# Chapter 7
# Seeing the Unseen

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## ABSTRACT

*The Synapse Group at the University of Akron was formed to explore enlightened collaborations between art and science, and to probe the ideas, images, and mutual interests connecting art and science professionals and disciplines. This chapter presents selected artworks created by members of the group. A major theme of this chapter is visualizing water that is unseen, such as invisible underground water or imaginary virtual water. Also explained in the chapter are the inspiration processes by which those artworks were created.*

## INTRODUCTION

In her book, Art & Science (Ede, 2005), Sian Ede, the Arts Director of the Calouste Gulbenkian Foundation, UK, (2011) raised the question "Is science the new art?" In the same book she showed us that in today's world "'art' is as vital to our existence as 'science'" and "There is much in contemporary science that can stimulate art's flexible, intuitive and visceral response to the world." New York Times columnist Amy Wallace (Wallace 2011a) recently wrote an article in her monthly Prototype column titled "Science to Art, and Vice Versa" (Wallace 2011b), in which she profiled sculptor Nathalie Biebach and scientist Matthew McCrory. Biebach uses scientific measurements to create three-dimensional objects and Matthew McCrory uses art to benefit science. "Both promote understanding by finding new ways of seeing the world" and "both are invested in the idea that better visualization leads to better thinking."

Visualizing with data, noticing the effects of change, using direct observation, and examining the gaps in information are motivations for the

DOI: 10.4018/978-1-4666-0942-6.ch007

interaction between scientists and artists. These processes are essential to both disciplines and take the work into a range of possible ways of making the invisible visible and making the visible more meaningful. Artistic explorations reflect upon either an appreciation of this world or a desire to make sense of it. Whether from a systemic view or from the point of view of a detail, the scientist and artist use data gathering, physical interaction with the environment, observation, and consideration of dynamic forces working in conjunction with the focus of study. Through the eyes of installation, new media interactive performance, ceramics, and painting, the possibilities of using scientific processes and pursuits are reconsidered and energized. These collaborations invite innovative views of both fixed and time-based descriptions of space and material.

The Synapse Group (Synapse, 2005) was formed at the University of Akron to encourage conversations between arts and science professionals. Through initial discussions within this group it was clear that mapping, material properties, and environmental restoration were central concerns for both disciplines. A process of making and consultation resulted in the group's interactions between computer science, geology, biology, and the arts, and it demonstrated the possibilities of these collaborations. Forming an investigation of both the process of science and art, as well as what can be made as a result of this intersection, is demonstrated through the examination of a specific issue or design problem. These interactions flow from either a vision that is about systemic relationships or from a fascination with the details adding up. At the Synapse Group, the participants in this process used water as a metaphor, subject, and material involved with biological structures and systems. The subject of water is a global issue. Water makes life possible and sustainable. Water affects all facets of cultural, political, and organic systems. How this material functions, is used, is owned, and is preserved touches life on this earth from the micro to the macro levels.

Biology is the study of life. Modern biology, at least as recognized by most biologists today, has been a formal discipline for about 200 years, but biological study of various sorts formed the basis of an older recognized area of inquiry known as 'natural philosophy.' Whatever its exact origins, Biology has become a central and possibly a definitive scientific discipline of our time, with, for example, scientists across many fields declaring the 21st century as the 'Age of Biology.' Biology, in this view, can be placed at either the core or interface of nearly every interesting question we might wish to ask in our modern society. Consider the prominence of just two different sources of news continually bombarding us through newspapers, blogs, radio, television and other mediums: healthcare issues (e.g., policy, costs, technologies, etc.) and environmental catastrophes (e.g., the BP oil spill, Japanese nuclear reactor meltdowns, greenhouse gases and global warming).

Presumably, it is rather obvious that biology has much to offer in computing and computer science (and vice versa) as they relate to many problems and endeavors, including applications where artists use computers and related technologies as a way to create, interpret or otherwise inform their art. It is likely the rare biologist who doesn't comprehend the interesting dualities of explicitly biology-computer interfaces: computational biology and bioinformatics. In either of these areas, a biologist might emphasize how the technology of the computer has transformed biological exploration and discovery (gene sequencing and the human genome project are just two examples), while the computer scientist might be more captivated by how genetic algorithms and neural nets lead to novel computational models and even the creation of capabilities such as 'artificial intelligence.' It does not require a big extension to bring art into this mix and see the possibilities. In our modern age, computing is used to code and define the graphic and statistical information in both science and art. But as with any interactive relationship, science and art explorations are increasingly hav-