20 May 1966, Volume 152, Number 3725 **SCIENCE**

EDITORIAL CORRESPONDENCE: 1515 Massachusetts Ave., NW, Washington, D.C. 20005. Phone: 202-387-7171. Cable: Advancesci. Washington. Copies of "Instructions for Contributors" can be obtained from the editorial office. ADVERTISING CORRESPONDENCE: Rm. 1740, 11 W. 42 St., New York, N.Y. 10036. Phone: 212-PE 6-1858.

Water Pollution

A few years ago the Wisconsin State Board of Health reported the existence on the Mississippi River of a "wall of foam 35 feet wide, 300 feet long and 15 feet high." This was only one of many photogenic news-making incidents. Consequently, the issue of water pollution was publicly dramatized and oversimplified. Synthetic detergents were spotlighted as sources of the nuisance. The principal chemicals involved were alkyl benzenesulfonates, the alkyl group usually being a C_{12} branched-chain hydrocarbon. Biological degradation of this structure is slow. Threatened with congressional action, the detergent manufacturers abandoned production of the branched compounds, using instead a linear alkyl benzenesulfonate that is degraded more readily. This changeover (made at a cost of $150 million) was completed by June 1965. In hearings last week before a committee headed by Senator Muskie, a year of field experience with the new products was described. The input and output of detergents from several major sewage treatment plants have been monitored. As a result, it was possible to follow closely the consequences of the changeover. Part of the chemicals now are degraded on the way to the treatment plant, and the rest are more easily removed once there. When 90 percent of the other sewage is consumed, a similar fraction of the new detergent disappears.

In spite of this excellent experience with modern treatment plants, the manufacturers may yet face further pressures. Much of the sewage in this country is disposed of in cesspools or septic tanks. In well-designed systems the effluent flows into surrounding soil, where it is acted on by aerobic bacteria, and the new detergents are removed. However, if free oxygen is absent, the detergents are not degraded. Householders using wells may still find their water foamy.

The dramatic aspects of the detergent problem, however, seem solved, and this is good. Now our people and the Congress can turn to the substantive problems of water pollution. Only a minor fraction of the sewage from towns and cities is fully treated. Upstream communities show little enthusiasm for spending money for the benefit of communities farther down. Even in those cities that have "full treatment," performance is often poor. In most instances the storm drains and the sewage systems are interconnected. When a storm occurs, the treatment plant is bypassed. This occurs at a time when the scouring action of high-velocity flow dislodges large quantities of solids that have accumulated during low flow. The problem will not be quickly disposed of. The cost of separating storm and sanitary sewers has been estimated at $20 to $40 billion.

Water pollution is not one problem but many. Each watershed requires a different approach, depending on technical, economic, and political factors. A particularly instructive case to follow will be events at Lake Tahoe. This beautiful lake is threatened with degradation. Once relatively poor in algal nutrients, the water has been fertilized by effluent from treated sewage. The communities surrounding the lake now plan to pump their effluent out of the Tahoe watershed. However, even this practice may not suffice. It may become necessary to ban use of fertilizers on garden plots around the lake.

The problems of water pollution are many and complex. The greatest present difficulty is that, while the public favors pollution abatement, only a few politicians are providing imaginative leadership.

—PHILIP H. ABELSON