THE ELECTRONIC GARDEN

Iain Whitecross - Artist

The Electronic Garden is a cybernetic sculptural environment of light, movement and sound. It is made up of nine freestanding units or 'plants', each consisting of a cluster of similar 'flowers' with the tallest being close to human height. The installation is exhibited in a darkened space of sufficient size to allow spectators to stroll from one plant to another, much as they would in nature. Since the Garden is activated by sound, spectators are encouraged to clap, whistle or sing, or talk to the plants as they would to a pet. Some even arrive prepared with their favorite musical instrument.

The sculptures are constructed of acrylic plastic, (the 'blossom' of each flower) and stainless steel, (the 'stem'). Employing the principles of fiber optics, incandescent bulbs concealed within the opaque 'ovary' of each blossom transmit their light through the translucent 'petals' and 'stamen' causing them to glow and shimmer. The lights are arranged in three separate colour circuits, each responsive to a different frequency, while their brightness is determined by the volume of the input stimulus. At the base of each stem, an electromagnet is positioned so that when activated it exerts a pull upon it. The pulsing of this magnet causes the sculpture to tremble and sway much as does a real flower stirred by the breeze. Finally, the sounds emanating from each cluster are generated electronically and manipulated by the same three frequencies that determine the colour of the lights. This produces small but infinite variations similar to the repetitive yet ever-changing rhythms heard in nature. Activating these responses is the feedback system, whereby the spectator sounds already mentioned are picked up by microphones, amplified and fed to the various switching devices that control output to the lights, electromagnets and sound synthesizers.

Hopefully this brief description is sufficient to introduce the reader to the Electronic Garden and provide a basic understanding of how I made it. In fact this always seems much easier to explain than why, which I find I'm often asked in a slightly skeptical tone of voice as though there was something perverse or contradictory about the concept, that in this world of already ubiquitous technology, a garden surely should be sacred and made of good old-fashioned dirt. I can even imagine myself being ironic, were it not I who had devised it. So it's with some care that I have retraced the path I took that led me to my switched-on garden.

My first brush with the idea of art combining with technology came during a fellowship I received to the Macdowell Colony in New Hampshire. I was working there on a series of large paintings executed with pen and air brush that presented a somewhat surreal interpretation of microphotographs of plants. In a sense therefore one could say that I was already attracted to the new worlds revealed by science, but this impulse was something quite instinctive and unplanned. That was now to change, for while I labored on these inner landscapes of the leaf, I became

friendly with a fellow colonist, a Chinese-American sculptor, Wen-Ying Tsai. He was surrounded in his studio by a wall of multicolored gyroscopes, each rotating at a different speed, but I became more often giddy from his talk than from his work, for his convictions as an artist and his training as an engineer made him a most articulate spokesman for the future of a match between technology and art. Once more then in New York, I was introduced by him to a group called Experiments in Art and Technology, or E.A.T., as it was known to its adherents. Founded by an engineer from Bell Labs, E.A.T.'s objective was to bring about collaborations between artists on the one hand and engineers and scientists on the other, not just to spark creative work, but also on a more philosophical level to try to bridge the gap between these two polarities in our culture and in so doing, perhaps help shift technology away from war and weapons and towards more human needs.

Through E.A.T. I was introduced to the person who became my collaborator, a bio-engineer at New York Hospital. He was a most eccentric man, his conversation sprinkled with obscure (to me) meanderings of scientific jargon and a laugh that sounded like a medley of Strangelove and Svengali. He also had two fingers missing and one eye that seemed to my unpracticed gaze as though it might be glass. When I say 'obscure', you must understand that I had no scientific background. Technically I was more or less illiterate, having early given up the science track at school for languages and literature. In fact it was a sort of joke at home that I couldn't even change a light bulb. I suppose my new collaborator found my enthusiastic innocence amusing, at any rate we laughed lot, became good friends and began to work together.

At this point I need to backtrack, to mention two influences that shaped the artistic direction I now followed, both dating from the years I had spent in Paris. They were the monumental stained glass windows of St. Chapelle and the great panorama of Monet's water lily paintings. In both these works there was a mysterious, almost hypnotic quality that haunted me, while on an intellectual level I was still drawn to their involvement with the phenomenon of change. In his water lily series, Monet had captured the passing of the day across his garden pond, while in St. Chapelle, that great band of artist-craftsmen had used the flux of sun and clouds to give their work its never ending life. "What if", I said to my collaborator, "what if I made a lily pond and we used lights and they could change...?" "No problem," said Svengali/Strangelove and laughing launched into a description that took me long to follow. But eventually I did and learned a lot and our collaboration prospered.

