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Therapeutic Landscapes: Designing Gardens for Health and Healing

American Horticultural Therapy
Association
362A Christopher Avenue
Gaithersburg, MD 20879

THErapy AND REHABILITATION THROUGH HORTICULTURE

Horticultural Therapy is a discipline that uses plants, gardening activities, and the natural world as vehicles for professionally conducted programs in therapy and rehabilitation.

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CONTENTS

PREFACE

- Sharon Simson, PhD, Karen Haas, HTR, and
Jean Stephans Kavanagh, ASLA* 4

INTRODUCTION

- Karen Haas, HTR* 5

FEATURES

- Design Considerations for the Development of
Therapeutic Gardens
David Kamp, ASLA 6
- Designing for Emotional Restoration: Understanding
Environmental Cues
Marni Barnes, MLA, LCSW 11
- The Garden as a Restorative Environment:
A Theoretical Perspective
Gowri Betrabet 15
- Guidelines for Designing Healing Gardens
Mara Eckerling, JD 21
- The Primary Colors of Nature: The Essentials of
Therapeutic Landscapes
Elizabeth R. Messer, MLA 26
- Stress Management through Garden Design
Virginia McGrath Salamy, RN, MLA 32
- Growing Citizens: The Role of Gardens in a
Women's Prison
Weeks Ringle, ASLA 36





The Paradise Garden: A Model for Designing for those with Dementia and Alzheimer's Disease <i>Margarette E. Beckwith, ASLA, and Susan D. Gilster, RN, BGS, NHA</i>	45
The Walter and Alice Borgeest Garden at Friends Hospital <i>Ronald Durham, BS, HTR, and Nadine Kenline, HTR</i>	53
The Evolutive Prosthetic Garden: A New Concept for Elderly Living in Nursing Facilities <i>Carole Labreque, BSc, CSLA, and Lucie Tremblay, RN, BSc, MSc</i>	56
The Therapeutic Quality of Plants <i>Karen Haas, HTR, and Rob McCartney, MS</i>	61
Design of Outdoor Environments for Wellness and the Role of Landscape Architecture <i>Scott C. Scarfone, ASLA</i>	68
Compact Nature: The Role of Playing and Learning Gardens on Children's Lives <i>Robin C. Moore</i>	72
Classroom? Playground? Garden? or Clinic? <i>Nancy K. Chambers, HTR, Sonja Johansson, ASLA, and Donna M. Walcavage, ASLA</i>	83
What's a Nice Guy Like Me Doing in a Place Like This? A Landscape Architect and Recovering Alcoholic's Thoughts on Designing Therapeutic Landscapes <i>Robert Benson</i>	88
The Healing Gardens of Makahikilua: The Landscape as Healer <i>Calley O'Neill</i>	92
Notes about Contributors	97

Cover: Resident Jeanna Folkerts and Activity Aide Ann Olee working in the McKinstry Garden at the Elizabeth Jennings Home, Cleveland, Ohio.

PREFACE...



"Therapeutic Landscapes: Designing Gardens for Health and Healing" is the premier issue of the redesigned *Journal of Therapeutic Horticulture*. The articles in the *Journal* are based on papers presented at a symposium convened at Cleveland in 1995 by The Friends of Horticultural Therapy to benefit the American Horticultural Therapy Association. It was jointly sponsored by the Ohio Chapter of the American Horticultural Therapy Association, The Holden Arboretum, Cleveland Botanical Garden, and Sea World of Ohio.

Under the leadership of Nancy C. Stevenson, HTR, Karen Haas, HTR and Jean Stephans Kavanagh, ASLA, this symposium focused on design and programming for garden accessibility and therapeutic benefits. Nearly 125 persons participated in dialogues involving horticultural therapists, landscape architects and designers, health care professionals, and members of the "Green Industry."

The excitement and discoveries generated by this interdisciplinary exchange influenced a decision to formalize symposium papers and to publish them in a recognized format that could be widely available to others. Building on the *Journal* legacy of Richard Mattson, PhD, HTM and in keeping with the practice, education and research goals of the American Horticultural Therapy Association, the *Journal of Therapeutic Horticulture* is pleased to present "Therapeutic Landscapes: Designing Gardens for Health and Healing."

Sharon Simson, PhD

Karen Haas, HTR

Jean Stephans Kavanagh, ASLA



...INTRODUCTION

The papers presented in this issue of the *Journal of Therapeutic Horticulture* are from many professionals with diverse educational backgrounds and experiences with people, plants, and design. Together, they explore the topic of "therapeutic landscapes" and open the way to dialogue across traditional professional lines. As a result, we have the opportunity to benefit collectively.

Therapeutic landscapes address two types of therapeutic experiences: active and passive. Some are designed for active treatment of an individual's health care goals between patient, client, or participant and a therapist. The passive experience is one that occurs individually, as a result of participants' interaction in the garden.

The designs and concepts presented in the *Journal* are as diverse as the individuals for whom they are intended: from design criteria to gardens that provide a place to improve motor skills, to meeting needs of Alzheimer patients, to providing a play area so kids with physical disabilities can experience a playground. While they are diverse, there are a striking number of similarities in the use of design teams, identification of goals and execution of the plan.

The concept of "therapeutic gardens" is not new. Gardens and landscapes have existed for therapeutic purposes, in one form or another, for thousands of years. However, the discussion among health care providers, horticultural therapists, and landscape architects and designers about what constitutes such a space is on the cutting edge.

*Karen Haas, HTR
Editor for Horticultural Therapy*

Design Considerations for the Development of Therapeutic Gardens

David Kamp, ASLA

Nature is an agent of healing. It helps restore a sense of well-being, reduces stress, fosters dignity, and offers a sense of hope and promise by virtue of its power to produce memorable experiences, powerful and positive feelings, and a sense of connectedness to the world around us. Healing is a personal process, a process of discovery as one copes with illness. Gardens encourage such discovery by helping to restore a sense of self, reconnecting with life and life's processes through the thread of care that brings about growth.

Nature attracts and fascinates us, offering infinite and ever changing variety and complexity. Landscape designer Vince Healy has said that although much more remains to be discovered, gardens and the landscape at large engages all our senses more fully, making us aware of and reconnecting us to life in ways that cannot be fully replicated or appreciated indoors.

Frederick Law Olmstead, one of the founders of modern landscape architecture, wrote extensively of his belief that contact with nature is beneficial to psychological and physiological health. Olmstead was stating not a modern concept of nature but reiterating a centuries-old premise when he said that nature "employs the mind without fatigue and yet exercises it; tranquilizes it and yet enlivens it; and thus, through the influence of mind over body, gives the effect of refreshing rest and reinvigoration to the whole system (1865)."

Historically, the importance placed on gardens to foster a sense of well-being has not been a constant ideal. The historian Sam Bass Warner Jr. states that the ever-present psychological possibilities of gardens were sometimes reinforced by contemporary culture and at other times neglected or even denied. While each garden experience is shaped by individual circumstances,

personal perceptions are also modified by what one's culture teaches as the meaning of that experience. Gardens are a cultural response, an expression of values in our relationship to nature. At various times gardens have been interpreted as protective retreats, stages for social display, or links to religious experiences. Warner feels that when a culture finds intense feelings in nature and seeks religious experiences in gardens they are interpreted as agents of therapy: a place to promote healing and the relief of pain; to assist in the struggle for equilibrium and orientation; a place of richness and wonder to alter the frame of mind. With the development of modern technology in the twentieth century, our priorities have altered. Our concepts of health and healing changed to where today the connection to nature is largely denied.

Those concepts are changing once again. What Olmstead stated 130 years ago is being redefined, expanded, and advanced within modern and emerging ideas of care. From the initial research of such pioneers as Charles Lewis to the ongoing work of current researchers, including Stephen and Rachel Kaplan and Roger Ulrich, through such concepts as Edward O. Wilson's Biophilia Hypotheses and the efforts of such organizations as the American Horticultural Therapy Association, we are seeing that nature is, indeed, an intrinsic part of being human. Today we no longer look to gardens to heal the body, but rather, toward healing the mind. To quote Charlie Lewis, "...medicine not to be taken orally but rather perceived sensually, to heal the scars on the human psyche."

DESIGN APPROACH

Design considerations are not rules or instructions, but guidelines for planning and design. Each site is unique, each participant an indi-

vidual—with individual needs, abilities and perceptions. Gardens must reflect this, maintaining a sensitivity for both site and participant and acknowledge the constraints and opportunities in each to create a more fully enriching experience.

Design considerations are balanced with specific technical criteria to establish an approach from which the unique qualities of site, participant, and program are tailored to specific situations through specific details. This is done by looking at the:

- Site: Where will the garden be?
- Participants: Who will be using it?
- Goals and program: What do you want to accomplish there and how will it be done?
- Budget: What funds do we have to work with?

Essentially we are creating opportunities—opportunities for each individual to make their own relationship with the garden and with nature in their own way, on their own terms, and at their own pace. Opportunities for quiet repose; for activities and interests; for extending social horizons; for minimizing feelings of isolation, loneliness, or a loss of capabilities; for enhancing a sense of self and personal image; for release and closure. Opportunities for the ordinary and extraordinary moments in one's life. We are designing for the human condition.

As illness limits individual choices, the therapeutic garden seeks to enrich those choices. The garden honors the individual by maintaining an attention to detail in the individual experience. The design of a therapeutic garden encompasses a broad perspective. The design seeks to incorporate all the senses or, perhaps due to illness or disability, ensure the richness and delight of experiencing just one. It includes the perspective from a bedside; or with the assistance of a wheelchair, a walker, or cane; or with the sense of routine, or the exhilaration (or peril) of walking unassisted. The design includes the perspectives of children, teenagers, and the elderly. It responds as those needs change over time.

The design considers a place to address the mundane, emotional, and deeply philosophical issues of one's life. It provides not only for the needs of those in care, but for their caregivers

(family, friends, volunteers, and staff) as well. It entails understanding the distinctions and commonalities of designing a garden serving an Alzheimer's residence, an AIDS care facility, hospice, or a rehabilitation center. The design requires a focus on the site and facility as well—understanding the physical and fiscal characteristics of the garden's development, use, and long-term maintenance.

DESIGN RECOMMENDATIONS

The following recommendations explore criteria, environments, and elements that advance the therapeutic qualities of gardens. These recommendations intend to outline design qualities that enhance and enrich the experience of nature, rather than provide a definitive design checklist. The recommendations start with a first look, then build on a series of design principles:

- Site analysis
- Diversity in site design
- Accessibility and ease of use
- Diversity of plant material
- Quality of maintenance

Site Analysis, Planning, and Design Considerations in Appraisal

The assessment and selection of the site is a critical early step in the design process. Site analysis and site planning establish the framework for addressing the project's specific needs, integrating the design's program and objectives with the site's inherent opportunities and constraints. The range of needs and issues to be addressed will vary greatly with different client groups, programs, sites, and facilities. Often, a project requires addressing changing and conflicting needs. It is important to assemble a coordinated team of design professionals with administrative, maintenance, and healthcare backgrounds. The team should include therapists, who provide a day-to-day and one-on-one level of insight. The analysis of a site should include:

- Site history: What should we know about the site's past use or condition?
- Site surrounds: What is the surrounding area like?
- Site topography: What is the terrain like?

- **Climate:** What is important to understand about the weather, prevailing breezes, and the garden's microclimate?
- **Orientation and views:** Which direction will the garden face? What are views like?
- **Existing site features:** Are there any notable existing features on the site to consider?
- **Soil conditions:** What are the soils like? What are we building this garden on?
- **Site pollutants:** What is that smell or noise?
- **Utility services:** Where are the existing and proposed utility services?
- **Access, staging, and phasing:** What other constraints and opportunities are there?

Diversity in Site Design

Whatever their size, gardens should contain different areas that offer aesthetic, sensorial, and functional variety and interest. Together, they should form a cohesive whole of unified yet distinctive spaces. The overall organization and the individual spaces themselves should be easily comprehended and identified. Some spaces should afford privacy, offering solitude and quiet contemplation; others should encourage interest and activity. They should accommodate a range of active and passive uses, including sitting; walking; viewing from indoors and out; provisions for using materials from the garden for activities and hobbies, outdoor gardening, sport, group gatherings, or events; and the enjoyment of wildlife. They should consider the psychological characteristics of fostering a sense of privacy, comfort, security, participation, and place. The garden should provide a multidimensional experience with interesting uses of vertical spaces, varying plant bed heights, and overhead plant canopies. Basic qualities to consider in the garden's use include:

- **General ambiance:** Provide a setting that is both benign and supportive.
- **Passive use:** Provide opportunities for the restful pleasures of the garden's setting.
- **Active use:** Provide opportunities for more active participation in the garden, accommodating a range of interests and changing abilities.
- **Features of interest:** Consider features that draw interest and provide orientation.

Accessibility and Ease of Use

The design of any outdoor environment must provide easy and safe access for its users. This applies not only to mobility but also to use and enjoyment within the garden. The garden must be easy to enter, move through and exit, have surfaces and gradients that allow safe and free movement, and be barrier-free. Gardens are most effective when they are fully integrated into the physical layout of the facility. Consider:

- **Accessibility:** Access must accommodate a range of changing needs and abilities, while providing convenience, flexibility, and opportunity.
- **Ease of use:** The garden must do more than accommodate varied and changing interests, abilities, and needs; it must provide more than convenience and flexibility; it must ensure that they are all provided for with maximum comfort and safety.

These considerations must be coordinated with the specific technical requirements of governing building and safety codes. While every design must meet these regulations, they are intended to establish minimal standards. They should be considered the starting point of the design process, not the end, from which we enhance the garden's convenience and enjoyment.

Diversity of Plant Material

Plants should be selected to provide a pleasing variety of sensory stimulation and interest, including seasonal changes, colors, scents, form, texture, sounds, and tastes. A thoughtful selection and combination of plant materials maximizes interest and provides the opportunity for participation at many levels. Plant selections must take into consideration available light, water, and other local climatic conditions and reflect desired levels of maintenance. Considerations in plant selection include:

- **Structure:** Consider plant materials that complement and accentuate the garden's basic structure, including screening, shelter, shade, and the definition of spaces and displays.
- **Sensorial interest:** Consider the value of

every season and ensure that displays and interests are provided throughout the year.

- Materials for hobbies and interests: Consider materials for indoor displays, decorations, and hobbies, including flowers, leaves, fruits, vegetables, and herbs to extend interests through many seasons.
- Food and habitat for wildlife: Consider plant materials that attract wildlife to gardens and that can enhance existing woodland edges.
- Safety—hazardous materials and conditions: Carefully consider plants that are poisonous, thorny, or scratchy; cause allergies or itchiness; or produce messy or slippery droppings of sap, pods, fruit, or leaves.
- Time—growth, decay and renewal: Consider the garden's process of growth, death, and renewal in plant selections to provide a positive affirmation of our place in the natural order.

Quality of Maintenance

Gardens will remain attractive, safe, and functional only if properly maintained. The facility needs to recognize the garden's continual need for maintenance and provide sufficient funds for staff, training, supplies, equipment, and plant material replacement. A rich and diverse planting design need not require a high degree of maintenance. Designs with low maintenance costs, however, are demanding. They require careful attention to material selection and coordination with a facility's operational procedures. They also often require a larger initial capital and maintenance outlay to ensure the successful establishment of plant material. Maintenance is an investment. Considerations need to be incorporated into the design process from the beginning, not on an *ad hoc* basis or in response to a sudden problem. Maintenance considerations include:

- Long- and short-range implications of program, design, and material choices.
- Existing and projected resources.

Finally, consider the desired setting and ambience created with the maintenance program.

While safety and security are paramount concerns to be addressed, also consider the garden's care within the natural order. Perhaps every leaf is not in place or every spent blossom picked.

Vince Healy feels that perhaps with every leaf not in place there is a much larger lesson to learn: That nature will take its own course in our lives as well and that we, too, are part of the natural order. Nature will, after all, take its own course in its own way, on its own terms and at its own pace. Perhaps this is the way that the garden makes the individual connection.

CONCLUSION

These recommendations have sought to explore basic design qualities that enhance and enrich the experience of nature. With new gardens being built, expanding our opportunities for research, these considerations should be seen as part of an ongoing process of compilation, evaluation, and refinement, evolving to reflect new ideas and evolving concepts of care.

The design process has been called a mosaic. That mosaic includes such considerations as understanding the site, the participants, the goals, and the program. It includes providing for opportunity and choice, diversity and variety, convenience and ease of use, and safety and security. However, design is more than simply the arrangement and manipulation of these elements. Design is an expression of values. Through design we reflect the qualities of our lives, expressing our hopes and aspirations in how we choose to live, to heal, and to die. Design offers opportunities to connect to oneself, the larger world, life, and death. Design enhances the essential human quality of identity. Through gardens and nature, design celebrates the richness of the human spirit.

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Designing for Emotional Restoration

Understanding Environmental Cues

Marni Barnes, MLA, LCSW

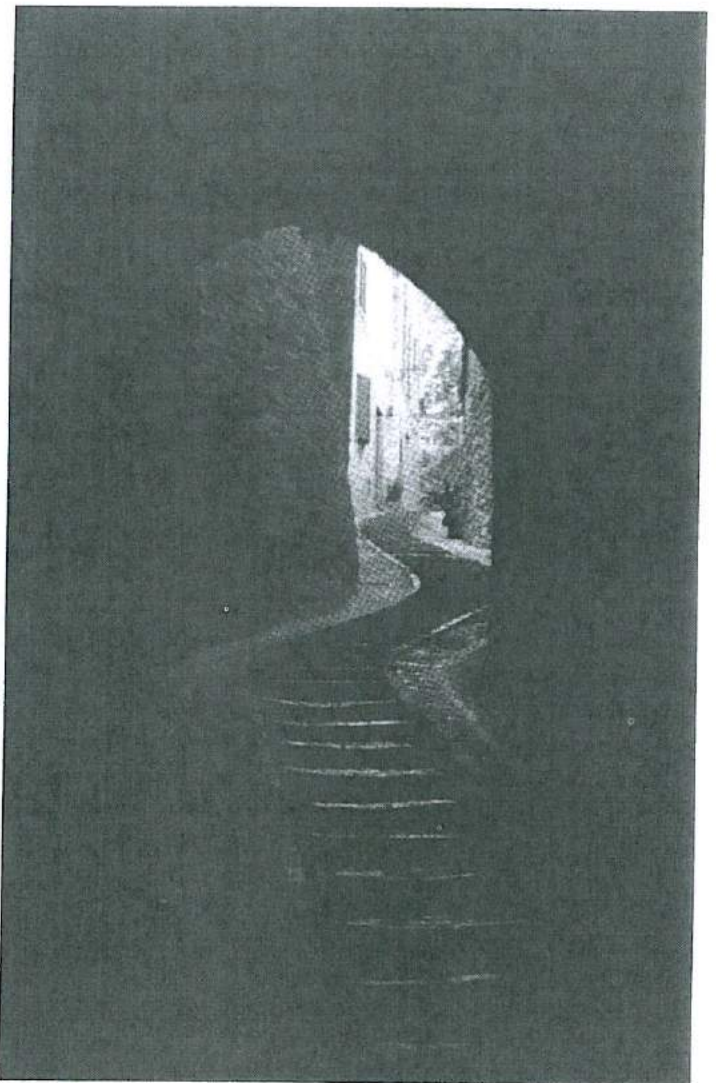
The sights, sounds, and smells that surround us have a tremendous impact on our emotions. The appearance of a rainbow gives rise to a smile on the lips, memories are triggered by fragrances, cleansing and releasing is assisted by a stiff breeze or a plunge into a cool lake. Horticultural therapists and designers of healing outdoor spaces can dramatically increase the degree of therapeutic benefit derived from our environment by attending to this "passive" impact of our surroundings. To do this effectively, the process of emotional restoration and the relationship between our environment and our feelings need to be understood. This research elucidates the connection between emotional restoration and the environmental settings specifically chosen by individuals to assist their healing process. The resulting conclusions have significant implications for the design of therapeutic outdoor spaces.

RESEARCH RESULTS

The subjects of this study were asked to describe what types of spaces they went to when seeking solace in the outdoors. Drawing on previous work done by Fran Segal, Stephen Kaplan, and Janet Talbot, the empirical reports were analyzed in relation to the process of emotional healing as experienced on therapeutically led backpacking trips. Parallels were found between the process of emotional change recorded on these wilderness trips and the experiences of individuals in this study who were seeking solace in a variety of outdoor settings (ranging from museum courtyards to

suburban gardens and city parks to wilderness areas).

The study reveals that emotional healing is a complex process. Not only is there variety among people, each individual has a range of needs and, over time, moves through a series of phases. These phases, as they appear in outdoor settings,





Drawing the eye through the space, this stairway promises hidden vistas and suggests brighter times ahead.

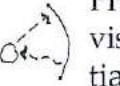
have a strong correlation with the components of a meditative process outlined by Dr. Herbert Benson. Dr. Benson has studied the physiological response that accompanies relaxed states and has concluded that one of the most efficient methods for attaining a relaxation response is mindfulness meditation. He lists the components of this meditative process as being:

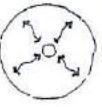
- A passive letting go
- Focusing on this moment
- A cognitive shift to more flexible thinking
- The attainment of an altered state of consciousness¹

These same components, or psychological tasks, were recorded in outdoor settings. They are:

 Phase I—Seeking change and separation to allow for the opportunity of perceptual movement.

 Phase II—Refocusing one's attention through absorption and fascination and, in so doing, shift to a differing perspective.

 Phase III—Revisiting the initial feeling state from the newly gained perceptual orientation and emotionally or cognitively working it through.

 Phase IV—Shifting from an analytical thought pat-

terns to a more basic and nonlinear perceptual mode, wherein one's sense of self is experienced within the context of the whole².

DESIGN IMPLICATIONS

Each task has its own set of environmental cues that assist and facilitate the working through of that phase. The design implications of using this analysis as an organizational structure for assessing and creating healing spaces are significant. The breaking down of the process of emotional restoration into its component parts can serve as a structure for setting design goals and, in turn, can facilitate the incorporation of appropriate elements in the landscape.

Design principles can be formulated for each phase, and the application of the principles can facilitate the creation of emotionally healthy environments. Paradoxically, by narrowing down the focus of design to the specific needs of each phase, the range of possible solutions is expanded. Instead of having to repeat the use of identified elements—the shopping list—again and again, the function of those elements can be replicated in a variety of other forms. This gives greater creative flexibility and, even more significantly, allows for the application of healing principles in a wider array of situations. These needs can be addressed in ways that relate to the larger context, be it urban, suburban, rural, or wilderness.

The first phase, *The*




The beauty and fragrance of this rose draws us into the realm of our senses.



The critters of the wild can bring a sense of wholeness and connectedness into a garden.


Journey, is a mechanism for creating a break, gaining distance or making a separation that allows the individuals to step back from their situation. It creates space for change and resolution and may serve to shift the individual away from an unproductive perspective.

 The design principle for this phase is to emphasize transition, change, thresholds, and movement.

Examples of the application of this design principle are:

- A series of focal points to draw one into the space—creating movement;
- Variety in scale to create a sequence of outdoor rooms—providing thresholds;
- Changes in elevation leading to increasingly expansive views—demonstrating new perspectives;
- Bridges—replicating transitions and a sense of “leaving behind”;
- Limiting the view back along a path—emphasizing the distance traveled.

The second phase, *Sensory Awareness*, involves attunement to external stimuli in the moment. This serves as a method of escape from everyday thinking, a refocusing on qualities of our surroundings, and a shift in perspective and thought processes.

 The design principle is to provide sensory stimuli of a non-invasive character. Examples illustrating the principle are:

- Fragrant foliage underfoot and scented blooms planted along pathways and near seating areas—for olfactory stimulation;
- Pleasing combinations of colors and textures throughout the space—for visual interest;
- Areas of overhead shade and reflected heat




Finding a private spot from which to observe, yet retain some seclusion can be a creative endeavor.

to create a variety of micro climates—to stimulate the tactile perception of heat and humidity;

- Plants that are edible for humans and other animals—to delight the taste buds;
- Running water or wind chimes—to provide soft sounds.

The third phase, *Self Awareness*, focuses on the self. This phase requires a safe haven for turning inward and opportunities for self-reflection.

 The design principle for this phase incorporates two aspects: 1) allow for safe seclusion and 2) promote esteem-building experiences.

Examples illustrating this principle of allowing for safe seclusion are:

- Benches with a backdrop that allows the individual the opportunity to visually scan the surroundings—creating the security that comes from that orientation;
- Seating around the perimeter of a space—providing the safety that comes from being part of a group;
- A fountain—to provide insulation from others with “white noise”;
- Trees to climb or a pond with small islands

or secluded peninsulas—for solitary activities that are visually defensible, yet private.

The second aspect of this principle incorporates traditional design concepts to support psychologically enhancing activities that complement periods of self-reflection. It also extends beyond traditional design, into the realm of community participation. The esteem building aspects of pride of ownership, or sharing one's self by helping others, can be facilitated by good design.

Examples illustrating this principle of promoting esteem building experiences are:

- Challenging par courses, adapted and aimed to serve differing ages and abilities—to increase confidence;
- Space for solitary and social games, such as a half basketball court—to develop skills;
- Physically strenuous trails and activities—to build strength;
- Community garden and instructional facility—to offer a sense of belonging;
- A design process that incorporates community participation—creating pride of ownership.

The fourth phase, *Spiritual Awareness*, facilitates the deeper awareness of a connectedness that expands on the sense of well-being and transcends time.



The design principle for this phase is to play with the majesty and mystery of the site and its surrounds. Examples illustrating this principle are:

- A human scale sundial—to demonstrate the passage of time;
- Plantings with seasonal variation—calling attention to the cycle of life, death, and decay;
- A bench from which to observe the strike of the setting sun on a multitude of distant

windows—marking the rotation of the earth;

- High nectar blossoms to attract hummingbirds and butterflies—incorporating the ephemeral;
- Groves of trees that sway and rustle in the wind—calling our attention to the forces of nature.

As demonstrated in these few examples, by looking at how healing occurs, step by step, and addressing those needs, the environmental requirements become focused, and the variety of design options open out. The development of these design principles distills the relationship between environment and emotional healing into concrete, applicable, design considerations. The incorporation of the principles into the design process allows for the maximum flexibility and appropriate adaptability to the site and its surroundings. Using design principles to guide the design concept and incorporating the context into their application is the key to innovative, successful design for emotional restoration.

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Footnotes

¹Kutz, p. 2.

²Barnes, pp. 70-72.

The Garden as a Restorative Environment

A Theoretical Perspective

Gowri Betrabet

An emerging area of interest in human-nature relationships is the concept of natural settings as restorative environments. This is a latent concept in some fields, such as healthcare and tourism that sell restoration or landscape architecture, which explores the link between aesthetics and restorative experiences. Other fields, such as horticultural therapy and environmental psychology, have been more visible in directly targeting the exploration of the process of restoration and how and where it may be achieved. These fields continue to pursue the investigation of what people need to be restored from and why restorative experiences are important. There is an abundance of anecdotal accounts in various forms of contemporary literature that converge on some research findings on restorative experiences. People tend to overwhelmingly prefer experiences of varying degrees in natural environments of varying scales. From accounts of gardening experiences to hiking in the wilderness, several personal stories testify to the magical healing power of being in nature.

It is at this point of convergence that a closer look should be taken to find out some of the common aspects of such restorative experiences in restorative environments. In this paper, existing conceptualizations of restorative environments—places for restoration—from the fields of healthcare and environmental psychology will be presented. Also, the common aspects of restorative environments that were implicit in an analysis of literature in the fields of tourism, landscape architecture, and horticultural therapy will be presented. From these different yet similar conceptualizations, a composite picture of a restorative environment will be presented. It will

be shown that the common aspects of restorative experiences from different fields exist in different dimensions in different examples of garden and gardening experiences. By bringing the common aspects together in a profile, this paper will show the complexity as well as the dynamic nature of restorative experiences and restorative environments. In conclusion, it is hoped that this step in understanding the multidimensionality of restorative experiences in restorative environments will lead to a deeper exploration of ways to improve their quality.

EXISTING CONCEPTUALIZATIONS OF RESTORATION AND RESTORATIVE ENVIRONMENTS

Definitions of *restoration* in academic discussions are based on the antecedent conditions used. The Kaplans (R. Kaplan and S. Kaplan, 1989) conceptualize restoration as the recovery of *voluntary attention*, in other words, concentration. The antecedent condition is named *mental fatigue*; a condition similar to *overload* (e.g., Cohen, 1978; Milgram, 1970), where the capacity for voluntary attention (required for everyday cognitive functioning in the built and social environments) is depleted. Restoration in this case, occurs when the demand for voluntary attention is relaxed by functioning in ways that draw forth effortless, or *involuntary attention*. Therefore, a reduction in mental fatigue is achieved when voluntary attention is replenished.

