

GARDENING THE ELEMENTS IN A LANDSCAPE OF TECHNOLOGY

by  
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May 8th, 1992

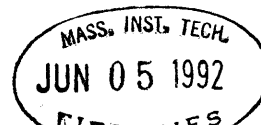
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Gardening the Elements in a Landscape of Technology  
by  
Diane Willow

Submitted to the Department of Architecture on May 8, 1992  
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ABSTRACT

Gardening the Elements in a Landscape of Technology discusses three multisensory environmental sculptures: **Wave Garden**, **Eyes of the Wind**, and **Thermal Delight**. Each of these installations explores the relationship between people, nature and technology. It is my thesis that technology can be used to enhance the intimacy of our experiences with natural phenomena. Each of these interactive sculptures is inspired by my encounters with common natural phenomena. The form, materials and choice of technology which comprise these environmental sculptures are guided by the quality of sensory experience inherent in the phenomena which they explore.

Thesis Supervisor: Paul Earls  
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## **Thesis Raga - Finding the Atmosphere**

This thesis, Gardening the Elements in a Landscape of Technology, has evolved from my explorations using technology to activate sculptural environments which support intimate experiences of natural phenomena. The accessibility, power and meaning of our experience of nature within environments dominated by technology have become persistent destinations of my thoughts. I am interested in using technology to reveal natural phenomena. This endeavor raises recurrent questions about the relationship of nature and technology. Inherent in this inquiry is the dynamic triad of human beings, technology and nature.

The word nature embodies an extensive range of meanings, concepts and constructs that are far too complex for me to explore within the scope of this thesis. The idea of gardening the elements brings this work into the particular realm of the garden.

"The Garden as an 'orderly cosmos' is archetypally enclosed. It is walled and separate from the Unknown, from Wilderness. As an archetype, it synthesizes a vast range of meanings, each distinctive, yet converging always upon a common conceptual significance in art, architecture, ritual, myth, and poetry. In ancient Sumer, the Garden was equated with the Cosmos. ... For pre-Christian Celts, the place of worship was a sanctuary in the woods where a small number of shrines were erected and which contained human burials and cremations. ... Enclosed landscapes in every culture served to separate sacred space from profane, culture from chaos, garden from wilderness. They signify sanctuary, peace and order."<sup>1</sup>

Gardens also symbolize constancy and change. The direct involvement which is the essence of gardening, puts the gardener and the aficionado in contact with the reassuring sequence of cyclical events. From the planting of the seeds to the ensuing growth, fruition, death and decay, gardens are places of regeneration. Their capacity for

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1. Art Gallery of Windsor, Worlds Apart: The Symbolic Landscapes of Tony Urquhart, Windsor, Ontario, Canada, 1988, pg. 44.

restoration lies in their potential to enrich the landscape as well as their capacity to provide physical and spiritual sustenance. The experience of being in the garden assumes sensory participation. Permeating this multidimensional experience of the garden is an implicit dialogue concerning its relationship to nature and, through its form and substance, definitions of the natural. <sup>2</sup>

It is the idea of the garden as an abstraction of the natural organic world, designed as a microcosm of nature that is most related to the work of this thesis. The three installations which comprise Gardening the Elements in a Landscape of Technology evoke the multisensory experience of place, the encompassing sense of environment and the human scale of a garden.

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2. A multifaceted discussion of contemporary gardens has been edited by Mark Francis and Randolph T. Hester, Jr., The Meaning of Gardens, MIT Press, Cambridge, MA., 1990.

The gardens of my childhood are reservoirs of psychically nourishing experience. In middle childhood we planted vegetable gardens that I experienced as forestal universes. Plants grew fibrous stalks that towered over me and crisp hollow stems that reached along the surface of the fertile soil yards away from their subterranean roots. The pungent odor of fuzzy tomato leaves blended with the smells of mint, sage, chamomile and corn husks. These aromas wafted at varied heights in the atmosphere as assorted pitches to be encountered above the deep bass scent of warm, lush earth. These gardens were hosts to what I once viewed as mythical creatures. I remember the time we found a flying bee-bird-dragonfly. It had the body shape of a rotund bumblebee, covered with what seemed to be feathers, and feverishly fluttered its transparent netted wings. I think we learned that it was a bee hawk, but I'm not sure. The fleeting visit of this astonishing creature remains prominent in my memory.

My experiences of natural phenomena continue to be potent sources of inspiration and creative catalysts. I gather them in many ways. Often it is through a serendipitous encounter that I become attuned to a subtle yet dynamic characteristic. This may happen while I am walking, in transition, intently on my way from one enclosed structure to the next. Other times it occurs while I am wandering without a compulsory destination, free to be directed by whatever emerges in my reverie or within the immediate environment. Sometimes my attention is captured while the pace of my movement is governed by the momentum of riding a bicycle or driving in a car. Rare sedentary moments in the out of doors become repositories of environmental sensation.

Vivid, sensoral memories emerge from momentary interactions such as these. A two a.m. drive home along Memorial Drive unveils the textured glow of mercury vapor light. This luminosity is held in the night mist between the surface sheen of the river and the gritty stretch of concrete arch which supports the bridge. During a brisk walk along the river, I see the same arch become a momentary projection surface.



A swift break in the heavy afternoon cloud cover coincides with a scintillating light dance, mirroring the undulating fluid motion of the water below. My experience of the energy of a season in transition is acute as sudden gusts of autumn wind levitate spreads of the daily newspaper, whirling them in the air as if they are performers in a surrealist cinematic scene. The radiant energy of the sun becomes apparent to me when a large rock within an open, grassy area provides an inviting thermal pillow for a midday rest; the surrounding air carries warm, aromatic, fertile moisture as it rises from the soil.

The sensuous, ephemeral qualities of these experiences accumulate over time, strengthening the initial encounter with a particular phenomenon. Such intrinsically compelling natural phenomena are my reference, resource and source. I am interested in their capacity to engage us fully, sustain contemplation, invite reverie and transform our perception of time and space. To bring these phenomena into the realm of environmental installation, I am exploring the state of being which they evoke as sculptural form and sensory experience.

"Thus haptic experiences which include the entire body give fundamental meanings to visual experiences, while visual experiences serve to communicate those meanings back to the body." <sup>3</sup>

My knowledge of these encounters is kinesthetic. They are retained in my bodily memory. This kinesthetic sensation guides my process of visualizing, designing, selecting materials and configuring the space of a sculptural environment. This is an internal reference which is active throughout the process. It has been and continues to be nourished by powerful encounters with natural phenomena. The realization of an environmental sculpture becomes apparent to me when the physical installation merges harmoniously with this internal kinesthetic image/sensation.

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3. Kent C. Bloomer and Charles W. Moore. Body, Memory, and Architecture Yale University Press, New Haven, CT., 1977. pg. 44.

My approach to writing this thesis, and making the environmental sculptures which are its genesis, is akin to my experience of the unfolding of a raga. Each raga is particular to a season in the cycle of the year, a time within the periodicity of day and night and an emotional state within the range of human expression. This melodic system is the basis of Indian classical music. As a delighted listener of this music, I experience a raga as the playful exploration of a structure which has infinite variations. The musician shapes this melodic form through improvisation within a set of distilled characteristics. As a focus emerges through sonic exploration, the raga gains vitality from the way a musician conjures atmosphere through the exploration of subtleties. I find that this atmosphere subsumes whatever state of mind I bring to this experience.

## Sensation

"One of the magical things about our senses is that they do not function in isolation. Each sense contributes to the fuller comprehension of other sensory information. Indeed, one may not be able to understand the information from one sense properly until it can be related to information from the other senses."<sup>4</sup>

We are sentient beings, conscious of our environment through sensory perception. Each sense informs us uniquely and holds particular powers of evocation. It is through sensory contact that I am able to elicit the memories which I hold. The human body accrues and retains knowledge through the senses. And through sensation the human psyche regains access to these inner resources. With this in mind, a digression into the world of the senses will help to put the sensory emphasis of my installations into context.

Although smell is often a subliminal aspect of our experience, an odor has the power to evoke emotionally charged memories of places, people and objects. Our sense of smell is very immediate. The olfactory receptor cells protrude into the environment, and connect

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4. Lisa Hescong, Thermal Delight in Architecture. MIT Press, Cambridge, MA, 1989. pg. 24.

directly with the olfactory bulb which sends messages to many parts of the brain. The volatile chemicals which we inhale as fragrance travel up the nose, are detected by the hairlike cilia extending from the receptor cells in our nasal passages, then transported to the contiguous olfactory bulb which signals the cerebral cortex and directs neural information to the limbic system. Odors become meaningful through association and are embedded in our long term rather than short term memory. It is significant to me that this sense which has the capacity to overwhelm us with images and emotions of the past is associated with the section of our brain considered to be most ancient.

Experience is not segregated into distinct, clearly bounded categories of sensation. It is our perception of this sensorium which leads us to comprehend our experience as a set of distinct stimuli and responses. It is from this point of view that I approach the construction of experience within environmental installations. The multisensory nature of human experience is essential to the involvement of people as whole beings rather than as fragmented conglomerates of isolated

perceptual attributes.

