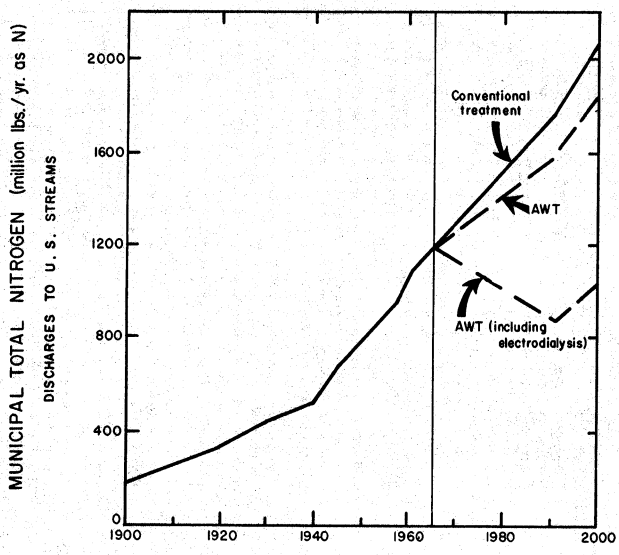

FIGURE 10(d). Potential impact of AWT on municipal discharges of nitrogen to U.S. streams.

about 300 bgd and by 2000, more than 475 bgd. Actually, the situation is vastly more complex than this, and a detailed discussion is beyond the scope of this paper. Briefly, however, with 95 per cent BOD removal, the calculated dilution volumes required would need be only one-half of those above, and with 99 per cent treatment, only one-tenth. The conclusion[3] that theoretical dilution water requirements for these wastes will not go to zero as treatment efficiency approaches 100 per cent is in error when physical-chemical treatment, and not extended biological treatment, is assumed.

In summary, new systems or mechanisms must be developed and maintained in this country to assure that adequate quantities of water of suitable quality are continuously available to meet our demands for municipal, industrial, agricultural, and recreational purposes and to protect our fish and wildlife resources. Past techniques for maintaining or improving the quality of water have included conventional waste treatment, dilution, and stream self-purification. These techniques by themselves, however, will be unable to serve the needs of the future.

Advanced waste treatment processes which may range from extensions of biological treatment methods to quite complex physical-chemical separation techniques are now under development. Such techniques could, in proper combination, not only provide complete elimination of pollution from municipal and industrial sources but even produce water suitable for direct and deliberate reuse. Advanced waste treatment or, more properly, water renovation will become a major tool in solving both of our major water resource problems—water supply and water pollution.