

turbid and therefore not polluted simply because they lack the sparkle of mountain brooks that tumble across rocky beds free of any sediment.

A simple but useful concept, therefore, is to regard pollution as the presence in water of "too much" of something added by man. Too much—so that the water is depreciated for potable purposes, industrial use, or agricultural requirements. Too much—so that it has become unsatisfactory for maintaining aquatic life or for recreational pursuits.

The mere addition of something to a body of water does not necessarily constitute pollution. It is the injury caused by "too much" that gives rise to concern. From a purely technical standpoint the exercise of control consists of (1) establishing limiting concentrations on substances that are prejudicial to desired uses of the water; and (2) securing compliance with means to prevent those concentrations from being exceeded.

TYPES OF POLLUTANTS

The discharge of any materials into waterways that offend the aesthetic senses of sight and smell may be tagged as universally undesirable, and therefore, classified as pollutants. Other substances potentially capable of causing undesirable changes may be broadly classified into two groups:

(1) *Persistent (refractory) materials*.—Those whose detrimental influence is mitigated only by dilution once they are permitted to enter a body of water; and

(2) *Die-away (decay) substances*.—Those that are capable of being assimilated or otherwise converted to an innocuous state by biological purification processes that occur naturally in waterways.

Among the persistent types of pollutants would be included inorganic materials such as chlorides and sulfates from brine processing and irrigation drainage, metallic salts, and other kinds of mineral residues. In recent years, new types of synthetically compounded chemicals have been added to this list. Among these, until the formulation was changed only recently, were so-called hard detergents. And now there are a galaxy of pesticides and complex agricultural chemicals that are being washed from the land into waterways. A common characteristic of all of these substances is that when they do get into a waterway their undesirable effects on water quality can be mitigated only by dilution, because either they are unaffected by biological decay or they are highly resistant to such influences. In flowing streams their concentration will build up during drought conditions; in lakes they simply accumulate without change.

The second group of pollutants are those of an organic nature that are susceptible to breakdown or destruction by natural biological action. Sewage, for example, is quite unstable in a flowing stream; and so are residues from cannery operations, as well as organic industrial compounds such as phenols. However, as these materials are converted into simpler, inoffensive constituents this self-purification process makes a demand upon the oxygen resources in the water. This may result in the depletion of oxygen levels below those suitable for the maintenance of fish life, and if the organic loading completely exhausts the available oxygen septic conditions will result. Furthermore, where conversion of these organic materials produces nitrates