On Chemistry, Scientists, and the Arts

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The International Year of Chemistry series finishes with this article. Over a period of a year, the 11 previous articles have provided historical and contemporary glimpses into the field. They have also discussed different aspects of chemistry's complex structure as a major field of science.

Early chemistry evolved from metallurgy *(1)* and alchemy-turned-pharmacy *(2, 3)*, and from its very early stages of development, chemistry has been linked with the quest to understand human health and disease. In fact, a "chemist" was originally a physician who decided to follow the Paracelsian path, as opposed to Roman (Galenic) medicine *(3, 4)*. Later, physician–chemists, and physicians working together with chemists, formulated the field of biochemistry and clinical chemistry *(5)*. Subsequent practical implications of chemistry added yet another major dimension, leading to the development of entire new industries *(6)*.

The spectacular scientific discoveries needed an increasingly complex infrastructure to ensure and maintain the validity of newly gained knowledge, as well as continuity of the development of chemistry as a scientific discipline. This series has addressed various aspects of this framework, from the role of eminent teachers and their "schools," to architectural spaces dedicated to chemistry—the laboratories *(7–9)*.

Scientists are people and, to quote I. Glynn, "often fascinating people" *(10)*. The personal narratives are as absorbing a part of the story of chemistry as are the widely known discoveries. Several pieces in this series were about exceptional individuals *(8, 9, 11–13)*. Now, I wish to mention one more story, somewhat different from those of major researchers. Primo Levi's book *The Periodic Table*, published in English in 1984, tells about his life in Italy before and during the Second World War *(14)*. It chronicles life's turns and disasters, including Levi's year of incarceration in the Auschwitz concentration camp. What is relevant about the story is that the author, a chemist by training, narrates these events by anchoring them to various aspects of his professional "being." He shows how chemistry became part of his personality and how it influenced all other parts of his life.

Such narratives are important for the science of chemistry, if only because their human dimension speaks to those who consider entering the field. Marie Curie, for instance, had remained a role model throughout the 20th century for women who dreamed of becoming high-flying scientists *(12)*. Recently, Carol Robinson discussed in *Nature* the necessary evolution of such role models *(15)*.

The International Year of Chemistry series has looked at chemistry through the arts. As it turns out, the knowledge that is chemistry strongly influenced the arts through technologies that had an impact on painting, sculpture, and photography *(1, 6, 16)*. Conversely, the artists influence how society sees chemistry, chemists, and science in general. Their imagery settles in the collective societal mind and creates cultural constructs: in a sense, it fulfills a Homeric role, helping to create stories (and sometimes myths) that embed themselves in culture. Naturally, artists' insights might either synergize or clash with the views of insiders. Whichever it is, their "external" perspective helps to contextualize science within culture.

The image presented in Fig. 1 returns, yet again, to the chemists' dwelling place—the laboratory. I previously discussed the work of Tony Cragg, who has talked about the wider world by using the language of laboratory forms *(7)*. This image is a simple still life that shows a fragment of a working laboratory. One might look at it simply as a composition of forms, shapes, and light, or think of the meaning of its components: the measuring equipment; the pens to plan, mark, and record data; and the relative isolation of this space from the sunlit "outside."

Looking at artwork or reading literature that addresses science, one wonders how important is the art–science interface. Robert Grudin, in his book *Design and Truth*, stresses the importance of "design" in a knowledge-based society *(17)*. In his text, one meaning of the term "design" is attempting to develop knowledge in the architectural environment that maximizes individual and collective creativity. Knowledge, environment, and people are precisely what the International Year of Chemistry series has reflected upon. Such reflection might well be relevant when we think strategically about our own particular field—clinical chemistry.

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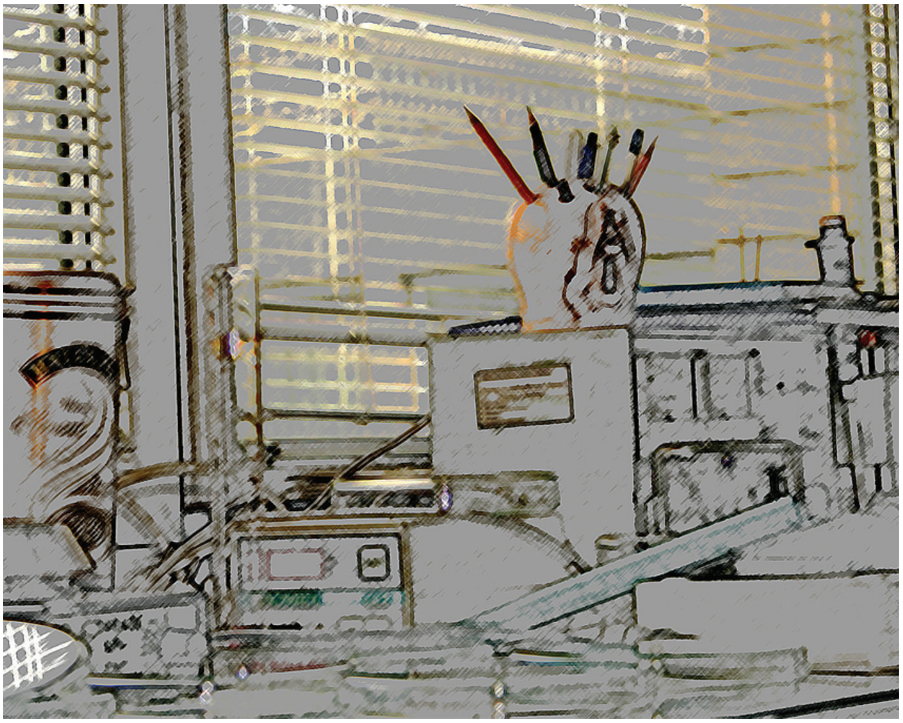

Fig. 1. Marek H. Dominiczak.
Laboratory Still Life—Late Afternoon. Processed digital photograph, 2005.

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