that the atmosphere is in fact a giant chemical reactor. Thus, the inter-relationship of such diverse factors as specific pollutants, population density, and meteorology, must

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1. Hereinafter referred to as EPA.

be analyzed in order to understand properly the true nature of air pollution.

The relative inefficiency of the internal combustion engine, for example, manifested in the explosion of unspent fuel and nitrogen oxides, when combined with the type of atmospheric conditions present in the southern California area, produces an irritant-smog aptly labeled "Los Angeles type." The identical elements injected into the air elsewhere, however, might produce an entirely different and less objectionable condition.

The burning of fossil fuels, principally coal, accounts for almost three-quarters of the kilowatt hours of electrical power used in this country, yet the by-product of this activity, sulfur dioxide, is one of the most damaging and deadly pollutants. Since the opportunity cost of the economy's power demands necessarily cannot be destruction of life, alternative procedures must be explored and refined. Dr. Sproull explains the less efficient capabilities of nuclear power in terms of converting heat energy into electrical energy, and the resulting thermal pollution of water caused by such heat waste. Alternatively, the use of natural gas, a relatively clean approach to energy production in terms of contaminant by-product production, seems impractical since the known supplies of natural gas are insufficient to meet projected industrial need. Pilot programs involving conversion of coal into sulfur-free natural gas are still in the rudimentary stage.

Part of the solution to these problems, Dr. Sproull explains, lies in "control" of the particulate matter emission associated with fossil fuel burning by industrial use of mechanical precipitators, filters, collectors, scrubbers, and other cleansing apparatus. Such methods of cleansing represent a substantial financial commitment by the industrial sector, however, which will in large part ultimately be borne by the consumer. It seems clear also that something more than reliance upon the social conscience of American industry must provide the impetus for such an investment. New and potent legislation on both the state and federal level must be forthcoming.

In this regard, the Federal Clean Air Act and its 1970 amendments permit federal authorities to designate air quality regions throughout the country followed by enforcement of air quality criteria in those areas. EPA has recently promulgated tentative standards for air quality with respect to major air contaminants. Upon finalization of these standards the states must in turn implement enforcement programs with the prospect of federal intervention upon default. With respect to the role of the states, EPA Administrator Ruckelshaus has said:

The states, as part of their implementation plan, must identify all sources of pollution, analyze the content of their emissions, and devise schedules to bring them into line with standards. In some areas, where even maximum control is in effect on carbonmonoxide from stationary sources, automobile traffic may have to be regulated or curtailed by 1975 . . . .

The new programs in air and water demand a substantial expansion of state agencies and a tremendous acceleration in state efforts. Simply put, the states are going to have to do a lot more, and they're going to have to do it faster.

Dr. Sproull's efforts in this book are a valuable aid to those sectors of the community charged with the responsibility of responding to this newly measured social challenge. As with almost any problem-solving endeavor, a firm understanding of the nature of the problem is critical to an effective response. Industry, legislatures, the scientific and legal communities, and the general public can bolster the effectiveness of their response to this pressing problem by reviewing the materials offered by Dr. Sproull and his contemporaries.

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