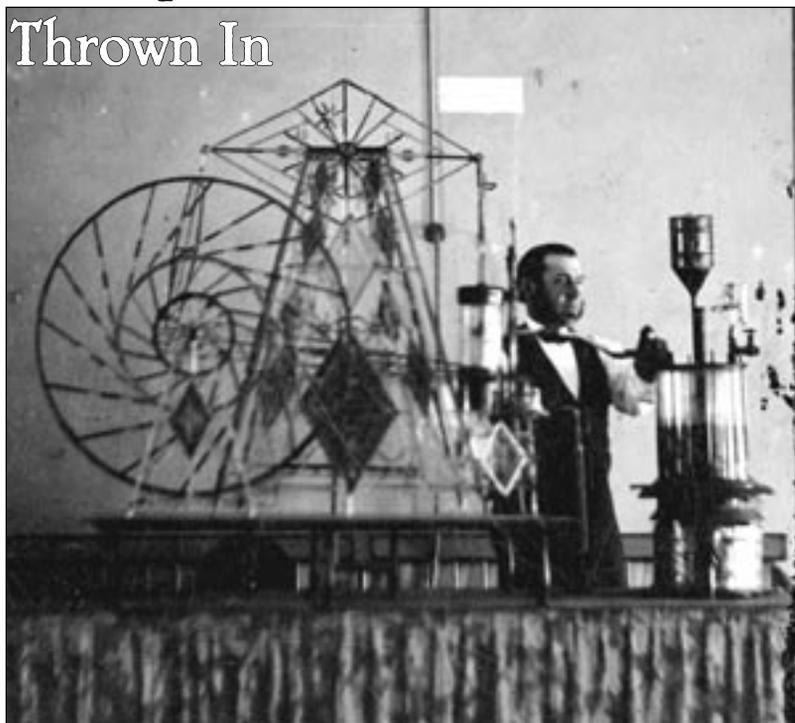


A History of Kinetic Glass Sculpture, with a Bit of Philosophy Thrown In

by Bandhu Dunham

I think a lot of lampworkers have dabbled briefly with kinetic glass and then abandoned the venture when the practical challenges became too frustrating or when results fell short of expectations. With little information available on the subject, we have each had to reinvent the wheel (perhaps even literally!) on our own. These factors have created a high “entry threshold” that has discouraged the development of kinetic glass sculpture. Let’s fix that! Sometimes it takes an obsessive and crazy personality to leach onto a subject long enough to surmount the barriers that dissuade more reasonable people. That personality would be me, although other, less crazy people have also been involved.

In exploring kinetic glass sculpture, I have found it useful and even necessary to rethink a lot of my assumptions about glass and what it can do, including my assumptions about lampworking and how it is done. In fact, this type of work has challenged me to rethink the way I organize my approach to art making generally and maybe even how I approach my own mind. These ways of rethinking will, I’m sure, be useful to anyone who wants to bring his or her own work to a new level or simply a new direction. So even if you’re skeptical about kinetic glass, I hope you’ll play with some of the techniques we will discuss, if only to stretch your own conceptual envelope a little bit. Furthermore, the construction tricks I use, including graphite and mullite jigs, can be useful for nonmoving applications also. Experimenting with these techniques may spark solutions to other problems you have encountered (or will encounter) in your work with glass.



Unidentified Fancy Glass Worker, said to be of the “Bohemian Troupe,” with Steam Engine, undated tintype. Photo courtesy of the Corning Museum of Glass, Corning, New York, Rakow Library collection.

Why Kinetic Glass?

As I mentioned, learning to work with glass in a different way can be a real eye-opener. It sheds new light on ideas you may already have, opening new doors, revealing ideas you didn’t know you could have. For this reason alone, it is worth looking into.

My own personal motivation was a certain delight I have always had with contraptions and gizmos. When I learned of the glass steam engines such as the *Excelsior*, made 150 years ago, I was fascinated. After some initial, ill-fated experiments, I was, in fact, hooked. But in thinking about why I was so attracted to these machines and why other people responded to them the way they did, I had to consider my own conflicted relationship with technology in general.