"I touch and find out the temperature. I learn about roughness and smoothness of things. Is the object dry or moist? Moist from warmth or cold? Pulsating or still? Yielding to the finger or protected by its surface? What is it really like? Not having touched. I don't know."<sup>5</sup>

The directness of physical touch affirms our sense of reality. What lingers as doubt when perceived through sight or sound is resolved through touch. We experience our primary sensation of touch through our skin. The skin may be considered our largest sensory organ. It develops from the same layer of embryonic tissue as the nervous system. Throughout the development of this tissue, the skin retains this close connection, ultimately functioning as a quasi external nervous system which detects heat, cold, pressure and pain.

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5. Magdalena Abakanowicz, *The Museum of Contemporary Art, Chicago*, Abbeville Press, NY, 1982, pg.104.

Most of the cold receptors lie in the face, at the tip of the nose, the eyelids and the forehead. These facial features are in constant, unmediated contact with the thermal environment. The receptors for warmth are deeper in the skin. This physiological attribute is consistent with the perception of warmth as an internal sensation. A change in temperature of one or two degrees lower is experienced as cold. A rise of three or four degrees feels warm.

Tactile experience also adds to our visual information. What we might see as an area with defined stripes of curved light grey highlights alternating with coves of dark grey and saturated black stripes in a black and white photograph, we might read as corrugated metal. Through our imagination we project the experience of touching the surface. This projected physical contact adds to our understanding of

what we see. Viewing this image of the surface of a material stimulates memories of touching its texture. Our minds retain and elicit this tactile recollection while actively gathering more information visually.

For many, vision is our dominant sense. We rely on this sense to orient ourselves within an environment and to gather an enormous amount of information concurrently. Our response to light is fundamental and powerful. Our highly developed mechanisms for focusing light and distinguishing color engage us in constant, often unconscious, photo reception.

It is interesting to contrast our orientation to light and sight with that of sound and hearing. Both of these perceptual systems can be isolated from one another. We have the capacity to control the sights and sounds we process. Seeing is directed outwardly. Listening is sometimes described as "taking in." "The word mystic comes from the Greek *myein* = close the eyes." Listening has an enveloping quality. Unlike seeing, it can be a affect the whole body. Perhaps it



is the rhythmic nature of vibration that has such a powerful effect on us.

The combination of all forms of perception is the ideal combination. Moholy Nagy commented that the highest form of space comprehension means the synthesis of all sensory experiences.<sup>6</sup> In my pursuit of creating environmental sculptures, it is sensory experience that guides the definition of the form of the space, the appropriate materials and the choice of technology.

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6. L. Moholy-Nagy, "The New Bauhaus and Space Relationships", *American Architect and Architecture*, New York, NY, December, 1937.

## Giving Form

I heard Itsuko Hasegawa speak recently about her work as an architect in Japan.<sup>7</sup> I felt a kinship with her philosophical approach and a sense of affirmation and reassurance in her articulate validation of a receptive, intuitive mode of relating to the environment. She talked about her approach to architecture, usually thought of as the designing of buildings, as landscape architecture. The central idea of architecture is defined as a way of giving form to the pre-existing presence of the land. The term she coined for her way of working is "architecture as second nature". Conceptually this view encompasses a belief in nature as an intelligent being, evoked by an orientation to its mystery rather than a stark rational delineation and permeated with the concurrent belief that the human impulse to build structures is also "second nature".

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7. The following comments reflect my understanding of the ideas which Itsuko Hasegawa communicated during a presentation at the Harvard Graduate School of Design on April 8, 1992.

Citing a recent structure which is primarily below ground level, she described her use of mud excavated from the site to make the walls of the sunken gardens. Through this act the land has become a tangible architectural element. Viewing this work from projected slide images, I was most strongly aware of layers of terraces. Diaphanous veils of perforated sheet metal hovered over some of the terraces, others were open to the air. This atmospherically responsive material reflects the changing luminosity and moods of the sky. These technological arbors are not canopies of living vines but contribute to the construction of habitats in which thousands of plant species connect built forms and the earth.

The use of layers in the exploration of the boundary between inside and outside permeates her work. She described her design of a building which has glass on its outermost walls to reflect the weather outside, a layer of perforated metal to further mediate the inside and the outside and an innermost layer of sliding translucent panels. This further communicates her attitude of the built form as a "second nature", of the land.

I understand her work as the architectural process of giving

form to earth energies. I am reminded of *fengshui*. Fengshui is described by John Mitchell in Fengshui<sup>8</sup> as "the art of perceiving the subtle energies that animate nature and the landscape, and the science of reconciling the best interests of the living earth and those of all its inhabitants."<sup>9</sup>

Literally translated, Fengshui is "wind-water", referring to fluid media in constant dynamic flux. Itsuko Hasegawa refers to an architectural structure as giving voice to the energy of place, of a particular area of land; I think of my work as the process of giving form to the human experience of natural phenomena. Phenomena such as wind, waves, and heat are "gardened" into environmental installations which are designed to facilitate intimate, sometimes serendipitous encounters. It

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8. this citation is referenced to the afterward by John Mitchell, in Ernst J. Eitel's book Fengshui. Synergetic Press, 1984.
9. Teh Tien Yong. Spiritual in Architecture. Mimar: Architecture in Development Mimar 27. March 1988. Concept Media Pte Ltd. pg. 27.

is through my experience of the physical as well as emotional and psychic energies of the phenomena that I derive the form of these environmental sculptures. Each of the three installations comprising this thesis will be explored in the following sections: **Wave Garden**, **Eyes of the Wind** and **Thermal Delight**. I will relate my process of giving physical form to the experience of natural phenomena, the choice of materials which best shape these environmental installations and the technologies employed to activate and energize them.

## Participation

"... art is not an object distinct from ourselves, but an experience, an event, including the observer"<sup>10</sup>

The emphasis on sensory experience, the formation of spaces scaled by the human body, and the choice of familiar, tangible yet expansive phenomena create a climate which invites participation. My work is conceived with human interaction as a fundamental element. The innumerable decisions one makes in the process of developing a work are filtered through this value. In each of the three installations, the idea of the viewer as participant and the participant as activator are essential.

This work adds to a continuum, a process of transforming the role of the spectator of contemporary art into that of a participant in contemporary art. Many of the genres of activity directed towards this change in orientation and definition of art have taken place in Europe, North and South America and Japan. This brief discussion refers to a particular "cultural bandwidth" of activity directed towards

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10. Peter Gena and Johnathan Brent ed., John Cage Reader, C. F. Peters Corp., NY, 1982, pg. 21.

participation. This attitude has been evolving since the early 1920's. At that time, Laszlo Moholy-Nagy envisioned the "spectator" sharing in the unfolding of a work of art. The 1950's brought continued efforts with transformable structures and transformable objects which emphasized the viewer/participants movements in relationship to the work. The concept of the spectators involvement expanded to encompass multi-sensorial participation.

In the ensuing decades of the sixties and seventies, many concurrent explorations contributed to this social redefinition of art. The idea of art as an object was challenged. Artists pursued their interests in kinetic work, architectural and environmental scales, art as an integral part of daily life, art as a democratic experience, art in relation to science and technology, art and the environment.

There was a surge of participatory art including the activities of Group Zero, with Otto Piene, Heinz Mack, and Gunther Uecker. There were the "Happenings" involving Claes Oldenburg, John Cage, Alan Kaprow, Jim Dine, Robert Whitman, Red Grooms and many

others, as well as "Eventworks" presented by Robert Rauschenberg and Billy Kluver and others through E.A.T. There were "Expressions", "Demonstrations", "Actions", and "Art and Life." "Total Environment" exhibitions such as the Magic Theatre exhibition in Kansas City and the Electric Circus in New York City continued to bring many new media into the realm of art, action and participation.<sup>11</sup> The artistic, political acts of Joseph Beuys, the evolving choreography of Ann Halprin, the public rituals of Mary Beth Edelson all contributed to the multifaceted evolution of art as experience.

Many artists have described the meaning of participation within their work:

In the 'Elements' catalog from the exhibition at the Museum of Fine Arts in Boston in 1969, Otto Piene includes in his reference to the 'elements' not simply the materials of fire, earth, air and water, but the 'human elements' such as action, reaction, involvement and participation.<sup>12</sup>

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11. A eclectic and detailed overview is presented by Frank Popper in Art - Action and Participation. New York University Press, New York, NY, 1975.

12. Frank Popper, op. cit., pg. 108.



Regarding his use of the elusive medium of light, to create palpable environments, James Turrell said that his work is intended to elicit "a visceral response accessible only by participation."<sup>13</sup>

During an interview with Jack Burnham, Hans Haacke made these comments about the role of participation in reference to his early work with natural systems: "A number of things that I've made require the participation of the viewer. Otherwise they are dead. I like this physical involvement between viewer and object. In larger pieces which would not allow handling, I would use photo cells to retain this intimate relationship. But, as you know, I have also made things

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13. Julia Brown ed., Occluded Front: James Turrell. The Museum of Contemporary Art, Los Angeles, Lapis Press, Larkspur Landing, California, 1986, pg. 98.

which change independently of the viewer, reacting on their environment." 14

In his vanguard conception of art in the future, "Moholy Nagy envisioned the participation of the spectator in environmental spectacles. The part-theatrical activity of the Happening involves the spectator in an assemblage which extends in time as well as space and is open to all materials and media." 15

It is always heartening to know that there are many artists whose work has strengthened the foundation of a form which considers art in terms of action, and participation. It is my hope that my attention to the participatory elements of the environmental sculptures that comprise my work will lead me to develop a broader capacity for communication and a more inclusive environment of participation.

