

Mr. DADDARIO. He was our witness yesterday.

Dr. WEINBERGER. The need for more research has virtually the unanimous concurrence of all of those concerned with water pollution control. The highest priority of research is invariably the need to develop new and improved techniques for waste treatment and specifically to develop the technology to permit more waste water reuse.

Present waste treatment methods were devised, generally, for the pollution problems that existed 40 or more years ago. Although there have been improvements in these methods, they are proving to be increasingly inadequate for the concentrations and complexities of many of today's wastes and the requirements being posed by the increased loads on receiving streams. In addition, no satisfactory methods were ever devised for many industrial wastes and some of the impurities found in municipal wastes.

Water supply and pollution trends show that one of the most pressing problems in water quality management is the need to develop new treatment processes which will remove much more of the pollutional material from municipal and industrial wastes than is possible by present biological methods. The volume, strength, and complexity of future wastes can only result in the discharge of larger and larger amounts of impurities into badly needed water resources if we continue to apply presently known treatment processes only. The sole currently available solution, in many cases, would be low flow augmentation, that is the provision of dilution water from upstream artificial impoundments.

Each water-use adds increments of wastes that are not removed by biological treatment. If we are to meet our future water needs, as seems inevitable, through repeated reuse of our fresh water resource, much more of the impurities must be removed from waste streams. To do this, new treatment processes are being developed, based, in some cases, on concepts and principles that will achieve complete conversion of waste waters to fresh waters. This will require a major research program and the best scientific minds in government, industry, and universities. It will require the utilization of physicists, physical chemists, chemical engineers, and virtually all other scientific resources not yet fully brought to bear on water pollution problems.

The Nation has already entered the water reuse phase but increasing needs will require multiple reuse of the same waters, particularly in the water-short Southwest and the Southwest-Pacific areas and in the highly populated and industrialized areas of the Midwest, Northeast, and Middle Atlantic.

Multiple reuse of water will not be possible unless much more economical, effective, and efficient waste treatment processes are developed than those available now. These will need to be basically new processes, probably utilizing chemical and physical techniques.

The object of our water purification and reuse program is to develop these new treatment processes—this has been referred to as advanced waste treatment. More broadly, the goal is to develop a new arsenal of treatment tools which will permit not only total pollution control but also deliberate, controlled reuse of water. Reuse, greatly augmenting our natural fresh water supplies, will be possible