

What is an Iconoclast?

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Iconoclast : a person who attacks, criticizes or opposes beliefs and practices that are widely accepted; from the Greek roots for image and breaking into pieces

Is an iconoclast a good thing or a bad thing? Most of the historical references are to heinous acts of destruction of religious artefacts and social structures, yet many biographies of revered figures include this descriptor. A review of a book celebrating great scientists (*Rebels, Mavericks, and Heretics in Biology*, Eds. Oren Harman and Michael R. Dietrich, Yale University Press, 2008) was entitled “Innovators and Iconoclasts” (A.J. Wolfe, *American Scientist*, vol. 97, 2009). Why do we associate innovation with iconoclasm?

Here is an extended metaphor that may help. In medicine, the formation of bones requires a balance between two types of cells: osteoblasts deposit new bone tissue; osteoclasts remove existing bone tissue. None of these cells individually has any direct knowledge of the desired shape or strength of the bones they are continuously modifying. Instead, each responds to subtle and complex cues about local conditions according to genetically defined rules that (usually) result in the emergence of robust and efficient animals. Those cues and rules themselves emerged from evolution rather than design. Nevertheless, they embody one of the most important principles of adaptive control – two competing mechanisms that reach a desirable equilibrium. An excess of osteoblastic activity leads to ossification resulting in a rigid and immobile structure; an excess of osteoclastic activity leads to osteoporosis and a weak structure that is prone to catastrophic failure. Organisms whose genetic rules result in either of those states do not survive and their deficient rules disappear. Importantly, both the osteoblasts and the osteoclasts reside in and are therefore dependent on the success of the structure that results from their competitive actions.

We can view large social structures such as religions, governments, corporations and universities as complex organisms that emerge from the collective behavior of individual persons. The rules that influence the behavior of the individuals have evolved as the culture of those structures, piled on top of the genetic predispositions of humankind. The emergent social structures must be both robust and adaptive to deal successfully with changing circumstances, including competition from other societies. Inevitably this requires some balance between processes that strengthen the existing structure and processes that prune away the unnecessary, inefficient or excessively rigid portions.

Oddly, iconoclast is a well-known English word; iconoblast is not a word at all. Societies seem to spend so much effort shoring up their existing structures that iconoblast is essentially the default condition for normal. But perhaps this is changing. When internally calcified bones were first “invented” by evolution, the mechanisms for forming them and the resulting structures were primitive (e.g. skin plates and teeth) and not particularly adaptive during the life of a given individual. Osteoblasts came first; osteoclasts were added much later from a completely different, itinerant cell line (hematopoietic) and their complex rules for interacting with bone evolved over hundreds of millions of years. Perhaps societies are just reaching the level of sophistication where their iconoclasts will allow them to adapt rather than simply to dominate or become extinct through social Darwinism.

Only in the past couple of centuries have some societies taken to lionizing iconoclasts rather than executing them. Only in the past few decades has “innovation” become an aspiration of rather than a threat to at least some of our large social structures. Only in the past few years have we come to value the “disruption” of the existing fabric of these structures that is required for them to adapt to changing and competitive circumstances. Longstanding youthful instincts for political anarchy and philosophical nihilism have given way to the commercial pursuit of disruptive technology. This is supported by the

social infrastructure of higher education and venture capital that even the most conservative greybeards hesitate to oppose. Homo sapiens is now evolving much more rapidly through social engineering than it ever could by genetic evolution.

"I don't want to belong to any club that would have me as a member."

Groucho Marx, circa 1949

This famous joke from a well-recognized iconoclast poses the essential logical paradox of iconoclasm: you can't be an iconoclast unless iconoblasts have created an icon for you to destroy. The larger and more rigid the icon, the more opportunities there are for destruction. Furthermore, no one will appreciate one's iconoclasm if no one survives the destruction. So the iconoclast has at least as large a vested interest in the structure and its builders as the builders themselves.

But the obverse is not true: at least in the short term, the builders of a structure can work more efficiently by eliminating the iconoclasts. It takes a great deal of maturity for a society composed mostly of iconoblasts to impose cultural rules that prevent their natural instincts from prevailing. The benefits of avoiding social ossification accrue slowly; the risks of catastrophic failure are immediate. One need only compare the recent political histories of the United States, China, Russia, Egypt and Syria to realize that the evolution of culture is at least as risky as the evolution of species.