

SciArt in America

October 2013



STRAIGHT TALK

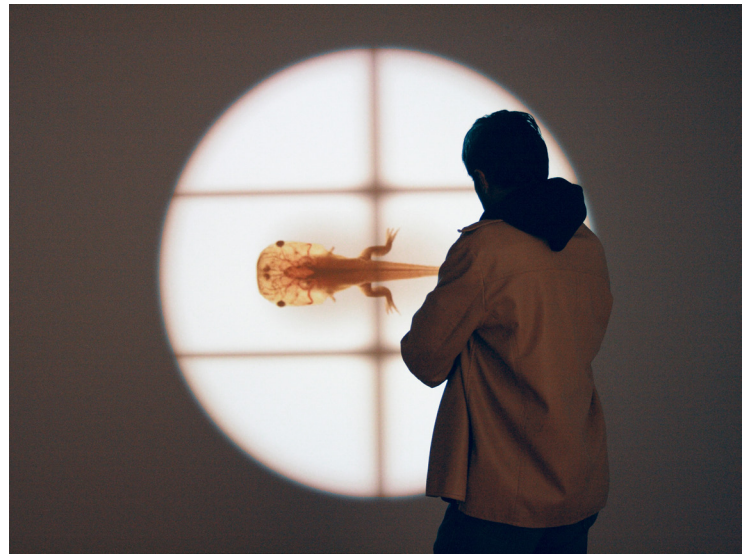
with Brian Knep

SAiA: In your formal education you studied mathematics, computer science, ceramics, and glass blowing. How did you come to combine your interests in art and science?

BK: At university, I was interested in a lot of things—psychology, philosophy, politics—before focusing on mathematics and computer science. I think I was drawn to the abstract beauty of mathematics and the creative control of computer programming. These led me to jobs in computer graphics, including a stint in a research group developing educational and artist tools, and then work at a feature-film special-effects company. These gigs were great, but I didn't share the passion of many of my peers. I have a deep distrust of new technology and its promises. Our cultural faith in technology and its role in human progress is something I find suspect. Rather than seeing history as an arrow from the (horrid) past to the (better) future, I see cycles within cycles within cycles.

After a time, I quit and decided to see if I could make peace with having no externally-generated goals, no deadlines, no people counting on my efforts. It was a tough time, but I started sketching and eventually took a local ceramics class. The difference between working with computers and working with clay was profound. Computers, for me, were cerebral, conscious, and calculated, whereas clay could be emotional, subconscious, and intuitive. I often didn't plan what I would make, instead letting the material guide my hands, and I loved the results.

For various reasons, I got back into the high-tech world, this time working with an exhibit-design firm. We did some wonderful projects at science and children's museums, but again I wasn't passionate about the work, so I started creating artwork in my spare time. I was trying to see if I could make computer pieces that had



Frog Time (2007). Image courtesy of the artist.

some of the feeling I got from craft pieces, both in their creation and in their final form.

The result of that, the Healing series, touched me in a deeper way than my previous work in high-technology. It seemed worth pursuing and has led me to where I am now.

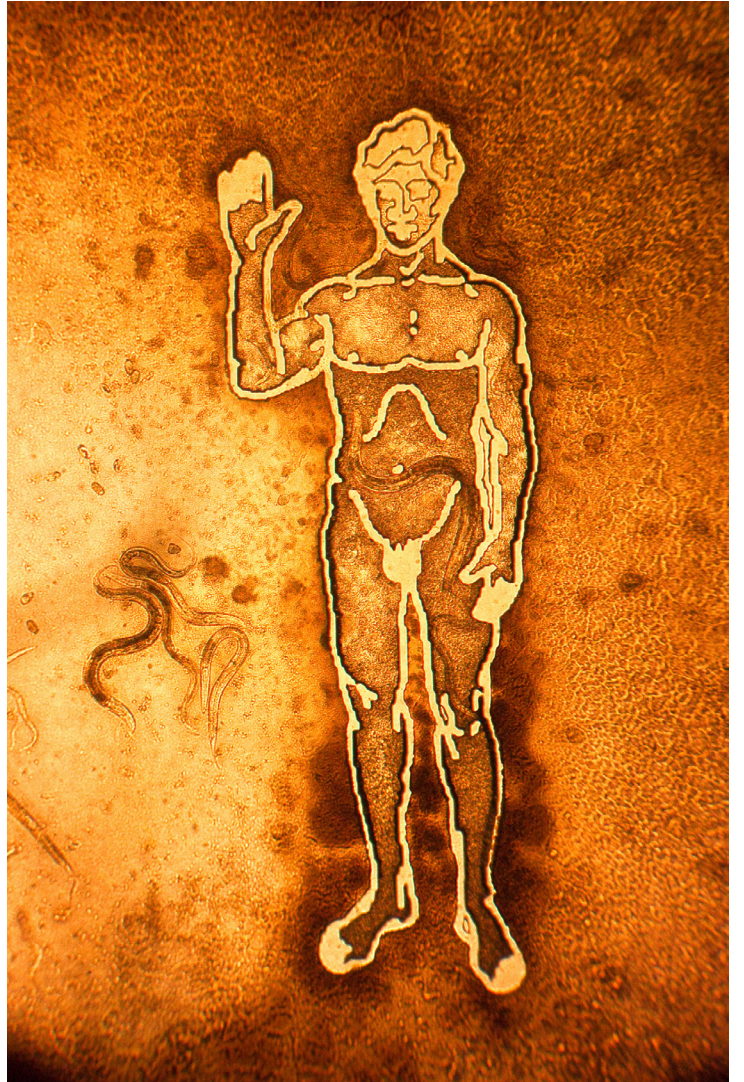
SAiA: You were the first artist in residence at Harvard Medical School—these types of residencies are still few and far between in the U.S. Can you talk a little bit about your experience there, and the Aging/Frogs work you were able to do because of it?

