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Georges Calas

Since their foundation in the early 19th century, the mineral sciences have been concerned not only with natural minerals but also with their numerous synthetic counterparts. These materials exhibit a large diversity of structures and properties and find countless applications. Such continuity between natural, synthetic and sometimes technological materials is good for research: breaking boundaries between scientific fields has always been positive. This continuity is also good for our students, and it is a good reason to attract students to mineralogy: these students often show excellence in mastering complex systems, even in fields outside of the Earth and environmental sciences. *Elements* is an excellent illustration of how some subjects require interdisciplinary thinking. Indeed, many mineralogy-related issues of *Elements*, from the Diamond issue (the second issue of *Elements*) to more recent issues, for example, those on garnet and kaolin, illustrate the importance of minerals in the Earth sciences as well as in materials science. The current issue, devoted to graphitic carbon, continues in this interdisciplinary vein.

Even if textbooks teach that the carbon family comprises two members, graphite and diamond, this family has always been considered to be much larger, as illustrated by the large diversity of coals, reflecting the intensity of diagenesis and low-grade metamorphism. For instance, vitrinite reflectance, a property that measures the evolution of coal structure, has been, and still is, a widely used, simple technique for indicating the level of thermal maturation of sedimentary rocks during burial. On the other hand, the family of synthetic carbons has expanded greatly in the last three decades, stimulated by many major discoveries, such as carbon fibers, low-pressure diamond, the fullerenes, and graphene (the recent discovery of which resulted in the 2010 Nobel Prize in Physics being awarded to Andre Geim and Konstantin Novoselov of the University of Manchester, UK). The carbon family is even bigger if we include the various kinds of soot and engineered carbon nanotubes, the latter being widely used in consumer products and medicine. The atmospheric concentration of soot is a matter of concern worldwide because of its potential influence on public health. In addition, it was recently shown that the direct influence of soot on atmospheric warming could be larger than predicted, with approximately two-thirds of the impact of CO₂.

This *Elements* issue also illustrates the link we often underline in the magazine between our scientific fields and societal questions. It highlights perfectly how the structure of minerals drives their electronic properties, as illustrated by the most recent high-tech applications of graphitic materials. However, graphite is a limited resource: experts fear that Chinese graphite resources could

A BIG FAMILY

be exhausted in a few decades. As a consequence, a significant tension surrounds this mineral, as both the European Union (EU) and the USA are dependent on imports, mainly from China, for up to 95% of the graphite they use. As a matter of fact, graphite is now classified by the EU as one of the 14 critical raw materials. And recycling is limited as the present-day abundance of graphite on the world market hinders increased recycling efforts.

This is my last editorial as a principal editor of *Elements* magazine. It has been a unique experience for me to participate in this adventure, with probably a special feeling as the first editor whose native language is not English. *Elements* is now well established in our community, well supported by the contributing societies and, over the years, has established editorial policies that result in smooth running of the magazine—so smooth that we forget that *Elements* was developed from scratch with no similar example in our community for guidance. Retiring Executive Editor Pierrette Tremblay was the efficient conductor who made the magazine look so professional, leaving the principal editors to concentrate mostly on the scientific content.

“...the link that we often underline in *Elements* between our scientific fields and societal questions.”

This year, it was a great pleasure to see the success of the two-day Union session at the Goldschmidt Conference in Sacramento, California, entitled “Elements: 10 Years Old,” organized by the *Elements* editorial team. Over two days, twenty-four present and past authors as well as principal and guest editors delivered 30-minute keynote and contributed talks to a large audience, which demonstrated the strong support of the scientific community. These talks enlarged on and updated the topics of articles published in *Elements* by these same authors. And this format stimulated animated discussions between the audience and the presenters, which continued even after the session. The feedback has been and still is excellent, even months later. I want to thank warmly Paul Beattie and the Science Committee, Dominique Weis, Adina Paytan, and Paul Renne, for their support and advice for making this idea a reality: a session fueled by topics published in *Elements* and presented with the same philosophy as in the magazine, that is, explaining simply the important challenges of major scientific issues in our fields.

Ten years after its launch, the good ship *Elements* is now clearly visible on the ocean of science. It has visited many original fields, new for most of us. This beautiful ship brings knowledge not only to the big family of *Elements* readers and members of our supporting societies but also—we hope, we wish—to a broader audience, including decision-makers. With John, Trish, Gordon, and now Bernie as principal editors and Pierrette and now Jodi as executive editor at the command of the ship, we are sure that *Elements* will continue to provide our readership with plenty of opportunities to discover many new and exciting scientific landscapes!

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