Introduction

The effect of small quantities of contaminants in our water supplies is of increasing concern. However, the very definition of what constitutes trace contamination is undergoing rapid change. Improved analytical instrumentation and procedures permit detection or quantification of lower and lower levels of materials. A concentration range of microgram per liter to milligram per liter represents several orders of magnitude more than ionization detector limits in gas-liquid chromatography of pesticides and herbicides. This has practical implications. If a food supply has been deemed free of pesticide and fit for human consumption as measured by the best available analytical procedures, is it necessarily unfit when an improved more sensitive analytical technique detects the presence of concentrations subthreshold to the first technique? Obviously, this question alone could ignite extended discussions about toxicological, analytical, and legislative considerations.

It is also well-established that the effect of trace quantities, microgram per liter to milligram per liter, of organic contaminants in water may produce synergistic sensory effects. Since consumers judge water as much by taste and odor as any other property, the presence of certain microcontaminants in complex mixtures may present a trying situation for the water-treatment plant operator. The production of solid-state electronic components and the operation of high-pressure boilers and nuclear reactors are examples of industrial requirements for very high-purity water. Simply monitoring this requirement poses a challenge to the chemist. Other examples could be cited. It is sufficient to postulate that future research and applied studies will involve trace components to a greater extent.

This Symposium is devoted chiefly to discussion of organic contaminants. Only a superficial coverage of the vast subject matter is possible during a program limited to a single day. However, the papers do present an excellent microcosm. The role of microorganisms and biological manifestations are as important as the strictly chemical processes in aqueous sciences. The subject of pesticides is currently a matter of national attention. The development of concentration techniques to bring contaminants up to minimum detectable analytical levels is essential for many studies. Newer chromatographic and spectrographic techniques exemplify the present generation of analytical devices. These are among the subjects to be discussed by the participants in this Symposium. It is our collective desire that the proceedings will be of use to our colleagues in

their studies and that additional advances will result from these beginnings.

R. A. Baker
Senior fellow,
Carnegie-Mellon University,
Mellon Institute,
Pittsburgh, Pa.;
symposium chairman.