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14. Jack Burnham, op. cit., pg. 23.

15. Guy Brett, Kinetic Art: the Language of Movement, Studio Vista, London, 1968, pg. 59.

### **The Triad of People, Technology and Nature**

I think of my work as gardening the basic elements of earth, air, fire and water, and related phenomena such as wind, heat, and waves, into interactive sculptural environments. I design them to activate our senses and to bring people into intimate contact with captivating natural phenomena. When I began my work at The Center for Advanced Visual Studies at M.I.T., I was conscious of wanting to use the medium of environmental art to mediate the perceived polarity of nature and technology. As technology increasingly dominates our experience and is considered to be in destructive opposition to the natural world I am interested in creating installations which employ technologies to enhance our experience of ephemeral, everyday yet inspirational natural phenomena.

Throughout the history of The Center for Advanced Visual Studies, with the leadership of the founding Director Georgy Kepes and its current Director Otto Piene, artists have been engaged in dynamic art

which is positioned within the balance or challenge of the relationship of people, technology and nature. The presence of this environment, and my participation in it has formalized for me what had previously been very personal, private works of art.

My current series of installations responds to my observation of the reluctance of many people to experience natural phenomenon directly in the out-of-doors. For example, when presented with a choice, many people prefer to take indoor rather than outdoor routes to their destinations; others are more comfortable sheltering themselves within the interior of buildings rather than experiencing the variations of temperature, moisture and wind outside.

Initially, I thought that I would make outdoor sculptural installations that would mediate peoples' experience of a natural phenomenon by referring to its presence or absence. However, my process drew me into the interior of a building. There, in a near cubic space, without natural light, with a floor that was formed below ground level and a

ceiling that rose above ground level I developed installations that I hoped would evoke the power of natural phenomena. As I clarified the intention and form of my work, the siting of each installation became more defined and, eventually, a sculpture emerged from this place of inception.

One in this series of three interactive environmental sculptures has offered people the opportunity to explore their relationship to an ephemeral phenomena through an outdoor installation. The process of installing and the period of installation offered me the opportunity to reflect upon the attributes that I have discussed thus far. The elements of: evoking the atmosphere of natural phenomena through environmental sculpture, the attention to the human experience of sensation, the process of giving sculptural form, the integral attribute of participation and the constant consideration of the relationship of people, technology and nature currently highlight the territory which I am exploring. The ensuing sections discuss each of the three environmental sculptures which comprise this thesis.

## Wave Garden

"Water is a fluid element, the universal element. Water is not enclosed within its inner surfaces but open to its surroundings and to all the stimuli and formative impulses from without. It is the impressionable medium par excellence. The formative boundary surfaces in flowing movement prove to be areas of sensitivity. They respond to the slightest changes in their surroundings by expanding, contracting, or making rhythmical waves." 16

Raindrops fall gently into still water. Each intermittent drop stretching the surface tension upon impact. Many drops syncopating this taut yet receptive surface of water. In a call response pattern, with each swell there is a complimentary compression. This repetition of ebb and flow, ebb and flow is compelling. Soon it has focused your attention, and your mind enters a realm in which you become one with this fluid pulse.

While experiencing the intent, focused attention of contemplation and the expanded perception of space and time induced in reverie, the subject/object of contemplation and the exterior public environment become an extension of our intimate internal space. Our awareness of the inter-contentedness of inside and outside emerges, evoking a state

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16. Theodor Schwenk. Sensitive Chaos: the Creation of Flowing Forms in Water and Air. Schöken Books, N.Y., 1976. pg. 65.

of conceptual vastness which Gaston Bachelard refers to in the Poetics of Space as intimate immensity.<sup>17</sup>

These qualities of experience suggested the use of physically and visually permeable materials for the construction of a contemplative environmental installation. In the subsequent installation of the **Wave Garden**, suspended netting in the form of a thirteen foot high, thirteen foot wide spiraled cylinder successfully expressed the polarity of enclosed, secure, intimate, internal space and connection to the larger external public sphere.

When lit from above, this heavy white netting created a space within the spiraled cylinder that felt illuminated from within. Though voices of people outside of the space could be heard and their presence was perceptible as indistinct shadowy forms, it was this central, inner space which dominated the experience.

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17. This concept of intimate immensity is discussed in chapter eight by Gaston Bachelard. The Poetics of Space. Beacon Press, Boston, MA.. 1969.

This same lighting arrangement made visible to those outside of the suspended mesh space all that was within it. The netting afforded the characteristics of personal space within public space. This unique quality has the potential for contemplative as well as performance space. This material facilitated the involvement and transition of people as viewers, observers of others interacting within the installation and as participants activating the installation.

I approached the making of the **Wave Garden** as the process of creating a gateway. The spiral entrance became the gateway and symbolized the transition of moving from one state of being into another. I imagined it to be an environment which would have the capacity to take you to an inner dimension unlike the one you inhabited upon entering the space.

At its core was the mesmerizing, quieting quality imbued by a center slowly expanding, concentric ripples swelling, then receding, the rhythmic contraction and dilation of space and time. This captivating kinetic activity was the effect of light projected through slowly



rippling water. Two gravity fed tubes of water were clamped to adjust their flow as they slowly released drops into a transparent tray of water hanging beneath the light. The drops fell onto the surface of water at different rates causing concentric rippling shadows. Their focused motion began in the center of the circular space, expanded, then rose up the walls of the cylinder mesh just as the next drop touched the center with its fluid shadow. This sequence of projected shadows in motion continued. Adjusting the flow rate of the water was a meditative process which activated the calming capacity of the **Wave Garden**.

The intent engagement characteristic of contemplation suggests heightening sensory experience and extending the range of modalities involved in interaction. This was achieved in the **Wave Garden** with the use of: incandescent light projected onto the white floor through the slow swells and contractions of steadily rippling water, manipulation of sound hoops which could be moved in innumerable ways to elicit water sounds ranging from light drips to undulating and crashing waves, a programmed sequence of scanned blue argon laser

light projected characteristic forms of water movement onto scrims of light mesh suspended above the open cylindrical structure, an invitation to remove shoes as a transition into the **Wave Garden**, a double walled spiraled entrance of netting which shimmered with moire patterns, and sand filled pillows for optional reclining.

The entrance to the room which contained the **Wave Garden** gave an initial overview of the environment from a balcony area. As you proceeded down the metal stairs you interacted immediately with the installation through the vibration of your movements which were echoed in the projected fluid light patterns. At the foot of the stairs you could sit on a garden bench to remove your shoes or watch other people.

"Sound hoops" invited participation within the **Wave Garden**. These plastic hoops, thirty inches in diameter, are covered with transparent plastic film. They contain small seeds and grains which create an incredible range of water related sounds as they are manipulated. They easily captivated ones attention and transported one's awareness with the sounds of waves. The **Wave Garden** becomes complete each

time participant/viewers enter. They are an essential element. The sound hoops are an invisible, inaudible aspect of this environment until people play them. Their sound transforms the electrical din of a room into one filled with the sensations of imminently crashing surf or of the gentle tip, tap of the first drops which announce the coming rainfall.

This installation evolved from a desire to create an environment which would have the potential to engender contemplative moments, relaxation and personal restoration. I referred to my own sensory experience while giving form to this environment. The circle was chosen for its enclosing, wholistic associations. The spiraled entrance forms a path, a gateway to a transformative experience. The suspension of this structure suggests the release of terrestrial weight. Pillows offer the opportunity for reclining and further physical reorientation. While reclining, the viewer is able to watch a cycle of

fluid forms projected onto overhead scrims by a argon laser. This series of drops, ripples, vortices, etc., constructed an experience which was evocative of water in motion and reminiscent of cloud or lightning watching.

I was able to install this sculptural environment three times. Each time I refined the elements. Initially a sequence of scanned argon laser images were projected upon a double layer of suspended tule.<sup>18</sup> I think that the presence of the argon laser projections elicited a very electric feeling. The lulling sensation of the recurring waves had a counterpoint with these dynamic light forms. Extending the analogy of cloud watching, these laser projections gave intermittent contact with the external in the same way that the recognition of a cloud as an identifiable form briefly alters ones state of reverie.

