

efficiency due, in part, to the lack of knowledge or desire on the part of operators. All too often, these operators are employed as much for their political connections than for a knowledge or ability in the field. Thus, anything that can improve professionalism in this area will be beneficial.

We should like to express our approval of reenactment of the comprehensive estuaries study and its extension. We are especially familiar with parts of this program and believe it should be extended. We also are in accord with the desirability of extending the authorization for the research, demonstration, investigations, training, and informational programs and for those on separation of storm sewers, advanced waste treatment, and industrial wastes.

CONTROL OF EUTROPHICATION

I should like to comment specifically upon the provisions in both H.R. 15907 (Sec. 4) and S. 2760 (Sec. 1), which would authorize the development and demonstration of new or improved methods for the prevention, removal, and control of natural or manmade pollution in lakes, including the undesirable effects of nutrients and vegetation.

Lakes, both natural and manmade, are among man's most valuable natural resources. From the utilitarian point of view, they provide sources of water supply for municipal, industrial, agricultural, and navigational purposes. From the recreational point of view, they offer magnificent opportunities for fishing, hunting, and a host of water-related sports such as swimming, water-skiing, boating, and skating. The mere existence of a lake lends beauty and attraction to a landscape.

The Committee may be interested in a few statistics. The Bureau of Sport Fisheries and Wildlife, Department of the Interior, completed an economic survey of the sports of hunting and fishing for 1965. The survey revealed that 28,348,000 sport fishermen spent nearly \$3 billion that year in pursuing their activities. They enjoyed 522,759,000 fishing recreation days, of which 426,922,000 were spent on fresh water. Undoubtedly, a major part of the fresh water fishing is done on lakes and ponds. And, these statistics do not include the many other recreational uses of lakes.

Limnology, or the study of fresh waters, especially ponds and lakes, is not a new science. Prof. F. A. Forel, of the University of Lausanne, Switzerland, is regarded as the founder of modern limnology. He established the study in the 1860's. However, much of the present information on the ecology of lakes is relatively new, having been developed since World War II. There is much that scientists still do not know, particularly about pollution and eutrophication.

Eutrophication, or aging of water, is regarded by many scientists as one of the foremost natural resource problems of our time—certainly with respect to water pollution. Eutrophication most often results from man-produced nutrients which enter the lake or pond and eventually become a part of the plant and animal growth cycles. The control of excessive production through pollutants is of major importance and concern to those who use the water for recreation. Once biological nuisances develop, the controls are costly and time-consuming. Often, the controls are temporary. Over-production will remain a continuing problem unless the basic causes can be reduced or eliminated. And, this is a point worth stressing: biologists of the Federal Water Pollution Control Administration say that the problem of altering basic causes has not been fully solved at the present time. This fact highlights the need for comprehensive pilot programs in lake pollution prevention and control, as would be authorized by these bills.

The Federal Water Pollution Control Administration, in a bulletin issued in 1964 when the agency was a unit of the Public Health Service, listed the following effects from severe water pollution: "(1) transmission of enteric diseases by water inadequately treated, (2) transmission of diseases by insects from polluted streams, (3) harmful reduction of individual water intake because of water potability, (4) possible toxicity of chemical and metallic wastes, (5) neuroses caused by noxious odors from polluted streams, (6) spread of diseases by cattle and other animals having access to polluted streams, (7) loss of recreational areas, and (8) economic changes."

Pollution of lakes, of course, may come from many sources: domestic sewage, industrial wastes, mammal and bird wastes, runoff from agricultural lands and cities, pesticides applied from the air or by boats, and others. In a general sense, however, the principal problem is that pollutants add fertility to the water—