Peter Vogel's work melds art and science in a unique way, and a glimpse at his early life history helps to explain how this came about. Born in Freiburg, Germany, to artist parents in 1937, Vogel was drawn to art from an early age but came to realise how difficult it would be so soon after the Second World War to make a living as an artist. So he decided to study physics and, after a period in industry developing medical tools and equipment, he spent 10 years with Hoffmann-La Roche working with cybernetic models in the fields of neurophysiology and psychology. Throughout this decade (1965-75), he continued to feel drawn to art and to pursue painting. He became particularly interested in how to represent movement and time in art and was influenced by the abstract art movements of tachism and action painting.

Fascinated by the work of English neurophysiologist William Grey Walter (1910-77), who invented small robots (called Machina Speculatrix) that simulated basic neurophysiological behaviour, Vogel was intrigued to discover that, with the help of sound and light sensors, such machines could react to the world. Thus, at a time when many artists were pursuing the idea of the viewer as active participant, Vogel began to embrace interactivity as a major theme in his work. And all of this prompted him to move away from painting and start to create picture-like interactive objects.

A good example is his Drehstäbe (1970) [Turning Sticks] for electronics, 2 photo cells, 5 motors and wood, which looks like a normal abstract picture containing geometrical forms, but which constantly changes in response to the viewer. Another is Bedürfnis (1973) [Need], an electronic wire object incorporating 1 photo cell, 1 microphone and 1 loudspeaker. The object ‘listens into the room’ and creates sounds in response to shadows cast by the viewer. Paradoxically, the more the viewer interacts with it, the less the object reacts, following the psychological principle of ‘negative habituation’.

From 1975 Vogel dedicated himself fully to his art. Convinced by now that painting could not adequately convey a sense of time to the viewer, he increasingly turned to sound for this purpose, creating numerous three-dimensional works which he calls ‘sound objects’. Vogel’s sound objects are constructed with filigree metal wires moulded into various forms. Attached to the wires are electronic components, such as condensers, photo-electric sensors, light-emitting diodes (LED) and loudspeakers. All components are visible, but they are arranged in
an imaginative, engaging way. Viewers are frequently surprised to discover that an object reacts to their movements or sounds, and this entices them to investigate further and continue interacting with the work.

Meanwhile, Vogel also continued to explore movement in his art. For example, around 1980 he started to create reliefs placed behind plexiglass, including elements that move in response to sounds or shadows created by the viewer. These elements are often little metallic sticks that rotate. Other works incorporate wings or propeller blades, connected to electromotor, creating the impression of a flying machine about to take off – Vogel has dedicated many of these works to the Belgian artist who inspired them, Panamarenko.

Another key feature of Vogel’s work to the present day is playfulness. Play, he points out, brings out the *homo luden's* in us:

> In play the best forces are activated in man, his imagination, his power and his perception is sensitised. Only by playing can man develop his creativity, in the interaction between creating, perceiving and reacting (Interaktive Objekte. Catalogue, 1996:13).

**Sound Wall**

The documentary *The Sound of Shadows* features a performance of a ‘Sound Wall’ by Vogel in his studio. This work incorporates dozens of photo cells and electronic circuits and can be seen purely as a ‘sculpture’, but to be fully appreciated the sounds need to be triggered through interaction with a viewer or performer. In this sense they are open works, which are ‘completed’ by the viewer who encounters them, typically in an art gallery. Vogel has also performed his *Sound Wall* in public on several occasions, and has invited dancers in Berlin, New York, Zagreb and Basel to improvise with it.

Vogel started developing his sound walls in 1979, but had already articulated the idea as early as the mid-1970s, describing the ‘environment’ of the artwork as a place for activity:

> Each conscious movement made in front of the sensors will result in a modification of the sound event. The first movement triggers a sound, while subsequent movements have a modifying function... the sequence and modifications that emerge in this way are the actual compositional work. (Peter Vogel: Musical-cybernetic environment;

Minimalist music had captured Vogel’s imagination since the mid-1970s and he quickly saw its suitability as material for sound walls. Based on processes that, once set off, automatically take their course, each piece of minimal music is then completed through the act of perception by the listener.

Many of Vogel’s objects have become ‘sound instruments’, integrating glissando, vibrato, staccato, legato, and using noise and percussive sounds (e.g. Minimal Music, 1983, for 6 players, electronic wire sculpture, 6 photo cells, 5 loudspeakers, 2 reverb coils). Viewers can trigger minimal loops and influence their volume through the duration of the shadows they create. They can also trigger rhythm and timbre changes by repeating the shadows.