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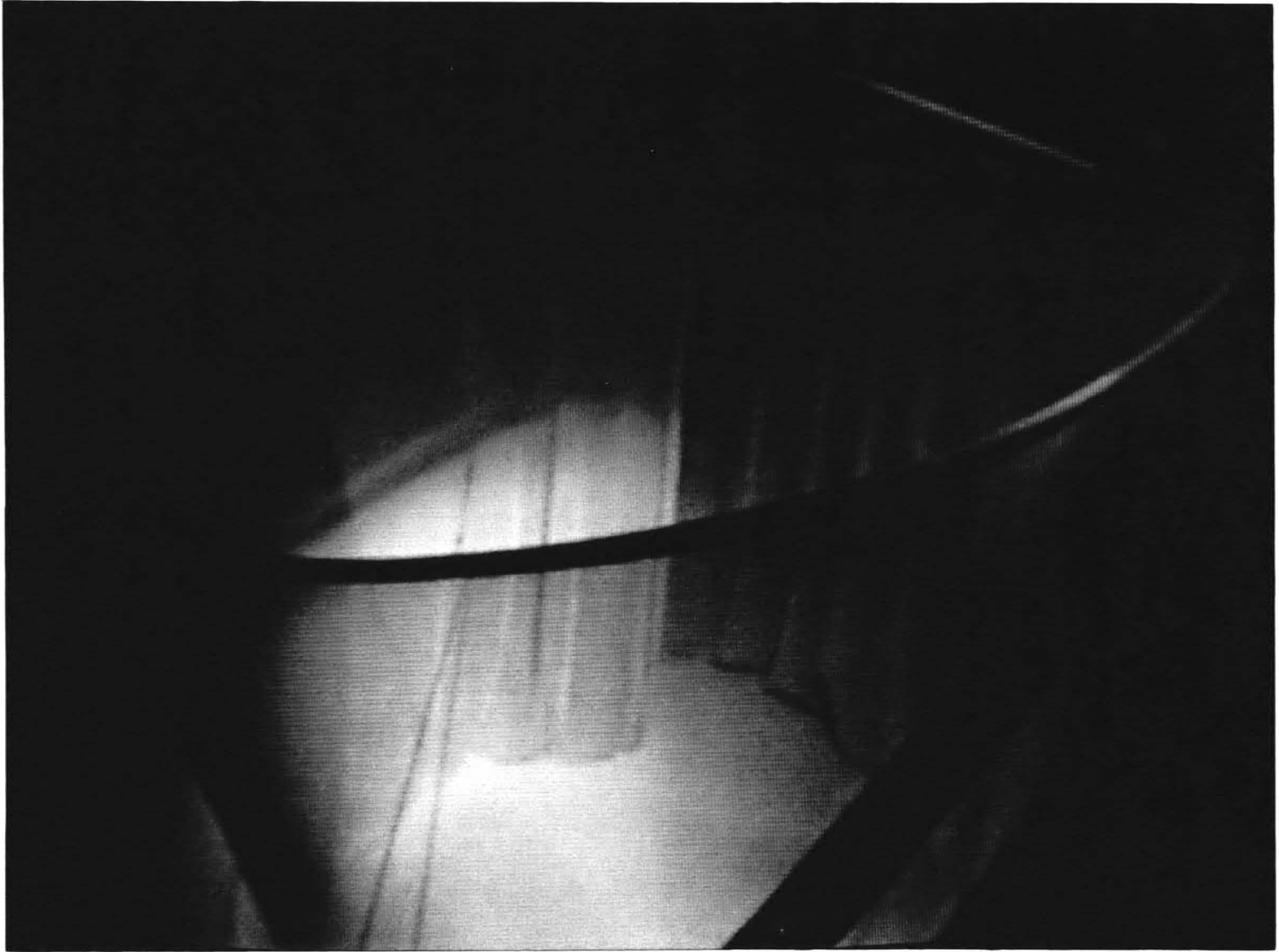
18. Tule is a great material as a surface for laser projections as it adapts easily to form multiple layers of imagery. Its open lightweight weave transmits some of the image while providing a surface for the laser light.

Due to logistical restraints, the installation was also shown without the laser projections. This was satisfying to the participants as well. To some the experience was stronger without the laser, for others the presence of laser light was preferred. Although I prefer the **Wave Garden** with the argon laser projections, I think that it also has integrity without them. Eliminating the legal and safety issues which accompany the public use of lasers, it is more likely that the **Wave Garden** may be installed in a health care or work setting. In these settings the **Wave Garden** offers much needed relaxation and restoration through the experience of natural phenomena mediated by technology.

## WAVE GARDEN IMAGES



38a.