Other ways of explaining the process of restoration stem from arousal and affect theories (Ulrich, 1983). Restoration, in this case, is required from *stress*, which is caused in anticipation of a challenge or threat to well-being (urban

conditions are strongly believed to be the major cause). Attention to stimuli in an environmental encounter is guided by previous experiences, and visual perception of the environmental features results in an initial affective response without any cognitive mediation. This initial reaction in turn influences psycho physiological arousal, cognition, and motivation.

Environmental psychologists are interested in the process of restoration and break down the process into four successive stages of deepening levels of restoration based on cognitive processes (Kaplan and Kaplan, 1989):

- Clearing the head—the removal of “cognitive leftovers” still running around in one’s head after a task or activity;
- Recovery of directed attention;
- Achieving cognitive quiet fostered by soft fascination—facing and dealing with the cognitive residue of the preceding days, months and years in order to prevent potential distractions;
- Reflection on one’s actions, goals, priorities, and possibilities.

Each level calls for increasing amounts of time and increasingly high-quality restorative settings to be achieved. Although some of these levels of a restorative experience can be attained in several places, such as a tourist town, a movie theater while watching an engrossing movie, or even cyberspace through a virtual reality experience, the most satisfying and complete experiences, comprising all levels of restoration and often expressed in glowing terms, have been found in the natural environment. A restorative environment according to the previous definition is a setting that fosters restorative experiences and consists of interesting elements that engage and fascinate, drawing forth without taxing the individual’s capacities, and create an ambiance conducive to reflection.

In the healthcare field, the concept of supportive environments (Ulrich, 1991) emphasizes the importance of *social contact*, *a sense of control* with respect to surroundings, and *access to positive distractions* (environmental elements eliciting positive feelings, holding attention and interest without taxing or stressing individuals). Accord-

ing to this model, a supportive environment is one in which these factors assist in an individual’s restoration from an illness or surgery. While this model was developed in the healthcare field, it has valuable application in other fields and the general area of human restoration.

From the previously described conceptualizations of restorative and supportive environments, salient aspects of a place for restoration can be drawn out. A restorative environment:

- Has access to positive distractions;
- Enables a sense of control with respect to the surroundings;
- Has access to social contact;
- Creates an ambiance that enables *clearing of the head*, *recovery of directed attention*, *achieving cognitive quiet*, and *reflection*.

OTHER PERSPECTIVES

A journey through literature in landscape architecture, tourism, and horticultural therapy indicates other implicit aspects of restorative experiences in restorative environments.

Landscape Architecture

Several theories originating in environmental psychology have influenced the field of landscape architecture; for example, theories of environmental aesthetics are used to explain landscape preferences. The Kaplans speculate that “*the natural environment is often experienced as a preferred or aesthetic environment*” (R. Kaplan and S. Kaplan, 1989). This is attributed to the content, patterns, and rhythms of nature that contribute to an aesthetic experience. Therefore, within the area of environmental preference and aesthetics, links are being made between aesthetic and restorative experiences.

Tourism

Tourism research, on the other hand, is replete with tourist motivation and trait theories; the focus being on the individual’s preferences because the strong economic considerations of tourism promotion and marketing are dependent on tourist decision-making. The need for restoration is caused by states of disequilibrium in one’s life, followed by a strong need to break away from routine behavior. Therefore, *restoration* is a pro-

cess to restore equilibrium, driven by the individual's motives and the sociopsychological and cultural push and pull factors (Shaw and Williams, 1994).

Horticultural Therapy

The emphasis on gardening has been the mainstay of *horticultural therapy* as one of the means of physical, physiological, and psychological restoration in a health care setting. The activities are designed to suit the individual's competence levels. In this respect, the philosophy of horticultural therapy strives to achieve the *compatibility* required for a restorative experience. Especially for people who are disabled and disadvantaged, horticultural therapy provides an experience to deal with loss. Horticultural therapists motivate their patients into participating in a living reality—the world of plants. Growing and caring for plants are considered challenges, involving the acceptance for responsibility and a hope for achievement and success. This experience is also aimed at social interaction, providing opportunities for groups to come together in the activity schedule.

From the previously described brief accounts of perspectives from different fields, as well as anecdotal accounts, certain common issues begin to indicate aspects of a restorative experience in a restorative environment. The most salient issue is the *presence of nature/natural features* in the immediate environment. The presence of vegetation, trees, other planting, and water has a restorative influence on stressed individuals and has a positive influence on unstressed individuals also.

However, there is a difference in the *scale* of the environment (e.g., some restorative experiences occur in small, intimate-scale settings, such as a backyard garden, whereas others take place in large natural settings, such as a forest preserve). The environments could also vary in the *degree of naturalness* and the *extent of human intervention*. For example, a topiary garden or an urban park show extensive human manipulation of natural elements whereas a forest preserve is less likely to show signs of human intervention.

The most important factor, however, in the person–environment restorative relationship is the *extent of involvement of the person* in the environ-

ment, or conversely, the extent to which the environment engages the person in an interaction. This could result in *passive observation*, as in a patient's room in a nursing home, where the patient might be engaged by a scene outside the window. In this situation, the person is physically stationary and yet is engaged in a visual and aural interaction with the scene.

In another situation, a person walking through a well-laid out garden is *actively* engaged in a sensory experience in the environment. In yet another situation, the person–environment interaction could be *participatory*, as in a gardening experience. These three situations represent a continuum of *passive*, *active*, and *participatory* modes of interaction with the restorative environment. Restorative experiences can range anywhere along this continuum depending on personal traits and capabilities and the environmental demands. The extent of the involvement of the person depends on the congruence between the environmental demands and the person's capabilities.

Another important factor in the person–environment restorative relationship is the *duration* of the experience itself. Some experiences are *short* and *instantaneous*, as in the models of affect, whereas other experiences are in *longer* successive stages as in the four-stage restorative experience described by the Kaplans. For example, to a tired person at the end of the day, the sudden view of a field of flowers on the route home could generate a quick, instantaneous feeling of restoration. However, to another person, a long walk in a nearby arboretum could provide an extended restorative experience.

Therefore, salient aspects of restorative experiences in restorative environments are:

1. Presence of *nature/natural features*;
 - Degree of naturalness;
 - Extent of human intervention;
2. *Scale* of the environment/environmental experience;
3. Extent of *involvement*;
 - Passive, active or participatory;
4. *Social environment*;
5. *Duration*.

The following section will illustrate whether and how these salient aspects of a restorative experience in a restorative environment are manifested in garden/gardening experiences. By bringing these aspects together in a profile, examples will be used to illustrate the multidimensionality of garden/gardening experiences.

GARDENING AND GARDEN EXPERIENCES

Gardens and gardening are the focus of several contemporary discussions in the area of human-nature relationships. Various articles in magazines and newspapers tell the story of a growing awareness of the benefits of gardening experiences. Several garden meanings are reflected in *The Meaning of Gardens* (Francis and Hester, 1990), a book that is a rich compilation of the different facets of garden and gardening experiences. The garden is simultaneously an idea, place, and action and is attributed different meanings that are reflected in various aspects of people's daily lives.

Anecdotal evidence of gardening experiences highlights the quality of the experiences, especially indulging in the gardening activity, and the subsequent outcomes, such as satisfaction, sense of community, sense of autonomy, and ownership and pride. On the other hand, there are several garden experiences that emphasize the visual engagement of the garden (e.g., Japanese gardens). This begins to reveal the varying intensity of different garden and gardening experiences and also that they range along a continuum of passive to participatory engagement.

Let us take, for example, two points on the garden experience continuum. At one end is a visitor to a flower garden who is *actively* engaged in a sensory experience with the colors of the seasonal flowers, perhaps the humidity in the air, and the sounds of chirping birds or the falling water. This could be considered as an *active* experience (because the visitor is moving through the space), and perhaps mildly restorative. At the other end of the continuum is an avid gardener who is engaged in deciding where to plant saplings, how to organize the rows, and how to nourish and care for the plants in a backyard garden. To this person, the level of restoration could be achieved through working in the garden, dig-

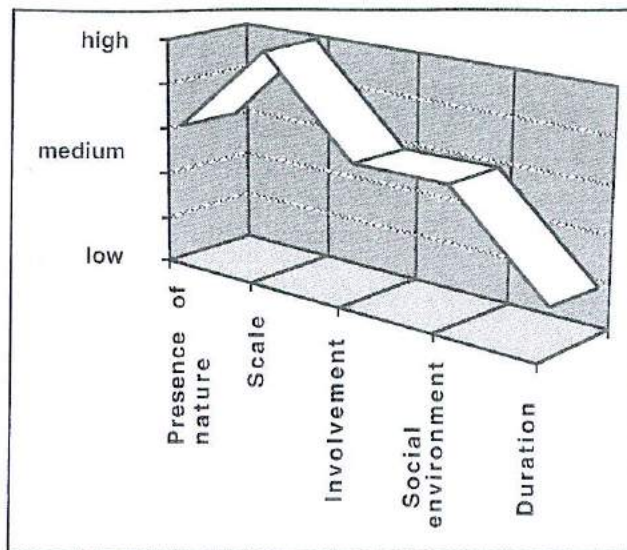


Figure 1. Experience in a flower garden.

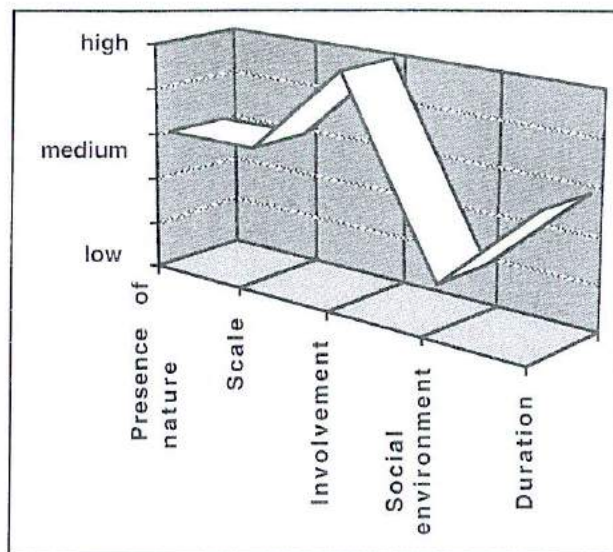


Figure 2. Experience in one's backyard garden.

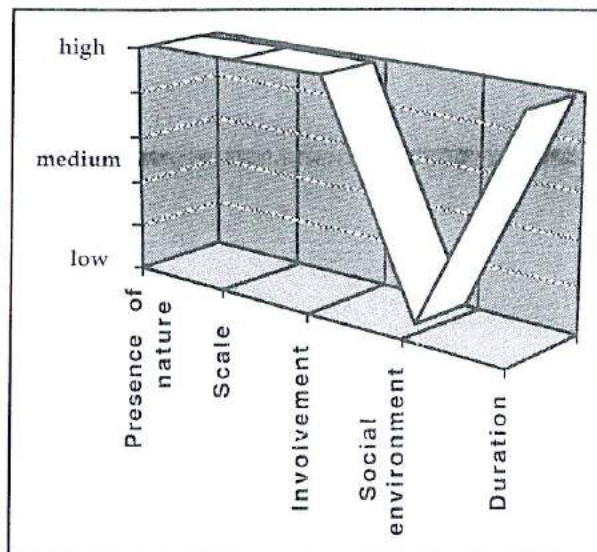


Figure 3. Hiking alone in the woods.

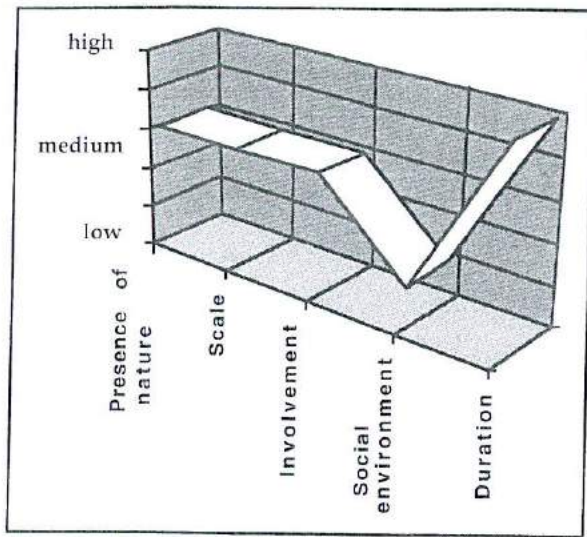


Figure 4. Mildly restorative environmental profile.

ging in the soil—a different *participatory* sensory experience.

Both these experiences, therefore, can be considered restorative, but there are other dimensions in addition to the extent of engagement of the person by the environment. Other dimensions, such as social environment and duration of the experience, also begin to influence the quality of the passive, active, or participatory experience.

To help in this discussion, let us elaborate on the previously described examples. The garden visitor who is visiting the flower garden with their family spends around half an hour walking and taking photographs, talking to family members and engaging in the scents, sights, and sounds of the experience. If we were to map a profile¹ of the different aspects of this experience, it would probably look like Figure 1; an experience in a large scale environment with a moderate presence of nature, where there is a medium level of engagement in the company of a few people for a short period of time.

However, if we map a profile of the experience of the active gardener working in their backyard garden, perhaps talking to a neighbor across the yard, and highly engaged in planting bulbs for around two hours, we see that it (Figure 2) is different from the earlier example, although both are restorative and perhaps might be equally restorative.

In contrast with these two medium-scale experiences, a person in a large-scale wilderness expedition might be highly engaged by the

exhilaration of being alone in the challenging environment for two days. In this example, the scale and the presence of nature is high, social environment is nonexistent, and duration is high and extended. Such a profile, also of a highly restorative experience is given in Figure 3.

Let us now take a garden designed to be restorative: In the Joel Schnaper Memorial Garden in Manhattan, the design accommodates sensory stimulation, focusing on sound and fragrance (McCormick, 1995). Simple circulation patterns, open views, shade-providing tent pavilions and vine-covered trellises are some of the design features of the garden. Sounds of wind chimes and falling water are also part of the sensory environment that includes fragrant wisteria, herbs, flowers, and fruit trees. Texture is another important consideration as is visual interest. In this medium-scale natural setting, a person might find mild engagement where he or she can spend long hours alone with a friend. This environmental profile (Figure 4) then might be considered as mildly restorative.

However, the same profile might not be sufficiently restorative to another person whose needs for social interaction as well as stimulation are higher. In that case, the same environment to be restorative might have to show the profile in Figure 5.

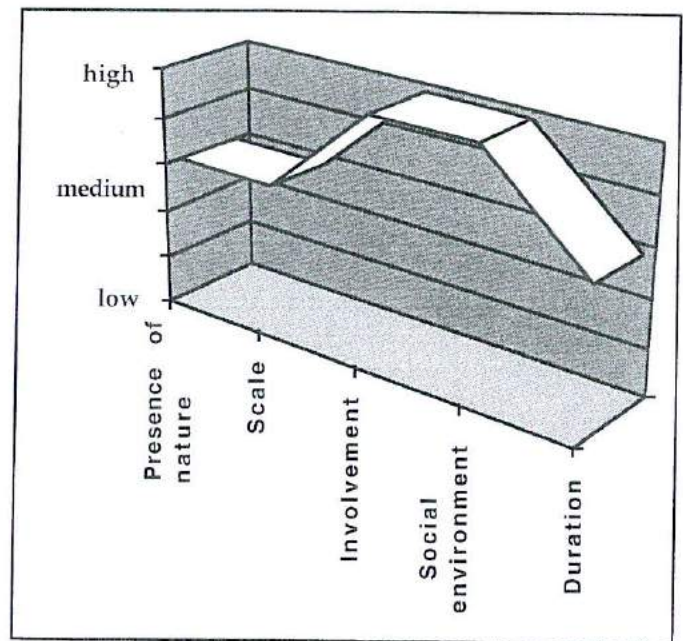


Figure 5. Restorative environmental profile.

CONCLUSION

The preceding examples and profiles begin to indicate that restorative activities, such as gardening or visiting a flower garden or even hiking in the wilderness are multidimensional and complex, often involving both personal and situational variables. Therefore, what is proposed is a new way to look at the findings and understand the consequences. The restorative environment profile is a quick way to present and understand the needs of the population being served, while estimating the environmental characteristics required to fulfill them. It will constitute a more comprehensive language between environmental researchers and designers, while also beginning to assess the person–environment compatibility. These profiles can also be useful tools in planning and evaluating designs of restorative environments.

While the profiles used in this paper are conjectured examples to illustrate how different they can be, much testing and refinement is necessary to begin to flesh out the nuances of people's restorative experiences in restorative environments.

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Guidelines for Designing Healing Gardens

Mara Eckerling, JD

For this paper, a healing garden is defined as a garden in a healing setting designed to make people feel better. The ideas for what should be in the garden are taken from historic precedent, clinical studies, literature, interviews with designers, and existing guidelines, as well as personal experience. The prime consideration for designing the space is the emotional state, or how a person would feel while in the space. For a healing garden to be successful, the person in the garden should feel less stressed, more comfortable, safe, and even invigorated. This is the goal of these guidelines.

Consider the range of emotions that a person feels when they are waiting for treatment, during a hospital stay, recuperating, visiting, or in a long-term care facility. On the negative side, these feelings would range from depression, loneliness, anxiety, fright, sadness, unhealthy, and stressed. This would vary among individuals and the purpose of their visit to the hospital and garden. If mind and body are connected, as most literature suggests, then these are not good for the healing process. So any garden designed as a healing garden should aim to ease these emotions and feelings. One would want people instead to feel soothed, comforted, distracted, interested, hopeful, thoughtful, safe, even invigorated.

The following "methodology" is organized in layers. Each layer represents a level and depth of design. The first layer incorporates the spirit of the place, or what makes a place unique. The second layer is what I call "Making It Work." It includes the physical part that is needed for a garden to work in a hospital setting. The third layer is "Fine Tuning." It is the most esoteric level and seeks to involve all of a person's senses to make a person's experience in the garden healing.

LAYER I: THE BASE

At the heart of "the base" is finding or creating a spirit of the place. This does not necessarily mean

spirit as in sacred space, but space that because of the "quality of the environment itself, calls forth an inner response" (Hughes, 1991, p. 18). This will make the design unique and memorable, and, therefore, better used to make people feel better. It is one of the most important things to designing healing gardens, but then, of course, it's important to designing any garden. The problem of finding, making, or keeping the spirit of a place is particularly acute, as hospitals are burdened with so many physical requirements. Because of this, the sense of uniqueness and making a memorable place can easily be lost in making ramps accessible, finding non-allergic plants, code requirements, etc. The idea is not to make a generic or clinical space. The idea is to make a place where a person would feel less stressed, which can only help the healing process.

LAYER II: MAKING IT WORK

This is an outline of the physical, practical side of designing a healing garden. This is important. Even if the place is wonderful but not many people can use it, it does not serve the purpose. The considerations affecting usability are who will be using the garden, views into and out of the garden, location, physical access, and layout. Since this varies by the type of institution and population, the way to find out the particular needs of the user group would be to interview staff, therapists, patients, and their families. Also, research the different needs and characteristics of the user group, as well as consulting with a horticultural therapist.

Who Will be Using the Garden? (examples to ponder)

- AIDS patients may be sensitive to light and may have lost the use of several senses;
- Patients who are receiving radiation treatment may be sensitive to any strong smells;

- Alzheimer's patients may experience difficulty in finding their way and experience memory loss as the illness progresses;
- Children need areas in which to play and run that accommodate IV poles or breathing equipment, or at least places to observe others playing that are accessible for those with a disability; also, the use of nonpoisonous plants is important;
- Visitors need private spaces for visits with patients that can accommodate groups of many sizes;
- Staff areas need to be at least visually separated from the patient and visitor areas.

Views into and out of the Space

- Spaces need to self-advertise by being visible from inside the building and patient and exam rooms;
- To avoid the fishbowl effect, there needs to be screening or layers of plant material or structures between the windows and the people in the garden;
- Staff needs to be able to supervise the area easily;
- Lighting would be important if people will be around at night.

Location of the Garden in Relation to Interior Spaces

- Those who could use the garden, but are less mobile, should be located closer to the garden;
- Children should be close to the garden;
- Bathrooms and drinking fountains should be located close by.

Physical Access (Who Will Use the Garden?)

- Adequate space needs to be allowed for wheelchairs, gurneys, and walkers to maneuver, especially around doors;
- Paths need to be wide enough to let two gurneys or wheelchairs pass;
- Surfaces must be nonslip, and perhaps de-icing;
- Handrails and seating could help those who are unsure on their feet to get around;
- Raised planting beds would make access to what is planted easily viewed, smelled, and touched by those in wheelchairs;

- Doors into the garden could be automatic, or at least easily opened or monitored if necessary.

Layout of the Garden

- Spaces need to provide privacy for individuals and small groups, as well as for contemplation, viewing, and visiting;
- Seating and tables should be comfortable to sit in and movable, encouraging comfort, and, therefore, longer visits;
- Sun, shade, dappled shade, wind exposure and protection, and warm and cooler spots would be desirable by making a greater variety of people comfortable and, hence, stay longer;
- Electrical outlets would be helpful, as well as emergency phones.

The physical requirements in Layer II are an important part of the process. They are the bones that will make a healing garden work. Without access, views, and good basic garden design, the place would not act as a successful garden, let alone a healing garden.

LAYER III: FINE TUNING

This layer involves all of the senses of sight, sound, smell, touch, and taste. It could be argued that this is intuitively already in any good garden design as described in Layer I and II. However, this provides a more systematic way of looking at dealing with each sense and ensures that they are all individually addressed and incorporated in the garden. Variety, color, texture, and change in the garden are discussed in terms of visual and tactile senses. Aromatherapy theory is used to stimulate the sense of smell, as is the use of plants from "Grandma's garden." Sound is explored for positive sounds and masking negative ones. By incorporating the senses explicitly into the garden, the experience is fuller and more complete.

Visual

Spaces should have variety, textures, and shapes packed into the space to keep boredom at bay. Textures should be everywhere, for sight as well as for touch. It takes the form of plant textures, paving textures, and materials textures. Plants come in a myriad of textures. They have the

added benefit of producing sound when the breeze comes through. Even if a person can only view the garden from the inside, the vegetation will move, suggesting the sounds or the feel of the breeze. That way, they can still benefit. Use different paving materials. There is more than asphalt and concrete that is wheelchair accessible. Mulches used on playgrounds can be negotiated by electric wheelchairs (though difficult for those without upper body strength) or crushed gravel that would make sounds when people walk on it. This may not be for a main path, but perhaps for a side path or an area to rest in. Materials should range from dull to shiny, rough to smooth, stone to natural. Very shiny surfaces need to be used cautiously, for those sensitive to glare.

Seasonal changes are important. This is true not only when patients will be in the facility a long time, but when they will visit at intervals. The garden will change depending on the season and will show and be a measure of the passage of time. It will keep interest in what is happening in the garden.

The shape of the space should be considered in terms of who will be using the space, its purpose, and what those people may be feeling. If it is attached to a waiting area for treatment, the person may be feeling frightened, depressed, apprehensive, or ill. They may even be feeling hopeful, thinking that, "yes, this treatment will help, and I will get better." Positive mindsets should be reinforced and encouraged. In response, the design should consist of enclosed, ordered spaces, that would encourage feelings of safety and comfort. There should be places for privacy and contemplation, that evoke serenity and calm. In a garden for children, in contrast, there would also need to be some open space for running, playing, and burning off steam.

Another element to consider is paths for walking. The path could suggest a mysterious destination or a place to go that is apart from everything else. In a long-term care facility with dementia patients, paths need to circuit, so they do not get lost. It is important to consider who will use the garden, what they will be feeling when they come into the garden, and what feelings the garden aims to promote and encourage.

Color is another aspect of the visual to consider. Warm colors, such as red oranges, particu-

larly with bright light, promote outward, active behavior. Cool colors, blues and greens, especially at lower light levels, induce inward, more passive behavior. However, as people age, they have trouble seeing blue greens, and need brighter light so they feel safe moving around. The color palette depends on who will use the garden. A place where people will be waiting should have a preponderance of blue and blue-green tones, with soft light. The object is to soothe and comfort and make a person feel safe. However, a long-term care facility may need more reds, yellows, and oranges, not only to encourage more active behavior, but so the residents can see the plants. Young children prefer primary colors when given a choice. Color should be considered both in the plant palette and the hardscape.

Sound

This translates to incorporating into the garden water, wind and living elements, such as fish, birds, vegetation, and even people. Water sounds can be varied from delicate for a more contemplative, serene mood, to bubbling, active water, for a more active place. Paths could be made of different materials, so people approaching can be heard, as discussed under Visual. Vegetation should rustle with the wind or when people walk by. This includes trees with rustling leaves, delicate-leafed shrubs, grasses, or bamboo. Encourage birds, with natural food sources and bird feeders. Fish in a pond would make soft water sounds when they surfaced to eat, besides being fun to watch. Windchimes of varying levels can also produce lulling sounds that people prefer. In more active areas, the windchimes could be louder and more lively sounding. In quiet areas, they could be softer and delicate sounding. Noise from mechanical sources, such as air conditioners should be muffled or neutralized with white noise, perhaps from water. Instead of overhead paging systems in a waiting area, pagers could be used. The object is to have the most "unhospitable" sounds as possible.

Smell

The study of aromatherapy dictates that certain scents can be stimulating, refreshing, antidepressing, and relaxing. Stimulating scents include basil, cypress, peppermint, lavender, and

lemon scents (artesia, saucer magnolia, lemon-scented geraniums, and certain roses). Lavender and lemon scents are also refreshing, as well as rose, pine, juniper, and chamomile. Bergamot, chamomile, cedar, clary sage, salvia, sclarea, scented geraniums, peppermint, pine, and rosemary are all antidepressants. Citrus scents, such as from philadelphus and some citrus scented roses and geraniums, are also antidepressants. Tarragon, sage, and thyme are calming to the nerves, and marjoram, lavender, scented geraniums, and roses scents are relaxing (Minter, 1994, p. 1105–111, Valnet, 1980, p. 79–198). To use these scents in a garden, one needs to consider, again, who will be using the garden, and then use them to produce the desired moods. They also need to be where people can smell them, or brush up against them to activate the scent. The list derived from aromatherapy does not preclude the use of other scented plants in the garden. Other highly scented plants, to name just a few, include lilies, dianthus, hyacinths, hostas, honeysuckles, winter daphne, some viburnums, and lilacs.

Several of these highly scented plants suggest another way of helping people heal through a sort of memory therapy, “plants from Grandma’s garden.” Grandma’s plants would be plants that people remember from childhood, which is a different time than the now, where the person is ill and in the hospital. It is primarily sensed through smell but is also a function of vision. Therapists use fragrant plants to stimulate long-term memory, trigger reminiscing, and provide reality orientation. Examples of such plants include lilacs, roses, butterfly bush, magnolias, fragrant narcissus. Someone from the south may remember jasmine or gardenia. Again, plants need to be tailored to the people who will be using the garden.

Touch

Adults tend to view nature rather than be in it. They ignore that need to touch, because it is trained out of them. This may be partially why people see texture without actually feeling it. Flowers with petals and seed pods, leaves on trees, and bark all provide tactile experiences. So could gardening in warm soil in a raised bed. Brick, stone, and metal all feel differently. Once again, variety is the key for different types of experiences.

Temperature is a part of touch. The sun can warm a space or it could make it uncomfortably hot, so there must be consideration of the angle of the sun coming into the space at different times of the year. Space for sun, dappled shade, and shade are crucial because of people’s differing sensitivities not only to temperature but bright light. A light breeze may be refreshing when it is hot, but freezing in cooler weather. People should be encouraged to touch things in the garden, and things in the garden, such as sun, wind, warm and cool spots, should touch those in the garden.

Taste

It is good to make sure that all the plants are if not edible, at least nontoxic. This is particularly important for patients who have dementia and where there will be children. There could be places to eat in the garden, with tables that are easy to clean, and accessible to wheelchairs. It is nice when visiting someone to be able to eat with them in a pleasant setting, and it provides another reason to come to the garden. Thought would have to be given if people are on restricted diets, if food is available. Or, possibly, arrangements could be made for patients to eat meals in the garden. The garden could be located near a cafeteria, making food easily available. An additional benefit is that the garden would be used more by visitors and staff in the hospital. This has both positive and negative aspects, because unless there are spaces that are quiet, it may be too busy to be a contemplative space.

CONCLUSION

Designing a healing garden is not very different from designing any garden. It could be argued that any quality outdoor space heals. However, there are some problems that must be addressed in a healing garden that will positively contribute to “healing” the people using it. To address these problems, this methodology divides the design process into layers, each building on the previous layer, as well as reinforcing and rechecking it. The garden must be a unique, quality space, that has some sort of “spirit” or memorable quality. If this is lacking, the space will not be used to its potential. A second layer deals with the constraints that make it hard to incorporate a “spirit.” This would include consideration of the types of us-

ers, views into and out of the garden, accessibility, and location. These are the physical things necessary for any space that is attached to a hospital. The third layer deals with involving and engaging the senses in the experience of the healing garden. People access the world through their senses, and they tend to use vision the most. Involving other senses makes the experience more complete and meaningful. In addition, often in hospitals, people lose the use of one or more of their senses, so it is important to encourage the use of others to access the world.

