International Societies

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Professional societies serve many functions for their members. They educate. They inspire. They connect. Ceramic societies, in particular, have an especially difficult task given the breadth of the field itself, not to mention the cultural, political and industrial landscapes they navigate with – and for – their members. Challenges encountered by societies and the ceramists they support can be found worldwide. They can be as different as the cultures themselves, or as universal as how to stay relevant in a rapidly changing world.

The *Bulletin* talked to leaders of many ceramic and ceramic-related societies around the globe to take a peek into their industries, challenges and memberships. Where are the areas of opportunity for ceramists in Italy? What percentage of the GNP does the ceramics industry comprise in Brazil? How does the Slovak Silicate Society find success in reaching out materials science students in its country? Here's what they had to say.

Associacao Brasileira de Ceramica

When considering the status of the ceramics industry in Brazil, it is important to note the number and concentration of its inhabitants. Of the 180 million people living in the country, most are situated in urban areas – a fact that has important implications for the type and distribution of the industry. Brazil's ceramics industry accounts for around one percent of the country's GNP. It is defined by sectors, with the bulk of the production value in structural ceramics and ceramic tile sectors. Established in 1954, the Brazilian ceramic society Associacao Brasileira de Ceramica has about 300 members, split roughly in half between those who work in academia and research (about 50 percent), and those employed in the industrial realm (an estimated 43 percent). ABC members hail predominantly from four sectors: engineering/technical ceramics (18 percent), raw materials (16 percent), refractories (13 percent) and floor and wall tile (13 percent). In general, the ceramics industry in Brazil has been growing and, concurrently, several other new scientific- and industry-related societies have been established in the past decade, which has catalyzed an exodus of members from ABC. About 800 members comprised the society a decade ago, now that number has been cut by 500. Despite that fact, ABC has managed to keep three periodicals going and continues to run its annual congress, which typically draws about 700 attendees. ABC also organizes several other smaller thematic meetings and workshops, including raw materials, refractories, energy conservation and ceramic art.

The raw materials, refractories and floor and wall tile industries in Brazil are quite powerful and healthy, on the forefront of the development of new materials, design and production techniques.

The greatest challenge identified by ABC is the lack of well-trained human resources. Despite the great efforts of some Brazilian institutions, the country still has a large gap between the demand for and availability of well-trained personnel.

Another challenge is glass production. At present, the flat-glass industry is doing well because of the construction boom in Brazil, but other manufacturers, such as the bottle-glass industry, have been suffering for years from competition with plastic.

ABC has had some modest collaboration with other South American societies and organizations, as well as with the Portuguese and Spanish ceramic societies. ABC became a member of the International Ceramic Federation this year, hoping to boost its level of international cooperation.

The growth of international competition in the field of ceramics impacts Brazil in some areas. With raw materials, for instance, the competition from the Chinese is really strong, aided by low import duties and the strength of the Brazilian currency.

Deutsche Keramische Gesellschaft

The Deutsche Keramische Gesellschaft boasts nearly 960 individual (including 162 student) and 223 institutional members. The membership of a company includes membership for all of its workers. This means that most of DKG's individual members are from universities and institutes, while many of the people from industry are indirect members. Members hail from all sectors of ceramics. However, DKG does not define ceramics as including glass, cement or concrete

The past 10 years have been good for ceramists in Germany because of the increasing number of start-ups and a stable employment rate, specifically in the area of technical ceramics. The technical ceramics sector, especially electronics, engages a growing number of ceramists with a scientific background.

According to DKG, the increase of turnover in technical ceramics is in the range of six percent per year, and the actual number of employees is constant. On the other hand, the field of silicate ceramics is evidencing a steady decrease of two percent per year in turnover and a decrease of employment of nearly six percent per year.

The biggest challenges for industry in Europe are high labor costs, high energy prices and competition from the Far East, in part because of copyright and patent laws. DKG takes the position that fair competition never will be a threat for a country's economy, but will foster its own efforts.

Looking ahead, DKG expects that future developments in ceramics will occur in the following sectors: energy storage systems; high-temperature fuel cells; abrasion-resistant systems and tools; bioceramics; sensors; catalysators; membranes;

piezoceramics (lead-free); high-temperature semiconductors; and nonvolatile memories.

As a society, DKG points to several great achievements over the past decade. It set up a working cooperative for research work, a financially stable publication, an increased international cooperation in Europe and a working knowledge-development system for its members.