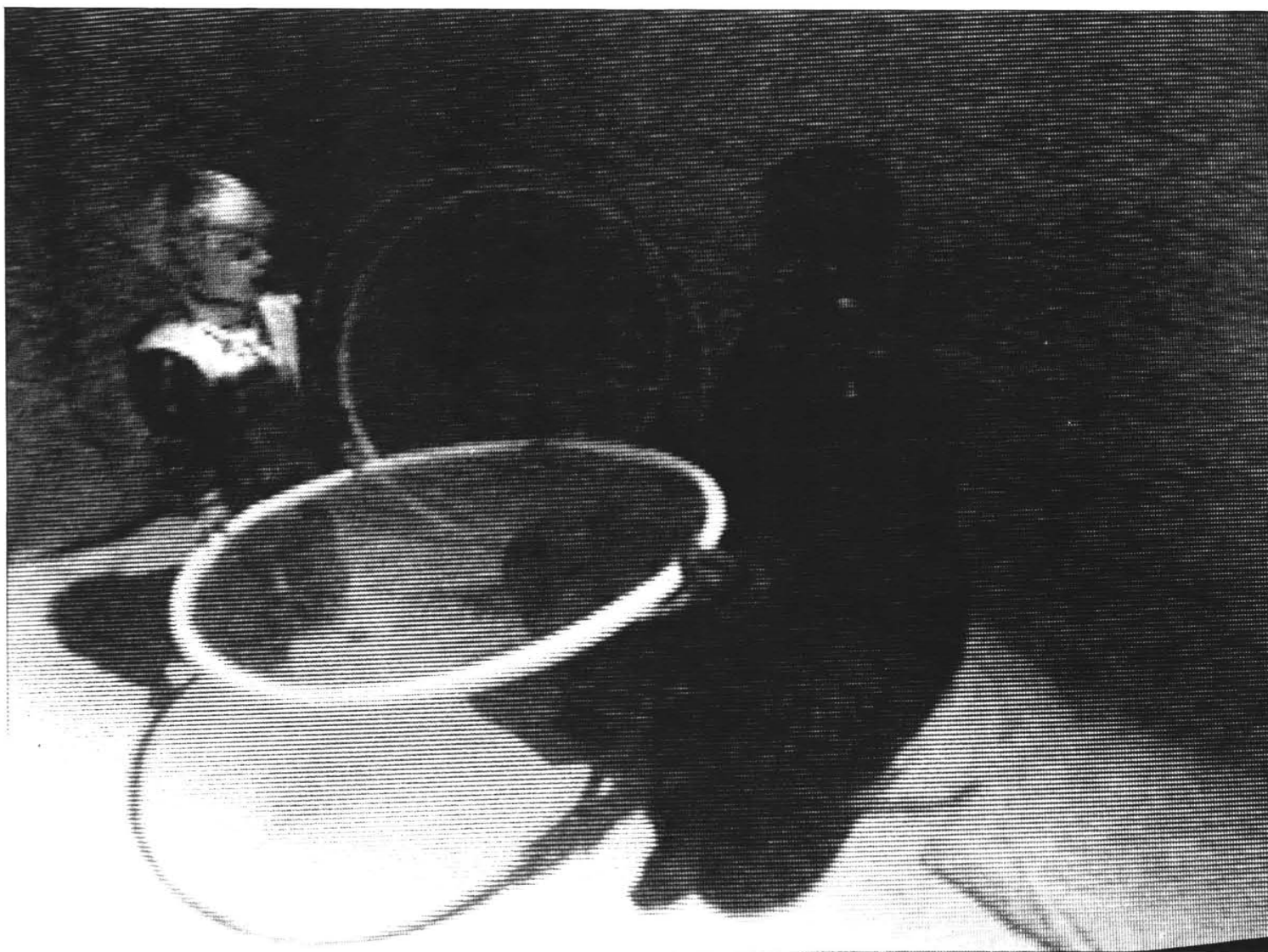


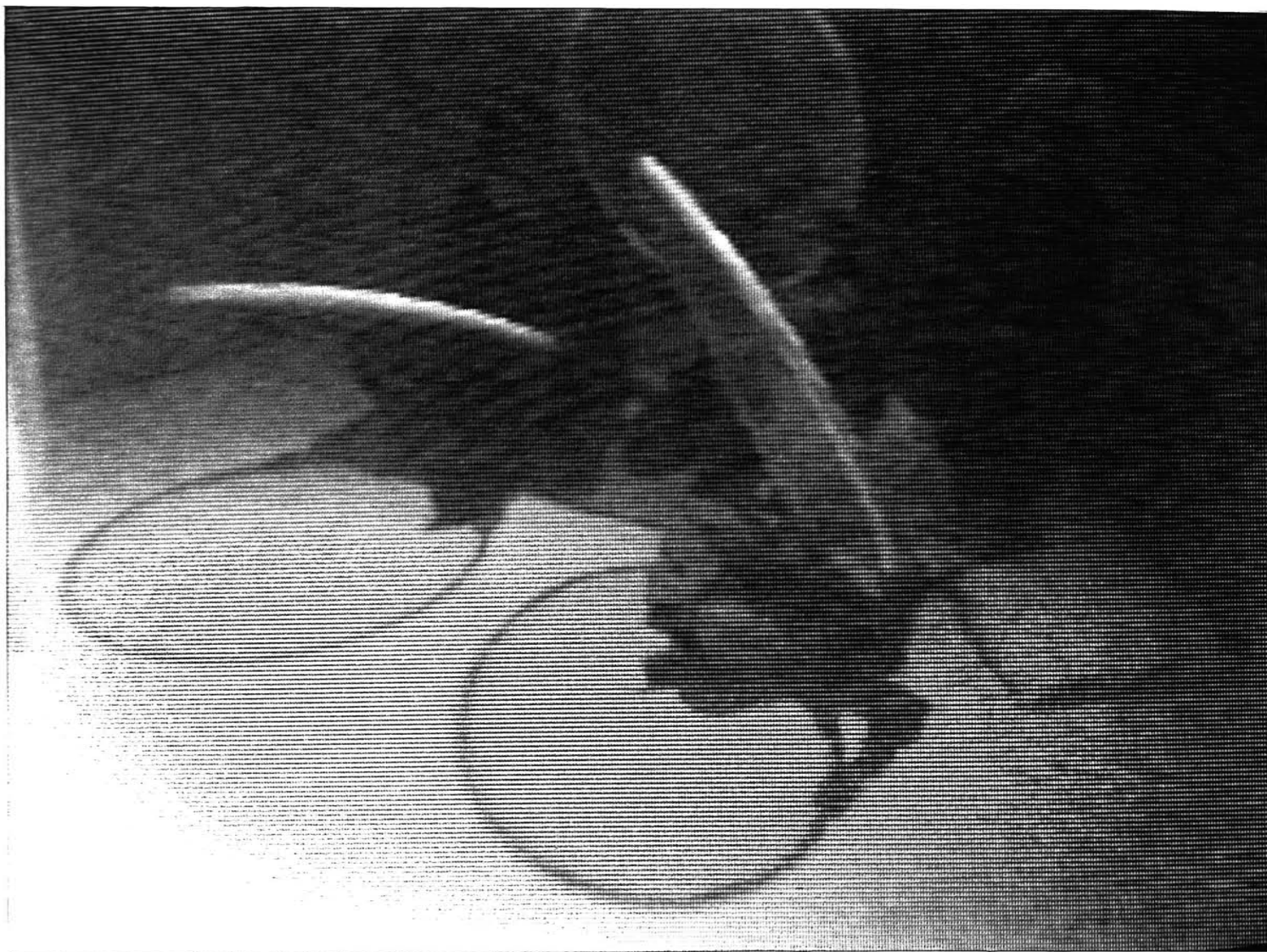
386.





38c.





## Eyes of the Wind

"In Arabic, the wind is *ruh*, but the same word also means breath and spirit. While in Hebrew, *ruach* enlarges the sphere of influence to include concepts of creation and divinity. And the Greek *pneuma*, or the Latin *animus* are redolent, not just of air, but the very stuff of the soul. What matters is that we, as humans, feel instinctively that we are part of this power, and that it is part of us. ... We are nourished and animated by the wind, brought into being by the touch of Heaven's Breath."<sup>19</sup>

The wind is an ephemeral, elemental force visible through its effects, not its substance. It can "clear the air", imbuing the atmosphere with physical and psychic renewal or it can "stir things up" in a turbulent gesture portending imminent change. It is this dynamic quality of moving air which animates the wind and signifies it with attributes which are of the universe and within the individual being. The unanticipated force of the wind setting things in motion and the sudden transition of movement into stillness is pulselike, reminiscent of our bodies breathing in and out. The wind has been called Heaven's Breath, the breath of the universe.

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19. Lyall Watson, Heaven's Breath: a Natural History of the Wind, William Morrow and Company, New York, NY, 1984, pg 7 & 329.

**Eyes of the Wind** was inspired by the engaging experiences I had watching gusts of wind as they gathered fluttering leaves into a rising vortex on my way to an Ancient Cosmology class in the Landau building at M.I.T. This image and the sensation of those weekly experiences in the fall of 1990 led me to the visualization, design and construction of **Eyes of the Wind** during the autumn and early winter of 1991.

I wanted to make a form which would facilitate peoples' experience of being in the wind, enveloped within the sensations of this phenomena yet aware of its nuances, its relationship to the form, its affect within themselves. As I thought about the qualities of an environmental form which would facilitate the intimacy of physical experience and the capacity for personal contemplative extension of this experience of wind, I became intrigued with the word window.

"It derives from two Scandinavian terms, *vindr* and *auga*, meaning 'wind's eye.' Early Norse carpenters built houses as simply as possible. Since doors had to be closed throughout the long winters, ventilation for smoke and stale air was provided by a hole, or "eye" in the roof. Because the wind frequently whistle through it, the air hole was called the 'wind's eye.' British builders

borrowed the Norse term and modified it to 'window.' And in time, the aperture that was designed to let in air was glassed up to keep it out." <sup>20</sup>

This poetic image of the **Eyes of the Wind** became a guide to its physical and metaphoric structure. The circle would shape the openings which make visible these fluid dynamics and refer to the cycles of moving air within the contained system of the earth's planetary winds. The scale of the structure would accommodate people walking in and out of the sculptural space. Its form and materiality would be visually compatible with the intangible nature of the wind and responsive to the multisensory dimensions of moving air.

The fortuitous find of fiberglass hoops, once used by the Plasma Fusion Center to support magnets, clarified a design which had been evolving from initial models of a horizontal helix. A sequence of six to eight fiberglass hoops (depending on the site), each nine feet in diameter, formed the structure of **Eyes of the Wind**. The upright hoops leaned one against the other in a series of inverted v shapes.

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20. Charles Panati, Panati's Extraordinary Origins of Everyday Things, Harper and Row, NY, 1987, pg. 158-9.

The openings became passageways for the viewers to explore the dynamics of moving air. The spaces which the hoops formed between these openings were covered with crystal clear plastic film and became envelopes for leaves and moving air.

The viewers became participants as they went in and out of the passageways. Sensors responded to their movements and activated blowers which were directed into the envelopes causing the leaves to swirl, whirl and cascade. When people stopped moving there was a delay following which the blowing air ceased and the leaves were at rest.

The process of scaling up the prototype which I made using two hula hoops, plastic film, leaves and a hair dryer was very complex. I called upon the resources of Professor Ain Sonin from the Department of Mechanical Engineering. His particular interests are within the field of fluid dynamics. His greatest assistance to me was his reassurance that the large scale installation was possible because the prototype worked. It was a matter of assessing the incremental variations required in this change of scale. The clue which ultimately led to the resolution of this

technical difficulty was the venting. The blowers had this curious effect of pressing the leaves in place rather than circulating them. This was due to a build up in the internal air pressure of these sealed compartments. It was not until I made significantly large vents that the leaves began to move.

Heat shrink plastic formed around the nine foot hoops succeeded in providing people with an intimate encounter with moving air. This material is so transparent that it is sometimes unclear where the sky and the film meet.

The sensor activated blowers evoke the sensation of a sudden gust of wind and their cessation is experienced as a repose, an exhalation of breath. A first encounter with **Eyes of the Wind** elicits this unexpected action of the blowers. The sensors respond to temperature change and are not initially an apparent part of the installation. After some interaction they become another element to explore.



The passageways invite varied approaches and multiple paths of movement within this interactive sculpture. The combination of the qualities of the clear windows and parallel semi-enclosed spaces add a dramatic, theatrical potential for participants interaction.

The subsequent installation of **Eyes of the Wind** in a cluster of trees outside of the M.I.T. Chapel completed this piece. Its physical presence was compatible with the site and its location encouraged much dialogue with the M.I.T. community during installation. The heat shrink film was very enticing. Many people could not pass it by without feeling its taut curved surface.

