Introduction

ASTM is a voluntary consensus standards development organization. As such, most of the previous seven aquatic toxicology and hazard assessment symposia have focused on presentations relating to research aimed, directly or indirectly, at test methods development. The focus of this Eighth Symposium on Aquatic Toxicology is the utility of these methods in the regulatory and industrial context, their limits of environmental applicability and a continued discussion of improvements in the methods.

Quite often in the protective womb of our own laboratories, we forget to consider the ultimate use of the method we are developing. We often focus on research in the narrow context of our specific area of expertise. The intent of this symposium is to open our perspectives to the broader context of use of our individual efforts to develop safer products or to regulate product use to ensure that we protect our environment.

In attempting to define more clearly how our research is used, we built the foci of the sessions in pyramid fashion. The symposium begins by examining how scientific data are used and interpreted by the U.S. Congress and by the European Community, a very broad base, possibly the ultimate end use of the fruits of our labors.

The second session examines specific legislative mandates in the United States and the use of our particular scientific disciplines in decision-making. Although only one paper on the Clean Water Act is included in this edition, several others were discussed at the conference itself: the Maine Protection Research and Sanctuaries Act; the Toxic Substances Control Act; the Federal Insecticide, Fungicide, and Rodenticide Act; the Resources Conservation and Recovery Act; and the Comprehensive Environmental Response, Compensation, and Liabilities Act. Each of these regulations requires data generated and interpreted by scientists to achieve specific goals such as “fishable, swimable waters,” “balanced indigenous populations,” and so forth, more than the pipedreams of Congress.

The third session of this eighth symposium features a debate about articulating more clearly what must be protected to achieve these environmental goals. The papers featured here focus on an examination of the role of single-
species, microcosm and system level responses in decision-making. The goal of all panel members was clearly the protection of aquatic life.

Our pyramid progressively narrows from continents and countries, to laws, to identifying what we are trying to protect. The fourth session on research needs responds to the goals outlined in previous papers. In the environmental sciences, knowledge is rarely sufficient and gaps in knowledge are many. Panelists discuss what is needed to fill some of those gaps. Those identified were assessments of sorption to sediments, effluent impacts, rapid determinants of chronic toxicity, translation of laboratory data to the field, the use of multispecies tests, and structure/activity relationships as effect indicators.

The last three sessions discuss on-going research to address some needs described above. We are indeed filling those gaps now. It would be wonderful to be able to accurately predict ecological implications of our acts instead of reacting to environmental consequences of underestimating hazard or economic costs associated with overestimation. Hopefully, the research described here will continue to improve our predictions or lead us to new research areas to make our goal a reality.

The fifth session seeks to answer the following questions: How well does laboratory data predict what really happens in the environment? Can or should we use laboratory data to develop water quality criteria or predict environmental hazard, and so forth? It is obvious that the answers are not simple.

The largest session of this symposium deals with new concepts and methods in aquatic toxicology. These range from biochemical tests, such as the use of a lipid index for predicting bio-uptake by daphnids, to interlaboratory studies of the variability of bioconcentration tests with one species, the eastern oyster.

Our last session reaches the narrowest point of the pyramid. The papers are focused on a single chemical class, dioxins. This session was especially timely because of the Times Beach, MO, incident. This session again points to the need for low-level detection of various chemical species of this material. The research involved not only the regulator, but also the manufacturer. Presentations describe the intensity of effort being expended to this single class of compounds. In the past, similar efforts have gone into a variety of pesticides, metals and polychlorinated biphenyl (PCBs), as well as some less hazardous materials such as detergents and dredged materials.

Thus the pyramid is complete, from its base in national and international arenas to its apex in a single chemical class. By means of these sessions, we hoped to address the question of the use of our scientific achievements. We recognize it is just a modest beginning and that not all blocks that constitute the pyramid are in place, but we hope we have provided the audience with both relevant information and questions to be addressed by future aquatic toxicology symposia.

We, the symposium chairmen, are especially indebted to our session chairmen Dr. Tudor Davies, Dr. Charles Coutant, Dr. Kenneth Dickson, Dr. James Fava, Mr. Scott Sautter, and Dr. William Adams for assisting us in
developing and convening the sessions; to Ms. Anne McKlindon for arranging for symposium facilities; and to Ms. Kathy Greene and the ASTM staff for supervising the publication of this volume.

_Rita C. Bahner_

Association of Official Analytical Chemists, Arlington, VA, 22209; symposium chairman and editor.

_David J. Hansen_

Environmental Protection Agency, Narragansett, RI 02880; symposium chairman and editor.