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## Viabile Substitute Proposed For Detergent Phosphates

EUTROPHICATION is a word that might be translated as "banquet" from its Greek roots, but it is bad news to anyone who thinks of a river or lake as other than a sewer. It refers to the fertilization of a body of water with plant nutrients, starting a cycle of algal growth and decay, now too well known as the Lake Erie syndrome. It is a natural process in the evolution of a lake, but is greatly speeded up by man's works.

The specific factors involved in eutrophication vary greatly with local conditions, and are not always known in sufficient detail. Some experts conclude that the discharge of phosphates is the chief stimulus to eutrophication in the Great Lakes basin and several other areas.

It has also been calculated that about half the phosphate load in these regions can be traced to detergents. The remainder comes from human wastes, runoff from fertilized farm lands and the like. The phosphates could be removed from the sewage, but only by more expensive methods of treatment. Hence, there has been great pressure to eliminate a large part of the phosphate load at the source by banning the use of phosphates in detergents.

A large dent could probably be made in the phosphate load by less drastic pressures such as a tax on the phosphate content in markets where eutrophication is a problem. Furthermore, housewives are encouraged to use larger quantities of detergents than are needed for most washes.

The chemical industry, however, is fairly happy with another solution: a sub-

stitute for phosphate called "NTA". This is nitrogen-triacetic acid, and its chemical composition is  $N(CH_2COOH)_3$ . It has been the subject of considerable testing in the United States and Sweden and is being pressed very hard as a synthetic replacement for phosphates in a market of two billion pounds a year.

NTA is remarkably nontoxic in short-term feeding experiments. However, very little has been published about its potential for long-term damage to man or complex ecological systems. In this respect, it is in a situation similar to DDT 20 years ago.

Unlike DDT, NTA will be extensively degraded and transformed in the course of sewage treatment, and elsewhere in the environment. On the plus side, this means we probably need not fear the kind of accumulation that has occurred with DDT. On the negative side, we will not have the easy chemical identification of NTA derivatives that made it possible to detect DDT at levels of parts per billion in Antarctic fish.

Preliminary Swedish studies on NTA have suggested some genetic effects with fruit flies, but "only at high doses." Less efficient tests with mice gave no sign of trouble. A speech by Environmental Health Administrator Charles C. Johnson paraphrased the report as saying that "clinical data revealed no genetic effects" but that further studies are needed to "shed light on the possibility of long-term toxic effects in humans." Not surprisingly, a trade journal quoted the first but not the second statement.

THE MAIN potential for trouble is not from NTA itself but from some of its probable, but poorly understood, products of partial breakdown. Not all of the NTA in an effluent is completely broken down in a typical sewage plant. Moreover, NTA will inevitably find its way into ground waters without having been treated at all, or after a variety of treatments. Nothing is known of the interaction of NTA and its products with other chemicals, for example, chlorine.

A rational response to this level of uncertainty about a product intended to be dispersed so heavily throughout the environment would be intensive research on the biochemistry and ecological potential of NTA before we have made an irreversible commitment to it. In fact, the fiscal 1971 budget request for water hygiene research eliminates the entire program of research and training grants.

According to an analysis of the verbiage in the Congressional Record, rhetorical concern over the environment is second only to that over Vietnam, exceeding even crime. Any further comment on my part would only add to the pollution.