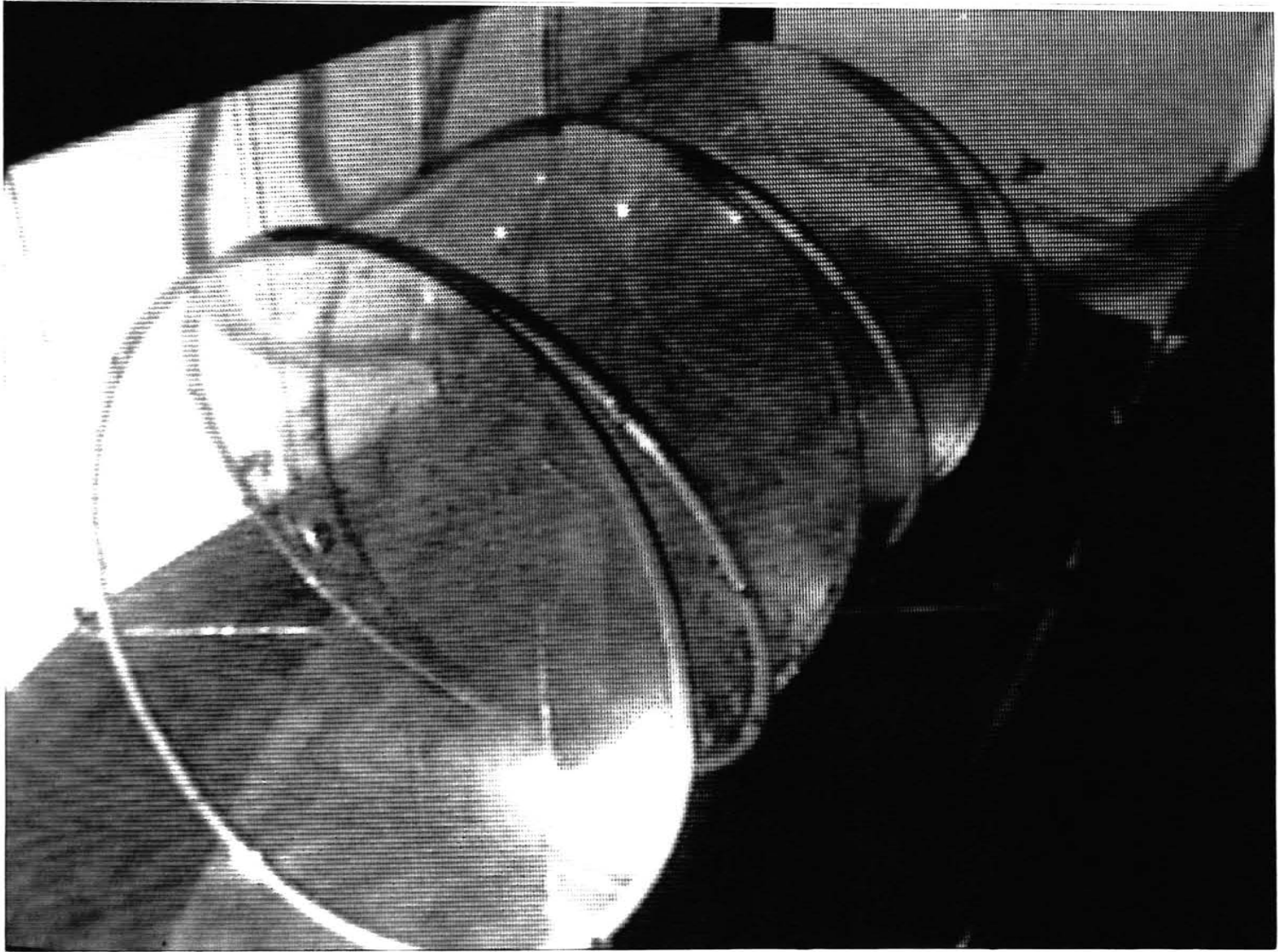
The optical properties of this transparent, minimal surface, bubble filmlike structure varied over the time of construction and time of day.

When the series of eight hoops were installed they became multiple frames for viewing the landscape. In its fixed form, this configuration of circles had an almost kinetic presence ... as if they were the elements of an outstretched coil spring. When these hoop structures were covered with the plastic film, the installation acquired a buoyant appearance.

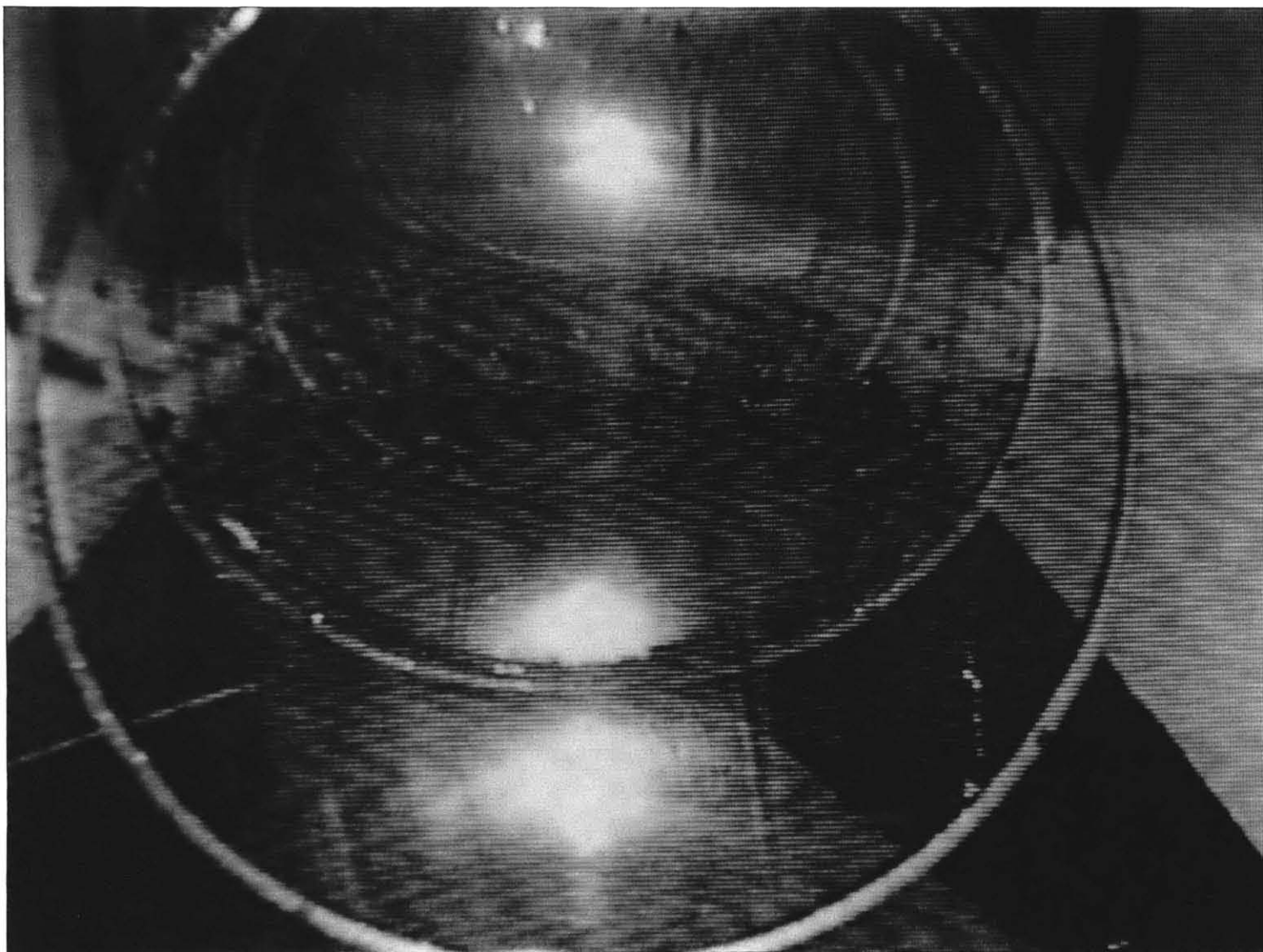
The heat shrink film reflects light, diffracts the sunlight in prismatic patterns, creates internal reflections which challenge one's orientation in space. As a surface for shadows and reflections of nearby trees, this sculpture easily merges with the surrounding biotic and abiotic environment. Its form echoes the circular M.I.T. Chapel and the minimal surface form of Kresge Auditorium. At night the Chapel Walls become projection surfaces for shadows cast by swirling leaves and engaged participants. A quartz halogen light, resting on the ground and directed on axis to the hoops, animated an extraordinary shadow play.

In its perfected form, **Eyes of the Wind** is an interactive environmental sculpture. The movement of people passing by activate sensors which control the blowers and create gusts of moving air. Leaves which were once still swirl within the transparent enclosures. The change from day to night activates a photocell which turns on the light which projects enormous shadows. It is a sculpture that rests easily on the land and is responsive to people and the environment.

