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## Long-Term Efforts To Clean the Environment

During the past few months many leaders, ranging from student activists to top industrialists, have spoken in behalf of restoring the environment. In response President Nixon has called for vigorous action and increased expenditures. His recommendations represent a substantial victory for those working for a livable environment. Nevertheless, this is no time to relax, for the fight to attain a decent environment must go on for a long time.

A cursory analysis of efforts to control water pollution illuminates some of the problems. These are both technological and political. Until a few years ago, little effort was devoted to achieving a substantial improvement in methods of treating municipal wastes. The techniques employed were those of 50 years ago. Primary treatment of sewage consisted of mechanical removal of solids. This was followed by a secondary treatment essentially biological which accelerated the oxidation of organic matter. The result was a reduction in "biochemical oxygen demand" by 80 to 95 percent. However, the processes were less effective in reducing the levels of fixed nitrogen, phosphate, and intractable organic chemicals. During the last decade we have come to realize that in many instances reductions in biochemical oxygen demand are not enough. To combat eutrophication, we must also reduce nitrate and especially phosphate. In addition there has been growing concern about the numerous organic chemicals that are finding their way into streams and lakes.

At long last some imaginative engineers have turned their attention to the problem. What can be done under favorable circumstances is illustrated by a new plant at Lake Tahoe.\* Processing there results in the reduction by 99.3 percent of biochemical oxygen demand and the removal of 94 percent of phosphate and 99.99+ percent of coliform bacteria. Included among the steps are a flocculation at pH 11.5 to 12.0, with lime; adjustment of pH with carbon dioxide; and a final polishing of the effluent with activated charcoal. The effluent is pumped from the Tahoe basin into another valley where it is stored, for irrigation, in a man-made lake in which trout thrive.

The citizens at Lake Tahoe were highly motivated and were willing to spend heavily to save their beautiful lake. However, citizens elsewhere have not been so effective. Communities have refused to tax themselves to provide benefits for downstream users. Authorities have been reluctant to interfere with industrial pollution, fearing loss of local industry.

The federal government has functioned poorly. After more than 15 years the federal water pollution program has not yet brought about significant improvement in any major water course. A recent government report† states:

Federal grants have been awarded for construction of facilities which provided treatment for only part of the pollutants being discharged into waterways . . . nearby municipalities or industries have continued to discharge untreated or inadequately treated wastes.

With a great show of unanimity and self-praise a Democrat-controlled Congress passed the Federal Water Pollution Control Act of 1965. The act authorized substantial appropriations for grants for cleanup. However, Congress neglected to appropriate more than trifling sums until last year. These funds cover only roughly half the costs of projects and much local foot-dragging can be expected.

Cleaning up the rivers and lakes of this country will require good technology and good politics. It is to be hoped that some of the current fervor about the environment will be channeled into insuring that the needed actions are taken.—PHILIP H. ABELSON

\* R. Culp, "Water reclamation at South Tahoe," *Water and Wastes Engineering* (April 1969), pp. 36-39. † *Administration of the Construction Grant Program for Abating, Controlling, and Preventing Water Pollution.* Report to the Subcommittee on Air and Water Pollution of the Committee on Public Works, U.S. Senate, 91st Congress, 1st Session (U.S. Government Printing Office, Washington, D.C., 1969).

# Science

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Philip H. Abelson

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