I think that people like watching kinetic gizmos with gears and pulleys and crankshafts because, in a paradoxical way, these machines reconnect us with Nature. Our modern technology is so refined that its workings are beyond our perception. We cannot see with our eyes how a television or a cell phone works, and we can hardly fix anything on our own cars anymore. The nuts and bolts of our technology hardly exists for us now—it is out of our grasp and increasingly revolves around microchips and wireless connections and the manipulations of molecular biology. No wonder we feel a little paranoid. But when we watch a piston moving under the pressure of steam and it makes a beam pivot on its axis, which



John Backman in his early nineties. Photo labeled “McCroskey Studio,” courtesy of Larry Williams. Note the bottle imp at left.

pushes on a crank to turn a flywheel, we see something that we can understand (or at least that we might be able to figure out).

The ability to figure something out does more than boost our confidence, though. People often say that our ability to reason is what separates us from the animal world. I disagree. I think it connects us. The more scientists learn of animals using or even creating tools in their daily lives, the less special our ability to reason in this way appears. Our thinking mind is really just a more sophisticated version of the analytical survival skills that a crow or a monkey or a squirrel has. I think that our rational capacity places us on a continuum with the animal world, not in distinction or opposition to it. A healthy, practically oriented mental workout actually puts us in touch with our animal nature. We are thereby reconnected with the natural world through the right use of our analytical consciousness, our human nature.

The Beginnings of Kinetic Sculpture

It's one thing to simply enjoy playful moving objects; it's another thing to think about the meanings these objects and experiences might have in a bigger cultural context. This information is offered as a bit of a jump start for your deeper thinking processes, so that movement can become more than an attention-grabbing gimmick in your creative work.

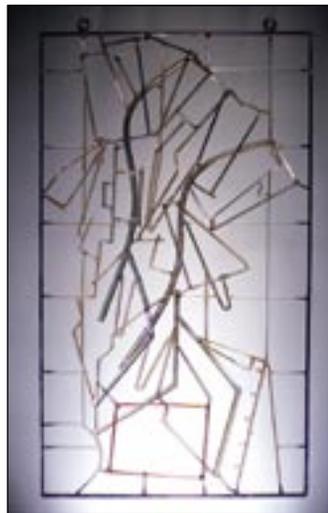
The term "Kinetic Art" is often used in reference to a movement (quite literally) of modern art that came into its own in the 1950s and 1960s. Nonetheless, a number of well-known artists including Naum Gabo and Alexander Calder were experimenting with movement earlier in the twentieth century. It's not hard to find photographs of the artists' work on the Internet.

Some people consider Marcel Duchamp to have made the first kinetic sculpture with his *Bicycle Wheel* in 1913. You've all seen the pictures—it's the fork and front wheel of a bicycle mounted upside down on top of a stool. The wheel is free to spin, but the viewer either needs to spin it himself or imagine it turning. This idea of the audience needing to participate in the fulfillment of the artwork was important to Duchamp. "The creative act is not performed by the artist alone; the spectator brings the work in contact with the external world by deciphering and interpreting its inner qualifications and thus adds his contribution to the creative act."¹

Sometimes it is very useful to revisit the art of our predecessors. Marcel Duchamp is particularly interesting to me because of his radical ideas, but also because he worked both with glass and kinetic sculpture. I was reading a book of interviews with Duchamp and became inspired to play around with collage, which was a technique he enjoyed. In particular, it seemed like a good way to make use of leftover parts from my early kinetic experiments.