EYES OF THE WIND IMAGES



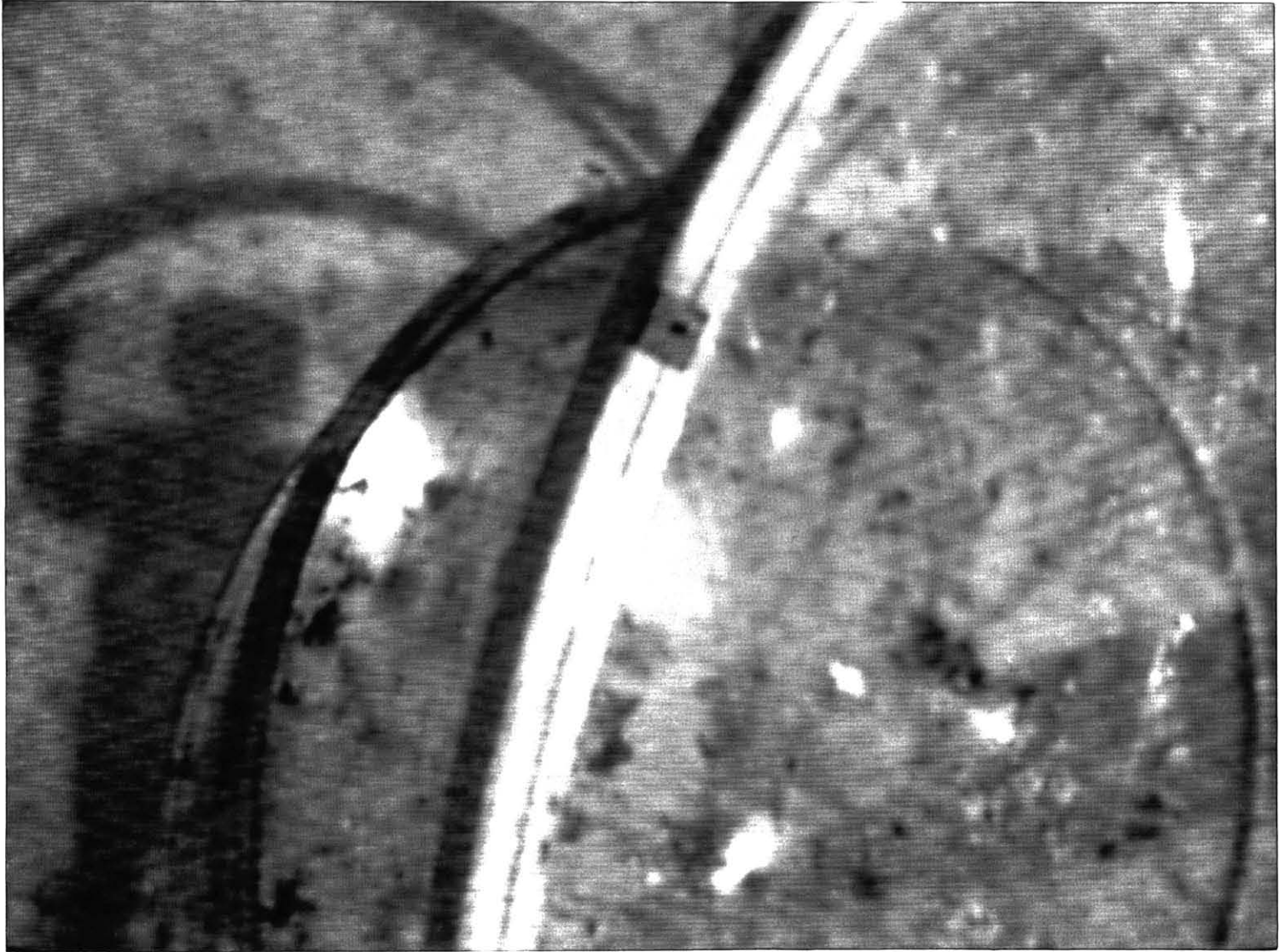
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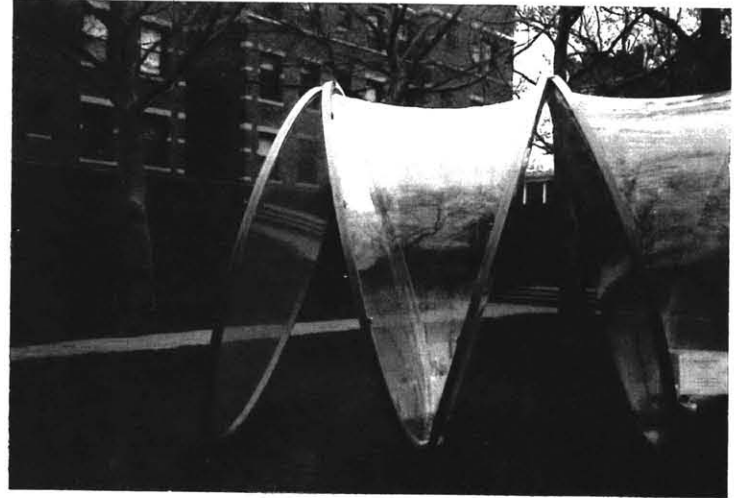


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## THERMAL DELIGHT

"The thermal sense cannot be easily isolated from overall experience, unlike seeing or hearing. We cannot close it off like closing our eyes. Nor does it provide highly differentiated information, as does the individuality of a person's voice, or even smell. The thermal sense is intricately bound up with the experience of our bodies. We continually sense the heat flow of our bodies, information that creates a general background for all other experience."<sup>21</sup>

The sensation of heat is consuming when experienced in the present and elusive when the sensation is surfaced within a memory. I have vivid childhood memories of hot midsummer afternoons. By this point in the season, the grasses had lost much of the moisture once contained in their tender new growth. The blades of grass were more fibrous and their scent was deeper. The pulsating hum of crickets rose with the temperature and seemed to amplify the sensation of heat.

The air feels dense on a humid summer night, heavy with heat and suspended water vapor. This thickened atmosphere becomes a medium through which the chirping of crickets rises and subsides. As their rate peaks, approaching the incessant, my experience of the heat seems to rise in unwitting sympathy, an exaggerated thermal sensitivity.

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21. Lisa Heschong, op. cit., pg. 24.

When I imagined giving form to this sensation I thought of a cone shape. This shape focuses a large area of space or energy into a point. There were two cones in **Thermal Delight**. Without contrasting experiences, you are not as aware of the thermal environment. The character of each cone developed as an expression of its relationship to thermal experience. Associations with materials and forms which suggested insulation of heat or cooling guided the choices I made.

Fibrous Japanese paper casts a warm glow when it is illuminated. Lamps and screens seem to envelope the light gently.<sup>22</sup> This radiant quality attracted me to the use of this material in this installation about the sensation of heat. Wool evokes warmth and was an instant choice. Wool felt comprised of the dark grey, deep brown and black wool became the contrasting material.

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22. Tanizaki, Junn'ichiro, In Praise of Shadows. Leete's Island Books, New Haven, CT., 1977, pg. 10.

Each cone was nine feet in diameter at the base and nine feet high from base to apex. One cone was surfaced with the *kinwashi* paper, the other with the wool felt. The interior floor of the felt cone was filled with scoured raw wool. The interior floor of the paper cone was filled with timothy and alfalfa hay.

The hay provided a plant material which could be sculpted into cozy resting places by participants while imbuing the space with a sensuous aromatic quality. Its texture suggested a fibrous paper covering. This idea of an environment which was of the plant world was complemented with one evocative of the insulating capacity of animals. Wool felt covers the contrasting cone and raw, scoured wool fills its interior with an extraordinarily embracing surface.

A copper pipe structure consisting of a base ring and an upper ring a foot below the apex of the cone remained exposed after the coverings were applied as linings from the inside. Copper is an excellent conductor of radiant energy and was the only material which could communicate the idea and physicality of heat

The apex of each cone was formed by a smaller cone constructed from sheets of matt acetate. Suspended below each acetate cone was a five milliwatt helium neon laser directed towards its highest point. The translucence of this material allowed the glow of the red helium neon light to be visible, its textured matt surface emphasized the characteristic speckle of laser light, and its glossy side facilitated the internal reflection which strengthened the presence of the red glow. This structure became the visual communicator of the idea of heat.

The entrances to the insides of the cones were not initially visible. The glowing helium neon laser illuminated apex of each cone define the rising energy embodied in these forms. They were beacons in a room illuminated with dim incandescent light. Unlike sounds or smells, the thermal quality of these spaces needed to be experienced directly to be known. The materials suggested a climate to the viewer and this impression was then contrasted with their experience.

Clues such as color and material have very strong associations with heat and may at times substitute for the thermal experience itself. The presence of living crickets heightened the experience of heat. These cold blooded nocturnal creatures are active only on warm nights. Their presence is apparent through the sound they make. In the future, when the installation is developed further, a thermostat and an incandescent light as a radiant energy source, will maintain the thermal climate in the cones when they are unoccupied and mediate it when people are within it. During the installation which I am describing, as people begin to enter and experience these spaces the heat which their bodies generated was retained at different rates according to the properties of the materials of each cone.

"There is something basically internal about warmth, probably because we associate it with the warmth generated within our bodies. Warm is what's alive at the very core of things." <sup>23</sup>

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23. Lisa Hescong. op. cit.. pg. 38.

Our thermal nerve endings are heat-flow sensors, not temperature sensors. They monitor how quickly our bodies are losing or gaining heat and are in constant environmental interaction. This characteristic gives our thermal response a dynamic rather than neutral quality. As with other dynamic phenomena, there is great variation in how people experience the sensation of heat.

People experienced preferential attraction to each of the cones. The sounds of the crickets, the smell of the wool and hay, and the visual presence of the paper and felt coverings evoked many memories. The majority of the memories that people shared with me recalled a particular place. For some it was a barn or agricultural fields, for others it was a field with a canopy of bright stars overhead.

The environment of the cones was synthesized by the crickets. Their presence was experienced through their continuous, rhythmic sound. Distinct variations in temperature could be "read" through their chirping. The receptive materials invited people to relax. Some people took naps, while others remembered particular summer evenings or enjoyed the contentment of conversation in a small group.

As part of the deinstallation of **Thermal Delight**, the multitude of crickets which had inhabited the cones in wire mesh enclosures suspended below the acetate apex of each cone, were released. After months of caring for crickets and maintaining their habitats, I still hear their sound..



