

This editorial briefly traces the ongoing influence of the book *On Growth and Form* (1917) by Scottish biologist D'Arcy Wentworth Thompson [1]. The book has been praised for its literary as well as scientific contributions and enjoys near-cult status in Scotland. However, apart from an informed group of scientists, mathematicians and artists, it is apparently not as appreciated by the general educated public in the U.S.A. It enjoyed popularity during the 1950s and again during the mid-1980s, when experimental programs in high schools and universities began using artworks to ease learning anxiety in the hard sciences. For example, the images of Fibonacci sequences of spiraling leaves and horns in Thompson's book were used to guide students to overlapping spheres of knowledge in art and mathematics [2].

Thompson offers much more than a way to explore shared patterns. His work proposed that constraints, physico-chemical reactions and body structures influence the development of organisms [3] and has inspired numerous other scientists, including C.H. Waddington and Stephen Jay Gould. Martin Kemp has shown that many attempts by the abstract expressionists to generate forms were stimulated by Thompson [4]. Dore Ashton indeed related to me that, when visiting artists' studios during the 1950s, she often saw a copy of Thompson's book.

Thompson reinforced thinking about biological systems in terms of fluid mechanics and "parametrizations" of growth, which guided Stephen Wolfram's tome on cellular automata (CA) [5]. This approach, in turn, lent weight to the production of art based on generative principles [6]. According to Wolfram, part of the importance of CA is that they might actually explain certain recurrent patterns in nature, such as mollusk shells. However, CA is not necessarily inconsistent with nor does it negate natural selection.

*On Growth and Form* has renewed pertinence for architects utilizing topological transformations (e.g. Greg Lynn) and artists triggering natural processes, such as Roger Hiorns, who, in 2008, coated the interior of a South London flat with blue crystals. [Editor's Note: The work of both Greg Lynn and Roger Hiorns is discussed in two separate articles in *Leonardo*, Vol. 43,

No. 3, 2010.] Based on the sheer number of contexts in which the illustrations have appeared, one can surmise that the book's images have enhanced cross-disciplinary learning.

Enrico Coen, a plant geneticist, recruited D'Arcy Thompson's deformations as a partial explanation of how physical restraints can affect genetic expression in *The Art of Genes*. Coming full circle to the spiraling leaves correlated with the Fibonacci series, Brian Goodwin has, in agreement with Thompson, proposed a developmental constraint to account for *Acetabularia acetabulum's* non-adaptive whorls [7]. Its Fibonacci patterns, often used to imprint texts upon the memory, are now employed in more fundamental ways—to signify the epistemological overlap between art and science and, for some, as a challenge to neo-Darwinism. Our culture seems to be catching up with Thompson.

ELLEN LEVY

Chair, Leonardo Education and Art Forum

E-mail: <levy@nyc.rr.com>

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