There was a lot of trial and error involved in the first couple of engines I made, and the pieces I took off or remade all had such cool shapes I couldn't bear to throw them away. Some of the pieces came together to make interesting faces, and some I saved for an hom-

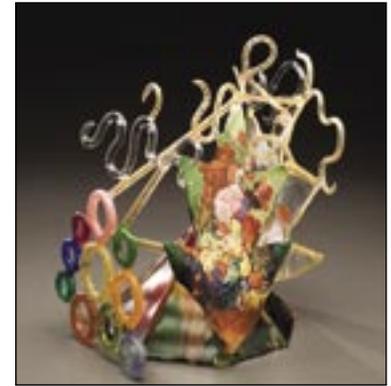
*Bandhu's version of
Nude Descending a Staircase,
lampworked borosilicate glass,
lustered, 2005, 42"h x 22"w x 6"d.*



age to Duchamp himself, my own take off on his *Nude Descending a Staircase* of 1912. This seemed to me a particularly appropriate subject, because the original painting was inspired by movement and expressed Duchamp's interest in the relatively new invention of cinema, which was starting to change people's perceptions of reality. It also reflected Duchamp's interest in machines, or rather, a certain kind of aesthetic relationship to that which is mechanical. Writing about his *Nu Descendant un Escalier*, Duchamp said:

"This picture is not a painting, but an organization of kinetic elements—an expression of time and space through the abstract presentation of movement . . . But we must bear in mind that when we consider the movement of form in space over a certain time, we are entering the realm of geometry and mathematics, as when we construct a machine."²

Duchamp was perhaps the first big-name, nonglassblowing artist to explore the implications of glass as a kinetic material. By the way, the lampworker Ginny Ruffner, to whom we all owe a debt, has said that she was inspired to start working with glass by Duchamp's *Large Glass*. And on another note Duchamp himself did design at least one lampworked glass sculpture—a simple bubble, resembling a Christmas ornament, containing 50 cc of Paris air.



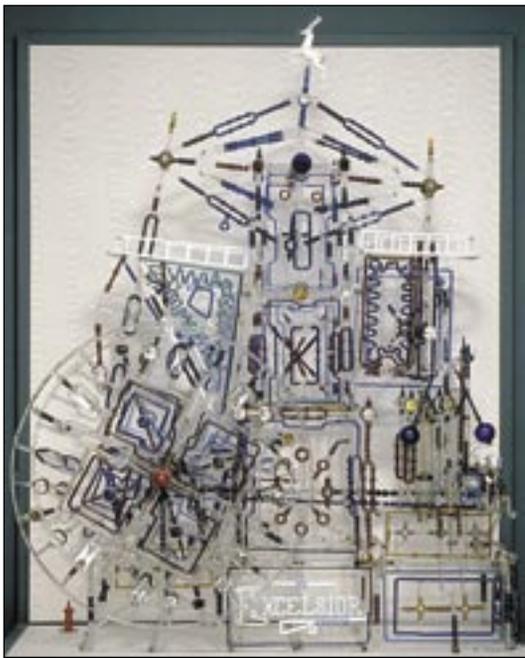
Ginny Ruffner's Aesthetic Engineering Series (AES): The Life Cycle of Lyrical Tattoo Bubbles, 2009, lampworked glass and mixed media, 16"h x 13"w x 11"d. Photo courtesy of the artist.

Kinetic Lampworked Glass

Regarding kinetic art specifically made in lampworked glass, bottleimps are known to have existed at least as far back as the seventeenth century. These are small hollow figures suspended in a sealed container of water. The figure has a single, tiny opening. When outside pressure is applied to the water, the air inside the figure compresses and water enters. The figure therefore becomes somewhat heavier and sinks toward the bottom of the container. Releasing the pressure reverses the effect, and the figures can be made to dance up and down (and even to spin) by pressing and releasing the lid. (See Volume I, page 19, of *Contemporary Lampworking* for more on bottleimps.) Related to these were "Passion Bottles" and other souvenir items in which solid lampworked figures were hung from small bubbles that floated in water-filled vessels. The figures don't seem to have changed their position much inside the bottle, as the floating bubbles were sealed completely. Passion bottles also date from at least the seventeenth century.³



Passion Bottle, Alexandre Soudar (French, about 1850–1914) France, Sars-Poterie, second half of the nineteenth century. Colorless, white, pink, green; blown, lampworked. H. 36 cm. Collection of the Corning Museum of Glass, Corning, New York. Gift of countess J. de Vogüé (77.3.25)



As mentioned in Volume I, the first glass steam engines were made in the United States in the mid 1800s. While I know of no others from that time besides the *Excelsior* that are still in existence, I came across some images of others from that time or a bit later that are of great interest. According to unpublished research done by Virginia Wright at the Rakow Library of the Corning Museum of Glass, the faded tintype shows what is probably the second version of the *Fairy Queen* made by the Woodroffe brothers. (The first version had been destroyed in a storm at sea in the Bahamas.) We have Larry Williams to thank for the charming Backman photo.