BK: I was hosted by the Department of Systems Biology, which welcomed me as one of its own. I had lab space, access to the researchers, even my own mailbox. I felt like part of the department. For the first year, my goal was to integrate myself into the department and learn as much as I could. I went to a lot of talks and scheduled one-on-ones with many of the professors and post-docs. I was excited by what I learned, not only about the science and the metaphors I found there, but also by the people I met and the culture of the department.

Eventually, I decided to create work using the same model organisms the scientists were using. I wanted to find alternative ways to connect with these creatures, and perhaps challenge the notions of progress being brought by science.



Healing Pool (2008). Image credit John Glembin.



Namaste (2009). Images courtesy of Brian Knep.

The head of the department, Marc Kirschner, encouraged me to work with *Xenopus tropicalis* frogs, of which he is an expert. With his support, I got several tadpoles and set up a system where I could film them developing into adult frogs. I worked out a way to photograph them daily at high resolution with minimal shadow and highlight artifacts, resulting in several thousand photographs of developing frogs. I filtered out the interesting or useful images, manipulated them, and created a continuous video showing the frogs slowly growing, changing, and cycling from tadpole to juvenile and back again, never coming to rest. The prints and video formed the basis for Frog Time and Frog Triplets, both non-repeating video installations, and Twin Paths, a series of photographic prints.

SAiA: Much of your work is interactive, creating the opportunity for the viewer to physically interact with the concepts embodied in the piece. One of these pieces, the Healing series, mimics a sort of two-dimensional life form. What do you hope viewers will take away from these kinds of installations?

BK: When I make interactive work, the interaction is critical to the piece and not just a means of drawing viewers in or of navigating the work. The pieces in the Healing series, for example, are about responses to change. When you meet someone or walk through a field, how does that interaction feed back into your thoughts and behavior? How does it affect the other person or the grasses? The pieces can be playful and engaging, but I hope viewers spend time with them to access these deeper ideas.

In Healing 1, the piece grows back over a wounded area, but it doesn't grow back the same way. It is forever changed by each interaction. The piece also exhibits no judgment: your walking over it is neither good nor bad. It just is, and the piece responds. In Healing 2, the piece calmly reduces the wounded area to its essence and then melts it away. There is no memory of the interaction, and again no judgment of whether the interaction is good or bad. In Healing 3, the piece aggressively fills up the wounded area, almost pushing you off. Like Healing 1, the piece is never the same twice, but it feels confrontational, like it doesn't want to be