In his piece Zufall und Notwendigkeit (1989) Vogel explores the seemingly opposite principles of chance and necessity:

I found it fascinating that the overlay of the same elements can create new, non-repetitive structures. Equally paradoxical was the chaos created by deterministic structures. That’s when I got interested in chance. I discovered that the interaction between viewer and object can create very different kinds of chance. (Interaktive Objekte catalogue, 1996:16).

Vogel’s latest sound wall is Rhythmic Sounds (also called Techno- or Berlin Sound Wall), created for the Berlin sound art exhibition ‘sonambiente’ in 1996. The same 6 meter long sound wall was used for a dance event with young people in Freiburg. After a demonstration by a professional dancer, the young audience took over. Even after two hours people were still dancing.

Another aspect of the sound walls is space. Vogel: ‘Experiences of space require the dimension of time, which happens through movement. The movement of the body, visible through a physical expression, is in its pure form simultaneously also a mirror of the soul … The cybernetic objects as ‘game systems’ are an invitation to movement, a prompt to simultaneously receiving and generating, the interplay between sensuous perception and physical action. Without the actions of the viewer the object remains dead. Only through movement is it stimulated into a reaction, which in turn challenges the viewer into ever new movements. Through their movements and actions (which reveal themselves as reactions and
learning processes of a primitive, metaphorical kind), viewers can see not only the object’s patterns of behaviour but also their own.’ (Peter Vogel, Interaktive Objekte. Catalogue, 1996: 92)

**Shadow Orchestra**

From the end of the 1980s Vogel extended the idea of a performative sculpture by integrating mechanical instruments made of wood, metal and membranes into his objects. He calls this the ‘Shadow Orchestra’. The instruments are arranged on a wide plinth and are triggered electro-mechanically through photo cells. The shadows of the illuminated instruments are projected against a wall, dramatically amplifying the tiny movements of their mechanisms. Again, Vogel’s intention with his Shadow Orchestra is to entice the gallery visitor into action and play.

Vogel describes this series of works himself:

*The Shadow Orchestra III is an interactive sound installation, consisting of an ensemble of electronically activated mechanical instruments. In front of a control panel, which contains 14 photo cells and control electronics, the viewer can trigger sounds in each of the 13 instruments by using the shadows of his hands. Through further hand movements he can create variations in rhythm and timbre. The resulting tone figures have repetitive structures similar to those found in minimalist music. If no shadow is cast on one of the photo cells for a few seconds, the sounds fade away. The ensemble of instruments is projected against a wall in magnified form. The instruments have pick-up microphones and are amplified by two loudspeakers. Shadow Orchestra III was created in 1998/99 and is the fourth installation that uses photo cells, electronics, motors and magnets to trigger sounds in mechanical, resonating materials like drums, strings, metal and wooden instruments…*

*The superficially similar Shadow Orchestra II was extended by playing with harmonics and sound effects: a rotating brush triggers strings, whose harmonics change according to the speed of the motor. Metal sheets, which are rubbed by slowly rotating metal sticks, create continuous metallic noises. The rhythmic structure consists of 8/8, 9/8 and 10/8 metres overlaid, which results in constantly changing patterns.*

*Like its predecessors, Shadow Orchestra III has mechanical instruments, a control panel, shadow projection and repetitive sound structures, but it differs in the sounds and rhythms: the sound structure is complex – i.e. the transients and timbres make it*
difficult to distinguish each instrument clearly. Drums, metal sheets, strings etc. have been manipulated by mechanical means (comparable with Cage’s prepared piano), resulting in unexpected, difficult-to-describe timbres. The rhythmical structures, on the other hand, are simple and are limited to 8/8 metre. Initially this simplicity was meant as a contrast to the complex sound structure, but it was also influenced by techno music, which pays little attention to rhythm, placing much emphasis on sound.

In 1996 I constructed a purely electronic Techno Sound Wall (Rhythmic Sounds), which generated techno music when someone danced in front of it. With Shadow Orchestra III, I revived this idea in a rather atavistic experiment: instead of generating the techno sounds electronically, I prepared and used ‘archaic’ instruments. The whimsical, bizarre shapes of the instruments – even though they were purely based on functionality – stressed the absurd and contradictory nature of the ‘Techno Orchestra’.

This interactive installation is located at the border between fine art and music. It is a sculpture and variable composition at the same time. The viewer can improvise or compose with the available sound material. The rhythms and sounds that I provide are part of a composition, which is completed by the viewer/player.


References


Peter Vogel. Catalogue Galerie Carzaniga & Ueker, Basel, 2004


Links

www.petervogel-objekte.de (Peter Vogel's own website)
http://www.vimeo.com/19780802 (Vogel performs the Soundwall 2009)

Publication reference of this article: