

FOREWORD

Industrial pollution is the most serious environmental issue today. It would be misleading to state that water pollution research and control associated with industrial activities is a problem only in developing countries and to presume that developed countries have already solved these problems. It is obvious that the extent of industrial activities is commensurate with the stage of development in a country. Also, industrial production processes possess a very dynamic nature, always subject to changes and developments, improving and creating better or new technologies. These are inevitably associated with similar complex problems of environmental control. Some developing countries either do not have these technologies or they are not prepared to cope with the environmental side of the problem, so that the latter is a much bigger issue for the developed countries. An illustrative example would be the case of hazardous waste problems which consume huge sums of research and control efforts and funds in developed countries and yet require too much to achieve. After so much effort, even the definition of hazardous waste is still not based on firm grounds, therefore its relation with other type of wastes requires examination, sometimes on a case by case basis.

Consequently, commonly adopted control schemes for industrial pollution control still demand significant research efforts. It may be stated that most developed countries have adequate conventional control measures for industrial pollution. While this may be partly true they still require basic research, applied research and development of technology and engineering, even solution to problems in practice. This is because most of the practical work is quite empirical in nature, probably due to its commercial characteristics. This aspect may be better envisaged by comparing it with the evolution of domestic wastewater technology: the latter was quite empirical between 1940 - 1960 until it was supported and perfected by related research to reach its present state of the art. The actual stage of industrial pollution control is very similar to the 1940 - 1960 period for domestic wastes. A very vivid example is the work of the IAWPRC Task Group on activated sludge modelling: while the model provided a significant improvement to the understanding and manipulation of the process for domestic wastes, it was the opinion of the same group that it necessitated substantial additional effort to be applied to industrial wastes. The picture may be completed by another example: A great part of the industries in the world discharge their wastewaters into a sewer system with varying degree of pretreatment. The treatment of domestic wastes is well defined, however, the joint treatment of domestic wastes with industrial effluents, especially when the amount of the latter take a significant part, needs careful examination of industrial wastewaters as far as their pollutants, treatability and their impact on joint treatment are concerned. This situation is further complicated by micropollutants which adversely affect the joint treatment as well as receiving waters; the sources and effects of micropollutants on both treatment systems and the environment have been subject of numerous studies. This area seems to be very demanding for continuous and extensive research.

The field and extent of research on industrial pollution control is considerable. It requires a systematic approach in a very broad framework, because of the complexity of the industry and its wastes. There are more than 60 different groups of industries in terms of their pollution characteristics, each having a number of additional subcategories, and it is almost impossible to find a reliable particular data in the literature. Although applied in many countries with

different names and ways, the systematic approach refers to the definition of processes and pollution profiles, categorization and subcategorization on the basis of pollution characteristics, determination of treatment alternatives, treatability testing and conceptual design of treatment systems. This approach yields the so-called technology-based discharge standards which is the basis of industrial pollution control in many developed and developing countries. However, there are two main reasons why the above approach cannot be presently considered adequate. Firstly, many of the basic definitions are still loose; e.g. the rationale of the subcategorization of the textile processing industry is still a matter of debate in spite of the fact that textile processing is of considerable importance in terms of pollution. It is almost impossible to find two similar pharmaceutical plants so that a meaningful subcategorization may be realized. These difficulties arise from the complex nature of the industry and dictate the fact that the elaboration of the above systematics will rather be a continuous process. Secondly, the industry itself is continuously renewing its structure, which in turn calls for the development of new techniques and approaches for pollution control.

Agro-Industries play a major role in the world's economy. At the same token, they are major contributors to the worldwide industrial pollution problem. With the tremendous pace of technological development, substantial research is devoted to cope with wastes of ever increasing complexity generated by Agro-Industries. A continuous need for additional research shows itself in many related areas such as appropriate treatment technology for strong wastes, energy recovery and reuse systems, sludge stabilization and disposal problems, etc. While most studies direct themselves to new sophisticated issues, it is also imperative to look back and continuously review and update traditional concepts like waste characterization and categorization, pretreatment, etc. In short, Agro-Industries require more than any other sector in this field a dynamic and comprehensive approach for appropriate waste management. It is hoped that this symposium will be the pioneering effort to provide and to continuously encourage all the scientific and technical ingredients for this comprehensive approach. It is also hoped that it will be the start of a series of similar activities in this very important field.

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