Special Section

ArtScience: The Essential Connection

Guest Editor: Robert Root-Bernstein

The fourth installment of a Leonardo special project exploring the work and writings of artistic scientists who find their art avocation valuable; scientifically literate artists who draw problems, materials, techniques or processes from the sciences; or others interested in such interactions.

Call for Papers

What is the value of artistic practices, techniques, inventions, aesthetics and knowledge for the working scientist? What is the value of scientific practices, techniques, inventions, aesthetics and knowledge for the artist? When does art become science and science, art? Or are these categories useless at their boundaries and intersections?

Can an individual excel at both science and art, or is even a passing familiarity with one sufficient to influence the other significantly? Do the arts ever contribute significantly to scientific progress? Where will current scientific innovations lead the arts in the next few decades?

*Leonardo* will publish a series of special sections over the next 3 years devoted to exploring these questions. Submissions can be from artistic scientists who find their art avocation valuable; from scientist-artist collaborators who can demonstrate a scientific or artistic innovation; from scientifically literate artists who draw problems, materials, techniques or processes from the sciences; or from historians of art or science looking at past examples of such interactions.

Interested authors are invited to send proposals, queries and/or manuscripts to the Leonardo editorial office: Leonardo, 800 Chestnut St, San Francisco, CA 94133, U.S.A. E-mail: <isast@leonardo.info>.
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ALBERT MICHELSON,
PAINTER OF LIGHT

Anything having to do with light fascinates Albert Abraham Michelson (1852–1931). His development of precise methods for measuring the speed of light earned him a Nobel Prize in physics in 1907. His demonstration that light moves at the same speed regardless of the motion of the object from which it originates laid to rest the notion that light is propagated through a hypothetical “aether” permeating all space and matter and helped to set the stage for Einstein’s theory of relativity.

Michelson was also an artist. In 1928, he had a one-man exhibition at the Renaissance Society of the University of Chicago [1] and exhibited two watercolors (Antofagasta, Chile and Vigo Harbor, Spain) at the Art Institute of Chicago’s Eighth Annual Exhibition of Watercolors by American Artists [2]. At one of these exhibits, “one woman told Michelson he should never have given up art for science. ’I did not have to choose,’ he answered, ’because for me they are inseparable’” [3]. Indeed, 25 years previously, in his book Light Waves and Their Uses (1903), Michelson had written:

Fig. 1. Albert A. Michelson, watercolor painted in Altadena, California, 1929. (Figure provided by the Special Collections & Archives Division, Nimitz Library, U.S. Naval Academy)

The aesthetic side of [physics] is, I confess, by no means the least attractive to me. Especially is its fascination felt in the branch which deals with light and I hope the day may be near when a Ruskin will be found equal to the description of the beauties of coloring, the exquisite graduations of light and shade, and the intricate wonders of symmetrical form [4].

Coronas, glories, rainbows, the iridescence of oil films on water and of beetle casings, the shimmer of butterfly scales and other refraction and diffraction patterns recommended themselves to both his senses and his intellect. Beauty intrigued him [5], and Michelson used both art and physics to capture that beauty.

Michelson’s combination of talents was already apparent when he entered the U.S. Naval Academy in 1869. He graduated first in his class in freehand drawing, mechanical drawing and optics, and was singled out to make topographic drawings of defensive positions [6]. Various pencil portraits he completed at this time show an almost photographic accuracy [7]. These skills came in handy when he began designing plans for the fabrication of the highly precise instruments he used in his research and when he published or lectured about his experiments, which he mainly did by drawing diagrams [8]. Michelson’s personal experience had a profound effect on how he viewed education. When he assumed the first chair of physics at the University of Chicago in 1894, in his inaugural lecture he expanded on the need for students of physics to master not only the content of physics, but equally the translation of equations into graphical curves, descriptive geometry, freehand drawing and machine-shop skills [9].

Drawing and painting also gave Michelson pleasure in themselves; he sketched and painted everywhere he went (Figs 1,2). He was chastised by his Naval Academy superiors for making sketches on the borders of his reports. He made drawings and paintings in almost every city he visited on his many scientific travels. He sketched and made watercolors at his vacation homes at various lakes over the years. After he moved to Chicago in 1894, he took five hours of drawing and painting lessons each Sunday from Rudolph Weisenborn at the Chicago Academy of Fine Arts and amused himself by drawing caricatures of acquaintances [10]. After he remarried, he built a house in Chicago in 1923 with a conservatory in which his wife grew flowers and both sat and drew or painted, a habit they took outdoors in their later years in Pasadena, California [11].

References

3. Livingston [1].
7. Livingston [1].
11. Livingston [1] p. 296, United States Naval Academy, Nimitz Library, <www.usna.edu/LibExhibits/Michelson/Michelson_personal.html>. Click on “Michelson Painting” for a video showing a Michelson painting accompanied by music composed by Michelson.

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Fig. 2. Albert A. Michelson, watercolor, c. 1929. (Figure provided by the Special Collections & Archives Division, Nimitz Library, U.S. Naval Academy)