These guidelines give concrete advice, but are really more of a systematic way of looking at the process of designing a healing garden. It assumes that the garden will be an integrated part of the healing facility. It aims to create a powerful, quality space that people will be physically able to use. It involves the senses of vision, smell, taste, and hearing to aid in the healing process.

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The Primary Colors of Nature

The Essentials of Therapeutic Landscapes

Elizabeth R. Messer, MLA

Therapeutic landscapes exist as places to stimulate the senses, the body, and the mind and to encourage imagination and exploration. This experience can be much more significant when we consider the various forms of the landscape and the natural phenomena that affect it, such as light, temperature, air movement, and sound. While there is a lot of good design work being done in terms of accessible spaces and opportunities to get people outdoors, many designs and designers are overlooking the most fundamental elements of the landscape and nature, which when used effectively are the most therapeutic qualities of any landscape. Every landscape offers cues for one's behavior and ability to function within the space, and our ability to offer therapeutic experiences is directly related to those cues and the properties of nature that make them up. In understanding the relationship between nature and human functioning, therapeutic landscape design can go beyond accessible gardening to incorporate and magnify qualities of the surrounding environment which evoke positive responses. Historically, horticultural therapy has dealt with the hands-on, tangible elements of nature and ways to make these elements accessible. These aspects of horticultural therapy are very important and very effective, but we also need to incorporate the intangible elements of the site, such as light, wind, sound and temperature, in both design and programming to provide a more effective and holistic approach to therapeutic experience.

Every landscape, whether urban, rural, big or small, has the potential to be a therapeutic landscape as long as the designers and users understand how to emphasize elements of the landscape, and of nature, to make it therapeutic. The therapeutic qualities of a landscape, both tangible and intangible, must be magnified through design and programming. It is very im-

portant that designers and programmers also understand the qualities of human functioning within a space and how functioning relates to environmental preferences and behavior. In other words, what about a space makes people function effectively, want to be there, and encourages positive responses? Having an understanding of basic environmental preferences and human functioning within a landscape in relation to the natural phenomena that take place on the landscape, enables horticultural therapists and designers to manipulate elements of the landscape to suit particular needs and provide therapy.

Rachael and Steven Kaplan, environmental psychologists at the University of Michigan, have done significant research and writing about human behavior in outdoor environments. In their book *The Experience of Nature*, they write about human functioning in nature, the preference for nature, and how preference studies provide a means for discovering the categories of perceptions of an environment. Obviously people have many different preferences for what they desire in an outdoor environment, but the Kaplan's studies have shown that these preferences are based on a few common needs and desires. It is very important to understand a few things about basic human functioning when considering the potential for a successful experience in a landscape. As the Kaplans point out, the way we function in a place is based on information that we have or that we are given. Much of this information comes from our immediate environment, and some of it comes from our sense of intuition. There are cues in a place that provide guidelines to our behavior and functioning within that space. These cues can be either verbal, such as speech and signage, or nonverbal, including sounds and views. As a space gets more complex or busy, the combinations and arrangements of these cues need an increasing degree of decipher-

ing. Many of us are able to store and retrieve this type of information gathered from experience, and this often enables us to anticipate actions and responses to an environment. For many of the individuals with which we work, however, storing information in that manner is difficult and often impossible. Therefore, responses to complex or highly stimulating spaces cannot always be anticipated, and there may not be a set pattern for an individual's behavior within a space. But for many of the same reasons, these individuals are often much more pure and honest in their reactions to the natural environment. Our ability to provide therapeutic experiences in the landscape should be based on these fundamental responses and through the fundamental aspects of nature.

Starting in 1970, the Kaplans began studying preference categorization using photographs of various outdoor scenes. The photos contained urban scenes with a minimal of nature, rural scenes with minimal evidence of man, and every type in-between. Individuals in the study would place the photos in one of five categories based only on their preference for the scenes. While discovering which scenes were most preferred was important, what was more significant was the relationship between the photos that were placed in the same categories. In other words, the similarities between photos placed in the same category were what pointed out the elements of preference. Through many series of these photo categorization studies, certain patterns of preference began to emerge, and it became more clear which environmental elements were essential to a preferred landscape.

The role of spatial organization in defining a preferred environment emerged repeatedly in the studies, and the Kaplans contribute this to the idea that a person's reaction to and categorization of a scene is an outcome of their being able to imagine themselves in the scene, and the ease with which they could move around if they were there. The possibility of entering the space and acquiring information, while also being able to maintain one's orientation, emerged as consis-

tently vital elements in the preference of a scene. For example, scenes of wide expanses of unchanging land were rated similarly to scenes of impenetrable forests in that neither offered obvious opportunities for orientation. Forests which were more transparent and which suggested the possibility of paths, offered more information on orientation and direction. This type of spatial organization also offers more information or ideas about what one might be able to do in that space.

A closely related element to spatial organization is that of effective functioning. Preference of environments is strongly related to one's ability to function effectively in a space. Accessibility

obviously plays a big role in effective functioning, both in getting to and from the space, as well as facilitative movement within the space. An environment that fosters effective functioning also often pro-

vides a sense of safety and competence; people like to feel comfortable within a space. An environment that meets these criteria has shown to be an environment that is naturally preferred.

Another important element found in preferred landscapes is that of exploration. In human nature the need for understanding is important, but it is often not sufficient. People also prefer circumstances where they have the opportunity to learn something, or the opportunity for exploration and discovery. As the Kaplans point out in their studies, exploration is an important part of accumulating experience and increasing one's capacity to understand previously confusing situations. Therefore, preferences for environments where both understanding and exploration are offered are greater.

Coherence helps to provide a sense of order in an environment and to direct attention. Coherence is enhanced by things that help to organize patterns such as size, texture, form, light and dark into comprehensive units or forms. Repetition of these features helps to delineate areas within the space. A coherent setting helps one to understand the space. A coherent space does not have to be a simple space, however; a successful coherent space is often complex, but its unifying

*C*oherence is enhanced by things that help to organize the patterns of size, texture, form, and light

characteristics and textures help to make it understandable.

Finally, there is the element of mystery within a place. Mystery is an essential element in the forming of preferences of environments as it undoubtedly invites intrigue and exploration. Some of the classic examples of mystery in a landscape include a bend in the path or river, partial obstruction of the view, or sounds coming from an adjacent area. Therefore, mystery is the promise that new information will be revealed if one walks further into the scene. It is the element of mystery that connects one to the landscape by encouraging exploration and discovery of objects and forms within the space.

While it is important to understand the role of these five elements in the perceptions of landscapes, it often seems that we are not in a position to manipulate our landscapes to include all of these elements. We must recognize that the things that make up the elements of coherence, mystery, spatial organization, and exploration are the very fundamental elements of nature that are common to every site: light, shadow, temperature, sound, wind, and moisture. These are the primary colors of nature, and these are the things that we need to focus on in our therapeutic efforts in the landscape. By manipulating and exposing these agents of nature through the use of plantings, pathways, enclosures, and thresholds, we can make the intangibles of nature understandable and experience-oriented. Through an experientially based landscape we connect ourselves to nature and to the land, and this in turn provides therapy and healing in the most basic and effective form.

A good example of the process and result of exposing the basic therapeutic qualities of the landscape can be seen in the design of the Brook Hollow project, which did so without largely manipulating or changing the site. The center is designed to be a working farm in eastern

Pennsylvania where residents with disabilities can live and work in a rural setting. Production at the farm focuses on the cultivation of native plants, and as an offshoot of this activity, two exploratory paths were designed to lead visitors and residents through the agrarian landscape. The purpose of these paths is to explore and experience the varying natural qualities and conditions of the site and by doing so, connecting oneself with both the tangible and intangible landscape. The beginning of the first path is marked by a single large tree in a cultivated field. Here the landscape is wide open, the vegetation is low to the ground, and the visitor is exposed to

the sun, wind, and rain. From this point the path winds through successional fields and young woods, eventually reaching a mature forest where the same sun, wind, and rain take on a new character. The evolutionary path that the cultivated fields of the farm would take if left unmanaged is intro-

duced by passing through a series of vegetative rooms. These rooms have their own organization, coherence, and sense of mystery and these conditions are conveyed by the changing qualities of sound, light, moisture, temperature, and air movement.

The second path follows a local watershed route from a spring at the top of the hill down to the creek in the valley. This path of water takes on various forms along the way, from a spring to a seep, to a series of ponds, to a seasonal stream and finally to the creek. Although the landscape is constantly changing, the repeating elements of water, humidity, and the sounds of water ensure the coherence of this progression of spaces. The plant species change with the water table and again define outdoor rooms and thresholds, which heighten the mystery and intrigue of the landscape as well as the desire to explore further. The Brook Hollow project is a successful therapeutic landscape design because it relies on the

***T**hrough minimal design intervention, the visitor explores, discovers, and becomes a part of the landscape, while being bathed in a multisensory experience that depends solely on natural phenomena*

natural elements of the site, both tangible and intangible, to offer therapeutic experiences as well as to guide the design process. Through minimal design intervention, the visitor explores, discovers, and becomes a part of the landscape, while being bathed in a multisensory experience that depends solely on natural phenomena. The paths at Brook Hollow do not create the experience, but rather make it accessible by exposing and enhancing the visitor's connection to the landscape, therefore allowing him to experience its therapeutic and healing properties.

Environmental artists have traditionally been very successful at exposing the varying natural conditions of a landscape. Environmental art is often set up as exploratory situations for the viewer that can only be fully experienced by movement through the

piece that in turn involves elements of time, topography, weather, and physical and visual perceptions. While each environmental art piece and

site are different, there is a common thread that runs through each one regardless of intent, use of materials or location within a site; the piece stands as an artistic device through which the viewer is able to explore and discover the surrounding site and gain a new understanding of his relationship to the landscape. Horticultural therapists and landscape architects need to be aware of these relationships in order to understand how a person's perceptions of nature and the surroundings contribute greatly to the success of the landscape as a whole and ultimately our experiences within the landscape.

Nancy Holt created an excellent working example of these relationships and perceptions in a piece entitled *Sun Tunnels*, which she worked on from 1973 to 1976 in the Utah desert. The piece consists of four concrete pipes, each eighteen feet in length, nine feet in diameter and fifty feet apart, forming an open X. The pipes are aligned so that on the summer and winter solstices, and for several days before and after, the sunrise and sunset can be seen through the pairs of pipes. There are also holes from seven to ten inches in diameter cut out of the top of the pipes in the

shape of specific constellations. In the sun or moonlight, these holes cast circles of light that move across the inside of the pipes with the passing day or night. These pipes achieve a poetic balance with the surrounding landscape even though they are foreign to the site. They offer a place of cool shelter from the hot desert sun as well as a reassuring reminder of direction in the overwhelming vastness of the site. The pipes become reference points in viewing the panoramic vastness of the desert as well; through the tunnels, the landscape is framed and in focus. Holt has created a humanly scaled device through which one can experience the expansive scale of the desert as well as its extremes of temperature and light.

Doug Hollis built a piece in 1983 in Seattle entitled *A Sound Garden*.

It consists of 12 towers, each 20 feet tall, which support a tuned organ pipe and a weather vane. This is a very simple, straightforward environmental

art piece and very effective. It captures the intangible quality of wind and transfers it into sound, which measures and conveys both the rhythm and intensity of the wind. This piece consists of man-made objects that rely on the natural phenomena of the site to become functional and experiential.

Christo is an environmental artist whose largest and most famous piece was a huge undertaking entitled *Running Fence*. It took almost four years to organize this project, and when completed in 1976, it stood for just two weeks. *Running Fence* consisted of 2,050 panels of white nylon fabric, each eighteen feet in height with a total length of twenty-four and a half miles. It ran through the hills of Sonoma and Marin counties in California, jumping roads, crossing cattle ranches and finally ending at the Pacific Ocean, where it plunged into the water. This billowing clothesline-like fence recorded and conveyed the contours of the California hills. It also went a step further in its ability to record the changing landscape by acting as a screen which recorded the color, light, and wind fluctuations of the day. *Running Fence* embodied the life of the landscape

Environmental art has shown that light enables us to experience the passage of time

because its materials made it come alive.

Through their work, Christo and Holt have shown that light is a very important factor in our perceptions of and relationship to the landscape. R. J. Wurtman supports this connection in a 1975 article in *Scientific American*, in which he discusses his research on the effects of light and color on human behavior and the body. According to Wurtman, light is a very powerful force and seems to be the most important environmental input, after food, in controlling bodily functions. Additional research has proven that light of different colors affects blood pressure, pulse and respiration rates, brain activity, and biorhythms. Environmental art has shown that light enables us to experience the passage of time. Light also allows us to enjoy an infinite amount of variety as our perceptions of objects and spaces change under different conditions of illumination. In the therapeutic landscape, the use of light, shadow, and all the variations in between provide opportunities for motion, variety, consistence, orientation, and discovery.

While it is clear that the various qualities of light help to guide our perceptions and behavior in a landscape, there are many other natural environmental cues that perform this function as well, including temperature, wind, moisture, and sound. It is the interactive qualities of these natural phenomena that we connect with through their ability to stimulate us sensorily. With this concept in mind, we must remember the basic requirements of sensory stimulation. Anita Olds in *Spaces for Children*, reminds us that our senses must receive changing stimulation to function. Our eyes see by scanning a view or the visual field around us, but are reduced to blindness when forced to stare at a stationary object. Our ears hear when sound waves approach and vibrate our ear drums. Changes in air movement around us reveal odors and sensations that go undetected in closed, static spaces. Our senses are organs that are designed to detect changes in stimulation, not to monitor constant input. However, Olds also points out that when the environmental input involves dramatic fluctuations in stimulation level, an individual can become frightened and disoriented. According to Olds, the senses will "maintain optimal levels of responsivity if confronted with rhythmic pat-

terns of predictable sameness combined with moderate diversity." Such subtle changes occur frequently in the natural world, and it is our job as therapists and designers to find and emphasize those opportunities in our landscapes. These opportunities exist on every landscape because they are made up of the light, the shade, the wind, the air temperature, the moisture, the natural sounds and smells, and these are the changing elements that are common to every outdoor site whether big or small, urban or rural, isolated, or exposed. As Olds points out, if something as seemingly minor as an increase in the negative ions in the air can "cure" allergies, headaches, dizziness, depression, and asthmatic attacks, then think how much more powerful things like sun, ocean breezes, earth, sand, and water must be to provide healing and harmony.

A successful and meaningful therapeutic landscape design relies on the natural elements of the site, both tangible and intangible, to offer therapeutic experiences as well as to guide the design process. Through thoughtful design intervention, the visitor should be exposed to the accessible, educational, and experiential landscape, while participating in a modifiable multisensory experience that depends primarily on natural phenomena. The design should not create nature, but rather expose and enhance the natural elements that already exist at the site, thereby enabling the visitor to become a part of the landscape and experience its therapeutic and healing properties. By connecting ourselves with the sun, the shadows, the wind, the temperatures, the smells, and the sounds around us, we are stimulating therapy. And from this starting point we can provide therapeutic opportunities for anybody because we are using the stimuli of nature to stimulate our senses, our bodies, and our minds.

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Stress Management through Garden Design

Virginia McGrath Salamy, RN, MLA

Research on stress indicates that stressful stimuli is detrimental to one's health. Several theories have determined that reduced stress can lead to enhanced immunity and health (Ader, Felton and Cohen, 1991, Benson, 1992, Kiecolt-Glaser and Glaser, 1993, Lazarus, 1966, Selye, 1976). A garden, if designed properly, is capable of reducing stress. Such a garden becomes: 1) an aphrodisiac that provides sensual pleasure through stimulation, diversity, and interest, 2) a haven that creates a bond with nature conducive to a personal and spiritual introspection, and 3) an environment that requires an active as well as passive interaction between the senses and natural stimuli. The garden is, therefore, recommended as one means of stress reduction.

A "Healing or Restorative Garden" should increase and stabilize health through the use of natural elements and aesthetic design principles. The following guidelines are based on my research for a thesis on "Healing Gardens." They reflect an analysis, synthesis, and interpretation of several theories relating to stress, nature, health, and design. They incorporate my views and conclusions in regard to these theories and healing design.

DESIGN RECOMMENDATIONS FOR STRESS MANAGEMENT

Diverse and Interesting Sensual Stimulation

Pleasure provides us with the impetus to seize and enjoy life. Without it life would be dull and remain unchallenged. We become aware of what pleases us when a sense of balance or harmony is felt in the environment and in our lives. Current data indicate a need for the environment to offer pleasure for psychological and physical health to occur.

An organism needs to be aroused to perform basic acts of survival to maintain health. In the

quest for pleasure, sensual stimulation that is consistent, exciting, and satisfying is preferred (Berlyne, 1960). Lack of interest or boredom is responsible for creating psychological stress in an environment because it does not offer enough sensory stimulation (Berlyne, 1960, Merhrabian and Russell, 1974).

Stimulation should be at a level that is balanced to produce pleasure. A rich, diverse, ordered environment that appears pleasant and offers numerous complexity has the ability to maintain and enhance pleasure because of its visual interest and multiple sensory stimulation (Merhrabian and Russell, 1974, Kaplan and Kaplan, 1989, and Ulrich, 1983). Nature seems to be abundant with diversity and complexity that usually appears complimentary rather than conflicting.

When Merhrabian and Russell, environmental psychologists, tested their Pleasure Arousal Hypothesis in 1974, they found that increased complexity was preferred if a setting was perceived as pleasant. The Kaplans (1989), researchers on the psychological effects of the nature experience, found that multiform complexity provided pleasure if coherence was an equal factor in the sensation.

If a garden is designed to create interest through a balanced multisensory stimulation, it should have a varied amount of complexity so that pleasure is a stable and predictable experience. Evaluating complexity in terms of recognition seems to enhance our ability to perceive pleasure, especially when order is defined by familiar patterns. Such an experience should reduce stress.

Spatial Organization that Is Ordered and Balanced

A well-organized garden should appear legible, coherent, and interesting. Spatial arrangements that possess order are usually perceived as pleasurable and relaxing. This perception may cause

the emotional and cognitive processes to sense an equilibrium that interprets a space as offering tranquility and enjoyment. The Kaplans (1989) found order in the form of clarity to be an important element in the preference for an environment. Clarity enables a cognitive assessment of how legible and coherent a space is and helps initiate exploratory behavior. If an ordered setting is perceived as too rigid or precise it may become uninteresting and lack challenge. This may create stress.

If an environment is legible, as Lynch (1960), a researcher of urban images who coined the phrase "wayfinding," implies, it produces relaxation because the fear of being lost is alleviated. According to the Kaplans (1989), coherent landscapes reduce psychological stress because movement and use are predictable. These two aspects were also found to be important indicators of survival since inability to comprehend and analyze a space does not promote safety and security (Appleton, 1975, Orians, 1980, Orians and Heerwagen, 1993).

Visual Evaluation of the Environment

A degree of openness is a preferred quality of spatial configuration that the Kaplans found to be consistent in their studies. Especially if within a bordered and defined area which defines and identifies the space of the garden and separates it from the rest of the landscape. If there is no definition of a space, it may be visually confusing as well as psychologically uncomfortable. Openness was evidenced in the designs of Humphrey Repton, a nineteenth century English landscape designer, and Frederick Law Olmstead, the designer of Central Park. They seemed to be intuitively astute to the benefits of openness as a contributing factor to the Kaplans' notion of "mental restoration."

Enclosure that Enhances a Sense of Mystery

A view enhanced by enclosure creates an element of curiosity that provides a sense of mystery encouraging exploration. The element of mystery is needed to pique interest and excite exploratory behavior to further enhance pleasure. The Kaplans discovered the sense of mystery to be highly preferred in most natural environments.

This was determined as an innate need to acquire more information about a space. The element of anticipated surprise seems to be the motivating factor in this analysis because it seems to increase the need to explore. If the surprise is perceived as pleasurable it may motivate well-being and reduce stress. Complexity through sensual interest seems to increase the effect of mystery. The more pleasantly complex an environment, the more there is to explore and derive pleasure from.

An active role in the garden, encouraged by mystery, seems to create a unique communication with nature that fosters health. When we physically embrace nature, through multi-sensory contact we become charged with a permeating energy that seems to create a lingering effect of well-being. It seems to be important to be both passively and actively involved with nature when health is being considered.

Charles Lewis, a horticulturist who has researched the people-plant relationship for over thirty years, proposes that gardens can be experienced in either an "observational" or "participatory" mode. According to Lewis both modes enhance well-being. However, he implies that the "participatory mode" seems to offer a more pronounced and effective experience.

Enclosure that Creates a Spiritual Haven for the Senses

Gardens that offer enclosure soothe the senses by offering a personal haven encouraging introspection and self-renewal. An enclosure may enhance healing when it provides a gentle stimulation of the senses. Vegetation and garden architecture that appear soothing seem to incorporate the interesting effects of color, texture, and form into a sensory experience that should increase our sense of pleasure. They are important elements for special spaces because their effects seem to offer a therapeutic outcome.

Garden Elements that Contain Symbolic Properties

Familiar forms that remind us of our connection with nature offer comfort and security because they are an innate part of our psyche (Jung, 1964). Shearer (in Relf, 1993) implied this in her reference to fractal geometry; geometric forms make up the structures of most objects in the universe.

CONCLUSION

For example, the circle holds symbolic meaning for most cultures and is a form used consistently in referring to health and nature. The sun, moon, and earth are circles and are responsible for the equilibrium and cycles in life. The earth is a sacred symbol of life that is a single organism maintaining homeostasis, according to Lovelock's (1974) Gaia Hypothesis. This maintenance of homeostasis between every organism on earth is what produces universal health, according to this concept. So the Earth, being circular, has a special significance in our lives that is intuitively understood.

Mountains, lakes, trees, and other natural forms seem to have fluid curves in their outlines and often appear as soft and melodic when viewed from a distance. We visually perceive these forms as familiar, comforting and non-threatening since they seem so natural. This may be a result of the harmonious relationships among light, color, and texture that appear so often in nature.

Natural light stimulates the senses to feel pleasure and comfort and is healing in this form. If natural light is available through reflection in a garden, it offers a physical, as well as symbolic, feeling of health. Colors that stimulate senses through a moderate contrast of hue, shade, and intensity may create a psychological restoration. Color combinations that are harmonious and do not cause conflict are considered therapeutic. Interesting textures seem to stimulate the senses through variation and contrast. The use of fragrance, sounds, and tastes that are sensually stimulating and soothing create an atmosphere of relaxation that may reduce stress by inducing the nervous system into a lower level of activity.

Symbolic features that innately touch our psyche as nurturing, comforting, and healing are important in the restorative garden. Vegetation (especially flowering plants), water, and light (includes color, which is a form of light) may be the three most important symbolic elements in a healing garden. Without these three elements life would not exist. They innately remind us of our dependence on them for sustenance and survival in this world. When they appear balanced and available we intuitively perceive a state of health.

If these six recommendations are followed a sense of harmony may be achieved throughout a garden. Harmony is the quality responsible for holistic health and a balanced aesthetic design. A "Restorative Garden" follows the universal law of harmony in both design and purpose. When light, color, texture, and form are created in a garden design, careful consideration should be given to the effect they may have on the senses. A restorative garden should stimulate more than one sense at a time; it should be a multi-sensual experience that causes a uniform response of well-being. These features, which seem to be the most important design elements in the garden, consistently appear in environments that are found to be interesting, relaxing, and pleasurable. When they occur in a garden it becomes a "restorative" environment.

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Growing Citizens

The Role of Gardens in a Women's Prison

Weeks Ringle, ASLA

Growing Citizens investigates the garden's potential as a linear space of movement as well as a boundary. This linear space functions as a nursery and test gardens for vocational training some inmates receive in horticulture (Figure 1). The nursery is a metaphor for a prison as a place of disparate and temporary associations and one of sheltered growth prior transplanting. The design of this linear space explores the role of nature in marking time and of self-development in a world where time is what separates a woman from her family and home.

SITE DESCRIPTION

The Virginia Correctional Center for Women (VCCW), located along Route 6 in Goochland, Virginia, is the oldest women's prison in the Commonwealth of Virginia and is only one of two women's facilities throughout the commonwealth. Approximately 800 women reside in the facility with an average sentence of 18 years. The facility houses felons with minimum, medium, and maximum security classifications. There is neither perimeter fencing nor guards as you approach VCCW. There is no clear boundary between the small town of Goochland, Route 6, and the prison compound itself. There is no dramatic threshold that marks the area of freedom and that of confinement.

The buildings are hidden by topography and mature trees. Even from the parking lot, the brick colonial revival buildings of the 1930s are partially obscured by forty-foot oaks.

Through the main door of the administration building, there is an obscured view to the left of the honor cottage, the intake building, and the high-security section of the prison, which is tucked into a swale. The periphery of the high-security area is fenced. Heading northwest along the path, the educational center is on the left.

There are open grassy spaces with no apparent formal relationship between the buildings.

A road used for security patrol runs between the education building on the south side and the chapel and gymnasium on the north side. Diagonally to the right is a one-story, brick, non-denominational chapel. Beyond the chapel is the gymnasium, where visitors are received on weekends and holidays. Beyond the gymnasium, on the south side of the road are two three-story dorms. On the left, the land slopes sharply down to a fenced swale. In the swale are a softball field, some benches, and a few tennis courts. It is in this confined area that prisoners can recreate after dinner two or three nights a week in the summer. Once a year a family picnic takes place here.

At the end of the path is the greenhouse building, which overlooks the James River to the south. There is a vertical drop of about 250 feet to the river at a slope of nearly 20%. A four-foot-high, woven-wire fence marks the edge of the prison grounds in certain areas. A person could easily step over the fence and walk down the grassy slope to the railroad tracks that run along the river. (Figure 2)

SCOPE OF DESIGN WORK

Research, site considerations, and design issues suggested four areas to be designed at the prison (Figures 3 to 6). A bounded path would provide the women with a safe place to walk during mass movements as well as an opportunity to understand the importance of boundaries. The Parlor Garden offers the inmates in the horticultural education program test gardens that can be appreciated by visitors to the prison. The Sanctuary provides a secured space outdoors for family members to visit inmates. The Loading Dock has both functional and symbolic roles as the area where plants are stored before being shipped to

the outside world. As part of a horticultural therapy program, that would compliment the design of the complex, therapists would explain how each of these spaces is a metaphor for personal growth.

The Path

VCCW's first warden did not want the complex to look like a prison and fought tenaciously for a campus-like setting, without perimeter fencing or bars on the windows. The women have no defined space in which they can wander freely, with the exception of the existing recreation area that is used only in the summer a few evenings a week. During mass movements, the women walk in the surveillance road. There is no differentiation between pedestrian and vehicular traffic. In *Growing Citizens*, nursery stock is planted in the six-foot-wide median between a pedestrian path of the same width and the road. The planting represents the boundary between the prison and the outside world. The bounded path establishes both rights and responsibilities for the women who walk it: they have the right to walk on a path safe from vehicular traffic and they have the responsibility not to leave the path.

The path also offers an opportunity to mark the passage of time. Mass movements occur four times a day at 8:30 and 11:30 AM and 12:30 and 3:30 PM. As the path is planted with nursery stock, inmates see growth and transformation as well as temporality. As the nursery stock matures from saplings to trees, it is shipped to the outside world. Ideally, a parallel transformation takes place in the inmate—with growth and maturity comes a return to society. The path offers an opportunity to mark both personal growth and the passage of time.

