Database on the Achievements of Chemistry

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The worldwide chemical enterprise suffers from a tarnished public image. Chemicals are associated in the public press, radio and television with bad things happening to the environment, to communities and to people. Often the word that is used to convey the notion that whatever it is that is creating a problem "has a chemical in it." To those in the field of chemistry these notions are as ridiculous as they are frustrating. They are not logical; nevertheless, they are widely used and repeatedly used by the uninformed.

Public perception undoubtedly has influence on other activities ranging from legislation governing the use of chemicals to the perception by young people of the field of chemistry as a career option. Much effort by industry and chemical organizations is directed toward a better public understanding and to dispel some of the misconceptions associated with chemistry.

Much work has been done in the past and continues today to educate the public about chemistry and its value to society and to bring balanced understanding about the benefits and risks of chemicals. We believe that an international effort led by IUPAC could provide an authoritative source of information on the ways in which chemistry and the industries based on the chemical sciences contribute to a better life.

We envision a website based on major innovations in chemical science over the past century and a half that occurred in many countries. The format would be attractive and provide easy access for students in science, for science teachers, for members of the chemical enterprise, for policymakers, and for reference by the general public.

The website might contain an encyclopedia of major chemical accomplishments that have contributed to the betterment of the human condition. It could include a detailed information base of chemical innovations and developments. Through the design of "access templates", it would permit viewing this information through a variety of types of queries. The access templates would be user-friendly and facilitate inquiries, for example, on the evolution of innovations in engineering plastics, or antibiotics, in which the user would be led through a series of connected developments in applied chemistry. Another example of an access template might lead the user through a series of innovations that had major impact on portable energy, or plant protection chemistry.

In short, the website would provide a flexible, "living" macro- and micropedia that could grow and develop in sophistication as needs developed and changed. It would provide an interactive, multimedia presentation illustrating innovations over the past 150 years that have provided life-improving breakthroughs in: energy, transportation, environment, food and agriculture, health and medicine, information and communications, manufacturing processes, as well as the tools to study the world around us at the molecular level. A structured website would allow the viewer to delve into a given subject in sufficient depth to learn about the chemistry involved, or to look at an overview of the many life-improving products resulting from chemical research. It would offer an attractive enhancement to general science studies and courses in chemistry, as well as an interesting and informative source for the general public. The website resulting from this project would help to strengthen the essential bridge between the chemical enterprise and the public, a linkage that is important for both communities for continued growth and development.

This is a very ambitious project – one that will take years to complete and require substantial resources. IUPAC has recently approved a feasibility study of this long-term proposed project. Among the factors that must be considered are the following:

Identification and contacts with potential partners. National chemical societies, the Chemical Heritage Foundation, trade associations representing the chemical and pharmaceutical industries, and other groups interested in the public understanding of science have already made substantial contributions in this area in many countries. Many of them may be interested in a joint effort to provide a central database that all could exploit for specific purposes.

Identification and contacts with potential sources of funds. Foundations interested in science education, relevant government agencies, and some of the groups listed above may be receptive to proposals for funding.

Creation of an inventory of websites, books and other documents that address the value of chemistry. An enormous amount of work has been done in this area. For example, the American Chemical Society produced a set of "technological milestones" in chemistry and has a vast amount of unpublished information on this subject. The Royal Society of Chemistry's book on "Chemistry, Society and the Environment: A New History of the British Chemical Industry" and similar efforts by other chemical societies are relevant. The Chemical Heritage Foundation and other groups interested in the history of chemistry have published books, brochures and articles that focus on specific areas and individuals. AllChemE in Europe and the National Academies in the USA have recently published reports that highlight current advances in chemistry. A major effort will be directed at attempts to learn what is available, along with the scope and limitations, in as many countries as feasible. Organizing, cataloging and summarizing this information in an accessible way on the IUPAC web site will constitute a tangible output from this study even if it should turn out not to be feasible to pursue the overall project as envisioned.

Determination of the value of the overall project. Two key questions must be answered:

1. What "added value" will the IUPAC effort bring to what has already been done by others?
2. How do we design the proposed website so that it is attractive to and will be visited by target audiences?

These questions will be addressed in discussions with potential partners and funding sources, as well as other knowledgeable individuals. Unless there is a consensus that this effort has a reasonable chance to achieve its objectives, it clearly should not be undertaken.

Assessment of resources needed. Like all IUPAC activities, the project will rely heavily on volunteer efforts, but there will be significant expenses in obtaining professional writing and especially in creating a web site that is attractive to the target audiences. We have developed one possible scenario for the form of a web site, for a pilot project to address one major area of application of chemistry, and for the ultimate comprehensive treatment. This scenario is based on the ACS technological milestone project, for which a great deal of information on international contributions to chemistry has already been accumulated and evaluated. However, the approach could be modified substantially during the feasibility study.

The task group carrying out the feasibility study welcomes comments from participants at the World Chemistry Leadership meeting. Over the coming months we will seek advice and assistance from the broad international chemistry community.