Societa Ceramica Italiana

Italy, and the districts of Sassuolo and Faenza-Imola in particular, is at the heart of ceramic tile production. These districts account for more than 85 percent of the Italian production of tile and a large chunk of the world's production of tilemaking machinery. The Societa Ceramica Italiana identifies this sector as one of the greatest opportunities for the country's ceramists. In fact, about 70 percent of the SCI's 280 members hail from the industrial sector, mainly in ceramic tile manufacture, machinery and plant production. The society also has a large portion of members in academia, working in the field of scientific and technical research.

Established in 1972, the SCI regards itself as a cultural society, and it is involved in the organization of conferences and congresses, to preserve and move forward the ceramic culture in the country. A point of pride for the SCI is a collection of technical books it produces every two years.

A few of the bigger challenges faced by Italian ceramists are directly related to the production of ceramic tile, including raw materials, additives, technology, pigments, glazes, pollution and the environment.

SCI is involved in the activities of the European Ceramic Society, and in the International Ceramic Federation. The SCI played a major role in organizing the International Ceramic Congress this summer, along with ACerS and ceramic societies from Japan, China and India.

International competition is viewed as a reality – not a threat – and allows the country's industrial and academic sectors to focus on producing top-quality materials.

In addition to tile, Italy is very strong in sanitaryware and heavy-clay products and represents a world player in these fields. Ceramic artcrafts are also very important in the country.

Georgian Ceramic Association

The Georgian Ceramic Association was founded in 1998. In 10 years, the organization has grown to 71 members who encompass several sectors: industry, brickyards, institutes (High Technological National Center of Georgia, Institute of Building Materials and Tbilisi Aviation Building mill) and academia (Georgian Technical University and Tbilisi Artistic Academy). Seven students are also members.

Members from the Georgian Technical University work specifically in the realm of nanoceramic and nanopolymer composites and in bionanoceramics, glass, coatings for tubes and hetero-module high-power functional ceramics.

From a countrywide perspective, Georgian ceramists focus their efforts in the following directions: boron carbide for nuclear reactors; ceramics for airplane hot points; artistic ceramics; brick, ceramic and polymer composites for the ballistic installations in airplanes and human peace operations; and transducers for rocket fuel container leakage, concrete, glass and enamel. Recently, Georgian ceramists began working in the field of single-domain bionanoceramic powders production for medical applications specific to cancer. The field in Georgia faces human resource and production challenges. On the industry side, challenges specifically originate in the production of technical hetero-module ceramic nanocomposites. From a personnel perspective, low salaries and low budgets for scientific projects prevent the support and completion of more progressive, technical projects, something GeCerA believes inhibits technical progress in Georgia. GeCerA became a member of ECerS in 2002 and ICF in 2007, something the society points to as one of its biggest achievements.

GeCerA publishes one journal, *Ceramica*, printing submissions in English, German, Russian and Georgian.

Sociedad Mexicana de Cerámica Zona Norte A.C.

Mexico is the seventh largest producer of ceramic materials in the world, an accomplishment the Sociedad Mexicana de Ceramica Zona Norte A.C. counts as one of the Mexican industry's greatest achievements. The Mexican ceramic society was established in 1972, initiated by a small group of ceramics and glass professionals. At present, the society has 134 members, most of them ceramics manufacturers and suppliers. Ninety-eight percent of members come from whitewares, while two percent work in glazes.

Mexican ceramists have the opportunity to work in various areas of the ceramics industry, including sanitaryware, tableware, tile and electrical insulators.

A current challenge of the society and the industry itself is the housing crunch in the United States. Decreased construction–related products from Mexico are needed, cutting down ceramics companies' exports. However, these businesses are making an effort to maintain employment levels to react quickly to market recovery.

Opportunities for growth in the Mexican industry can be found in the field of high tech ceramics, and the products and applications that can be produced. The feasibility of this direction is made possible by the industrial body of knowledge as well as the availability of raw materials.

One of the main objectives of the society is to increase the level of communication and cooperation with other ceramics societies. Society leaders believe that, in a global world, contact with similar organizations will allow continued growth and support of the industries it serves to increase productivity and competitiveness.

Correspondingly, the growth of international competition in the field of ceramics is seen as a plus. Competition gives the society and industry the opportunity to find creative solutions to improve products and processes.

The society seeks greater participation from academia, both students and professors. For instance, the society holds seminars designed for people who work in the industry, where university professors are invited to participate as teachers alongside industry professionals. During 2007 and 2008, the society conducted a 10-month-long training program in ceramics that included a one-day seminar every month. The curriculum covered the ceramic process from raw materials to finished products. Another way the society is encouraging participation from the academic world is through a national design contest that welcomes designs from students. The society maintains a quarterly magazine about the society's activities, plus stories about industry and research.