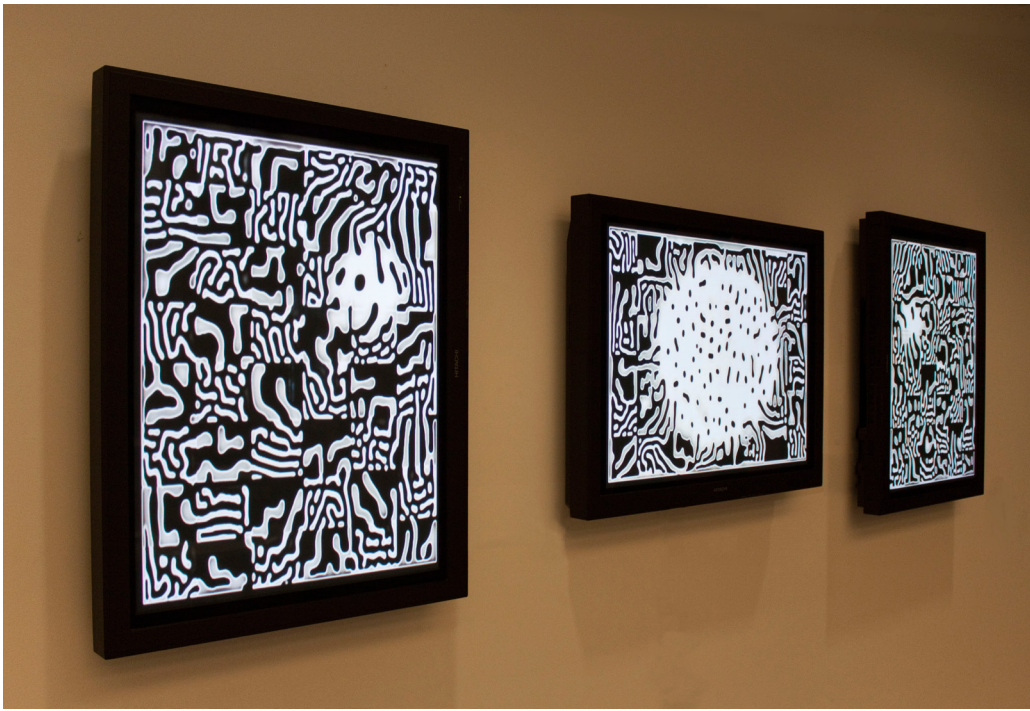
naked. Each of these is a different meditation on responses to change.

Each is also an example of emergent behavior, a term scientists use to describe complex behavior that arises, or emerges, from many, many simple interactions. Common examples of this include bird flocking and fish schooling. In each case, a lot of individual decisions lead to beautiful, complex group behavior. In the Healing pieces, I'm simulating thousands of chemical interactions spread over the two-dimensional floor projection. Each interaction takes into account the chemicals at a single point and its neighboring points. Somehow, these simple, localized interactions create a beautiful, life-like form. More miraculously, the math I'm using to simulate the individual chemical interactions is fairly simple, yet the result is unintuitive, complex, even magical. Exploring these types of systems gives insight into quite deep questions, such as how billions of neurons, each responding to only local connections, create a sense of being.

SAiA: You have one multi-part installation centered around *Caenorhabditis elegans*, the microscopic worm used by countless in the scientific community for study. What was it like to work with a living organism, and how did you come to decide on the elements of the installation?

BK: The lab that introduced me to *Caenorhabditis elegans* is using them to study aging. Research of this sort captures the media and public's imagination, always hopeful for a way to control aging and death. It seemed like a good place to create work about connection rather than control, acceptance rather than fear.

As I often do, I started with a very concrete idea of a piece to make, but my interaction with the worms opened up side paths that grabbed my attention. The work became a bit tongue-in-cheek about my attempts to connect with these microscopic creatures. I introduced them to bacteria and fungus gathered from my skin—my recent intimates; I built a fake worm as a representation of myself, or avatar, in their world; and I built many microscopic sculptures for them to explore, including meditation paths to see if they were spiritually minded.



Trigeminy Pulse
(2012). Image
courtesy of Brian
Knep.

It was wonderful and frustrating working with the worms. I watched them for hundreds (thousands?) of hours and saw many beautiful things. But it was difficult, as they often didn't do what I wanted. The project became my own mediation on giving up control. I intentionally created some constraints to avoid imposing my will on the worms. For example, instead of directly putting them in a sculpture, I'd put them in a coral to the side of the sculpture, giving them the choice to investigate or not. But no matter how hard I tried, they often escaped both the coral and my sculptures. It was humbling to realize that these organisms, with their three hundred neurons and single-minded focus, could outwit my 100 billion neurons and accompanying neuroses. At one point, I basically gave up and decided to take a week or so break. When I came back, the most wonderful thing had happened: the pieces looked beautiful. Yes, many of the worms had escaped, but some didn't, and regardless, an entire ecosystem of bacteria, fungi, and other microorganisms had developed, giving the pieces texture, shading, and a sepia-toned beauty. Most of the photos in the installation are of these "abandoned" pieces.

SAiA: In your most recent work, *Trigeminy Pulse*, you graphically simulate the irregular heartbeat of an arrhythmic heart, surrounded by simulated lungs. How did you come to explore this biological defect?

BK: I was asked to create a new piece for an exhibit in a venue that wasn't good for projection, and I thought it would be a good opportunity to explore flat-screen installations. I became attached to the idea of three screens, and I asked my dad, a doctor, if there were interesting biological systems that came in threes. He told me about the trigeminy pulse, and I liked the image of a system that's working but not perfectly in sync. I think what drew me to the heart-and-lungs metaphor is that the parts are working in tandem—the beat of the heart, the breath of the lungs—yet each is made up of many smaller systems. Individual cells, in the body's case, and individual reaction-diffusion systems, in my case.

Visit his website at www.blep.com