## THERMAL DELIGHT IMAGES



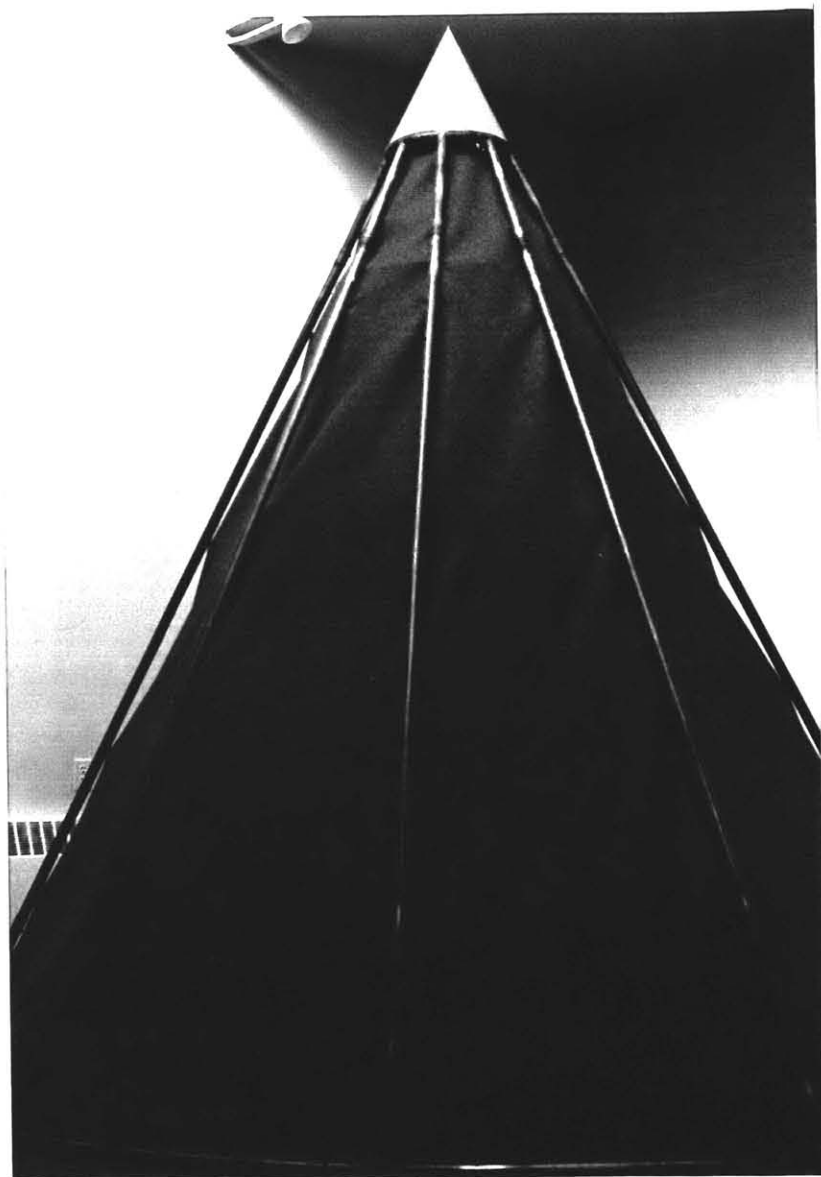
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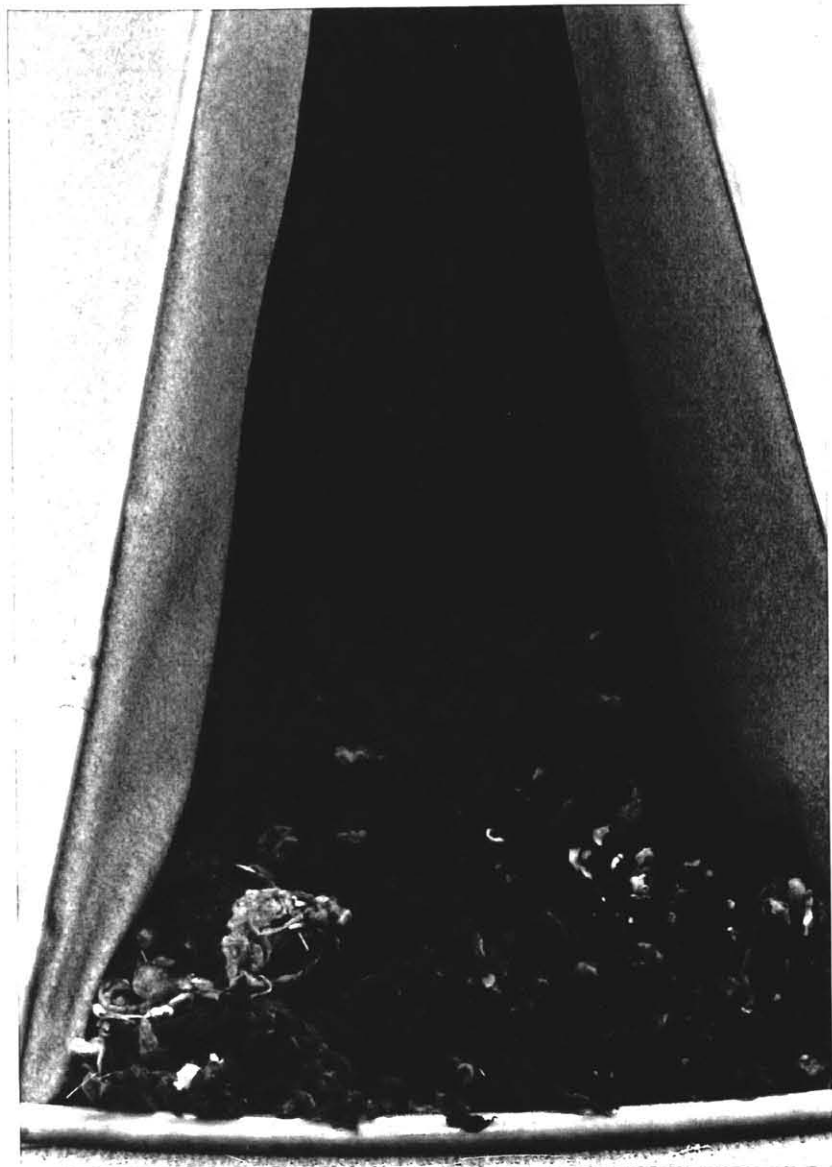
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## **Art, Nature and Technology in Context**

Gardening the Elements is a cycle of three environmental sculptures which evolved as I began to question an often espoused view of the relationship between nature and technology as one of destructive opposition. This work which exists as three self contained installations and one cycle of three, is guided by my intention to use technology as a means of enhancing our human experience of natural phenomena. My intuitive inquiry into this perceived relationship is fostered by my own reverence for the evidence of nature as I experience it through ephemeral encounters with natural phenomena in urban settings. This, in conjunction with the affinity which I have for gadgetry and my interest in the way in which human made devices are designed to implement their intended functions, contribute to a sensibility which is comfortable exploring this dynamic of nature and technology.

Although I bring my unique sensibility to this pursuit, there are many artists who have been and are concerned with these ideas. As I mentioned before, the concept of nature is complex; as is the relationship of the artist's work to nature and the landscape. Add to

this the use of technology in the mediation of experience and we enter inexhaustible, fertile territory.

As I attempt to put my work into context, I have been thinking about the work of people with whom I feel I can link my work. Hans Haacke's early explorations of natural systems emphasized particular, dynamic natural phenomena. These were put into contained systems which often involved participation. **Sail Construction** was a seven foot blue chiffon cloth supported above the floor by air which was directed by a blower placed beneath it. This cloth could be manipulated within delicate parameters while in suspended animation. This reminds me of **Eyes of the Wind** in that it also employs evocative motion reminiscent of natural phenomena such as wind.

What I experience as divergent from Haacke's approach is my orientation to the human body as a reference for scale and sensation. I envision architectural space which enhances an intimate relationship to the phenomena. This kinesthetic experience guides the configuration



of the space and the materials and technologies employed.

The **Condensation Cube** is a contained water cycle which responds to the climate of the space it occupies. Water evaporates, condenses, collects, drips and evaporates. The mechanism which projects rippling water within the

**Wave Garden** employs the direct action of falling water and through that has the power to evoke a variety of sensations. Although it is not a closed system like the **Condensation Cube** it is governed by the characteristics of the phenomena.

Alan Sonfist's **Crystal Monument** is another closed, environmental system. It is responsive to temperature and air currents. Unlike **Thermal Delight**, this is experienced as an object which "reads" the environment rather than an environment in which you can "read" the phenomena.

While different in intent, the architectural installations of Alice Aycock are also designed to elicit particular spatial and sensory experience. Her **Simple Network of Underground Wells and Tunnels**, **Maze**, and tomb/cellar like **Williams College Project** are all designed in response to the body and with keen awareness of the the influence of space upon the body and mind.

The web of relationships which could be woven is vast. Suffice it to say that there are many others know as earth artists, kinetic artists, and installation artists which influence me consciously or not. Reflecting on their work increases my understanding of my own values, intentions and priorities.

When I reflect upon my own intentions to use technology to elicit intimate experiences of natural phenomena within this work of Gardening the Elements in a Landscape of Technology. I think that people were able to participate in very personal experiences of natural phenomena. The importance of engaging people in multiple modalities, and the choice of materials and technology to most powerfully reveal the essence of the phenomena remain as guides in my continuing pursuits.

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**END NOTE**

**I dedicate this long awaited completion to Jo E.**

"Peace comes as you bring it.

All in being is what you make it.

There is no becoming no goal.

The right way is wrong and the wrong way right.

What is done is done.

What is faced is faced.

Without beginning or end.

Lowry Burgess