Then one day as we worked together I asked my friend about his missing fingers. He gave his laugh and said it was "an accident at work. I was doing research then, control systems for anti-personnel weapons. My project was a bomblet that jumped waist high and then exploded. The design was really elegant but... well, I got some wires crossed and... I suppose you could say I was lucky. When I left the hospital, I thought I really owed them something and since they had an opening, I took it... and I guess that is also why I got involved with E.A.T."

And so our work progressed. Unfortunately, even as it did, so grew the Vietnam War. At

first I didn't feel involved, since I was not a U.S. citizen. But contact with E.A.T. and other artist groups I knew, began to change that and soon like many, many others in this country, I grew every day more angry and distracted. When the Christmas bombing of Hanoi took place, something snapped and I broke up the work I had done as a mark of protest. It was a harsh and maybe senseless gesture, though at the time it seemed to me entirely valid. At any rate, it pushed my art in quite a new direction, a series of silk-screen prints entitled "Advertisements for War". They were brutal and ironic, juxtaposing brightly colored scenes of cruelty and carnage with titles drawn from the cheerful advertising slogans that appeared on T.V. like brackets round the daunting nightly news. And so time passed and the war at last was ended. I spent some years back in Europe, began and finished other projects and the shards of water lilies gathered dust. Then one day, once more in Manhattan, I got things out of storage, unscrewed crates, opened files of drawings and decided it was time again to build. And so I did, though now alone, for I had lost all contact with my eccentric engineer.

How and at what point exactly the rebuilt water lilies grew into a garden, I am not quite sure, though I can recall some ideas and influences which slowly yet insistently became the rules of this new game that I had now begun. A guiding force for many years was Arthur Koestler's dictum that creative development, both in art and science, comes most often from the bringing together of existing but previously unrelated matters. In this case, the combining of cool, hard, high-tech materials such as stainless steel and acrylic plastic with the soft, warm organic forms of plants would parallel the joining of technology and art and create, I hoped, a harmonious balance between Dionysus and Apollo. In those forms, there were perhaps some echoes of the sensual flower paintings of Georgia O'Keefe, who I discovered had also been obsessed with St. Chapelle. And there was input too from heat sinks, diodes and transistors, all those tiny electronic parts that now lay round my studio.

As for the sounds, their inspiration came from the creatures of the Adirondacks, that great wilderness to the north of New York State where I spent several summers near a lake called Paradox. But these are details. What of the concept of the Garden as a whole? For that perhaps I owe most thanks to that great visionary artist of the 15th century, Hieronymus Bosch. It is the grand design of his mischievous and inventive Eden that gave me courage to expand my lighted lilies into a cybernetic Garden.

Which brings me to Norbert Weiner, professor of mathematics at MIT in the 1940's, humanist and visionary author, who believed that the thought of every age runs hand in hand with its technique. Thus for him the 18th century was the age of navigation, made possible by clocks and lenses; in the 19th century, it was power with the steam engine at its core; while the 20th, which brought the electron tube, is the age of communication and control, or as Weiner chose to term it, cybernetics. "We have decided," he said, "to call the entire field of control and communication theory, whether in machines or animals, by the name cybernetics which we form from the Greek word for steersman." Successful steersmanship relies on feedback, whereby

experience is used to modify reactions. As an example think of a bird chasing a butterfly. The bird's every movement stimulates the butterfly's eyes, which in turn makes the butterfly's wings react, which moves it in a different direction. This changes the signals given by the bird's eyes which lead to new movements of its wings and so on. Insufficient feedback on the bird's part and the butterfly escapes; excessive feedback from the butterfly and its nervous system cannot cope, its flying pattern stutters and it ends up on the ground for lunch.

When all the plugs are plugged and the Electronic Garden is welcoming its visitors, I like to feel that, as an Elizabethan poet wrote:

My garden chaseth quite away
All heavy hearts and doleful dumps...

I want it to be fun, of course!

But not just that. I've not forgotten those youthful dreams to inspire technology for peaceful purposes and although sometimes in the intervening years they've seemed impossibly naive, (we Lilliputian artists tugging at the laces of the jackboots of the military-industrial giant), I dare now to think that we were just before our time and that this idea, which lay gathering dust like the pieces of my sculpture, has finally a chance to bloom.