The society also hosts a Convention of Ceramics every two years, to give attendees the opportunity to learn from the experiences of CEOs from the bigger Mexican ceramics companies as well as from industry suppliers.

Slovenská Silikátová Vedecko-Technická Spoloc˘nost

The Slovak Silicate Research and Development Society is an independent and voluntary interest society of engineers, researchers, educators, economists, project engineers and other workers in the silicate and related specializations. The society headquarters is at Bratislava, but the society covers the whole territory of the Slovak Republic. Slovak Silicate Society is a member of the ECerS and through this society is also a member of the ICF. The members of the Slovak Silicate Society are individuals as well as corporations. Individuals come from academia (universities and Slovak Academy of Sciences) and industry. Corporate members are exclusively the producers of traditional ceramics. Students are a special category of membership, and special interest is devoted to their activities. The best diploma theses of the master's students in the field of silicates are evaluated annually, while the best doctoral theses are evaluated biannually. The winner of the Ph.D. student contest is able to participate in the Student Speech Contest at the meeting of the ECerS society.

Additionally, the society organizes local as well as international conferences in the field of ceramics, cements, refractories and others. Besides these activities, the society collaborates with industrial partners, and together they organize educational workshops with the topics based on the industry demands. The society has programs for secondary school students to increase their interest in the silicate industry. The Slovak Silicate Society publishes yearly the *Silikatnik* journal which covers the recent developments in the research, development and industry in the scope of interest of the society members.

European Ceramic Society

The European Ceramic Society is a nongovernmental, nonprofit federation of national ceramics societies each representing the ceramists of a member country. ECerS was established in 1987 to coordinate and promote the study of ceramics, in particular: encourage education, training and research; consult with and bring together individuals and representatives of members, research establishments, academic bodies and institutions of governments and other bodies including the Commission of the European Community; collect, disseminate and exchange information with other organizations; promote planning, promotion and organization of conferences and meetings; and procure planning, printing, publication and circulation of technical papers. The ECerS council consists of the presidents of the member organizations and one more member of each national organization. The president is elected by the council for two years, and an executive committee and advisory group assist the president.

Today, ECerS has 24 member countries with 24 different languages. All members of the national societies are members of ECerS. There are six standing committees active in the fields of education, research and development, editorial, communication, industrial and art, design and tradition. The editorial working group publishes the *Journal of the European Ceramic Society* with one of the Institute for Scientific Information's highest impact factor ratings.

Every two years the ECerS organizes a general conference in one of the member countries. The global road map developed at the ICF meeting in Verona this year says that the main points of future developments in ceramics are energy storage systems, high-temperature fuel cells, abrasive resistant systems and tools, bioceramics, sensors, catalysts, membranes, piezoceramics (lead-free), high-temperature semiconductors and nonvolatile memories.

The R&D focus in the various European countries varies. Portugal, Turkey, Spain and Italy, for example, concentrate on the development of whitewares and refractories. Germany, France, Russia, Sweden, The Netherlands and United Kingdom focus on advanced ceramics.

The biggest challenges for industry in Europe are high labor costs, high energy prices and strong competition from the Far East.

International Commission on Glass

The International Commission on Glass is a nonprofit international society of national scientific and technical organizations with particular interests in glass science and technology. It was founded in 1933, and brings together the world's most respected companies, universities and scientific institutions of the glass industry and allied organizations. The aim of ICG is to promote and stimulate understanding and cooperation between glass experts in the fields of science and technology of glass as well as art, history and education.

The ICG achieves these objectives by organizing technical committee work, such as laboratory round robins, comparative studies and topical meetings; compiling information on glass by publishing scientific and technical papers, reports and books; and by sharing and disseminating knowledge on glass in advanced educational courses and workshops. A further major role is to organize international meetings. Every three years the ICG holds an International Congress. Annual meetings are held during the intervening period often in conjunction with national society meetings. ICG is financed by subscriptions from member organizations, one per member country. There are currently 31 member countries: Argentina, Australia, Belgium, Brazil, Canada, China, Czech Republic, Finland, France, Germany, Greece, Hungary, India, Italy, Japan, Korea, Liechtenstein, Mexico, The Netherlands, Philippines, Poland, Portugal, Russia, Serbia, Slovakia, Spain, Sweden, Thailand, Turkey, United Kingdom and the United States. Technical

ICG President Herve Arribart (Saint-Gobain)

committees conduct the greater part of the continuing activity of the ICG. Created at the initiative of the member organizations, the TCs cover vital topics in glass science and technology. The members of the TCs have access to resources and facilities that are contributed freely in the pursuit of the technical objectives defined by the individual TCs. Meetings of the TCs are held regularly to discuss the results of interlaboratory experiments and surveys. In addition to advancing glass science and technology, the TCs are also concerned with the definition of standards, and many scientific publications originate from the work of TCs. TC members are experts in their particular fields and are selected from universities, institutions and industry.

The following is a list of current TCs: basic glass science; glass transition; nucleation, crystallization and glass-ceramics; optical properties of glass; mechanical properties of glass; nanomechanics; chemical durability and analysis; contact between glass and refractories; environment; gases in glass; sensors and advanced control systems; properties of glassforming melts; modeling of glassmelting processes; modeling of glassforming processes; nanostructured glass; glass surface diagnostics; coatings on glass; glasses for optoelectronics; glass for medicine and biotechnology; hazardous and nuclear waste vitrification; glass for a sustainable society; archeometry of glass; information and communications; and education and training in glass science and engineering.

International Ceramic Federation.

The discoveries of applications for silicon carbide and nitride-based ceramics and the discovery of high-temperature superconductivity led to an upsurge in ceramics activities worldwide led to an awareness of the need for international cooperation. In 1980, the ACerS established the International Ceramic Society Coordinating Committee. During the preparation of Austceram 88, the Australian Ceramic Society considered this meeting as a suitable opportunity to expand the relations and cooperation between ceramists throughout the world. To shape this idea representatives of ceramics societies were invited to attend a meeting with the view to establish an International Federation of Ceramic Societies. The invitation was well received and ceramics groups from around the world initiated the formation of the International Ceramic Federation. Presently, the member organizations are ACerS, Argentine Ceramic Society, Australasian Ceramic Society, Bangladesh Ceramic Society, Canadian Ceramic Society, Ceramic Society of Japan, Chinese Ceramic Society, Egyptian Academy for Scientific Research and Technology, European Ceramic Society, Korean Ceramic Society, Mexican Ceramic Society, South African Ceramic Society and The Academy of Ceramics.

ICF President Akio Makishima

The initial organization of the federation was largely patterned after the International Commission on Glass. The American Ceramic Society offered to act as secretariat in the initial stage and continues to serve in that function. During this meeting it was also decided that the Federation would not be involved in the organization of independent technical meetings, but would provide a central clearinghouse for coordination of international meetings on ceramics.

The first official meeting of the nascent ICF was held in1990 at Dallas, Texas, and was attended by 24 persons, during which a slate of officers and an executive committee consisting of six members were elected.

ICF has a council that is its governing body and serves to oversee the management and administration of the organization. The council consists of the officers and representatives of member organizations.

The official purpose of the ICF is to promote and stimulate understanding and cooperation between persons and societies from different countries. The federation also sketched out several objectives, including the promotion of the art, science and technology of ceramics; the understanding of the application of ceramic materials to components and systems, among the user community and the public; the maintainance of a worldwide calendar of meetings on ceramics and provide a central clearinghouse for coordination of international meetings on ceramics; and the facilitation of communication among ceramic societies.

The ICF has several standing committees:

- TC 1 – Research committee,
- TC 2 – Committee for listing of international meetings and listing of professional societies/officers,
- TC 3 – Coordination and endorsement of conferences,
- TC 4 – Internet,
- TC 5 – Standardization,
- TC 6 – History of ceramics,
- TC 7 – Education,
- TC 8 – Nomenclature,
- TC 9 – Traditional ceramics,
- TC 10 – International accreditation and licensing of engineers, and
- TC 11 – Ceramics and global environmental problems.

International Congress on Ceramics

The International Ceramic Federation plays a key role in endorsing and promoting a biennial International Congress on Ceramics. In general, these ICCs are organized to foster discussion and debate and compare the various status, perspectives and priorities among the professionals in the fields of science, technology, production and market for ceramics.

ICC President Gian Nicola Babini

The congresses attempt to synthesize various analyses and opinions into guidelines for the best sustainable mutual future development in the world, namely, "The Road Map of Ceramics."

The second ICC was at Verona, Italy, in June of this year, and the third will be held Nov. 14-18, 2010, in Osaka, Japan. ■