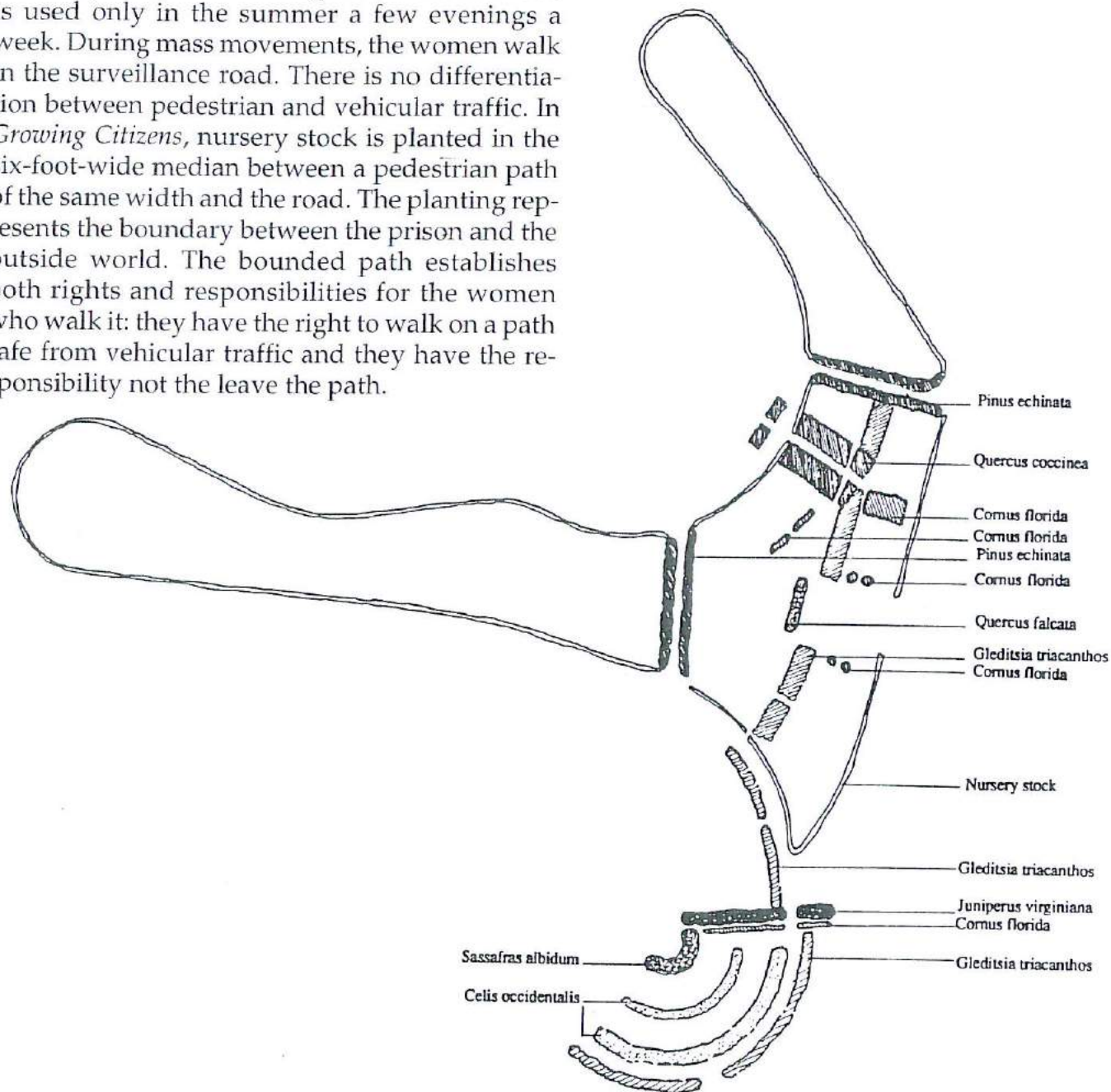


Figure 1. Planting Plan

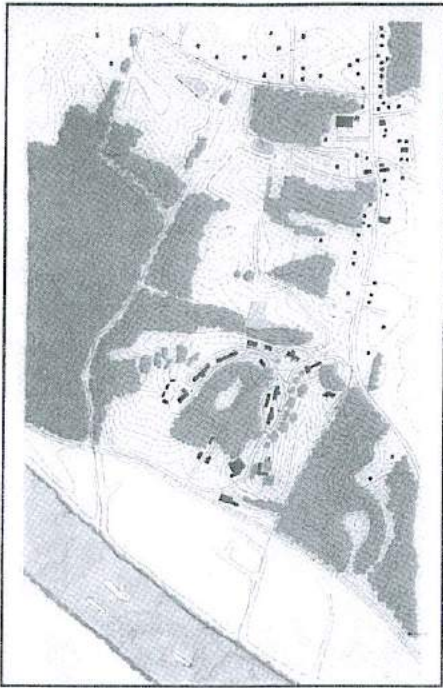


Figure 2.

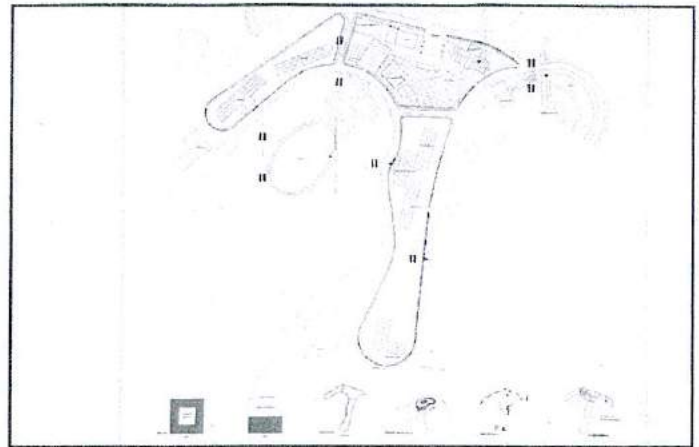


Figure 3.

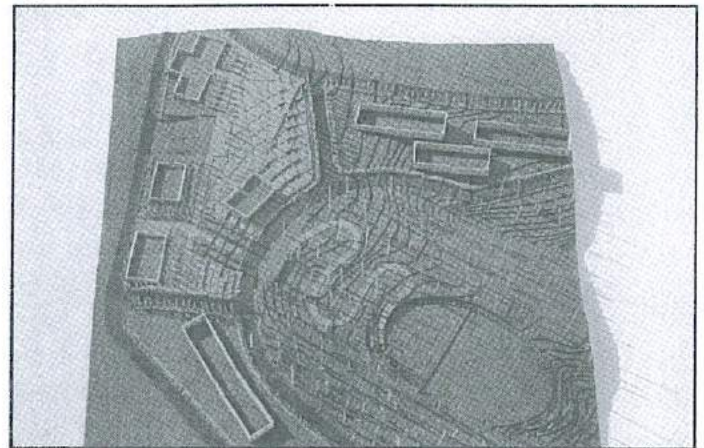


Figure 6.

Figures 2–8. (2) Existing Site plant. (3) Proposed site plant [doors closed and (4) doors open]. In the prison, exposure to nature is controlled through closed doors; opening doors, reveals views of each designed areas. (5) Parlor Garden. (6) Model of proposed site design. (7) Circulation within the prison is an integral part inmate daily life. To determine paths most heavily used, the author traced daily movements of inmates of various security classifications, visitors, and administrators through a study series of acetate overlays. (8) Detail of notational system.

The Parlor Garden

Among the definitions of *parlor* in *The Oxford English Dictionary* is “an apartment in a monastery for conversation with persons from the outside or among the inmates.” The Parlor Garden would be the location of the test gardens for the horticulture program. Siting the test gardens in the most public space in the complex would express not only VCCW’s horticultural tradition but would also allude to the ideals of the prison as being a place that fosters growth. Workers in the test gardens would gain self-esteem as their plants would be on constant display to the visitors of the prison.

In addition to growing flowers, the Parlor Garden could also grow food that could be donated to the community as a type of reparation. The giving of these gifts by the inmates to the com-

munity would begin to repair the bond broken by the inmate in the committing of the crime. In his book *The Gift: Imagination and the Erotic Life of Property*, Lewis Hyde discusses the role of giving within a society. Traditionally gifts have marked thresholds of change, death, and transformation. Hyde also notes, however, that “[i]t is the cardinal difference between gift and commodity exchange that a gift establishes a feeling-bond between two people, while the sale of a commodity leaves no necessary connection.”¹ The feeling-bond could acknowledge a debt to society and mitigate feelings of shame and alienation by the inmates toward society.

The Sanctuary

The Sanctuary would become the space that is currently used as the summer recreation area.

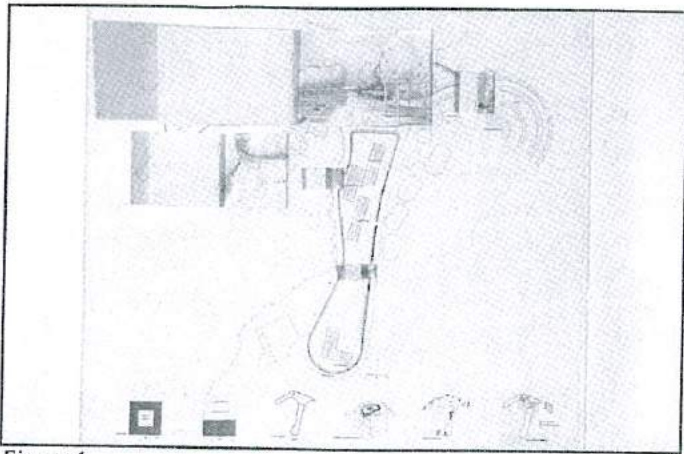


Figure 4.

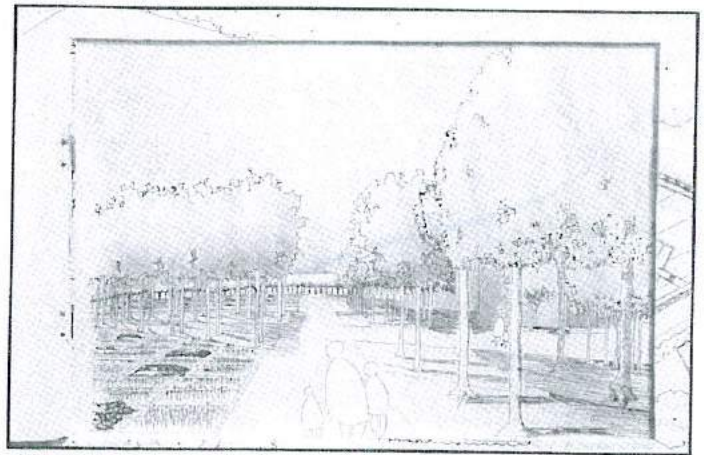


Figure 5.

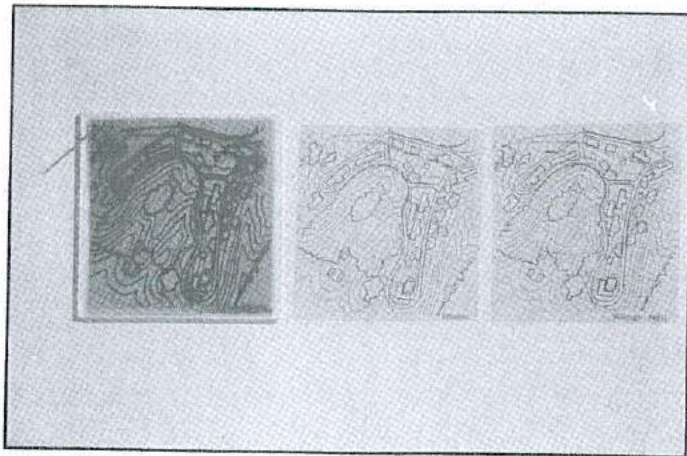


Figure 7.

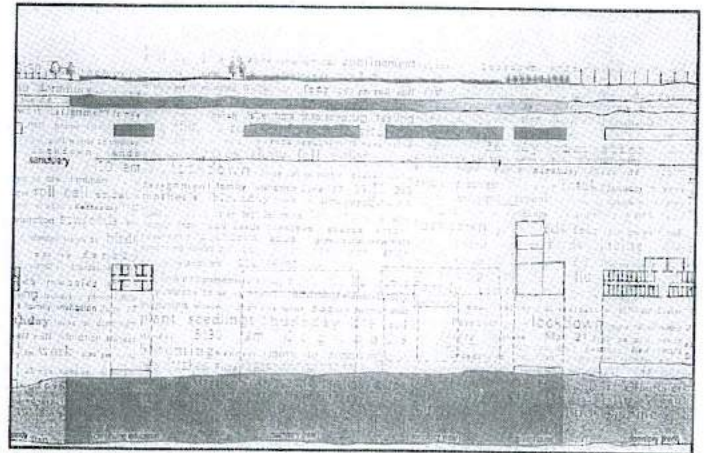


Figure 8.

The project proposes that the Sanctuary be used more frequently. By adding a path and gate, the Sanctuary could be used for family visits whenever the weather is favorable. Seats would be imbedded into the wall to provide seating for visitors. The site would be surrounded by a retaining wall that would eliminate the need for the existing chain-link and razor-wire fencing. Space in the middle of the Sanctuary would be available for softball or volleyball games. The entry to the Sanctuary in the Parlor Garden would serve as a memory device for the importance of ties to friends and family in the inmate's personal growth.

The Loading Dock

The Loading Dock has been designed for both functional and symbolic purposes. Functionally,

a loading dock for the shipment of the plants that is closer to the road presents fewer logistical problems for traffic and security than one that is located closer to the greenhouse. The symbolism of the loading dock also becomes important. It reminds the inmates of their connections to society and the fact that plants cannot be shipped out until they have grown strong enough to survive in less sheltered environments.

DESIGN ISSUES

The design of the prison evolved from research on the cultural history of incarceration, typology, the psychology of self-development and the logistics of instituting such a program in a prison with varying levels of security. (Figures 6 to 8) The design issues that emerged from this research include the articulation of boundaries,

paths and the marking of time, transformation and growth, metaphors for self-development and the role of horticulture, and ranges of involvement for inmates. Research and the consideration of these issues yielded both the program of the project and the physical form it would take.

Boundaries

The articulation of boundaries is one of the primary design issues as division and separation are themes that are entrenched in the concept of incarceration. A bounded path that surrounds the site is introduced to suggest in physical form the boundaries that the women understand mentally: their movements are controlled. While most prisons have more clearly articulated boundaries, such as extensive perimeter fencing and bars on the windows of cells, the boundaries that separate VCCW from the town and the inmates from each other are more diffused.

The nature of a prison suggests boundaries between freedom and confinement. A prisoner, using her free will, has committed a crime that warrants confinement. The absence of an existing gate or perimeter fence around the prison is puzzling. When asked why the women don't hop over the four-foot woven wire fence near the greenhouse and walk down the James River or simply walk down the driveway to Goochland, one administrator replied, "For many of these women, the real world is a confusing place."

They don't hop the fence or walk to town to freedom because they are not sure if it exists at the end of the driveway. Rather freedom comes with knowing that you can go back into the free world without falling prey to drugs, without thinking that prostitution or robbery is the only means of making a living. This would reflect the notion that freedom is not gained by merely "doing time" but rather comes with a transformation while in the prison, which enables the prisoner to envision a life outside against which committing a crime would not be worth the risk.

Paths and the Marking of Time

Incarceration is inextricably linked with the notion of time. At VCCW, the prisoners move along a series of paths to and from work and education assignments four times a day at 8:30 and 11:30 AM and 12:30 and 3:30 PM. There are additional move-

ments during the summer, for example, when they are allowed to go to the outdoor recreation area after dinner. These paths offer an opportunity to mark the passage of time.

In *What Time is This Place?*, Kevin Lynch writes,

Time is concrete, tied to remarkable natural and human events: generations, seasons, moons, days. It is not regularly and continuously subdivided but discontinuous, marked by named times, sunset, the dry season, market day. The significant discontinuities may be reinforced by ceremony. Duration is not conceived of absolutely but, if brief, is related to an action...²

The importance of time in the prison is evident on a number of levels. Thus, there become several clocks that mark time for a prisoner. There is the clock that marks the remainder of the sentence. There is also the clock that marks growth, the accomplishment of completing a GED, the birthday of a child who is hundreds of miles away. As this marking of time by several clocks is so critical a part of the inmate's life, the variety of plantings—both temporal and permanent—express differing cycles of time. For example, the plantings along the major paths in the Parlor Garden are permanent. Inmates would see slow changes in the growth of the trees over the period of incarceration. Changes in the size of the nursery stock would be discernible over a number of years. The visible growth in perennials, annuals, groundcovers, and other plants grown in the test gardens would be evident within months. Similarly, while the tree stock would remain in the prison nursery for years, annuals and perennials might remain only a season.

Transformation and Growth

Transformation and growth are represented in the design of *Growing Citizens* through the use of a nursery that bounds the site and permanent plantings in special places within the prison. The nursery not only would provide potential revenue (real or bartered) for the prison, but it would also remind the inmates of the importance of growth prior to release. There are important parallels between the type of the nursery and that of the prison. Similarly,

OPPORTUNITIES FOR HORTICULTURAL THERAPY AND SELF-DEVELOPMENT

the parallels between human growth and plant growth become especially clear in the model of the nursery. In the nursery, plants are placed in a sheltered environment that fosters growth. Once strong, the plants are transferred to less predictable environments. Ideally, the prison provides the same opportunity to individuals who have violated the law. The prison rehabilitates individuals, making them stronger and less susceptible to criminal influences. Once strengthened, the inmates return to society with the ability to resist criminal tendencies.

Some penologists argue that retribution, isolation, and deterrence are the main goals of incarceration, while others assert that rehabilitation should be the primary purpose³. Rehabilitation, however, suggests transformation. Indeed, horticultural therapists at the Garden Project at the San Francisco County Jail have used plant growth and the cycles of nature as metaphors for the dynamic process of personal growth. Inmates and recently released prisoners work in gardens and receive lectures on the parallels between growth in plants and in people. Compost is used as a metaphor for life's mistakes, misfortunes, and lessons that the individual can change into something that will enrich and encourage personal growth. Weeding is likened to the necessary removal of negative influences from one's life. Transplanting and watering-in symbolize the stage of leaving prison and reporting to a parole officer.⁴

RANGES OF INVOLVEMENT

The overall design of the VCCW gardens considers the varying degree of participation by the various groups at the complex. The horticulture trainees will have the greatest exposure to the gardens and, thus, will receive the greatest benefit from them. Other minimum- and medium-security prisoners will have access to the paths and the Parlor Garden, but not to the greenhouse. Maximum-security prisoners will have the least amount of contact but will occasionally walk along the paths and would have psychologically beneficial views of the plantings along the paths and the adjacent woods. Plantings near the maximum-security facility might offer aromas that could be sensed by fragrance even by prisoners without views to the outside.

Each inmate at the prison has a work assignment. The inmates walk in file four times daily between residence halls and work assignment locations during mass movements. Some of the inmates receive vocational training in horticulture at the prison's greenhouse. Although prison administrators view the program as solely vocational training, *Growing Citizens* asserts that inclusion of horticultural therapy into the curriculum and the design of the prison complex would enhance self-development and prospects for rehabilitation.

The Healing and Restorative Effects of Gardening

In 1798 physician Benjamin Rush began using farming as a therapeutic device with the mentally ill. Dr. Rush believed that working the earth would yield therapeutic benefits (Olson 1976). By the beginning of the twentieth century, institutions for the physically and mentally ill and correctional facilities had introduced therapeutic programs based on gardening and horticulture (Grossman). A 1990 survey of 55 prisons in 41 states indicated that "75% had vocational or correctional horticulture industries, 19% had formal or informal horticultural therapy programs and 6% had no horticulture programs."⁵

In his article "Gardening as Healing Process," Charles A. Lewis writes of the calming effect of gardening on prisoners and the therapeutic and rehabilitative use of horticulture in prisons. He comments that both wardens and prisoners acknowledged the importance of the plants grown in the prison gardens. Maurice Seigler, former Chairman of the Board of Parole, notes that when he was warden of a Nebraska penitentiary, inmates damaged buildings but they never destroyed the plants they had grown. Robert Neese, while prisoner at the Iowa State Prison, wrote, "These plants had a strangely soothing effect on our staff, when tempers did start to flare due to tension of constant confinement, a couple of hours work in the garden made pacifists of potential battlers."⁶

For many of the women, the primary source of stress is concern for their children.⁷ VCCW is one

of only two women's prisons in Virginia and is the holding facility for women from all over the commonwealth. As some 90% of the women have children and the average sentence is 18 years, many of the children of the inmates are raised with little exposure to their mothers. Many of these women are from poor families who cannot afford to visit them frequently. When visitors arrive they are not permitted to bring anything to the prison, including photographs of other family members. At best, the prisoner would have two to four hours a week with up to five people, including infants. Each inmate has a list of 25 approved visitors that may visit her. More common are prisoners who only see friends and family members periodically if at all. The gardening skills learned in prison, therefore, would not only provide marketable skills to the prisoners but would also have therapeutic benefits when trying to deal with stress during incarceration and after release.

In their research on the restorative effects of gardening, Rachel and Stephen Kaplan have enumerated four qualities of gardening that restore peace and tranquillity to the gardener. The Kaplans' research asserts that the stresses of the modern world reduce one's ability to concentrate, which, in turn, creates stress. Their findings suggest that a restorative environment is one way to recover from stress.

Through their wilderness research, the Kaplans identified four factors as being particularly important to creating a restorative experience: being away, fascination, extent, and compatibility. Each of these factors is present in gardening. Being away refers to a sense of escape that is often experienced quite intensely in the garden. For "escape" to contribute to the restorative experience, the activity must hold one's imagination or be fascinating. Fascination is central to the therapeutic aspect of gardening. Extent refers to the depth of fascination—that one system connects to another, one fascinating component is related to another to create an understandable world. The natural system in the garden would provide extent for the gardener. Compatibility refers to the satisfaction the gardener receives from understanding that he is able to supply the garden with something it needs and that he is a part of a larger system. The

Kaplans' research suggests that gardeners who used partially or totally organic approaches to gardening found greater satisfaction in the activity because they felt that they were complementing the existing natural system.⁸ Recently released felons at the totally organic Garden Project gardens likened chemical pesticides and fertilizers to drugs as unnatural.⁹

The Role of Gardening in Self-Development

Charles A. Lewis, who has spent over 30 years researching the therapeutic aspects of gardening, concurs. He writes,

The deeper meanings of gardening may be found in the gardener's responses to its progress. Soon after the gardening process is initiated, evidence of achievement becomes apparent. Each sprouting seed, new leaf, or shoot provides immediate proof to the gardener that his nurturing activities have been successful. Such positive feedback serves to entwine him even more closely with his plants. The investment of time, physical labor, acumen, and personal aspirations are rewarded when a plant blooms or bears fruit, bringing almost parental feelings of pride. The gardener gains a sense of accomplishment, self-esteem, and control over his surroundings.¹⁰

In analyzing the stages of self-development, Carl Jung (1960) refers to a total breakdown in one's emotional state as "blackening." Conversely, he labeled a period of extensive reflection and personal growth "greening." Jung postulated that in some individuals a blackening period preceded a greening period—an individual must be totally broken before strong growth can occur. In others, Jung witnessed the reverse pattern of a greening before a blackening. The individual must achieve a level of stability before reflection and personal growth can take place.

A "blackening" and "greening" analysis of associations with VCCW buildings revealed interesting patterns. The buildings that an inmate would associate with the "blackening" periods of incarceration would include the intake building, the psychiatric custody building, and the maxi-

mun security unit. Ironically, one of the "greenest" buildings, the Honor Cottage, is adjacent to most of the "black" buildings in the complex. The rest of the "green" buildings—the chapel, the gymnasium where visitations occur, and the continuing education building are located in the Parlor Garden. Moreover, the entrance to the "greenest" space in the complex, the Sanctuary, is located within the Parlor Garden. The rest of the buildings on the site, mostly dormitories, would be considered neutral.

This analysis is especially useful in comparing the overall "green" or "black" experiential character of the routes between various dorms and work assignments. For example, a horticulture worker living in the Honor Cottage, would pass no "black" buildings during mass movement. However, an ordinary dorm resident who works at the laundry would pass three "black" buildings four times a day.

Another analysis of light conditions was also undertaken to quantify the relative degree of sun and shade along different portions of the path. This analysis would not only be helpful in determining appropriate plant choices for nursery stock, but is also indicative of other experiential qualities along the path.

Psychologist Jay Stone Rice conducted a case study of the Garden Project and relates Jungian thought to his own observations at the San Francisco County Jail gardens.

Carl Jung...discerned how the human psyche was akin to nature. Seasonal variations are observed in human development, with periods of dormancy and growth; death and rebirth. Just as the decaying process in nature is integral to the emergence of new life, Jung posited disintegration within the human psyche could lead to reintegration and growth. A therapeutic relationship based on trust, safety, and acceptance can facilitate this process. As an inmate learns to cultivate life, the resultant increase in self-esteem may lead to the belief that she can be productive in other pursuits.¹¹

CONCLUSION

The growing of plants parallels the growing of

citizens. Both require the leap of faith that care, resources, and diligence will yield growth over time. Neither are always successful. Both are frequently problematic and often expensive. *Growing Citizens* suggests a vision for a more productive prison where horticultural therapy and thoughtful design improve the prospects for a felon's rehabilitation and return to citizenry.

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Footnotes

- ¹Hyde, p. 56.
- ²Lynch, p. 79.
- ³Conversations with Dr. Gary Hawke, 1994.
- ⁴Conversations with Garden Project administrators and workers, 1995.
- ⁵Rice, p. 204.
- ⁶Lewis, p. 250.
- ⁷Conversations with VCCW inmates, 1994.
- ⁸Kaplan and Kaplan, p. 242.
- ⁹Conversations with Garden Project participants, 1995.
- ¹⁰Lewis, p. 247.
- ¹¹Rice, p. 214.

The Paradise Garden

A Model for Designing for those with Dementia and Alzheimer's Disease

Margarette E. Beckwith, ASLA, and Susan D. Gilster, RN, BGS, NHA

In the nineteenth century, a number of clay tablets of cuneiform text were discovered in the ruins of what had been the temple library in Nineveh, once the capital of ancient Assyria. The tablets, dating from the seventh century B.C. were, it is hypothesized, collected from a much earlier text dated at about 2500 B.C. In the form of an oral history, its origins extended back even further to a much earlier period. The document has become known as the Gilgamesh Epic (Gardner and Maier 1984).

The story describes the experiences of Gilgamesh, the king and his friend Enkidu. It explores the depth of his grief at Enkidu's untimely death. In an attempt to assuage the pain, he pursues a course in search for the key to everlasting life. What is striking about this document is not only the universal manifestations of this emotion, but that it is probably the earliest description of the "Garden of the Gods," a place of eternal and everlasting beauty, sustenance, and pleasure. Here, the "Tree of Life," bears gems of ruby, carnelian, lapis lazuli, and other rare stones—fruit of imperishable beauty. These are the elements of hope, survival, and benefit, an oasis in an otherwise hostile environment. This seems to be depicting the earliest known antecedent of the "paradise garden," in the region of the world that would later introduce it to the great garden traditions.

As the paradise garden offered a spiritual oasis to those in early Assyria, so it provides a restorative, environment for individuals suffering stress or malady today. For the person with Alzheimer's disease it is the anxiety associated with progressive cognitive demise and gradual dissolution of memory. Here the designer has the opportunity to integrate elements that may be

less important to the unaffected group of individuals but are critical to that of the Alzheimer's population. These aspects deal with "memory." To most effectively involve memory, memory can be viewed on a number of different levels. First there is the *personal* memory, the repository of information amassed from earliest recollections and expanded daily, hourly, and by the moment, as our lives unfold. Personal memory is the basis of who we are and where we come from, and forms much of our world view. Another level of memory could be that of the *archetypal*. These are images lodged deep in our consciousness or unconsciousness, spanning cultural boundaries, they provide a potent reservoir of images and symbols to the designer. One such example is a bridge. A universal image, it suggests progression, crossing from one realm to another, moving over a river which may symbolize the passing of time. Finally, there is the *genetic* "memory," those innate based responses (Kellert and Wilson 1993) that have assured the survival of the species and continue to contribute to our life experiences. One such example is the pleasure of water, to hear it, see it, and feel it. Numerous studies have confirmed the preference for a water element in a landscape scene. One need only observe a space with a fountain, to confirm the response that it elicits. Our connection to water is reflected in the fascination that we derive from it.

As the disease of Alzheimer's progresses, ever contracting the realm of cognitive activity, the designer must pursue the diminishing bank of memories, which provide a connection to the continuum of life. Allowing this expanded interpretation of memory offers the designer a greater range of opportunities in the creation of a meaningful place.

Guidelines to confirming the effectiveness of a proposed exterior space and associated elements are revealed in two ways: first, through *current and recent research* into the response to the natural setting, and second, through *historic precedents* that have seeped into our psyches through culture and tradition. The repetition of garden elements over time confirms the preference for them. Based on the review of these bodies of information, an application of the concepts is presented in the form of three gardens designed for a specialized Alzheimer's facility in the suburb of a midwestern city. First, let us review some of the characteristics of the disease.

WHAT IS ALZHEIMER'S DISEASE?

Alzheimer's disease is a progressive, irreversible brain disease that effects approximately four million Americans today. Although first described in 1907 by Dr. Alois Alzheimer, currently there is no known prevention or cure. Generally appearing in the later years, it is initially noticed through subtle changes in a person's ability to remember things. As the disease progresses, additional cognitive functions are effected, such as language, abstract thinking, and physical functions, eventually leaving an individual dependent on others for all their care and daily needs. In the early stages of the disease, cognitive abilities and memory are not significantly impaired. The individual has relatively unchanged capacities for perceiving the environment, for remembering objects and space. The short-term memory is the first casualty of this disease. This decline takes with it the day-to-day, hour-to-hour recall of events. The names and identities of those most recently known and other more current experiences are often lost. For many, the ability to move, to walk, and to be physically active remains. "Wandering" or moving in a less directed mode is also a characteristic of the disease. This activity seems to relieve stress, as does walking for any unafflicted person, and it provides healthful exercise. However, due to the diminished cognitive capacity, this activity can cause anguish because in an unsecured environment, the individual frequently gets lost.

The long-term memory of the individual becomes the resource when recent events are no longer registered. Images, or things that played a

part in earlier years or childhood, remain in varying degrees as a connection to the past, providing memories and pleasures of an earlier phase of one's existence.