With the passing of the nineteenth-century lampworking “troupes,” kinetic sculpture in glass seems to have gone by the wayside or at least underground for many years. Stories of kinetic experiments by individual lampworkers are not unheard of since that time, but there has been nothing like the flowering seen in the 1800s. It seems a shame that such an interesting avenue has been relatively unexplored.

While steam engines are a worthwhile project for any interested lampworker to undertake, there are many other manifestations of kinetic art that you can explore in glass. These could include spinning tops, balancing goblets, mobiles, stables, clocks, rolling ball (marble) machines, cars, boats, fountains, whirligigs, puppets, automata, robots—you name it. Even simple rocking pieces that sway back and forth can qualify as kinetic art. You’ve probably even made bottles or goblets that wobble already without even trying! Perhaps you are, therefore, already on your way to becoming a kinetic artist.

Before getting into techniques for movable glass, we should also acknowledge the possibilities of expressing movement and change within glass that does not itself move. As a container for other objects or materials, glass becomes implicated in the movement of its contents. Perhaps the most dramatic example is that of plasma sculpture, in which lightning bolt-like arcs and shimmering vapor trails can be made to dance in either a semichoreographed or highly random fashion. The transparency and fluid forms of the glass (not to mention its electrical insulating properties) are essential to accomplishing these effects.

Similarly, glass offers unique possibilities for work in which water or other materials flow in, out, or through the transparent structure. And on the most mundane level, simple functional objects such as water pitchers or other vessels, well designed, have

a dynamic, performative quality during use that contributes to our enjoyment of their form. The same could certainly be said for tobacco pipes. Finally, the very transparency of glass means that its appearance can change dramatically under different light conditions. The interplay of front and back lighting or the shifting of shadows in natural daylight create another kind of movement, which takes a unique form in glass.

Notes

1. Marcel Duchamp, from Session on the Creative Act, Convention of the American Federation of Arts, Houston, Texas, April 1957.

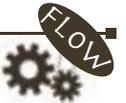
2. Frank Popper, *Origins and Development of Kinetic Art* (Greenwich, CT: New York Graphic Society Ltd., 1968), 51–52.

3. Harold E. Henkes and Julian Henderson, “Inhabitants of a Venetian-style souvenir bottle?,” *Annales du 14th Congrès de l’Association internationale pur l’Histoire du Verre*, 1998, 383.

This article was excerpted and adapted by Bandhu Dunham from his new book, Contemporary Lampworking, Volume III, Chapter 2, “Introduction to Kinetic Glass Sculpture.” For more information on the book, visit:

web.me.com/bandhud/CL3_VIII_promo/Home.html.

www.www.bandhu.info



An unidentified patron plays with one of Bandhu’s marble machines at the Yuma Art Center Museum.

Bandhu Dunham began to explore lampworking in 1975 while he was still in high school. After two years of self-instruction, he studied informally with the chemistry department glassblower while he was an undergraduate at Princeton University. He later completed his apprenticeship under American and European masters at UrbanGlass, the Pilchuck Glass School, and the Penland School of Crafts.



*Known for his whimsical goblets, abstract forms, and kinetic sculpture, Bandhu is represented by galleries around the United States, and his work can be found in the permanent collection of the Corning Museum of Glass and other museums. He has taught at studios and glass schools across America and abroad and is also the author of *Contemporary Lampworking: A Practical Guide to Shaping Glass in the Flame*, now in its third edition, and *Creative Life: Spirit, Power, and Relationship in the Practice of Art*.*