

Few chemists need to be convinced that molecules can be beautiful and attractive (or ugly and repulsive). Likewise, many artists would agree that scientists have created or discovered objects that are as fascinating as some of the masterpieces of architecture, sculpture or painting.

Peter Weibel and Ljiljana Fruk have succeeded to bring together colleagues from both worlds in *Molecular Aesthetics*, a volume published by the Center for Art and Media, Karlsruhe (ZKM), and distributed by MIT Press. It explores ways in which scientists and artists can learn from each other and draw inspirations from each other's work. Science and Art has always been a good match and were occasionally practiced by the same person. Few, if any, have been as successful in both areas as Leonardo da Vinci, to whom the introductory article by Peter Weibel refers. There are good reasons for this, such as the increasing specialization of both activities and the progressively abstract, mathematical character of science. Beginning in the mid-19th century, however, chemistry, in particular structural chemistry has done much to bridge the two areas of activity. Chemists have discovered countless new molecules and solids that are eminently aesthetic. Unlike their colleagues from other branches of science they have not merely exposed what was already in existence but they have created entirely new objects of study by virtue of their imagination ("la chimie crée son objet", Marcellin Berthelot, 1860). It is this creative, imaginative streak that makes chemistry such a close companion of the arts. Indeed, one is tempted to speculate which designs Leonardo would have filled his notebooks with, had he been familiar with the concept of molecules and the rules of chemistry. Undoubtedly, he would have kept synthetic chemists busy for a long time.

In a time when single molecules can be "seen" and giant molecular assemblies can be elucidated, the interplay between the molecular sciences and arts is likely to intensify. Weibel and Fruk's richly illustrated book provides numerous examples for the common ground that can be found. It features

remarkable works by artists like Drew Berry, Jaq Chartier, Edouardo Kac, and Christopher Puzio. What elevates *Molecular Aesthetics* over a mere coffee-table book, however, are the insightful essays, written by philosophers, scientists, and especially by the artists. I particularly enjoyed the contributions by Kenneth Snelson, Julian-Voss-Andrae, and Thierry Delatour. Eric Francoeur provides a fascinating essay on the graphical representation of protein structures and Richard E. Dickerson an article in memory of his friend and collaborator Irving Geis, whose beautiful illustrations drew many into the field of chemistry (including this reviewer). Wolfgang Heckl attempts a definition of "Moleculism" and Ljiljana Fruk discusses DNA, a molecule with immediate aesthetic appeal that doubles as a building material for fascinating meta-structures. Other contributions by chemists include essays by Roald Hoffmann (on Molecular Beauty and Abstract Science), Harold Kroto (on Geodesy in Material Science), Tami Spector, Leonard Lindoy, Pierre Lazlo, Robert Mulvey, Thierry Delatour, and Herman Roth. Some of these accounts are reprinted from earlier publications but made accessible to a wider audience and put into context here.

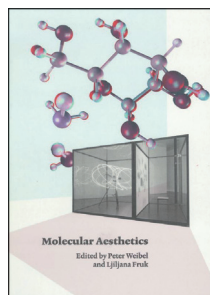
Overall, this book, which grew out of a symposium and exhibition at the ZKM, is a good read and a worthy addition to a chemist's library. As a synthetic chemist, I have been missing articles on the aesthetics of the constructive process (as opposed to the finished product), and I would like to learn more about what makes a molecule ugly in the eyes of many colleagues. I would also love to see more of David S. Godsell's brilliant paintings and illustrations. Perhaps, this can be addressed in future editions of the symposium and exhibition and a second volume of the book. The present one will hopefully motivate molecular scientists to connect with artists (including the inner one) and inspire artists to dive more deeply into the wonderful and largely unexplored world of molecules.

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