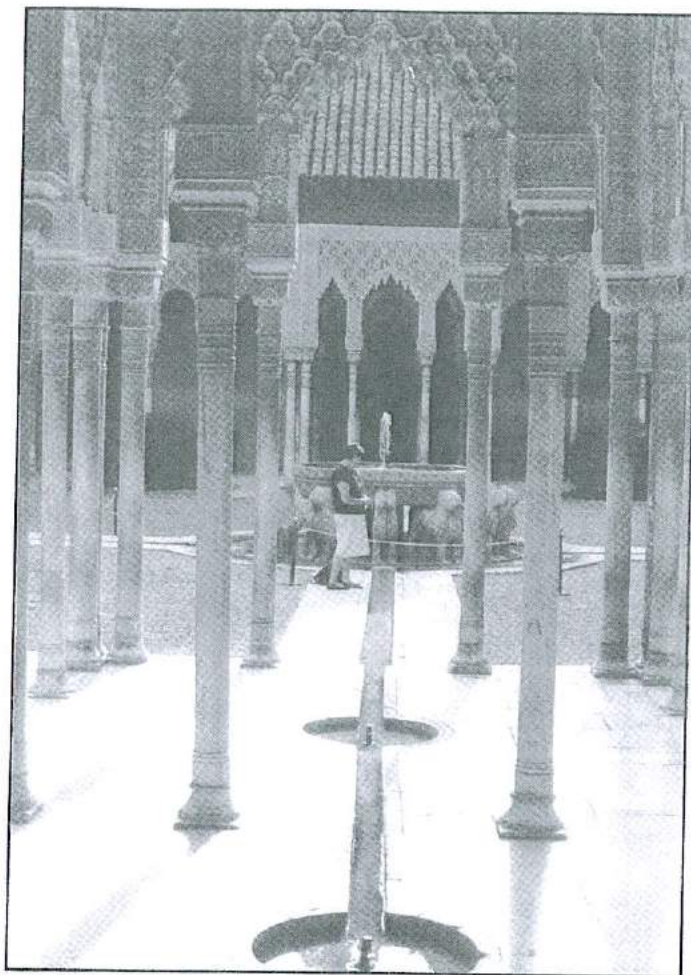
The continued decline of the cognitive abilities poses further challenges to the participant. In time, the disease leaves the individual unable to act independently. The person's capacities seem to be confined to the pleasures of the moment within an ever contracting arena. Exactly how much and what sensory abilities continue to function are not known at this time. Some interesting research is currently being pursued on this topic, but one could surmise that some very basic responses to the environment still exist. These are the responses that are innate, those that are bonded to our genetic heritage. Beyond the senses of touch, smell, and sight lie those preferences based on our earliest "race" experiences that resulted in the survival of the human species. It could be said that at this stage the job of the designer is most critical. What can be offered is a situation that maximizes the quality of life by enriching the immediate experience. Facilitating independence, where possible, and maximizing capabilities through modifications in the environment and therapeutic program aids in enhancing life's pleasures and creating joy. In most cases, death occurs many years after the earliest signs of the disease and subsequent diagnosed symptoms.

SELECTED CURRENT RESEARCH

Current research and empirical evidence of the beneficial affects of nature is extensive. It supports the concept that there exists an intuitive response to nature. The study of preferences and affinity to plants, animals, and life processes has resulted in a wealth of valuable information for the designer. The *Biophilia Hypothesis* (1993), a series of essays, has been assembled by Kellert and Wilson hypothesizing on the origins of these pleasures. It is Wilson's theory that response to the natural environment is genetically based. He stated that the affinity one has to a setting is strongly determined by survival instincts established "thousands or millions of years ago" (Wilson 1993). Survival strategies within the natural environment became the experience that effectively programmed the genetic memory bank.

One of the facets of this affinity has been the topic that Rachel Kaplan, an environmental psychologist, has studied for many years. Like Frederick Law Olmsted in the mid-nineteenth century, she has identified and described the mental activity that is involved in our interest and pleasure in the natural environment. This is what Kaplan categorized as "fascination" (Kaplan and Kaplan 1989). This is an absorbing, restful, and rejuvenating state of mental alertness not derived from other settings or situations. Richard Ulrich, another researcher on this topic, found that a room with a view of a planted landscape contributed to the speed of recovery from stress and from surgery (Ulrich 1991). Recorded brain electrical activity "data suggest that people were more wakefully relaxed during exposure to the natural landscapes" (Ulrich 1993). Could one say that this pleasure equates to a form of therapy?

Another topic of interest, particularly to the designer, is the response to the configuration and elements within the site situation. Ulrich and others have determined from many preference studies that there is a significant affinity to "savanna or parklike settings, including visual openness and uniform ground cover associated with large-diameter mature trees" (Ulrich 1993). Distant unobstructed views most certainly provided opportunities to see potential danger and enhance possibility for escape. The tree canopy screens the desiccating rays of the sun, and the trunks offer the agile individual a potential escape from the jaws of predators. Although this thesis is understandable, Judith Heerwagen and Gordon Orians have identified other aspects of site that are equally intriguing. There are major differences, they profess, in the way the groups of individuals respond to landscapes. Females, children, the elderly, as well as those who are physically ill or depressed, the researchers deduce, should exhibit "a greater affinity to enclosures and protected places..." (Heerwagen and Orians 1993). Women, possibly pregnant or with children, older people, and the ill (less fleet-of-foot) would be unlikely to survive in the open, park-like landscape. A place of shelter would offer a degree of security and refuge; hiding rather than escape would be a realistic defense. Their preferences and pleasures would lie in the security of the enclosed garden.



*Alhambra, Court of Lions
(Photo Christopher Diehl).*

This evidence on the benefit of nature and specifically the preference of enclosed space, as well as vistas into savannah like landscapes, coupled with historical precedents, which follow, is the foundation for the direction that has been taken in this project. It suggests the hypothesis that gardens, especially enclosed spaces, (Heerwagen and Orians 1993) provide an environment preferred by certain groups of individuals. This would include those people with Alzheimer's disease.

HISTORICAL PRECEDENTS

Historically, the preference for gardens is chronicled throughout literature, in pictorial arts and the remains of buildings and associated exterior spaces. Their repeated inclusion indicates a preference. These were restorative environments needed or desired to ameliorate life's pressures. An early example of the benefit derived from gardens is exquisitely illustrated in tomb paintings

of ancient Egypt (600 B.C.). These paintings describe ordered, productive and pleasurable enclosed spaces. Often associated with pools, stocked with fish and fowl, fruit trees, flowers, and water plants are painted with a degree of liveliness and acuity that conveys a sense of understanding and fascination with the garden environment. But, as cited in the introduction, in an even earlier era, of the Gilgamesh Epic are descriptions of the "Garden of the Gods." Emerging from the region described as the "cradle of civilization," between the Tigris and Euphrates Rivers of the Middle East (Kluger 1992), this becomes one of the earliest images.

Evolving from the same cultural roots as the Gilgamesh Epic situated in the Middle East was the paradise garden. A man-made oasis, it was characterized by an enclosing wall. This created a space that was stocked with animals and planted with trees for shade and fruit and plants for flower and food. Continuing as a garden tradition from earliest recorded time, the paradise garden spread rapidly with events of the eighth century. On the wave of Islamic religious fervor, the tradition moved across North Africa and the Straits of Gibraltar to Spain. Like any expression, over time it absorbed influences, including Greek, Roman, and Italian. Extending eastward, the influence of this landscape tradition seeped into the Mughal gardens of India and Kashmir. The garden setting of the Taj Mahal is Alhambra, Court of Lions (Photo: Christopher Diehl) Alhambra, Court of Myrtles (Photo: Christopher Diehl), probably one of the most well known of the examples of this tradition. Even earlier, it filtered into the Judeo-Christian tradition, providing images of the garden found in the Torah and Old Testament of the Bible. The garden seems to have penetrated into our cultural consciousness from a number of sources, becoming an archetypal image.

To more specifically describe and analyze the model of the paradise garden as myth and as cultural phenomenon, it is worth considering the elements that Moynihan (1979) identifies as being significant. They are the: enclosing wall, water element, canopy, and hill. These four elements can likewise provide a structure within which one can create a restorative space to meet the needs of the person with Alzheimer's disease.

An Enclosing Wall

The enclosing wall delineates the paradise garden. To look more carefully at this garden is to analyze its other features, but most obvious is the enclosing wall.

The term "paradise" is a transliteration of the Persian word, "Pairidaeza": *pairi-* meaning around and *-daeza* meaning wall (Webster's 1981). These enclosing walls associated with a residence, originally constructed of mud or stone, provided a degree of privacy, important to the activities of family life. Sheltering plants and people from the searing wind that swept the desert, they also protected against undesirable entry of thief and wild beast, and they secured the space for pleasure of shade, fruit, and flower. The sacred cedar, date palm, pomegranate, fig, and grape vines were among those plants cultivated in this man-made oasis of shade, pleasure, and plenty.

The walled or fenced space served as a refuge. For the Arabian, it defined an area that was removed from the "hostile aspect of the desert" (Dickie, 1976). For the individual with Alzheimer's, there is a similar appeal. It offers a safe and secure space for exercise: walking and "wandering," gardening, and socializing. Defining the limits of the space, the enclosure prevents the predator from accosting the individual made vulnerable by cognitive impairment. It provides privacy and offers a degree of dignity appropriate to those people with Alzheimer's disease. Whether this is a screen wall to prohibit the views of the public or picket fences (Hoover 1994), the delineation of space is the key attribute of the paradise garden.

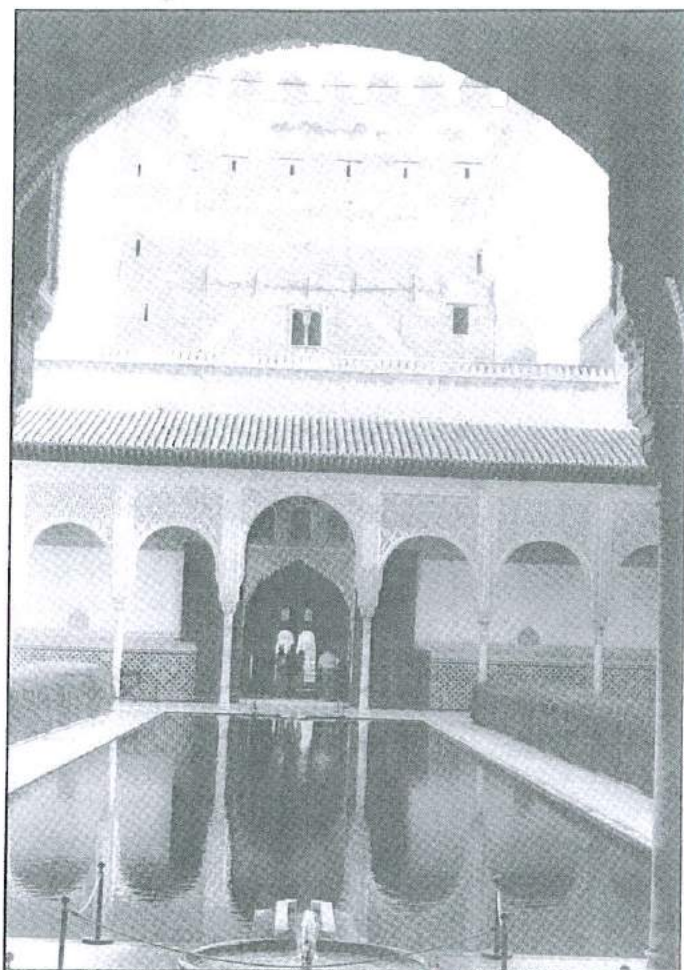
Whereas Rachel Kaplan, environmental psychologist, makes a strong case for the therapeutic benefit of accessible nature in a neighborhood scale, so it may be applied to the residence of the person with Alzheimer's disease. A secured exterior space immediately accessible has the same benefit in a "nearby nature" situation. This component of the paradise garden makes this free, safe, and importantly, accessible to the individual with Alzheimer's disease as and when desired.

In addition, the enclosed space, if planned correctly, can offer views from interior spaces, or "places of refuge." Changing views with the variations of daylight, night lighting, season, and

climatic conditions are reminders that are important for all of us but are particularly useful to those with diminished memory capacity. The aesthetic and affective experience of viewing the exterior space from within offer a psychic escape into the natural environment. Whether it is the delicate lavender shadows of a summer evening, the landscape laden with snow, or the gentle fury of a summer storm, the effect of nature's display can be engaging, engendering "fascination," and providing vicarious contact with the natural phenomenon. In the final analysis, the enclosure, as was the case in the early desert situation, provides privacy, security, and safety. It offers the opportunity for accessibility to exercise areas, to nature, and to social contact.

Water Feature

Water in the paradise garden is a key feature. One of the early depictions of water being the source of all life is found in an ivory plaque from Assur ca. 1247 to 1207 B.C. This image describes a mountain, trees, and a four-part river, symbolizing the four rivers of life (Moynihan 1979). The concept seeps through history, appearing in the Judeo-Christian tradition, Mogul Gardens, and beyond. "And the Lord planted a garden eastward in Eden;...And out of the ground made the Lord to grow every tree that is pleasant to the sight and good for food; the tree of life also in the midst of the garden... and a river went out of Eden to water the garden and from thence it was parted and became four heads" (Bible). The motif was manipulated and refined by the early designers of the paradise gardens. Greek, Roman, and other influences no doubt contributed, enriching the tradition as it was manipulated by successive designers through history. The concept was interpreted by the Christian monks in designing the cloister garths. Like many "pagan" events, the space associated with cathedral and monasteries, were imbued with meaning appropriate to the Christian doctrine. Eighteenth century carpet makers interpreted and embellished the quadralaterly bisected space, creating miniature two-dimensional gardens of colorful geometry in knots. Representing the four rivers, the tree of knowledge, and flowering plots, these decorative fabrics brought to the interior space the wonders of the garden.



*Alhambra, Court of Myrtles
(Photo: Christopher Diehl).*

The essential element for life, through irrigation or aesthetics, water in garden design has always been a significant feature. For both children and adults, it holds an attraction that, in general, has not been superseded by any other feature. Whether it is a muddy stream or a reflecting pool, people are drawn to water. Ervin Zube and others have conducted numerous studies that have revealed subject's unquestioned preference for bodies of water, especially with a calm surface (Zube 1978). Researchers have hypothesized that this is based on our biological necessity for the element. Or could it be that we are at one with it? Which ever the case may be, the affinity for a water feature in the landscape reveals a genetically based preference (Ulrich 1993).

For individuals with Alzheimer's disease, water can be experienced on a number of different levels. From a more cognitive perspective, when the symptoms are mild, it can be seen symboli-

cally: as source of ablution, time, or fertility. It can stimulate the recall of other features and events. As the cognitive abilities diminish, the reaction can be one of a more affective or precognitive nature. Elicited from the deeper memory, the aesthetic response, remains. Beyond these visual reactions is the physical. Dipping a hand into the cool liquid or hearing the murmur of a fountain can be another means of sensory stimulation when the cognitive activity has diminished.

Canopy (Tree or Trellis)

As the enclosure wall is the delineation of horizontal limit so is the canopy a delineation of the vertical. Whether by suggestion through the canopy of tree foliage or the overhead trellis, a "ceiling" element can be established. As Heerwagen and Orians have hypothesized, the tree has played an important role in man's survival. It offered the potential for food, refuge, shade, and a vantage point for surveying the landscape (Bourliere 1963; Isaac 1983; Shipman 1986, cited by Heerwagen and Orains 1993). Formed by trees or trellis for shade, it is as effective for the desert regions as it is for the temperate zone of North America. It defines and orders space, it shelters from the sun, and it filters and softens light. For individuals sensitive to glare, which is common to this age group, the extremes in light intensity can be a source of discomfort.

Trees can be clues to the climatic conditions. Tossed by the wind, the foliage flutters, sways or snaps, animating the space and providing an indication of the wind force. The annual cycle, especially visible in the condition of deciduous trees, reminds one of the season.

By their location, trees were frequently indicators of the existence of water, or an oasis, offering not only the potential for water but also the possibility of food. Historic examples are seen in Egyptian tomb paintings of Ammonhotep dating to 1300 B.C. Here the depiction of date palms and other fruit-laden trees define the garden parameter, while the center space was defined by a trellis. Grapevines, heavy with fruit, cover the trellis creating an edible and decorative ceiling. One can only imagine the pleasure of that space of dappled light, luminescent foliage, and fruit.

Another example of the trellis is illustrated in the alabaster relief of Assurbanipal of Nineveh,

Assyria, 660 B.C. Here, again, the trellis of grapevines creates the ceiling defining the space with visual and gustatory appeal. Alternating cedar and date trees provide the boundary of the space. Symbolizing the essence of royal pleasure, the king and probably his queen, sip wine while being fanned and serenaded in this most pleasant enclosure.

The Mount or Hill

And finally, the promontory, or hill, in the garden has been represented in the paradise myth and in many cultures (Moynihan 1979). The ancient ziggurat (a stepped building or "ladder to heaven") of Mesopotamia, is one of the earliest large man-made structures. A sacred setting in an elevated situation, it raised man nearer to the celestial beings. Other examples are the great Stupa at Sanchi (a sacred mound), and the burial mounds of the American Indians in southwest Ohio. But the concept of hill need not always be large to be effective. The Japanese gardens, such as Ryoan-ji, where from within a sea of white gravel, emerges the realistic mountains is such an example. These oriental gardens were designed as a visual experience.

In the gardens for the Alzheimer's population, the hill is also a visual element. Located in proximity to a seating area the hill becomes a metaphor for the place of prospect, allowing vicarious wandering. A place that defines, by its alternative configuration, the flat zones in the garden.

Thus, the essential elements of the paradise garden (wall, water, canopy, and mound) have been components of the design of three therapeutic gardens at an Alzheimer center in southwest Ohio.

THE MODEL APPLIED

The Alois Alzheimer Center opened May 1, 1987, in Cincinnati, Ohio as a specialized facility dedicated exclusively to the care of individuals with Alzheimer's disease and dementia. It is the setting for applying the paradise garden model. The home, which accommodates eighty-two residents, provides a continuum of care from the early onset of symptoms to the final stages of the disease. The facility is internally organized into three zones to meet the social and physical needs of the residents. Given the particular require-

ments of each of these groups, one garden would not work. Therefore, an accessible garden space was designed for each group.

The Courtyard

The first garden to be constructed was the "Courtyard." This space is not unlike the early Middle Eastern precedent in that it would become a focus for many of the adjacent interior rooms. The building was originally designed as an elementary school, only later to be adapted to an Alzheimer's center. This single-level structure was designed in the era when bringing daylight into the classroom and allowing a child to view the landscape was considered an advantage. Generous windows face into the courtyard offering a "psychic" escape in summer, winter, day, or night. This visual access was one of the therapeutic goals established for the project. Another was the need for the loop path (a circuit walk). This would accommodate the "wanderers" and the walkers on a sinuous path of leisurely progression, offering a variety of views along the way. As a means of consistent reassurance, it delivers the user back to the origin of the journey. A well-defined path, avoiding the confusion and resulting disorientation of "dead ends," is found to be the most successful configuration. Benches are located at intervals, offering an opportunity to sit with visitors or in quiet contemplation.

It is not necessary for all elements in the space to be participatory. The hill, or mound, as seen in the paradise garden or other ancient models can provide visual interest. This element offers variation in the otherwise two-dimensional ground plane, giving change and contour to the garden; offering fascination and mystery. A generous patio, for easy movement of wheelchair or walker, is screened overhead by a trellis for both shade and psychological containment. It is a ceiling creating a degree of security. Nearby a small pool in a raised planter is a focus to the space. The single jet of water gently ripples the pool surface, providing a quiet and comforting murmur.

A curved planted hedge designed to gently embrace the space is not so high as to obscure the view to the building entrance. It suggests enclosure of the sitting area. Raised planters facilitate the individual's desire to reach the soil, to plant a tomato, or to smell the flowers. Personal memo-

ries would be stimulated by old fashioned plants: pansy, peony, snapdragon, and nasturtium. Lavender, thyme, and mint would merge visual and olfactory pleasures. Tastes and fragrances tug effectively at the memory as Marcel Proust confirms, integrating into the situation what has been called "remembrance therapy" (Hoover 1994). As recent memory declines, the remembrance of earlier times can be the source of pleasure. There are numerous ways of creatively including elements into a garden landscape to provoke memory.

The South Terrace

The second garden, the "South Terrace", is somewhat smaller; a contraction consistent with the abilities of the participant. The individuals using this space have lost much cognitive ability but remain very active, continuing to walk and "to wander," sometimes with greater intensity than before. Disorientation, however, is more pronounced. Here, the length of path would need to be more limited. A planted island in the terrace would provide a zone to be circumnavigated. The paving would follow the gentle curve of a raised planter. Luxurious and colorful plants would fill the planter. A small pool with fountain, again, acts as a focal point, drawing attention from the screen wall and fence that secure the space. Clusters of solid garden furniture would be arranged beneath the trellis. The sunshine would be stencilled in an ever-moving pattern on the paving below. Again, consistent with the concept of "nearby nature," the space must be fully accessible to ambulatory or non-ambulatory users.

The West Garden

Further along the continuum, the "West Garden" area contracts the space still further. The need for a "wandering" loop gives way to an area configured to accommodate wheelchairs and comfortable, sturdy garden furniture. The canopy, once more a trellis, offers relief from the glare of the sun. The pool and fountain activate the space in a planter at about a 30-inch height. At this stage of the disease (described above), one of the remaining pleasures is tactile sensation. Plants are selected to provide that experience. Lamb's ear, dusty miller, and ornamental grasses are all

within reach: soft, velvety, rough, and smooth. Color and fragrance are offered through an array of annuals, perennials, and herbs: lavender, basil, mint, and chives. The cool water of a fountain offers a complementary experience.

A word of caution: These individuals are likely to touch and ingest parts of plants. Therefore it is essential to be knowledgeable of the plant materials that are included in the garden. Although the spaces are continuously monitored, the potential remains for flowers or leaves to be eaten. Beyond the obvious dangerous plants such as narcissus, taxus, and rhododendron, there are numerous species that have toxic or injurious properties. All should, of course be avoided.

As the construction process continues, the vortex of interest stimulated by the project draws in the curious, family, friends, caregivers, interested students, and all of those who intuitively sense the potential benefit of gardens. Although the search for a model began in the paradise garden, the key to these restorative spaces for people with Alzheimer's is providing the opportunity to return to where we began: in the garden. The description of a healing place that existed 5000 or so years ago reminds one that, our preferences as confirmed by researchers and a review of historical precedents, are probably correct. Nature is that continuum that offers a restorative relationship. When the mind is in turmoil, particularly for the individual with Alzheimer's disease and the spouse and families, the garden offers peace, tranquility, and quiet fascination. It provides a balm to the pain of grief; it gives comfort, understanding, and security. It offers an opportunity to

heal the spirit and most importantly, it confirms ones place in the universe of things.

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The Walter and Alice Borgeest Garden at Friends Hospital

Ronald A. Durham, BS, HTR, and Nadine G. Kenline, HTR

Friends Hospital, in Philadelphia, Pa., was the first nonprofit psychiatric hospital in America. Founded by Quakers in 1813, its mission statement has never changed. Horticulture has always been a part of the hospital, with the passive use of horticulture available in the hospital's 100 acres of mature woods, landscaped lawns, and nationally known 20,000 azaleas. In the active use of horticulture as therapy, Friends is known and recognized for its pioneering leadership.

Horticulture has always been part of the therapeutic experience as documented by the early Quakers. In 1991, the hospital completed its fifth and most modern greenhouse and horticultural therapy facility. There is a staff of three horticultural therapists and a greenhouse assistant. In addition to the 100-acre campus, the Horticultural Therapy Division maintains perennial, annual, herb, and enabling gardens.

While beautiful grounds, blooming azaleas, mature trees, and sprawling lawns are commonplace at Friends, many patients could only view them from behind windows or outdoors with close supervision. Among the many older adults treated at Friends Hospital each year are patients with Alzheimer's disease or similar disorders. Until now, many of the geriatric patients did not have the opportunity to go outdoors and experience the healing environment nature provides.

Horticultural therapists at Friends Hospital feel that a natural environment may help to lessen some of the agitation and anxiety that is often a symptom of Alzheimer's. It is further felt that plants and flowers can benefit these patients by evoking memories and stimulating the senses.

The garden project began in 1991. Nurses who were working with these types of patients had a vision for a special garden—"a safe garden where some level of independence could be reclaimed." The type of patient groups that were targeted were those involving persons in mid- to

later stages of Alzheimer's, needing psychiatric intervention to decrease severe agitation, uncontrolled behaviors, and a high level of confusion or disorientation. Many of these individuals are oriented to name only, or less.

A hospital committee was formed and the committee identified key areas that needed to be addressed in the garden. They included a safe area in which to wander freely with minimal supervision, plant material for sensory stimulation, and construction elements to provide safety. After three years of planning, meeting, researching, fund raising, and developing three major architectural blueprints (with and without the help of architects and engineers), the Walter and Alice Borgeest Garden began construction in the fall of 1993 and was completed and dedicated in October 1994. It was not an especially smooth process as the construction began with a lean-to greenhouse to be used as an entrance. After the greenhouse was installed, we had to abandon the site as the patient population it was to serve was moved to another building. A new site had to be chosen and two more garden plans designed.

ELEMENTS OF BORGEEST GARDEN

The overall design of the garden is circular in nature, permitting safe, independent wandering by the patients, while leading them back to a central point. Along the path are frequent rest areas and a large gazebo providing a quiet retreat for family visits and a distant focal point in the design. Three small trellises are also placed around the garden for additional interest. The gazebo and trellis were donated at cost by the artist, in lieu of displaying his work to the over 250,000 visitors who annually attend the Philadelphia Flower Show and view the hospital's yearly major exhibit on horticultural therapy.

The garden is easily viewed from the nursing station and interior areas of the unit for supervision of the patients "from a distance" if allowable

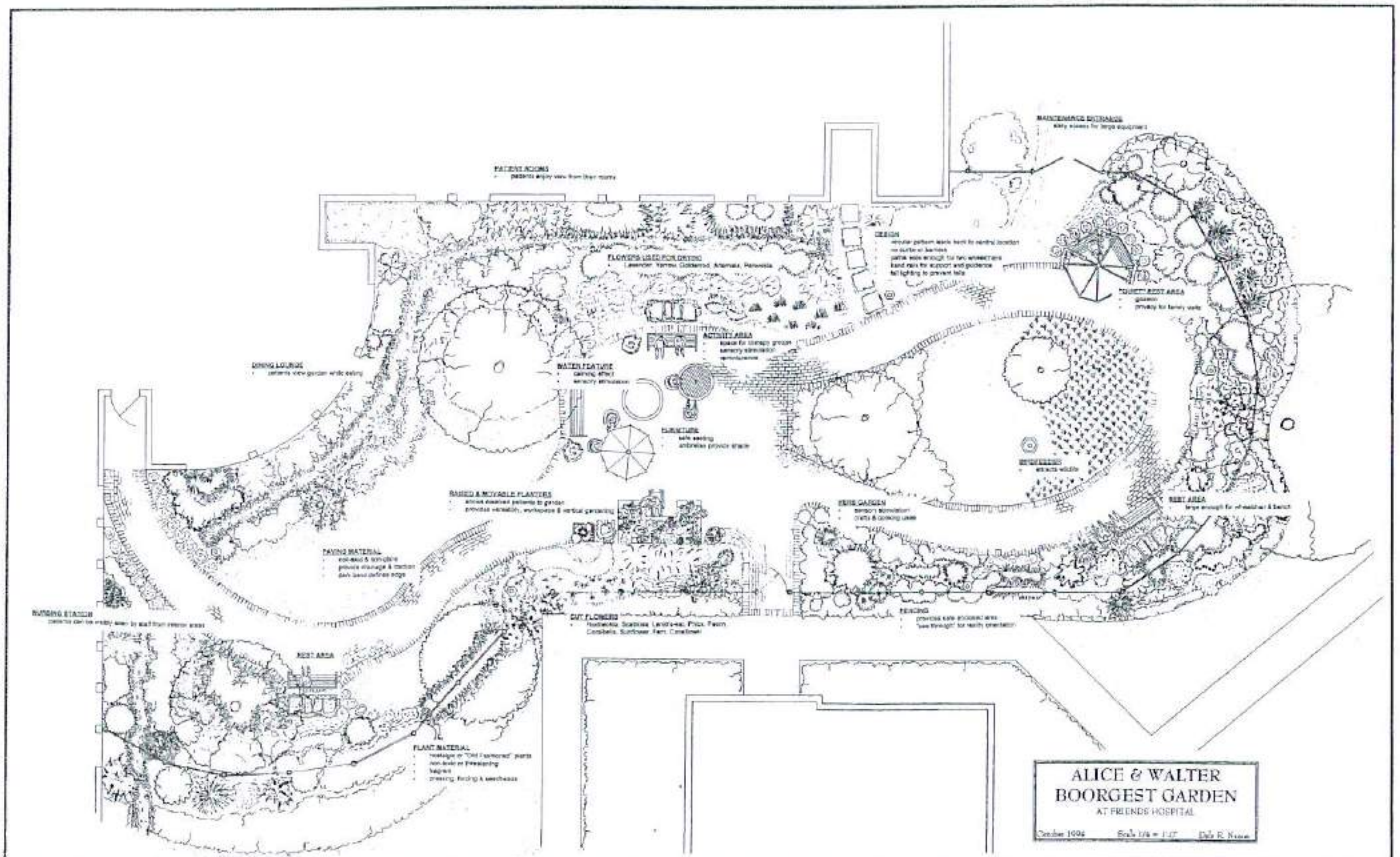
for those patients. Patient rooms also overlook the garden allowing them to enjoy the view from their private rooms. Circulating out into the garden is the patient dining area, allowing patients to enjoy the view while eating meals or sitting indoors in the afternoon sunlight.

