

Vice President's Column



by *Natalia Tarasova*

For nearly one hundred years, the mission of IUPAC has been to contribute to the worldwide understanding and application of the chemical sciences to the betterment of the human condition. As a scientific, international, non-governmental, and objective body, IUPAC can address many global issues involving the chemical sciences. By providing leadership, facilitation, and encouragement of chemistry, IUPAC contributes to the expansion of scientific knowledge.

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What is scientific knowledge? How is it produced and then applied to world needs? Scientists create some hypothesis based on theories, develop models, and implement experimental observations for the validation of the hypothesis (deductive inference). In time, based on the accumulation of factual knowledge, a new hypothesis can be formed (inductive inference). This knowledge (formal knowledge) can then be transferred and shared among the wider scientific community. By publishing papers and promoting communication, we exchange factual knowledge. Such widely shared factual knowledge is defined as scientific knowledge. During the past hundred years, this scientific knowledge has been increasing exponentially. Differentiation and systematization have proceeded, establishing a large number of disciplines.

It is very difficult to adapt accumulated sub-system knowledge to holistic knowledge in the service of humankind. Knowledge on a whole system can rarely be introduced to a targeted sub-system. In many cases, knowledge in one discipline is inapplicable to others. It is a difficult task to find solutions to issues across disciplines. To realize the benefits of scientific knowledge in society, we need to combine scientific knowledge of the natural world, the socio-economic world, and the world of human beings, and develop trans-disciplinarity as well as inter-disciplinarity.

How can we develop inter-disciplinarity and trans-disciplinarity? We need to share data and information and inter-link our knowledge by developing models and exchanging tools. Based on this kind of scientific activity, we can affect cooperation between the scientific community and society. Two examples of initiatives framing interdisciplinary research are given below.

The first is FUTURE EARTH, a program initiated by ICSU (www.icsu.org). Bringing together partnerships with existing programs on global environmental change, Future Earth will be an international hub for new, interdisciplinary approaches to research on three themes: Dynamic Planet, Global Sustainable Development, and Transformations towards Sus-

tainability. It will also be a platform for international engagement, to ensure that knowledge is generated in partnership with society and users of science. It is open to scientists of all disciplines, natural and social, as well as engineering, the humanities, and law. The IUPAC Divisions and Committees have a great potential to contribute to this platform.

The second example is the Strategic Approach to International Chemical Management (SAICM, www.saicm.org). SAICM is a policy framework to promote chemical safety around the world. SAICM has as its overall objective the achievement of the sound management of chemicals throughout their life cycle, so that by 2020 chemicals are produced and used in ways that minimize significant adverse impacts on human health and the environment. This "2020 goal" was adopted by the World Summit on Sustainable Development in 2002 as part of the Johannesburg Plan of Implementation and is echoed in the UN's Sustainable Development Goals (*Ci*, Jan-Feb 2015, pp 4-7). SAICM is distinguished by its comprehensive scope, ambitious "2020 goal" for sound chemicals management, multi-stakeholder and multi-sectoral character, endorsement at the highest political levels, emphasis on chemical safety as a sustainable issue, provision for resource mobilization, and formal endorsement or recognition by the governing bodies of key intergovernmental organizations. Acknowledgement of the essential economic role of chemicals and their contribution to improved living standards needs to be balanced with the recognition of their potential costs.

IUPAC is the official NGO partner of SAICM. Currently, the activities of IUPAC in the field of chemical safety and other related fields are not well-known to other members of SAICM from industrial sectors and intergovernmental organizations (including FAO and WHO), or to representatives of countries and regions. The IUPAC Committee on Chemistry and Industry (COCI) is now undertaking to fill this gap in collaboration with other Standing Committees and Divisions of the IUPAC.

While staying true to its mission, IUPAC has the potential—and maybe the obligation—to participate in the many programs that contribute to the betterment of the human condition. The expertise of chemists, and of IUPAC, is unique and complementary to that of others, and is as valuable today as it has been for the past century. 

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