Beyond this hope, I see my Garden now take on new meaning. When I named my flowers, I used their Latin names in deference to the principles of Carl von Linnaeus. Although many of his contemporaries considered this practice elitist and obscure, Linnaeus had quite other motives. He believed that by freeing plants and flowers from their human reference, be it religious, medicinal, or bawdy, he would make it understood that the natural world has its own existence, independent of mankind and must be seen by us accordingly. As Samuel Taylor Coleridge said, "Nature has her proper interest and they will know what it is who believe and feel that every thing has a life of its own." Yet even as we learned to grant this independence, we have become more and more obliged to recognize our mutual dependence, to accept that our relations with the natural world are ruled by feedback and that this feedback is a two-way street, so that indeed there is nothing that we do that does not have effect on what we see.

Thus it is that I have come to see the Electronic Garden as a fragile image of the natural world in the cybernetic age, a natural world that we now know is also very fragile - not just flowers and leaves and birds and trees, but whole species, the soil itself, the water, air, the very light. Much as I love my little Garden, I would not want it to replace the smallest portion of that world. It is no substitute for nature, just a faint reminder of what we stand to lose unless we start to listen far more carefully to feedback and manage to improve our present wayward steersmanship.

But not just feedback, there is also feedforward to consider, a concept defined by Dudley Young whose clarity and scholarship helped me articulate what follows. If feedback is empirical and scientific, feedforward is intuitive and magical. With it we can create an environment, a ritual, a gathering at which, not for sure but maybe, Nature's spirits may appear to inform and guide and

strengthen us in finding what is right to do to make Her well again. If this sounds mystical, it is, which is precisely why it's hard to talk about it in a scientific context. But just because it's hard, it seems to me all the more important. And one should not really be embarrassed. Scientists too use mythic language without any hesitation. Take the word 'pollution', for example. In ancient Greece both people and whole cities were 'polluted', not by acid rain or oil spills, but by taboos they'd broken, or desires they'd failed to curb and the only way they could redeem themselves before the gods was to make a sacrifice. Since the Greeks feared their gods, they would hasten to placate them before the retribution came - we unfortunately being more rational, decline to act until we have proof, scientific proof that is, that something bad will happen. (And even then we often wait until it does, because voluntary sacrifice is not a vaunted virtue in a culture of consumption.)

And so finally to Leonardo da Vinci, our almost mythic master of technology and art. Ironically perhaps, it was in his own time that science and religion joined in conflict, struggled fiercely and then, with the latter sulkily retreating, went each their own way. One can almost see this drama played out in Leonardo's own creative life. Consider his projectile, which he described as 'the most deadly machine that exists, for when the ball at the center bursts, it scatters the others which fire in such time as is needed to say an Ave Maria'. That this is the work of the same man who painted this same Maria as the Virgin of the Rocks, that supreme dedication to the nurturing Mother Goddess, seems to me almost inexplicable.

Did he go into the weapons business like my engineer, because there was good money for research and a steady living? So one wonders reading the resume he sent to Ludovico Sforza in which he placed painting at the very bottom of a list that included nine detailed military projects. And still it's hard to think that it was only this when so many less talented than he thrived at the courts from art. It is my belief that the more he studied and to use an appropriately phallic phrase, penetrated Nature's secrets, the more he came to mistrust the mystical and the more religion seemed to oppose research and its resulting clarities, the more he came to shun the obscurities that could not be examined directly with his senses.

And so the chasm opened between science and mysticism, intellect and intuition, mankind and Nature, a chasm which has deepened and grown wider to this day. To bridge it, which I believe essential for the survival of our planet, we have to lose our shame before the mythic and regain confidence in our intuition and if this means shedding some respect for intellect and becoming more skeptical of science, so be it. Knowledge by its nature is imperfect, whether instinctive or acquired and by giving each their due we may perhaps recover balance, both between ourselves and in our overall relationship with Nature. To quote Leonardo, "an arch is nothing other than a strength caused by two weaknesses."

It may seem at this point as though I have wandered rather far from my Garden, so let me end by turning back along the path to where I left feedforward, that place where spirits come and go, where magic strikes and contact with the mythic may be made. On the last day of the Garden's showing at the Hyde Collection, I came into the gallery and was greeted by the sound of someone

improvising on harmonica. As the player moved around the room, the sweetness of the melody and serendipity of tone created a response more subtle and intense than I had ever seen. When the invisible musician finally emerged into the light, she was indeed a curious and entrancing figure. A little girl of eight or nine with dark hair reaching to her knees, whom chance had brought from far Bombay to create, or so I felt, one of those moments to which I just referred, when feedback joined feedforward and the scientific met the mythic in Leonardo's arch of unity.

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