Various types of paving and paving designs were researched. Textured, poured concrete would have been the most economical but concrete pavers in cobblestone and regular brick design were chosen. The pavers provide the most aesthetic appearance and possess good drainage qualities and sure footing. They were available in many colors. A varying light-gray border was chosen to reduce sun glare and a charcoal-gray border to help patients identify the sides of the path. The pathway is wide enough to accommodate two wheelchairs to pass each other going in opposite directions. Also featured is "off-path" recessed seating areas to keep the path barrier-free. Recessed areas also feature open areas to accommodate wheelchairs.

The garden is surrounded by a five-foot, custom-made, hairpin-and-ball, cast-iron fence, and it was chosen for several reasons. It's strong and requires limited maintenance, and it stays within

the overall traditional feel of the hospital's architecture. Although it's there to keep patients in, it evokes a very aesthetic feel. The five-foot height permits security to keep patients from climbing over the fence, but it is not too high that it makes patients feel "imprisoned." The hairpin design also provides a safety element because if a patient should attempt to climb over there is limited chance of injury from impairment, unlike the more common spike design. The "see through" factor also helps the fence blend with the patients view beyond the garden and the feeling of being "connected" with the surrounding environment. Included in the fence are a large, double-gated service entrance for lawn mowers, snow removal equipment, and a service entrance gate from the greenhouse complex side.

A raised planter was also designed for accessible gardening from a standing, sitting, or wheelchair position. Only one permanent raised planter was chosen rather than several, as it was felt that this would be sufficient due to the extremely low level of functioning of the majority of the patients. This planter is located near the central space area for convenience during therapy sessions. Several portable containers on



wheels can be rolled into the garden, if needed, for therapy sessions or additional raised planting.

The garden furniture was carefully thought out initially. Custom furniture was seriously considered, but to stay within budget, commercially available furniture was chosen. The furniture chosen is sturdy and safe with sensible seat widths and arm heights. Although a wide pedestal table was preferred, we discovered one with the legs curved inward and felt that it would be just as suitable. The table was smaller, accommodating wheelchairs nicely, and was more in scale with the market umbrellas that provide additional shading. We chose to use two 48-inch tables that accommodate four people each, as the patient groups are generally no larger than that amount. All of the furniture is farm-raised solid teak, which was chosen for its low maintenance and ultimate durability.

An elegant bird feeder to attract birds and a water feature to add visual and auditory stimulation were planned. Plumbing for the fountain is in place as a fountain will be added sometime in the future.

Providing as much stimulation as possible, without overstimulating, was of the utmost importance. Plants were chosen for their color, fragrance, and texture in each season. Plant materials were also chosen that could be nostalgic or that were of an old-fashioned variety that could evoke a memory or stimulate reminiscence of another time. A therapist might say, "Did you pull petals from a daisy as a child, or receive a rose, or plant geraniums for summer color?" The plants may be helpful to begin a dialogue or some conversation with an agitated patient. The nontoxic or nonthreatening characteristics of the plants were also considered in selecting plant materials. Patients can quickly put a leaf or flower in their mouths or stray off the pathway into the areas. Additionally, plants were carefully selected for their use in horticultural therapy activities, such as flower arranging, pressing, forcing, sensory stimulation activities, etc. With the exception of the planters, most of the areas are planted with perennials.

The flowering season begins in early March, with crocus arriving up through the still dormant lawn areas, indicating winter is finally coming to an end. Closely following the crocus, are tulips with various blooming periods to continue the vivid color display. Signs of spring are everywhere as perennials begin to sprout, and as Spring begins to warm the air, patients start to go out more frequently.

The perennials selected were divided into four categories: herbs, cut flowers, plants suitable for drying, and plants that provide sensory stimulation—herbs including lavender, sage, thyme, oregano, and chives—all of which are very common and easily recognizable by many. A succession of blooming perennials for cutting was planned and include rudbeckia, scabiosa, phlox, peony, liatris, Marguerite daisy, sunflower, and a variety of ferns, to name just a few. Floral arranging is a very popular therapeutic activity, and it requires moderate motor skills. Annual flowers for cutting were placed in the raised planters. Flowers for drying include yarrow, lavender, grasses, and artemesia. The dried flowers are used during the winter months. Masses of rhododendron, azalea, daylily, and crape myrtle are used for visual stimulation. The trellis works are adorned with fragrant honeysuckle, trumpet vine, and huge clematis. Even the large red Norway maples give added color to the landscape with their showy maroon leaves. A butterfly bush is used to attract wildlife, and it also provides stimulation. The landscape flows quietly through the fencing, giving the garden even more size, a greater feeling of openness, and a connectedness to the surrounding landscape. This allows the fence to "melt" into the background.

The garden has been used a great deal, except during extreme winter and summer weather. You can almost always see someone ambulating about, sitting in a group, or quietly visiting with loved ones. You don't have to be a horticultural therapist to understand feelings of healing and serenity and the beauty that this environment provides for its users.

The Evolutive Prosthetic Garden

A New Concept for Elderly Living in Nursing Facilities

Carole Labrecque, BS, CSLA, and Lucie Tremblay, RN, BS, MS

In recent years, the elderly population has been increasing rapidly in most industrialized countries. That phenomenon is responsible for many social changes. One of them is the institutionalization of the elderly in need of special care. Most elderly would like to live with their loved ones to the end. Unfortunately, it is often impossible for the family to take care of a parent who requires specific treatment. Deciding to move to a nursing facility is always a difficult choice for older adults and their families. It is easy to understand when we consider the dramatic changes imposed on the elderly's life style.

Where one was used to living alone or with a few members of their family, he or she now has to move to a new environment, surrounded mostly by strangers. It is not easy to live in a large group. Everyone has their own habits and preferences that can become sources of tension, even more so since most residents have little to share and little in common. It can be hard for them to find something to talk about, apart from the weather and the taste of the food. It is even harder to make friends.

Living in a nursing facility also means a lack of choice. For better efficiency in the institution, daily activities are scheduled. Choices offered to residents are often limited to going to the bingo or the bridge activity, or deciding between the blue or pink dress. In many cases, residents used to live by themselves, and were active members of society. Having only short-term personal decisions to make can be frustrating for someone who used to take care of others, as opposed to being taken care of.

Residents having to adapt to that partition between care givers and care receivers is another

characteristic of life in an institution. They are often perceived by the staff as simple beneficiaries of care, forgetting that they are human beings with the same needs and expectations as themselves. Residents don't have many opportunities to share their great knowledge.

The Evolutive Garden concept has been developed to reduce some of the side effects of institutionalization, by giving residents, family, and staff a space in which they can build something together; a long-term project where residents can have major input. The teamwork required to build such a project is the key in establishing communication at all levels within the institution.

The conception of the Evolutive Garden was the result of such a team effort. It is the result of merging the experiences of two disciplines; geriatric nursing and landscape architecture. The project was created in a truly interdisciplinary way that has made possible the emergence of many of the principles presented here.

The Evolutive Garden goes far beyond the simple garden. It tends to be a global concept that has many ramifications in the day-to-day life of the resident. It extends from therapy to daily activities, from outdoor to indoor spaces. There are many benefits derived from such an approach that can be achieved within a very reasonable budget.

THE CONCEPT

What makes an Evolutive Garden truly different from the traditional institutional garden is that it is not a finished product, ready to be used, and complete in every way. Instead, it is more like a puzzle that has to be put together over many years.

PLANNING

The creation of a master plan is the first step when planning for an Evolutive Garden. It should be based on a thorough study of the needs and desires of residents, staff, families, and volunteers of the institution. The study helps define the program and establish the priorities. Representatives of each group have to be involved from the early stages, to make sure they understand the project is really for them and they have a role to play in its realization. The role of the landscape architect is to make the synthesis of the information and translate it in its spatial representation.

Depending on site configuration and the institution's budget, the master plan can also include the phasing of the project. Like big pieces of a puzzle, each phase comes together, one after the other, to create the complete project. Not only does such an approach allow the distribution of the investment over many years, but it also permits an evolution of the garden adapted to the changing needs of residents.

The next step is to start planning and building for each phase. One phase can be seen as a separate puzzle that has to be put together. The best way to build a puzzle is to start with the frame. In the garden, the frame is the basic infrastructure that allows the garden to be used by everyone. To do so, the garden has to be accessible, comfortable, and safe.

Accessibility

Accessibility is the first problem that has to be solved so that residents can go in the garden. It cannot be solved solely by the installation of doors and ramps, which address only the mobility problem. Other physical or mental illnesses frequently encountered with aging people must be taken into consideration when designing for accessibility. For example, vision can be effected in many ways: such as reduced perception of some colors, blind spots, or smaller viewing field which can impact the way these individuals can orient themselves in their environment. Using strong contrasts, bright colors, olfactory, auditive, and tactile markers help reduce the effects of such disabilities and increase the autonomy of the elderly, although, a good

knowledge of the disabilities is important in designing those markers. Using a high-pitch chime as an auditive marker will not prove to be very efficient, since most elderly suffering from hearing loss cannot hear high frequencies. A lower tone is much more appropriate.

Mental disorders also effect spatial perception. Elderly affected by such disorders often have difficulty orienting themselves in their environment. One way to make the space accessible to them is to keep the design of the garden very simple. For example, creating a path forming a smooth loop, linking together activity areas, is a good approach when dealing with residents suffering from dementia.

Comfort

In many institutions where gardens are accessible, they are not used by residents. One of the main reasons for that is that the garden is not comfortable for them. Large open areas often surround nursing care buildings, offering mostly windy and sunny areas as outdoor spaces. Those are hardly comfortable settings for elderly who freeze at the smallest draft and who can sustain a severe drop in blood pressure when exposed to high temperature. The garden must absolutely provide protection from sun, cold, and wind for residents to want to go outside. Comfort can also be increased by providing sufficient seating, in intimate settings, for meditation or family reunions, and in more active areas to facilitate socialization. Knowing they will be able to rest, residents will tend to venture further by themselves or to participate in organized activities. Using adapted working spaces, tools and furniture, also, will increase comfort and autonomy and may increase participation.

Safety

Safety is another limiting factor in the use of the garden. Sometimes residents don't want to go out for fear of falling and hurting themselves or, in some areas, from fear of outside interference. Great attention to detail must be taken to make sure all the residents feel secure outside. The installation of handrails along the path can be a good way to increase the safety for those who are afraid of falling, while the installation of an enclosed space can eliminate the fear of outsiders.

Such a space can also be used freely by mentally impaired residents who might otherwise have a tendency to wander away. Staff will then be able to let these patients go outside by themselves instead of having to escort them or keep them in.

The basic infrastructure of the garden should include every element required to provide accessibility, comfort, and safety. It does not include all the aesthetical elements that are usually found in a normal garden. That is where the evolution can take place.

THE EVOLUTIVE GARDEN

The Evolutive part of the concept has many aspects; evolution of the basic garden, evolution of the garden toward realization of a new project, and evolution of year-round activities. Evolution of the basic garden is simply the realization of the different phases, as they were defined in the master plan, which is a common practice for large projects. The other two forms of evolution are what make this concept unique and original.

New Projects

As explained before, the basic garden includes all elements required to make the garden accessible, comfortable, and safe, but in that phase, the aesthetical aspect is kept to a minimum. That choice has been made to leave room for improvement in the garden. Those improvements can be made by residents toward a wide range of projects integrated to clinical activities. They can become involved in the evolution of the garden at varying levels; conception, planning, realization, and maintenance, depending on their mental and physical capacity. The wide range of possibility gives the therapist a unique opportunity for innovation. From horticulture to wood crafting or painting, residents can be offered many new activities that will lead to a tangible product. That approach allows residents to act on their environment as they would if they were living at home. It can give them a feeling of accomplishment and belonging. This fundamental need seems to be forgotten by many.

The creation of work teams is a good way to handle the creation of a project. The team should be built based on common interest. There might be horticultural teams for lovers of roses, or perennials, or vegetables. Other teams can be

concerned with a specific space, like the patio team or the entrance team. Others can have interest in wood crafting or painting, or any other creative activity, depending on the specific interests of the team's members. Team members should include residents and therapists, for sure, but can also include other staff members, family, or volunteers, if they share the common interest and wish to be involved. The number of persons in each group will vary from one project to another, depending on the size of the project. Utilizing the strong points of every member of the group, the team should be able to carry the project from conception to realization. Figure 1, for example, shows a wall that was put in place as a wind barrier. The simplicity of the wall makes it easy to transform. Figure 2 shows the new space, now decorated with a mural. It could also be changed using trellises or plant material, depending on the team interest. That mural can become a center of interest for an activity area. Its creation will improve the quality of the environment for everyone. Team members will identify closely to that space when others can simply enjoy the new space and the changing aspect of the garden.

Year-Round Activities

The full cycle of design to realization and maintenance creates a project that goes on year-round. The use of subproducts from the garden adds to the number of activities available during cold months—from preparation of the seedlings to

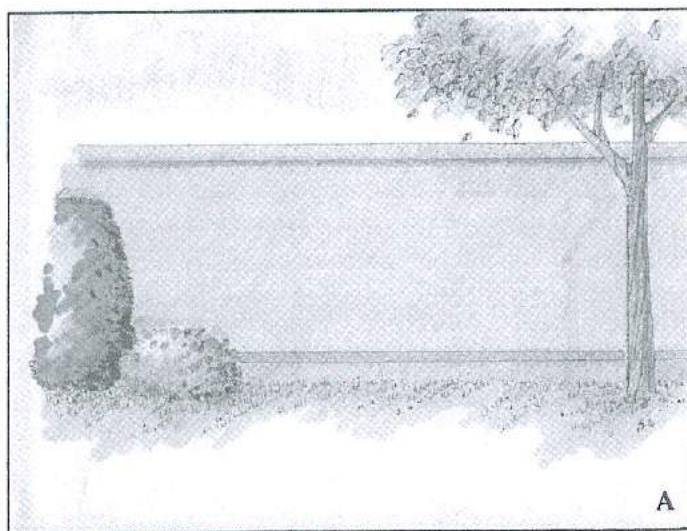


Figure 1. A wall that was put in place as a wind barrier. The simplicity of the wall makes it easy to transform.

flower arrangements, potpourri or perfumed oils and vinegar, the possibilities are endless. The profit of selling these products can help finance other projects for the Evolutive Garden.

A New Dynamic

The Evolutive Garden can create a new dynamic within the institution. The involvement of residents in the decision process not only helps them feel useful but also sensitizes the staff to the precious resources these people represent. In the creation of a project, therapists should make maximum use of the knowledge of the elderly. Families and staff can also be precious resources. They should be invited to participate as members of the teams, or for training, supervision or support for larger projects. The surrounding community can also be approached to fill in the missing expertise and resources that might be required for some projects.

Gathering for all persons involved can be organized around some garden related festivity. The Spring Clean Up Fest, for example, could become a tradition where family, staff, and community join together every year in a party to lend a hand preparing flower beds and gardens or doing other chores that cannot be done by residents alone. Creating traditions and getting everyone involved are ways of ensuring the long-term success of the garden.

Another key element of the Evolutive Garden is the creation of an overall plan and the long-

term implication of the landscape architect to ensure the cohesion of the garden. Each project must be evaluated for its own value, but also its impact on the existing garden must be considered. Such an approach redefines the traditional function of the landscape architect from an outside consultant to a true member of the interdisciplinary team. The nursing staff then has the responsibility of ensuring the day-to-day evolution of the project. This strong implication really makes the project part of the life of the institution. The long-term viability of the project depends on this implication.

Establishing the Communication

Older adults living in institutions, most of the time, are perfect strangers to each other. They might not have a lot to share. A common project helps them to come together and gives them something to talk about. The garden is a way to create new associations with fellow residents. They can help each other and learn to respect everyone without prejudice. The Evolutive Garden gives residents the opportunity to work together to improve the quality of life for everyone.

The Evolutive Garden helps staff put in place new therapies and new activities in which the residents have real input, a goal in creating something meaningful. It helps nursing staff realize the value of residents' knowledge and to learn from it. Seeing them involved in constructive activities gives a new perspective of the autonomy potential of older adults. Nursing staff then become partners rather than care givers, which can enrich the relationship.

Taking care of an aging parent can change the family system. Maintaining a meaningful relationship with disabled parents is sometimes difficult, especially if they suffer from a mental disorder. Getting involved in projects offers families a way to adapt to this new situation. It can bring them closer by working on a common project. When words are hard to find, action can be a wonderful way to express themselves. This is especially true for sons who are often less involved in caring for their aging parents. The need for labor can help sons build new relationships with their parents. It gives the resident and the family something to talk about and an interest in going outside during visits. It helps give a sense

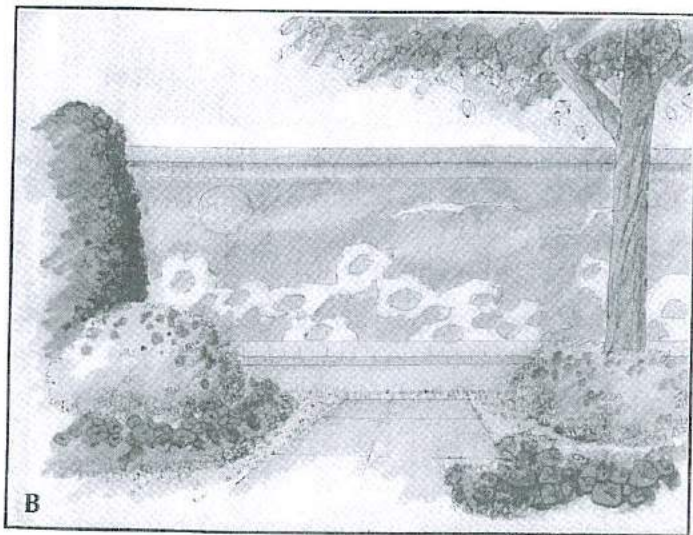


Figure 2. The new space, now decorated with a mural.

of belonging to the family.

Projects can be an incentive for the surrounding community to join in. Going into the neighborhood to seek needed resources can result in new people becoming involved, to give a lecture, or to assist a project by sharing their expertise. Education related to the creation of projects can be of interest to others. Courses offered for the residents can be open to the public, providing another way in which to help finance the project. It also helps integrate residents into their community, by bringing the community into the nursing home. In some cases the community benefits from the results of the Evolutive Garden, including the spaces it creates. One can even imagine that some projects could be realized in surrounding public spaces if space is limited in the institution.

Evolution Does Not Come in a Day

All aspects of the project cannot necessarily be replicated everywhere. Each nursing home has to set its own goals. First, you have to establish a long-term planning of the Evolutive Garden. Then, respect the residents' rhythm and wishes. Start small, but never stop thinking about your long-term goal. Within those limits, possibilities are endless. Be creative. Try new activities, new

approaches. You might be surprised by the response you get. You will never know if you don't try first.

Always utilize existing expertise maximally, whether it comes from residents, staff, family, or the surrounding community. Keep in mind that something that is not possible today might be feasible in a few years, when new resources become available.

CONCLUSION

For an Evolutive Garden to be successful, it has to be accessible to all, and must be comfortable and safe. The evolution of the garden must be guided by a good plan that helps maintain the cohesion of the overall project.

The Evolutive Garden is really more than just a garden. It is a life project for many residents. Its integration into the institution, by well established traditions and everyday activities, ensures its evolution over the years. It calls on everyone's creativity to find ways to help as many persons as possible. The Evolutive Garden has been developed with aging persons in mind, but this concept can easily be applied to other areas and settings, like psychiatric institutions, long-term care facilities for children, and community service offices and organizations.

The Therapeutic Qualities of Plants

Karen L. Haas, HTR, and Rob McCartney, MS

A fundamental question in the discussion of therapeutic landscapes is “what is it that makes them therapeutic?” Is it the accessible structure, the location or setting of the garden, the techniques of gardening in them, or the abundance of plants? This paper will explore the interactive qualities that plants add to therapeutic spaces and their role in “therapeutic landscapes,” rather than structures, techniques, or actual gardens. Plants intrigue our minds, stimulate our senses, awaken our curiosities, and motivate our spirits. Plants invite human participation in the garden. For, without plants, therapeutic landscapes are merely accessible locations.

Plants possess interactive qualities that involve people in the garden. It is the resulting participation of people that makes the selection of plants such a vital part of the process. The three primary interactive qualities of plants that inspire involvement can be categorized as 1) Sensory 2) Functional, and 3) Responsive relationship. Plants with sensory qualities stimulate one or more of the five senses. Functional plants take an active role in a participant’s use of the garden. In a nursing home or rehabilitation facility, for example, the plant may provide a product to be used as part of a therapy program outside the garden (herbs for a cooking activity that addresses daily living skills). Plants also foster responsive relationships when they respond to the care that is provided to them. This promotes a sense of control over one’s environment.

THE SENSORY QUALITY

Sight/Vision

The elements in garden design that are most commonly emphasized are those that appeal to our vision. This comes as no surprise, for horticulture is recognized by many as a visual art.

From what the painter captures on canvas to what the photographer captures on film, the form, texture, and color of plants have historically been an attraction to us and our culture. In dramatic fashion, plants can be eye-catching to the point where we refer to the site as an “impact landscape.” It is the type of setting that prompts the viewer to say “wow!” Traditionally this is achieved through the use of floral displays with bold, hot, or neon-like colors. Large overflowing baskets of blooming petunias, impatiens, or lobelia are quick to draw attention and are ideally positioned at front entrances to lure people closer. The distinction between cool and hot colors is best made in reference to the standard color wheel. Those colors ranging from yellow to red are considered warm and those on the opposite side are referred to as cool, namely green through violet. The distinction to note in garden design is the effect they can have on how we feel. To create a peaceful setting in a sunny exposure near a warm-colored house, we might do best by selecting cool, pastel colors. The site already seems to be a bit “hot” so flowers may provide some cool relief. At an entrance to a park, motel or restaurant, tactful use of hot colors might act as a beacon in catching the eye and drawing attention. From a design standpoint, cool colors tend to recede and fade, especially when planted in the distance. Cool colored plants like vinca, impatiens, blue salvia, and petunias are best positioned for close viewing. Hot colors like marigolds, red salvia, zinnias and mums can be effective from a distance as they seem to advance and can catch our attention from afar.

In a good example of color use, a tropical design was planted with the strawflower ‘Bikinis Mix’, known for its array of bright colors and tolerance of heat. Not far away, in the same park, was a secluded garden in full sun, with waves and drifts of white, pink, and purple vinca of the

“Cooler” series introduction. Both plants were appropriately named for the mood and color they portrayed and both supported the mission of the designer.

Bold, inviting color plants

- Verbena* × *hybrida* ‘Imagination’—Verbena
- Canna* × *generalis*—Canna
- Perilla frutescens*—Perilla
- Hemerocallis* species—Daylily
- Phlox drummondii*—Phlox
- Petunia* × *hybrida*—Petunia ‘Supertunia’

Warm

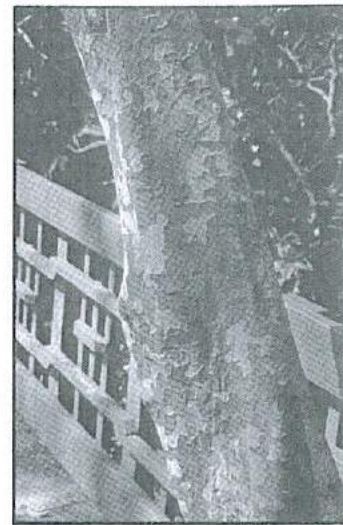
- Tagetes erecta*—African Marigold
- Papavae nudicaule*—Poppies
- Helichrysum* species—Strawflower
- Coreopsis* species—Coreopsis
- Gazania rigens*—Gazania
- Chrysanthemum* species—Chrysanthemum

Cool

- Impatiens walleriana*—Impatiens
- Ageratum houstonianum*—Ageratum
- Begonia* × *semperflorens-cultorum*—Begonias
(white, pink, coral, etc.)
- Petunia* × *hybrida*—Petunias
- Astilbe* species—Astilbe
- Cosmos* species—Cosmos
- Zinnia elegans*—Zinnia
- Zinnia angustifolia*—Mexican Zinnia
- Catharanthus roseus*—Periwinkle or Vinca

Scent

It is hard to walk by a beautiful flower without stopping to smell it. While the sense of smell is not considered as vital as the other senses (sight, sound, taste, and touch), it is an element to be incorporated carefully. Fragrances are detected by a series of nerves in the olfactory canal. Located at the top of nasal passages, they transport messages picked up by sensory cells to the brain. Sensory cells live an average of 30 days and are affected by a variety of factors, including age, drugs, nutritional and hormonal status, and therapeutic radiation (Thomas, 1985). The ability to detect smell is 10,000 times more sensitive than that of taste. It not only adds pleasure to eating but also warns against spoiled food. Everyone’s interpretation of scents is different. Most people have the ability



There are many aspects of the therapeutic qualities of plants.

to appreciate a wide range of fragrances, however appreciation requires practice to perceive and articulate the subtle distinctions (Squire, 1988).

Fragrance, an important and powerful element to include in the design, influences both the overall feeling of the garden and dictates a specific kind of therapeutic experience. Fragrances often trigger memories of particular times, events, places, or feelings. Since fragrances are known to stimulate the mind in unique ways, therapists use the variety of smells present to engage their patients in memory stimulation exercises and nostalgic discussions. Traditional flowers such as



lilacs, roses, and lavender to trigger memories of grandma's backyard, Mother's Day corsages, and spring picnics, for example. Like life, not all smells are sweet. The pungent smells of chives and sages can equally motivate individuals to push their physical capabilities to the limit.

The placement of fragrant plants impacts their effectiveness dramatically. It also directly affects how accessible the fragrances are to the participants in the garden. To actively involve individuals using wheelchairs in the garden, raising the plants to nose height with raised beds and hanging baskets is effective. If people are using the garden space as a waiting area, than placing fragrant plants near benches will involve people, if even in a limited way. Gardens designed to be accessible to people with visual impairments should limit the use of fragrant plants. Too many conflicting smells can cause sensory overload and is a little like someone shouting at you! Consider the additional design characteristics in Table 1 when incorporating fragrance.

Unfortunately, the fragrance of many of today's hybrids has gotten lost in the attempt to breed bigger and more colorful blossoms. Others have always been devoid of smell since other

Table 1. Factors that influence garden fragrance.

Plant variety

Use a variety of plant types to incorporate fragrance, including trees, shrubs, perennials, annuals and bulbs.

Use cultivars selected specifically for fragrance. Example: miniature rose cultivar 'Scentsation'.

Time of day

Volatile oils are more active in warmer weather, intensifying garden fragrances.

Select night fragrant plants for gardens with evening use.

Weather

Humidity prolongs fragrance by decreasing the evaporation rate.

Create a windbreak of tall conifers and hedges to contain the scents.

Fragrance quantity

Create pockets of like fragrances. Coordinate bloom times to use fragrances throughout the seasons.

mechanisms are used for attracting pollinators. The use of fragrance is regaining popularity and hybridizers are starting to add that element back into the mix.

Favorite fragrant plants

Heliotropium arborescens—Heliotrope
Lobularia maritima—Sweet Alyssum
Matthiola incana—Stock
Nicotiana glauca—Flowering Tobacco
Dianthus caryophyllus—Carnations
Dianthus plumarius—Cottage Pinks
Lavandula angustifolia 'Lavender Lady'—Lavender
Allium schoenoprasum—Chives
Salvia officinalis 'Tricolor'—Tricolor Garden Sage
Thymus citriodorus—Lemon Thyme
Clethra alnifolia—Summersweet
Magnolia stellata—Star Magnolia
Viburnum carlesii—Koreanspice Viburnum

Favorite evening fragrant plants

Aloysia triphylla—Lemon Verbena
Hosta plantaginea 'Honey bells' or 'Royal Standard'—Plantain Lily
Nicotiana glauca—Flowering Tobacco
Oenothera biennis—Evening Primrose
Lonicera species—Honeysuckle
Syringa species—Lilac
Tilia species—Linden

Sound

The design of most gardens is to stimulate our sense of sight and smell. How often are gardens designed to rouse our sense of hearing? Perhaps one of the most revealing exercises a design school can conduct with students is to blindfold them in a garden and instruct them to listen. With careful and attentive observation a variety of unique sounds can be identified and appreciated. Clump or mass plantings of ornamental grasses easily sway and bend from a slight breeze as the blades rasp against each other. Weeping willows have a pleasant sound when the wind moves through their long pendulous branches. The cottonwood tree that is not given high regard in the home landscape (due to its messy qualities) yet it is the first to signal a cool breeze on a hot afternoon. The quaking aspen has similar leaves that flicker, click, and rustle in the wind. We should also give consideration to those trees, shrubs, and

flowers that are attractive to wildlife (for food and shelter). What prettier sound greets a gardener than the song of a bird. Often garden elements can compliment or assist plants in creating sound or even masking unintentional sounds nearby. Design elements such as strategically placed chimes or a fountain or waterfalls providing the acoustics of water or even sound speakers hidden in the landscape can help drown out some undesired noises.

Touch

We have so much to learn from observing small children. They seem to be in a constant mode of discovery and observing new information. They ask repetitive questions and they, "touch everything they can get their hands on...." There is a value to touch, we learn from the experience and quite often we enjoy it. So why not provide for such an opportunity with our gardens? If your facility can not provide fuzzy puppies, cuddly ducks, or slippery dolphins, then consider the great tactile qualities of plants. Perhaps the key consideration in the use of "touchable" plants is careful placement, so that all people can interact with and enjoy them.

Some trees have distinctive bark that is both attractive and pleasing to touch, like the shiny smooth bark of young cherry; the frayed, crinkled, papery effect of a river birch; and the mottled, flaky feature of the lacebark elm. Some parks actually have paths built around the trunk of such species so people can not help but touch (or hug!) the tree's trunk. Construction beneath the tree is usually discouraged, but careful construction of decks and wood walks around the base can be done appropriately as not to damage the root systems.

Overhead arbors, arches, and pergolas can feature vines and cascading plants that achieve interesting effects as we pass beneath and possibly brush them aside. A truly entertaining eyecatcher is to stroll beneath an arbor of gourds, especially the long-dipper gourds. To meander down through a tunnel of long pendulous objects resembling wine bottles can prove to be an amusing venture.

Strategic placement of trees alongside path edges to experience the tactile qualities of the foliage is highly recommended. Trees with unique

foliage to touch are magnolias with long, smooth, waxy leaves; the fine feathery texture of larch and dawn redwood; and the soft wispy needles of white pine, and do not miss the fuzzy buds of magnolia, which are present before leaves emerge.

Consider constructing paths through meadows, abandoned pastures, and along the edge of ponds and streams. In these areas, visitors are bound to come in contact with tall grasses, reeds, long stemmed prairie plants, and an array of wildflowers. Some of these plants are great to run through, to pluck or stroke, and for some a light touch is all that is needed. Boardwalks and docks extended in bogs are ideal to get close to and experience wetlands and water plants. Grass does not have to be of the tall, ornamental variety to be effective. Providing a transfer point where a visitor in a wheelchair can successfully move on to a nice platform of turfgrass at an elevated height is most desirable. Unfortunately we often take for granted the cool, soft feeling of sitting on the lawn on a summer afternoon.

As referred to earlier, appropriate positioning is essential to the effective use and enjoyment of the plants described. Observe where visitors slow down, rest, or spend stationary time. Chances are these are often benches and seating areas. Consider them a captive audience and this is an opportunity to educate or at least interest them by surrounding the area with unique, tactile plants that draw them closer. Especially place some within arms reach and where bored hands tend to wonder.

In a final consideration of touch, consider the rose bloom. We all appreciate the beautiful color of roses as well as their fragrance. Yet have you ever gently touched or rubbed the petals across your lips? This is another enlightening act learned from observance of a child, when given a rose. It is difficult to describe exactly what it is like, maybe one should ask the child, but a feeling that is cool, smooth, fresh, and lovely comes to mind. Definitely an act that is better experienced than described.

Taste

Plants traditionally grown for consumption often add excellent textural and visual qualities to garden spaces. Possibilities range from herbs, vegetables, and fruits to edible flowers, all with

ornamental and edible attributes. One must exercise caution when mixing edible and non-edible plants, however. Each facility must evaluate the safety issues for their participants, especially people with dementia, confusion, or psychiatric disorders. Individuals must be able to discriminate between edible and non-edible plants. Care should also be taken to exclude any known toxic plants from the area.

Gardens that can meet the cultural requirements of fruits, vegetables, and herbs have much to choose from. Curly parsley and the various thymes are excellent edible border plants. The variegated strawberry 'Panda' not only adds visual interest but presents edible fruit as well. Okra 'Burgundy' adds colorful fruit and foliage. Compact, dwarf, and "patio" vegetable varieties grow well in containers and raised beds with ample sun. Lettuce 'Red Sails', carrot 'Thumbelina', and 'Mini Aubergine Bambino' eggplant are easily incorporated into mixed plant collections. Pumpkin 'Jack-Be-Little' or in smaller quarters, cucumber 'Bush Champion' create edible groundcovers. With a little imagination, fruits, vegetables, and herbs expand the plant list considerably!

THE FUNCTIONAL QUALITY

Therapeutic Uses

Plants with functional qualities are those that therapists can use in helping patients develop or improve physical or cognitive skills such as daily living tasks or decision making. These are generally plants that have multiple uses, beyond their contributions to the garden. Plants selected for the garden should be done so with therapeutic activities in mind, since it is the plants that motivate the patients to excel at their personal goals.

Growing herbs, for example, leads to a host of activities commonly done with patients in rehabilitation or habilitation facilities. Herbs need to be harvested, which promote hand-eye coordination, flexing, and stretching. In cooking exercises, patients work on sequencing steps and reading by following recipes, and motor skills like stirring and chopping. Flower gardens can be used for cut flowers to be used fresh or preserved for drying. Spatial perceptions, hand-eye coordination, and fine motor skills are integral parts of the

process of both fresh and dried flower arranging.

Often it is up to the horticultural therapist to make full use of the plant materials available for maximal therapeutic value. Old fashioned favorites as well as plants that offer flowers for pressing or drying provide the therapist with material to extend the use of the garden. For example, Mary is a patient who has had a stroke. She has limited use of her left side and neglects her left field of vision. The patient's therapist knows that she likes flowers, pansies particularly, because they remind her of her childhood. Although it is winter, Mary is presented with pressed pansies to use in making a sun catcher to hang in her window. To do this she must learn to position her left hand by using her right hand to hold down the sticky plastic. Then she must scan to find the pansies that have been placed on her left side, get the pressed pansies from the plate using her right hand, and place them on the sticky plastic in front of her. Mary is learning to adapt to her new limitations and work on diminishing them through this and other similar exercises, even when the garden is dormant. Mary is motivated by her love of pansies and the garden to attempt the challenging activity. The pansy suncatcher hanging in her window will be motivational as she looks forward to spring and the improvements she will make by then.

Entertainment/Humor

We hesitate to use the word "entertainment" when discussing gardens because it has unfortunately picked up some negative connotations over the years. Frankly speaking, the setting that gardens and landscapes provide is truly appropriate and conducive to social entertainment. Do not rule humor out either. We might consider the belly-laughs from neighbors when your zucchinis become logs suitable for bon fires. When the local county agent selects *your* yard to conduct a clinic on insect and disease problems, one might tend to chuckle. If entertainment has had a bad name let's give it a good one with how we design our gardens.

Topiaries are plants artfully pruned into various shapes and animated forms. Longwood Gardens and Disney are known for their clever recreations of characters and animals in a variety of plant configurations. Topiaries have the ability

to attract or catch the eye of people who may not have had an interest in plants. Once they slow down and observe the topiary, they are often intrigued that the object is actually composed of numerous little living plants. When they inquire about the care, attention, and thought that a topiary takes, they come away with a better appreciation of plants.

RESPONSIVE RELATIONSHIPS

When people become involved in growing plants, the relationship formed is interactive. Those growing and tending plants learn very quickly that plants respond to the care given to them. Furthermore, plants respond regardless of the disability or condition of the care giver. Without water, plants wilt. Without fertilizer, they turn yellow and grow weak. Too many robust weeds and they lose out to competition. The plant's positive response to nurturing is growth, and perhaps flowers and fruit. People respond with an increased sense of control over their environment, improved self-esteem and confidence, and a motivation to pursue coping with the goals that are before them. It is as basic as that.

Children who cope with chronic illness and frequently spend large amounts of time in hospitals respond enthusiastically to the opportunity to be the care giver. Gardens for these children may be as simple as large paper maché nursery containers. In fact, gardens can provide an interactive element for patients unable to leave their hospital rooms. By incorporating tiered shelf structures in the garden in addition to the other planting spaces, small window box planters can be planted by the patients indoors. When returned to the garden, the window boxes grouped on the tiered shelves create a large sensory impact. Patients who continue treatment in the hospital or return for outpatient visits watch the plants respond to their care, much in the way that they watch their own responses to the care that they are receiving. Horticultural therapists, nurses, physicians, and parents can use the garden to help the child cope with the emotional and physical realities of chronic illnesses.

Youth-at-risk and children with emotional problems learn valuable cause and effect lessons from taking care of plants. They learn the joys of positive reinforcement as the non-judgmental

plants respond favorably to their care. Responsibility and the value of following through with commitments also become very clear to youngsters who choose not to weed the garden for a few weeks. It is acceptable to design gardens in which children are allotted their own planting spaces to make these discoveries. Community growing areas are also a valuable component as team work and sharing are an important part of the program agenda.

Gardens provide a venue in which relationships, emotions, and memories can be explored. Specific plants evoke responses from garden participants. The choice of plants facilitates this process since they provide a link to people's histories, family values, and traditions. Traditional flowers are often used to stimulate memories and are used in cognitive retraining exercises. Plants, such as columbine, cosmos, lilac, peony, roses, witch hazel, and black-eyed Susan, have long-standing histories, particularly for older adults.

CONCLUSION

The most effective gardens are those that are designed to involve people. Access into the garden is important, but if the users of the space never actually interact with the created environment a grand opportunity is lost. The plants too must be accessible to the people using the garden.

Gardens are an active place. Plants should be selected based on the goals the garden is designed to achieve for the people using it. This list may include casual visitors, patients, families, physicians, nurses, horticultural therapists and other therapeutic professionals. The plants suggested here are just starting points for garden design. It is important to use plants to maximize their therapeutic value. How plants impact the senses, functional uses of plants for active therapeutic interventions, and the responsive relationships initiated confirm that careful selection is vital to the successful use of therapeutic gardens.

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Design of Outdoor Environments for Wellness and the Role of Landscape Architecture

Scott C. Scarfone, ASLA

At present, many architectural design guidelines for the design for wellness of health care facilities have been researched and documented. However, at present, landscape architectural supportive design for wellness for the ill and elderly have not been fully addressed. This paper is intended to provide an overview of the theory and the considerations for the design of outdoor environments for wellness and to illustrate the progress made by researchers and landscape architects.

THEORY

"Ugliness can demean the people who live among it. What a citizen sees every day in his America: if it is ugly, it can demean his existence, if it is attractive, it adds to the quality of life," said President Lyndon Johnson. This statement supports the notion that a person's physical surroundings affect his or her outlook on life and state of health in a positive or negative way.

Environmental psychology suggests that human well-being is fostered when our physical surroundings afford moderate degrees of positive stimulation. Positive stimulation is the degree to which human emotions and feelings are positively encouraged through a person's physical surroundings. This stimulation effectively holds a person's attention and interest without causing stress to the individual. Lack of positive stimulation causes people to focus their thoughts and emotions inward, increasing their troublesome thoughts and increasing their stress levels. This theory suggests that certain types of outdoor environments are important in reducing stress and encouraging the mind to initiate healing (Ulrich, 1986).

Environmental and human behavioral research reveals that stress and exposure to out-

door environments can be inversely proportional. Stress can be expressed through any number of physical and emotional indicators including, but not limited to, anxiety, delirium, elevated blood pressure, and depression (Ulrich, 1984.) Often the ill and elderly express this stress through verbal outbursts, social withdrawal, sleeplessness, and noncompliance in taking prescribed medication. The body's response to any one of these forms of stress can have negative effects on the immune system's ability to function correctly (Ulrich, 1991.) A reduced immune system has a debilitating effect on the body's ability to combat disease.

Stress affects not only the ill and elderly but also staff members. Even staff members who work in a caring environment experience stress (Pardes, 1992.) All too often, their response is negatively directed back toward the patient or resident. This will, in turn, increase the patient or resident's negative behavior, which further agitates the staff. A vicious cycle develops, creating a no-win situation for everyone.

Design must provide for all involved groups and must create environments that are physically and psychologically supportive (Ruga, 1989.) An environment of this type is believed to positively affect the overall behavior of a patient by encouraging relaxation and contemplation. In turn, this encourages the body to rest and restore itself. It supports wellness. Thus, the environment combined with other factors plays an important role in the overall well-being of a patient.

DESIGN PROCESS

Often health care administrators do not recognize the correlation between negative behavior and the environment. As a result, health care and related facilities have environments that are at

best “tolerable.” These facilities are not only unsatisfactory from the standpoint of marketing to patients, but more important, they fail because of the inability to cater to the physical and psychological needs of patients, staff, and visitors. The design of these facilities must do more than simply satisfy functional efficiency, codes, and budgets (Ulrich, 1991.) Whether the project is a hospital courtyard, extended-care facility, life-care facility, retirement village, or medical campus, designing outdoor environments involves researching and defining design solutions that respond to the needs of the user. A complex relationship often exists among the type of housing, the service levels, and the ability of the residents to respond to the environment. These special relationships affect the use and design of these outdoor spaces.

The design process for health care facilities requires participation from administrators, staff, and activity programmers—all led by the landscape architect. Administrators should also give patients and residents the opportunity to participate in the overall design process. Exchanging information enables the landscape architect to maximize choices, pay attention to all aspects of the outdoor environment, and see the space from patient and resident points of view. After all, residents are the ones who will benefit from the design. Another vital component of a successful design is the interaction among the landscape architect, health care management, and activity programmers. These groups must actively collaborate to determine the exact user group, type of activities that will take place, and extent to which the space will be used. The success of any design depends on if people frequently use the space and if people use the space as intended.

Early in the design process, all who are involved must plan the active use of the outdoor environment. It is especially important for individuals who may be less willing to investigate a new activity on their own or adapt to a change in their physical environment. The landscape architect must consider these groups’ abilities and preferences for outdoor spaces. The final design should consider the intended services and programs for residents, patients, staff, and visitors. Only then can the final design accommodate the needs and concerns of everyone.

The creation of accessible outdoor environments presents many special design challenges. Designing outdoor environments for the ill and elderly demands sensitivity to individuals’ needs, warrants the provision of a safe and secure environment, and requires certain behaviors to be encouraged and others subtly controlled. The following topics address design concerns and are not intended to be a thorough discussion or exhaust all possible methods. Rather, the considerations are to serve as a guide to some of the major concepts that must be addressed when designing special environments.

PERSONAL NEEDS

Closely related to Maslow’s Hierarchy of Needs Theory is the idea that certain basic human needs must be fulfilled for a person to respond to any type of therapy. This theory primarily addresses self-motivation. The following items must be addressed within the environment to stimulate a person to respond to therapy.

Promote Independence

Through management, the design must allow residents to initiate and perform tasks for themselves. Some items that promote independence are:

- Easy access to facilities and options for control of privacy
- Opportunities to participate in activity programming and organizing
- Opportunities to participate in outdoor maintenance—for example, vegetable gardening, raking leaves, potting plants, weeding, etc.

Challenge and Support

A major design concept must be the attempt to permit the individual to function normally despite any disability. The environment must allow for challenge and support by offering:

- Negotiable yet challenging walking routes (various grade changes)
- Various microclimates (sunny and shady areas)
- Recreational options—for example, gardening, sports, bird watching, and so on

Supply Public, Private, and Semiprivate Spaces

A mixture of these spaces, creating both formal and informal areas, cannot only encourage socialization and help combat loneliness but can reduce the potential for an invasion of privacy. Public, private, and semiprivate spaces must have:

- Clearly defined edges that serve to delineate the use of the space and reduce ambiguity
- A type of exterior space with a like interior space—for example, dining room and outdoor patio with table and chairs, bedroom with private patio, etc.
- A transition area between activity zones to allow for physical and psychological adjustment

Heighten Sensory Awareness

The environment should elicit heightened sensory stimulation and facilitate environmental cognition. To do so, incorporate:

- Plant material that is colorful (avoid shades of blue and violet) with many different forms and textures, showing seasonal variety
- Plant material that is highly fragrant
- A highly detailed but uniform environment
- Tactile cues—for example, changes in paving, Braille, and so on

Make it Personal (Tyson, 1992)

This concept is important for esteem building and raising personal satisfaction levels. Changing the environment to one's own preferences allows the individual to feel more at home and less in an institutional setting. This freedom is a form of expression. Several items that promote personalization in areas for individual garden activities are:

- Movable site and patio furniture
- Space within existing designs for residents' own garden amenities from home—for example, birdbaths, benches, etc.

- Resident input in the design process and encouragement of personalization from management

Designing for these outdoor environments requires a sensitivity to the basic human needs and feelings of an individual. For these needs to be met in an outdoor setting, an individual must first feel confident of his or her ability to negotiate the environment.

SECURE AND SAFE ENVIRONMENT

The safety and security of an outdoor environment are crucial. People avoid entering and exploring outdoors mainly because of lack of security or current health conditions make individuals fearful of their susceptibility to physical injury. Once made aware of these fears, a designer can respond by implementing design strategies that will support these individual's in their use of the environment. Certain areas must be addressed when considering their safety.

Visual and Physical Access (Carstens, 1985)

Views to the outdoor environment must be readily available. The scenery must be visually complex to draw the individuals outward through their own curiosity. Close, direct, and easy access to the outdoors may encourage its use. Visual and physical access may be accommodated by:

- Coordinated architecture that has many windows with a variety of views and many doors for easy access
- Views and access that have a variety of landscape experiences—for example, formal gardens, nature areas, etc.
- Access that is readily available and safe—for example, door stoops visible from inside the building
- Transition between two different areas that eases confusion—for example, verandas, trellises, and so on

Environmental Negotiability

As physical ability declines, concern about safety and ability to negotiate the physical environment become increasingly paramount. The accessibil-

ity of any space hinges on the physical relationship between the user and the designed elements. The concept of barrier-free site design develops. To address this issue, provide:

- Walkways that are relatively smooth in texture with nonslip surfaces at 5% gradients or less
- Ramps that act as alternative routes for steps not exceeding an 8.33% gradient
- Handrails that accompany all stairs
- Proper light levels that illuminate and provide security
- Signs that are easily legible—types of signs include 1) directional, 2) informational, 3) identification, and 4) regulatory
- Rest areas with ample seating placed at regular intervals

It is important to make the environment readily available to all people and eliminate their fears, both psychological and physical, associated with experiencing the outdoors. When problems of accessibility are addressed, the designers can begin to focus on the behavior they want to elicit and the experiences they want to give the user.

Designers and administrators must be genuinely sensitive. They must strive to make the outdoor environment accessible to all and must respond to everyone's needs. A dynamic relationship exists between design, management, and activity programming (Carstens, 1985.) The designer must consider the impact that services and programs will have on the user. The goal is a natural yet ordered setting where users experience a sense of well-being that promotes the healing process. This sense of well-being enables the individual, regardless of limitations, to live as fulfilling and independent a life as possible.

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Compact Nature

The Role of Playing and Learning Gardens on Children's Lives

Robin C. Moore, MLA

Each child is born both from and into our biospherical garden on which all humans depend. Healthy humans cannot exist without a healthy biosphere. It is our home. We are part of it. Indeed, health in the broadest sense can be defined as a quality of interrelationship between people and planet.

To feel they live in the biosphere, children must, in fact literally live in it, intimately, daily, and in a way that is developmentally appropriate. Especially urban children need to live in a designed landscape; that is to say, in some form of specialized, secure gardenesque space, where they can explore and experience natural materials and phenomena each day of their lives and where they can work with teachers, therapists, and facilitators in educational or developmental activities, including the arts and culture.

THE THERAPEUTIC LANDSCAPES FOR CHILD DEVELOPMENT

Children need places where their own culture can flourish. Such places, I believe, must be based on nature, for the good of children and the good of the planet. If we assume that early childhood experience becomes powerfully embedded in the psyche of most healthy adults, permanently affecting their values as adults, then we had better start paying greater attention to the quality of the environments where those values have their experiential roots.

The purpose of this paper is to explore the importance of special landscapes for playing and learning designed for children and families. Notice I do not use the term "playground," a construct of limited meaning in the United States, used to describe play settings of manufactured equipment for gross motor development. This

paper discusses a broader concept of children's landscapes, serving at least the following functions:

- As a source of preventive health
- As a place of healing and restoration
- As a place for learning to care for the Earth through hands-on involvement in natural settings
- As settings for implementing a variety of programs along a continuum of therapy, learning, and playing, including interdisciplinary environmental education for children of all abilities

Some of these functions are addressed by existing programs in schools and special education centers, where outdoor components are included. Educational programs offered by botanical gardens, community gardens, and the newly emerging children's gardens can cover some of these functions, but not on a daily basis. All come closest to the concept of therapeutic landscapes for children, along with European precedents to be described later.

If the definition of therapeutic landscapes is broadened from the point of view of children, all can be included. All need to experience the benefits of specialized landscapes. One of the main reasons is that children do not get outdoors as much as they used to. Indeed the lives of some groups of children have become massively restricted.

THE RESTRICTIVE ENVIRONMENT OF CHILDHOOD

Children need freedom to explore, play, and learn from their environment at their own pace, in their own space and time. This type of freedom

is essential for healthy development of the whole child. However, in little more than one generation, there are many indicators that suggest children's access to the outdoors has declined dramatically. There are several reasons.

Elimination of School Recess

This is surely the clearest indication of our adult disregard of children's rights. School recess is being curtailed or eliminated—an added problem in the United States that directly contravenes the Convention on the Rights of the Child (Article 31 addressing the right to rest and relaxation).¹

Changing Family Relations

Changes in family structure and lifestyle (growth in single-parent families and families where both parents work full time) have left a void in children's lives that the community has yet to fill with a political commitment to new types or social infrastructures for healthy child development. Until this happens, television companies and their advertisers have been happy to fill the void (largely with totally inappropriate programming).

The Bogeyman Syndrome

The "Bogeyman Syndrome," coined by Louv, is the fear of children being abducted, kidnapped, or physically harmed when playing outdoors.² Sensationalisation by the media has greatly reinforced parent paranoia and overreaction. The result is a completely distorted sense of reality where a bogeyman is seen around every corner. This has resulted in increasing restriction of children's outdoor activity.

Use of terms such as "lockdown" in large cities, like New York, is particularly bothersome. The child's right to play is being dramatically curtailed by current perceptions of adult threats to child safety in the outdoor spaces of residential areas. Even parents who understand the importance of outdoor play, find themselves caught in

the middle, between allowing freedom and fearing the consequences.

An exhaustive literature survey has not produced much reliable, empirical data on these trends. Although data are scattered and sources are frustratingly inconsistent, there is enough information available to put in perspective the overall dangers that children face in their environment. This indicates that anyone rationally interested in reducing the number of serious injuries and accidental deaths to children would take action on many fronts before attending to

the issue of kidnapping and abduction—and before clearing parks and playgrounds of low shrubs where bogeymen may supposedly hide.

A number of systematic studies of children's use of the urban landscape were conducted in the 1970s by Hart, Moore, and others.³ Follow-up field studies are

needed, using the same participatory methods, to assess changes in outdoor play as a result of the Bogeyman Syndrome. The results of such work could provide the basis for a more rational estimate of the degree of threat.

Traffic Dangers

Traffic danger has been with us for decades. It has simply become progressively worse because of the growth in the use of the private automobile and the lack of attention to the needs of pedestrians in the design of residential streets.⁴

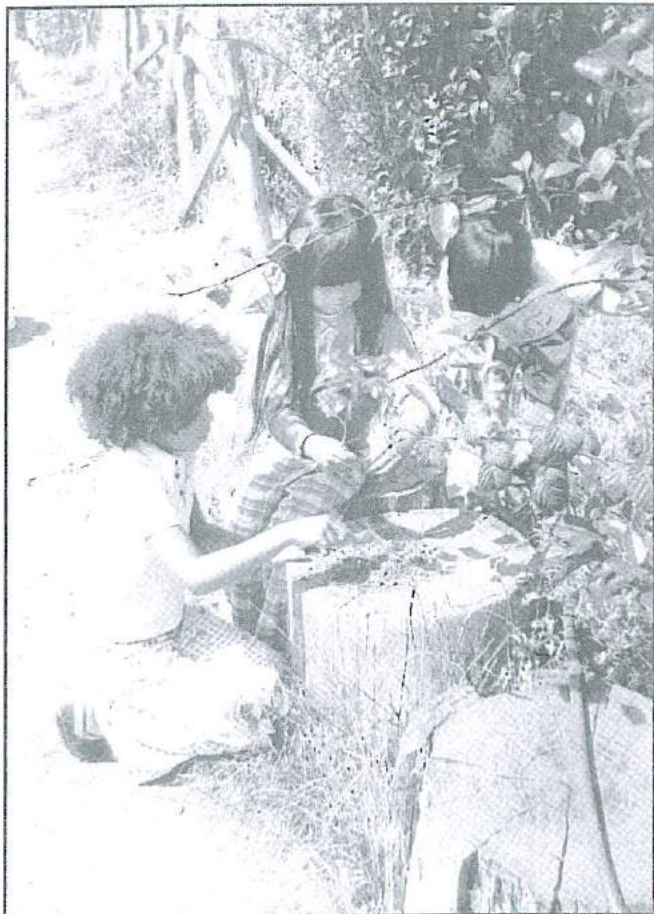
Electronic games

Use of electronic games and computers, along with the TV habit, are keeping children indoors for longer periods of time—especially if the outdoors is insufficiently attractive to "pull" them out!

Tightly Structured Schedules

The highly structured out-of-school schedule of many middle- and upper-class children have left

T*her·a·peutic. Greek, therapeutikos, adj. from therapeuein to attend, worship, treat medically. Also, therapeutae, ascetics of both sexes held to have lived near Alexandria and devoted to contemplation and meditation. Synonyms: Remedial. Helpful. Sustain. Nurture. Facilitate. Accommodate. Serviceable. Useful. Beneficial. Self-supporting. Self-sustaining. Boost.*



them with hardly any free time of their own. The negative impact on children's free play outdoors is substantial.

Commercialization of Play

The private sector has responded to the paranoia of parents and tightly scheduled family lifestyles with for-profit indoor play centers. They are run by staff often lacking in playwork training, offering a narrow range of gross motor activity and packaged birthday celebrations.

Reduced Time Outdoors

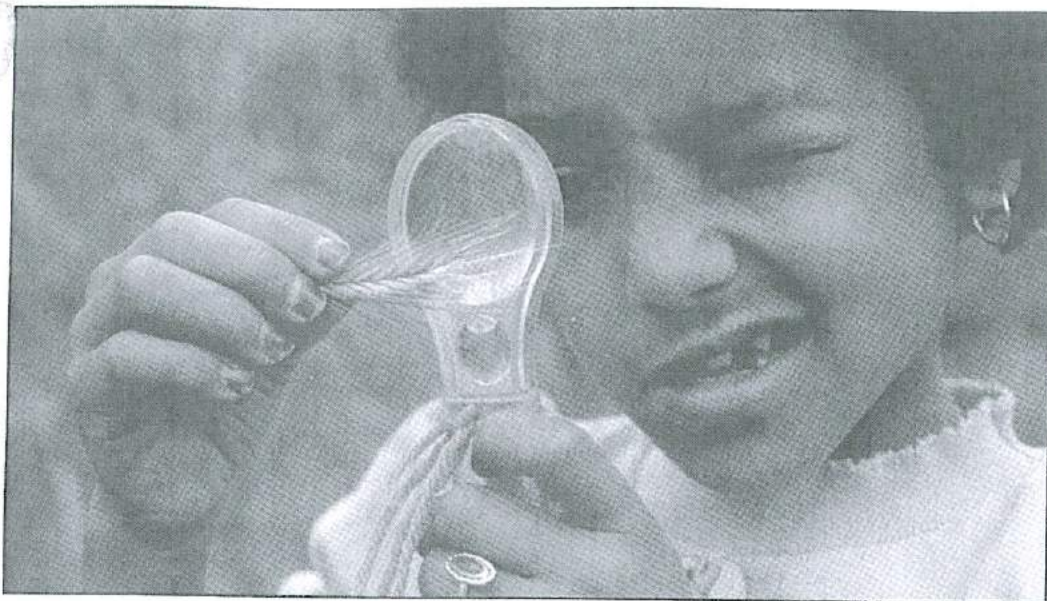
The number of restrictions on children's use of the outdoors have grown in quantity and severity in recent years, reducing the time that children spend outdoors, particularly in urban areas. Children are rapidly losing contact with their local cultures. To the extent that culture is continuously renewed by children through informal play, it is disappearing.

Loss of Contact with Nature

Louv, and Nabhan and Trimble express concern about children's loss of contact with nature in their daily lives.⁵ Although the data used in both volumes are primarily anecdotal, it is part of an increasing scatter of concern pointing to a childhood trend of reduced use of the outdoor environment. This is a very worrying trend because of the potential negative impacts both on child development as well as on the future of the Earth.

RESPONDING TO THE CRISIS

From being a simple matter of running free in the streets, open spaces and open country, outdoor play has become a complex issue. The negative trends have increased dramatically in the last two decades. In restricting our children to protect them from perceived dangers outdoors, what magnitude of injury is being done by restricting their development? If we assume the restrictive trends are correct, they have serious negative im-



All children need help to reach their potential. More than ever before, they need help to *prevent* them from becoming unhealthy or to *restore* their health when negatively affected by dysfunctional environments. The planet too needs the same approach!

**ALL CHILDREN ARE
AT RISK—SOME
MORE THAN
OTHERS**

These days it is commonplace to talk of

plications for both child development and the future of the Earth.

To reverse the situation will require a massive effort by landscape designers, horticulturists, therapists, educators, urban planners, and other professionals responsible for child development we need to create safe, natural havens for urban children where childhood and its natural inheritance can be reunited.

EACH CHILD'S POTENTIAL FOR SUCCESS

If all proceeds as intended, children are born with healthy minds, bodies, and spirits. Children's normal genetic endowment consists of the operating system of the species as a whole, with a very small portion customized to the individual as a *unique* member of the species. Each child is genetically programmed with *potential* for success both as a person and as a representative of the species. The degree of success, the extent to which the genetic potential can be realized, is dependent on the child's environment. The younger the child, the more important the environment, beginning with the effect of the child's mother, father, and other care-giving adults. But the physical environment, too, is influential. Why? Because it is the medium through which the child learns through the senses, primarily through informal exploration, through playful engagement. This is true also of children born with genetic damage or physical disability.

children and youth "at risk," meaning that their environment contains negative characteristics that are so strong that there is every likelihood that their development or health will be significantly impaired. Children are put at risk because of family circumstances and/or the negative characteristics of certain types of neighborhoods—usually in the inner city. All urban children are now at risk to varying degrees. All need access to secure, stimulating outdoor environments where they can discover themselves as individuals and as a community.

Although the impact on child development of at-risk environments are all too often self-fulfilling prophecies, there have been many exceptions throughout history of so-called "resilient" young people who survive and prosper as healthy individuals in very negative environments "against all odds."

Many cases have been researched by child development experts. The question being asked is, "Why do some make it, while others do not?" The most common explanations revolve around the presence of at least one caring, loving, adult in the child's life, most often parents, but the role can also be filled by an adult relation, school teacher, therapist, youth leader, church minister, etc. In every case, the individual was able to take the child in hand during the crucial period of the child's life. Adults in this capacity act essentially to protect the child against the negative conse-

quences of the surrounding environment, through formal therapy, or through some form of nonformal education, teaching the child how to recognize and deal with temptations and dangers on an on-going basis.

No one, as far as I am aware, has looked at the possible resiliency-inducing effects of physical environments. Is there a way that landscape designers can work with other care-giving professionals to intervene in the physical environment and facilitate such effects—especially in neighborhoods where children are at risk?

In more specialized settings, especially hospitals, there is a growing acceptance of the need for therapeutic landscapes that will have a healthful impact on patients. There are a few documented examples of such spaces being provided specifically for children. Research conducted in these spaces would yield useful information that could be more broadly applied to landscape design for children and families.

POST-RIO

As we confront the post-Rio call for sustainable development, the trend of childhood away from nature has serious negative implications for child development and the future of the Earth.

The degree to which the environmental needs of children are overlooked in research and practice continues to be very disturbing. All professionals working with children, including designers, and especially those involved in the urban greening movement, need to work together to advocate on behalf of children to highlight their environmental needs as an important policy issue.

For children, the therapeutic need is there constantly. We must take the point of view that children need access to therapeutic or programmed landscapes every day of their lives, not only under special circumstances, such as in the hospital. To think otherwise marginalizes the need of all children for designed and programmed neighborhood landscapes.

CHILDREN'S RIGHTS

Although children are a powerless group in our society (they are not able to vote), they are not without rights. In 1959 they were already embod-

ied in the United Nations Declaration of Children's Rights. More recently, they have been greatly amplified by a new international treaty: the Convention on the Rights of the Child.⁶ The fact that the United States is the only major industrial nation that has not yet ratified this most important international legislation is indicative of the extremely low standing of children in the United States.

Disregard of children's rights and the lack of visibility of their needs in political agendas trickles down in all kinds of ways to ensure exclusion from all manner of initiatives where they should be included. For example, in the latest trend in urban planning toward a so-called "new urbanism" (reducing suburban sprawl with higher-density neighborhoods that also have more focus on social relations among residents), children are almost never mentioned in the literature as *bonafide* residents with their own needs. Review of recent volumes published in the new urbanism field revealed only one work that included the word *children* in the index. Why is this?

Children in the United States are facing the worst battering, perhaps, in their social history. The signs are all around us. If hard evidence is required, a reading of Sylvia Hewlett's *When the Bough Breaks: the Cost of Neglecting our Children* will provide a dose of sobering reality.⁷

What is happening with our young people is not their fault, it is ours. They are suffering from our neglect which eventually will come full circle to haunt adult society. Perhaps it already is. If the children of the United States are considered to be the key to a prosperous and healthy future, the situation does not look good. Once we were concerned about losing the space race: a clearcut concrete objective. Now we are in much deeper danger of losing a more subtle, far more profound race: the healthy development of this nation's children.

LANDSCAPES FOR LEARNING

Children learn through three modes of experience: informal, formal, and nonformal. Children need local landscapes providing access to informal and nonformal learning experiences that are rarely found in the public schools.

Informal

Informal learning includes all experience—both good and bad, that come to children through their daily interactions with the social and physical environment of family, home, and neighborhood.

Children's play is the mainstay of informal learning, providing a fundamental motivating force in the learning process. Springing from within children in response to freely discovered external stimuli, play is a natural, universal endowment of young humans as it is with many other species. Play arouses innate curiosity that motivates children's active learning. The problem is that many urban children do not have access to ecologically valid play opportunities that are sufficiently stimulating.

All of us remember things that we learned as children because we experienced them at close quarters. Even though play stimulates the desire to learn, this desire is often overlooked or undervalued by adults. Little space is allocated to the desire to learn in the residential areas where children actually live.

Formal

Formal learning is what we usually consider schools to be about—lessons delivered to children, in a classroom, by a teacher. Education and schools are often considered synonymous. This is unfortunate as education has a broader scope than schools typically provide. Although many educational philosophers and child development experts put great value on play, few courses in play are offered in teacher training programs.

Nonformal

Nonformal learning provides the connection between the informal and formal modes. Typically, the term is used for learning that occurs in settings outside the formal classroom. Examples include the well-established European models, such as adventure playgrounds, urban farms, and ecological parks, that embody experiential learning characteristics.

Countries such as Sweden, Denmark, the Netherlands, Germany, and the United Kingdom, have well-developed centers of nonformal education. Staffed by professional playworkers, animators, or social pedagogues, the centers

serve children and youth during nonschool hours, including summertime.

WANTED: PLACES TO DEVELOP THE WHOLE CHILD

Can we create places for children worthy of John Dewey (the United States'—most formidable educational reformer), who saw schools as institutions with a much broader mission than they enjoy today. In his "pedagogic creed," he conceived education as "a process of living," as "a continuing reconstruction of experience" and not just a preparation for the future. He pleaded for a balanced pedagogy matching external societal needs to produce useful, well-adjusted citizens, while also respecting the interests and innate endowments of each individual.⁸ Since public school systems seem incapable of fulfilling the scope of this mission today, an alternative must be found.

We need to create landscapes where this vision of education can be applied in the nonformal domain, to demonstrate how a diverse, naturalized environment could be used as a vehicle for the development of the whole child. It is impossible to say which modes—formal, informal, or nonformal—are more important. We need places that integrate all three. Special pedagogical value derives from places that offer a wide range of learning processes. These include field observation; discrimination of sensory attributes; collecting; sorting; classification; record keeping; enumeration; verbal description, library investigation, analysis, and evaluation; selection and presentation of information; and many more. If a broad behavioral diversity is supported by the landscape, it will accommodate a wide range of particular strengths, abilities, and special aptitudes of children.

The nonformal learning approach naturally includes the child-to-child educational concept. Developed in the United Kingdom during the 1970s, it has become a major educational strategy in countries where there are not enough teachers to meet the needs of the student population. Initially, through play, children use this method to learn directly *from* and *about* each other (i.e., socialization), as well as learning directly *through* the process. By facilitating students' access to each other's new experiences, situations, or dis-

coveries, teachers can encourage this natural proclivity of children and apply it in the formal mode. Flexible open environments can offer many more opportunities for student co-learning, with the more skilled assisting the less skilled.

EXISTING MODELS OF NONFORMAL EDUCATION SPACES

Powerful precedents exist in specialized children's outdoor institutions that have evolved in Europe over many years. Each uses a nonformal learning approach. Child development professionals in the United States have, to a large degree, ignored these well-tested models that are based on what children like doing best—playing and learning outdoors.

Adventure Playgrounds

The longest-standing model of a nonformal type of learning environment is the "adventure playground." It was developed more than 50 years ago as:

...a place where children of all ages, under friendly supervision, are free to do many things they can no longer easily do in our crowded urban society: things like building huts, walls, forts, dens, and treehouses; lighting fires and cooking; tree climbing, digging, camping, gardening, and keeping animals; as well as playing team games, group games, painting, dressing up, modeling, reading...or doing nothing.⁹

An adventure playground is a place where children are able to create both physical and social constructions of their own world. The adventure playground was invented in 1943 by the Danish landscape architect C.Th. Sørensen, at Emdrup, Copenhagen. The original playground occupied an area of approximately 7,000 square meters and was surrounded by high berms excavated from the playground site. The berms were topped by a wire fence and planted with a variety of shrubs forming a dense thicket, which became a natural play setting.¹⁰

The concept of adventure playgrounds was introduced into England immediately following World War II, by Lady Allen of Hurtwood (a landscape architect) after she visited Emdrup.

She summed up the concept as follows:

Adventure playgrounds are perhaps the most revolutionary experiment we know for absorbing the interest and releasing the energies of young people. Children the world over have a deep urge to experiment with earth, fire, water and timber. They need to be masters of the materials at hand and be free to move them around to suit their own desires and to create their own seeming chaos. They delight to work with real tools, to use them in their own way and at their own pace without criticism or censure.¹¹

Outside of Denmark and England, classic adventure playgrounds are still rare because they seem so radical. They are very difficult to sustain. The important thing, then, is to understand how adventure play activity can be supported by the other types of environments that can still provide the key ingredients of the classic model, especially playleadership or animation.¹²

Children's Farms

Children's farms bring urban children closer to agriculture and nutrition through nonformal educational programs. Many examples exist in the Netherlands, Germany, and England (called Urban Farms). In every case, much of the program and maintenance of the farm is done by young volunteers who love this type of work.

Ecological Parks

Ecological parks first appeared in the center of London. They are relatively recent and express a need to heal the Earth and recreate a more ecologically viable urban environment—especially for children. In ecological parks they learn about natural systems through play. Because of their much stronger emphasis on the natural environment, these models are more acceptable aesthetically. They are also easier to design for the integration of children of all abilities.¹³

Naturalized School Grounds

Naturalized school grounds surely have the greatest potential as safe, natural havens for positive impact on healthy child development. There are aggressive national campaigns underway in a few countries to try to achieve this potential. The

United Kingdom and Sweden, as well as Canada, are countries that come to mind. The United Kingdom, particularly, has made great progress.

A fascinating piece of research conducted by Wendy Titman, for the Learning Through Landscapes Trust in the United Kingdom, compared the reactions of children to their school environment in both naturalized and un-naturalized sites.¹⁴ The children who participated gave powerful validation to the concept of the “hidden curriculum” that speaks to children through their environment. The results show how the environment can offer welcoming messages or alien, unfriendly messages—messages that make children feel valued and respected or ignored and marginalized.

DESIGN FOR PLAYING AND LEARNING

Children of all abilities become integrated through the social, sensory, and physical interaction stimulated by their physical surroundings. This process of action and interaction can be supported and enhanced by design. This was a lesson I learned from the Environmental Yard, an action-research project that took the adventure play and environmental learning concepts previously outlined and applied them to the redevelopment of the outdoor space of a primary school in California. The idea was to demonstrate how a typical asphalted, hard, unfriendly space could be turned into a socially positive, high-quality environment for all children.

A major reason for the success of the project was that everyone was involved in the design process. Children filled out a questionnaire saying what they liked, what they did not like, and what they wanted to see added or changed. They made designs for different elements. They made models and conducted preference studies. Teachers organized workshops to discuss how the outdoors could support and enrich all areas of the curriculum—how, in effect, the outdoors could become the curriculum focus. Parents also explored the potential of the site and participated in community workshops to help put all the design ideas together.

Helping nature to recapture the barren land was exciting and rewarding for everyone. Soon sterile asphalt was replaced with a living environment, where children felt themselves to be

part of a dynamic ecological system. They had many settings to explore, where irresistible urges of childhood curiosity could expand. Every moment there was something new to discover, to record, to learn from, to express, to apply in problem solving, and to transfer to everyday life in never-ending sequences of play and learning:

*It makes you feel like you're in a special place. You can hide around in the bushes and spy on people or play hide-and-go-seek, which at any regular school you can't do. It's the only place in the whole world like this, with pretty ponds and trees and birds.... It's a good-natured place. It gives me a new idea every day. It makes me feel like I can make skyscrapers and buildings out of sticks and sand.... Kids learn about birds and trees and fish. And maybe they learn they can't push other people around.*¹⁵

Many years later, I asked one of the former students (then 26 years old) to sum up her main feeling that she remembered of the space. Her reply was “intense peace.” These words were an incredibly clear reinforcement of my own feelings of the essence of what a childhood landscape should be and what it should do. Top priorities in the world today are to restore our damaged planet, care for its future health, and achieve peace among the peoples that inhabit it—goals that are intimately connected.

The operational link is childhood. Here the solution will be found. It will take time and an immense effort. A new type of childhood landscape must be *designed*. Landscape architects and designers must take the lead in defining what those landscapes should be. We must work in direct collaboration with children and youth themselves. Their deep involvement is critical to creating viable solutions.

The profound breadth and depth of learning in the Environmental Yard was only possible because the environment itself incorporated basic principles of a healthy ecosystem: diversity, change, interaction, and adaptation. Diversity enabled children to find their own special connection and to use the physical environment as a medium for creative imagination. In turn, this changed their perception of themselves and the world around them, which itself was always changing. The stimulation was never-ending.

Through this process, children adapted themselves to a higher level of conscious behavior and understanding of the world they lived in. Their behavior also was changed and adapted *by design* to fit the ever changing needs of the curriculum—as new resources, ideas, policies, and finances entered and left the system. It was truly dynamic.

The impact on children's feelings about their school was dramatic. They loved being there. It felt really special. Their days were filled with intense pleasure rather than feelings of anxiety and rejection that so many school children experience. As one of the children reported:

*At other schools I never wanted to go out, I didn't even want to go to school. But here I just love coming to school every day.*¹⁶

Our children inherit the continuing responsibility for caring for the Earth, they must be prepared for the task in the best possible way. A basic requirement is that they *feel* that they live in the biosphere and are a part of it. Without this sense of belonging, how will they acquire necessary skills, awareness, and understanding to protect it?

UNIVERSAL DESIGN

Diversity and choice, usability, and independence together represent the concept of Universal Design. This is the antithesis of the old idea of designing "special places" for "special people." We need to design with more sensitivity to the full range of abilities of all people—so that all can be accommodated in a variety of ways in all environments.¹⁷

In the United States, stimulated by the American's With Disabilities Act, a big push has been made toward the development of integrated outdoor public playgrounds. Because of the legal obligations and public awareness, manufacturers of play equipment have been competing with each other to develop solutions. Equipment settings, generally speaking, are difficult to make usable and at the same time challenging to children with varied abilities. However, many design innovations in play settings in both the USA and Europe have provided more comfortable and equitable opportunities for integration of children with and without dis-

abilities.

Usability and the support of independent behavior are the keys to design for integration. The provision of different levels of challenge is a key concept in the design of spaces for children's play. Children should feel that they can act independently and have as much control as possible over their environment. Children, like adults, have different levels of ability and need environments that offer different levels of challenge. Each child needs to achieve a satisfying level of independent choice.

A powerful way to achieve choice is through the design of natural play settings that emphasize water, sand, vegetation, and animals. Through multisensory design, children encounter a richer range of experience beyond the gross motor opportunities of manufactured equipment. Key aspects of usability and environmental quality, such as the need for shade and microclimatic comfort are also more easily incorporated.

The Role of the Arts

While working on the Environmental Yard, I received a call from a mother living in the neighborhood. She explained that while wheeling her brain-damaged son around the neighborhood, she had discovered the Environmental Yard. Soon they were coming every day as she observed the powerful calming effect the natural environment—especially the water—had on her son's aggressive behavior. The behavioral impact was so dramatic that she told other families with children with disabilities. She offered to help create an integrated summer play program using artists and environmental educators as animators. A nonprofit organization was formed called PLAE (Playing and Learning in Adaptable Environments) to raise funds and manage the program.

The program had the right ingredients to make it an almost instant success: a natural environment designed by and for children, creative animators who loved working with children, and most important of all, an *integrated* group with up to one third having some type of disability (physical, mental, and/or sensory).

Each year, according to the skills and interests of the animators involved, different thematic workshops were developed. The first and most popular was called Adventure Village (adapted

from the adventure playground model). The children in Adventure Village had to imagine they were shipwrecked on a deserted island, and had to work together to create a new settlement to live in. They had to survey the land, design and build houses, install a water supply, mine for clay, and make artifacts. They invented a bank and monetary system, a newspaper, a town hall, laws, playful punishment for “naughty” children, and even a cemetery.

In another workshop, the children spent the week creating a circus on the Yard. They practiced circus skills, and rehearsed their versions of theatrical pieces like *Phantom of the Opera* and the *Human Cannon*. On the last day, a performance for the parents was presented.

The most dramatic workshop was the children’s version of the classic tale, *Treasure Island*, with all the main ingredients: sharks, shipwrecks, pirates, walking the plank, treasure maps, and finding the treasure. Imagine the stimulating interaction, cooperation, and creativity among these children. They adored it. The whole production was videotaped and played to parents.

Another beautiful workshop, facilitated by an Anglo-American animation group, was called Visitors from Outer Space. The children came into the Yard on the first day and discovered a “crashed” spaceship. Strange beings emerged who only spoke space language, “ni, ni, ni?” which meant “What is this?” In this way the children had to help the visitors learn about the Earth, the people, the plants and animals, everything. It was a brilliant concept of playful language development.

One year the Yard became a radio station for a week. Children produced shows, conducted telephone interviews, and dramatized stories about the Yard. On the last day, parents came to the “studio” for a premier airing.

Other workshops included African Safari, Pag-eants in the Sky—where the focus was air and the skyscape above the Yard—and Monster! Have you ever wondered what eggs of monsters look like, or their footprints?

We did not have sufficient resources to study with great scientific rigor the effect of the program on the participants. However, we did gather much anecdotal evidence from the dis-

abled children’s parents about the positive effects that they observed at home—especially impacts on self-esteem and positive social interaction with peers. The workshops were memorable experiences for the children. Much of this positive impact was observed directly in the interactions between the children, expressed in their skill-enhancing behaviors and their smiling faces.¹⁸

We discovered that manipulative settings, such as sand, water, vegetation, made integration easier, richer, and longer term. Such settings were especially effective when combined with the design of informal gathering settings where children could interact with each other socially, in a calm atmosphere.

Play, Nature, and Peace

In all the investigations I have made of children’s playful relationships and use of nature in the city, there is one common finding. When children play in nature they are more likely to have positive feelings about each other and their surroundings. My assumption is that these feelings can grow and develop over the years to become a core of humanistic values and strong affect for the natural environment, helping people to understand and respect planet Earth and desire peace.

All the high-tech sophisticated games and all the instructional materials produced by the best educators in the world cannot substitute for the primary experience of hands-on engagement with natural settings. Secondary educational media can, of course, expand the depth and breadth of understanding. They can heighten motivation. They can extend the learning process into other realms of art and science, but they cannot replace that sensuous moment where a child’s attention is captured by the phenomena and materials of nature: the sparkle of morning sun falling on fresh dew, the sound and motion of leaves in the wind, the endless colorings of the sky at dusk, the boundless imaginative worlds of a few square meters of dirt, the infinite space of an iris flower. . . .

Ultimately, high-quality relationships can evolve that are stimulated by high-quality designed environments. Quality, however, resides neither in people nor in physical space. It is a characteristic of the interaction and evolution between people and their surroundings. As Robert

Pirsig says in his book, *Lila* (the second part of his brilliant treatise on quality), quality exists in two forms.¹⁹ First there is classic or *static quality*, which I interpret as the quality that gives stability and connection between the generations and between people and the planet. We are part of a natural system. We must obey certain natural laws to survive. Second, for Pirsig there is *dynamic quality*, which I interpret as the dialectical tension between our evolving social and cultural life, and the cultivation of Planet Earth to serve human purposes.

Play spaces and nonformal environments need to stimulate both types of quality for children to become fully human (that is to use their powers of creativity, and to engage in self-conscious, moral action). The need for dynamic quality must be stressed because it is easy for us to be lazy and ignore it.

Promoting play and nonformal education as children's rights, the involvement of artists as animators, and the application of Universal Design principles are all powerful strategies for nurturing our children, regardless of ability, gender, economic class, or ethnic origin.

Play is a pathway to peace for our children and for the future of the planet—in a fundamental way—because of what play represents at its deepest level of human meaning. It is an innate force within each individual and a powerful way for people to learn to live together. As adults, we have a responsibility to create fertile places where it can flourish vigorously. Children who have good quality play experiences have a greater chance of acquiring greater self-esteem and of becoming more productive, responsible members of society.

Special gardenesque spaces, in the broad and several definitions above, are becoming more and more important as a healthy refuge for children, as a sanctuary where they can escape the risks of the broader adult environment. Their function should be both preventative and curative. Most children are not in need of "healing," they are in need of peace and calmness to escape from the ever-increasing stresses of the world that impede their development. In this sense, the function of such landscapes is to be broadly therapeutic, as places where children can be nur-

tured, sustained, and helped.

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Classroom? Playground? Garden? or Clinic?

*Nancy K. Chambers, HTR, Sonja Johansson, ASLA, and
Donna M. Walcavage, ASLA*

The goal of treatment at Rusk Institute is to help patients achieve their highest level of independence—physically, socially, emotionally, and vocationally. This is achieved through an integrated team approach, with the patient and family sharing the work with physicians, nurses, teachers, therapists, and other team members.

Nearly one-quarter of the patients at Rusk are children, both inpatients and outpatients, and range in age from one to twenty-one years old. The children receive treatment for a variety of disabilities including cerebral palsy, limb deficiencies, amputations, spinal cord injuries, spina bifida, muscular dystrophy, brain tumors, and multiple trauma. More than 60% of inpatients and 80% of outpatients are members of underserved minority groups. There is a thirty-five bed inpatient unit and outpatient clinics offered eight times each week.

The pediatric unit also includes a five day, two class preschool for eighteen children, ages three to five, with orthopedic disabilities. They are referred by the New York State Department of Education and come from school districts throughout the five boroughs of New York. An early intervention program serves twenty children, ranging from a few months to 2.8 years old. They come five days a week but only for a half day session. Each of these children is diagnosed as having a developmental delay.

Because active, creative play is central to normal child development, an effective pediatric rehabilitation program must include play and leisure activities. Particular attention must be paid to how a disability might subvert or distort any aspect of normal child development and compensatory steps must be taken so that a disability's effects on the developmental process are minimized.

Recognizing the importance of play activities,

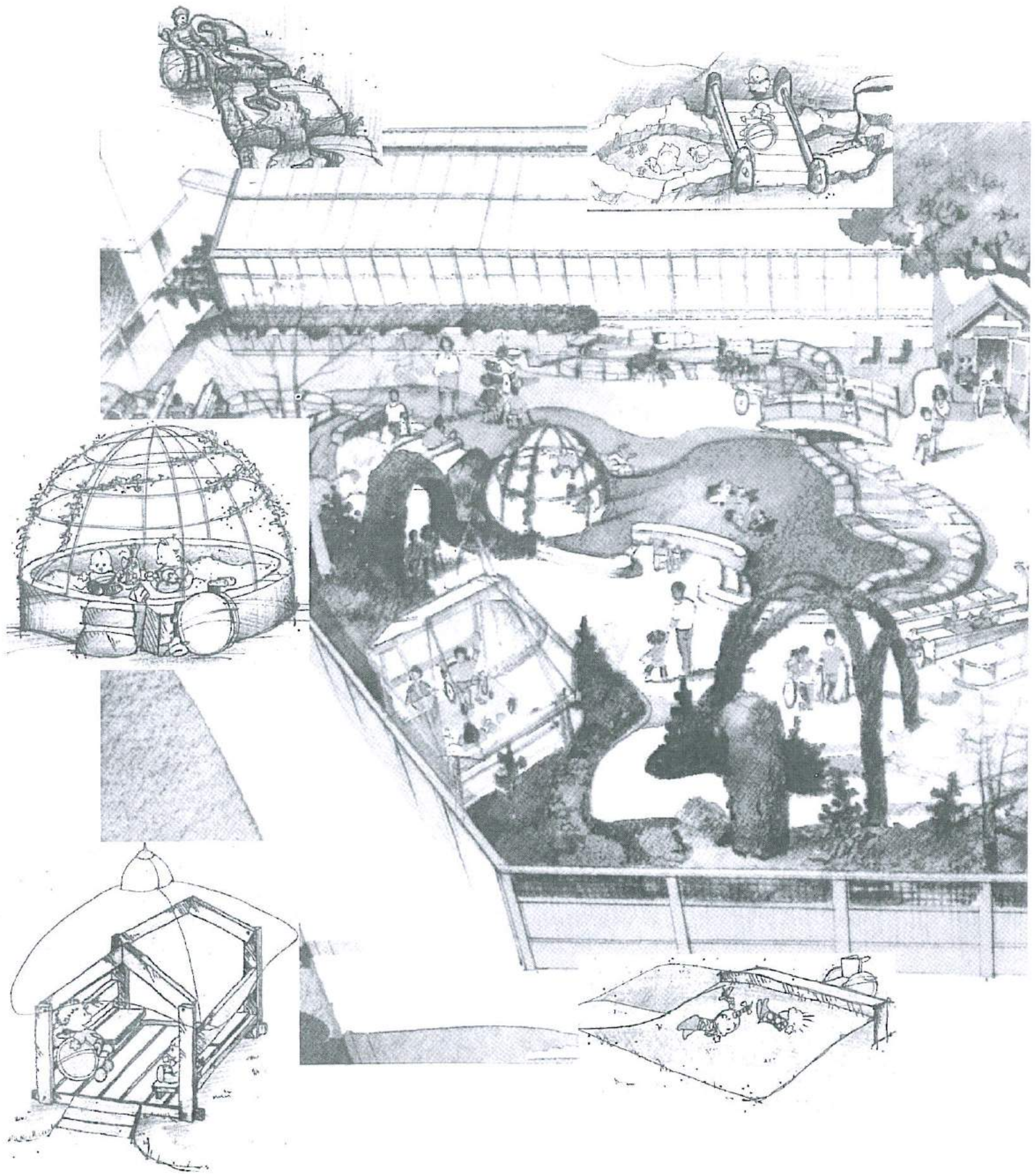
Rusk built an adapted playground in 1970. This playground, the first of its kind, was strategically designed to develop physical, cognitive, emotional, and social abilities of the preschool child. These children often had restricted mobility, reduced endurance, decreased motivation, and fear of failure. The playground was built to encourage them to interact with other children and objects in the environment.

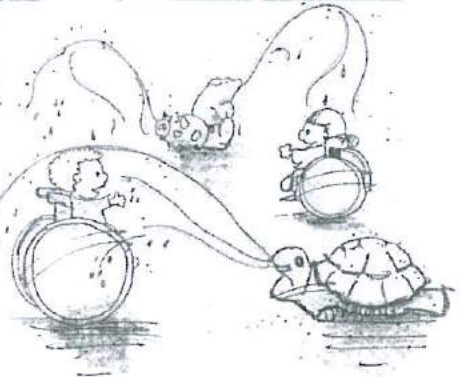
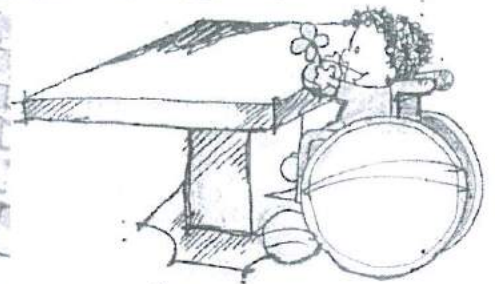
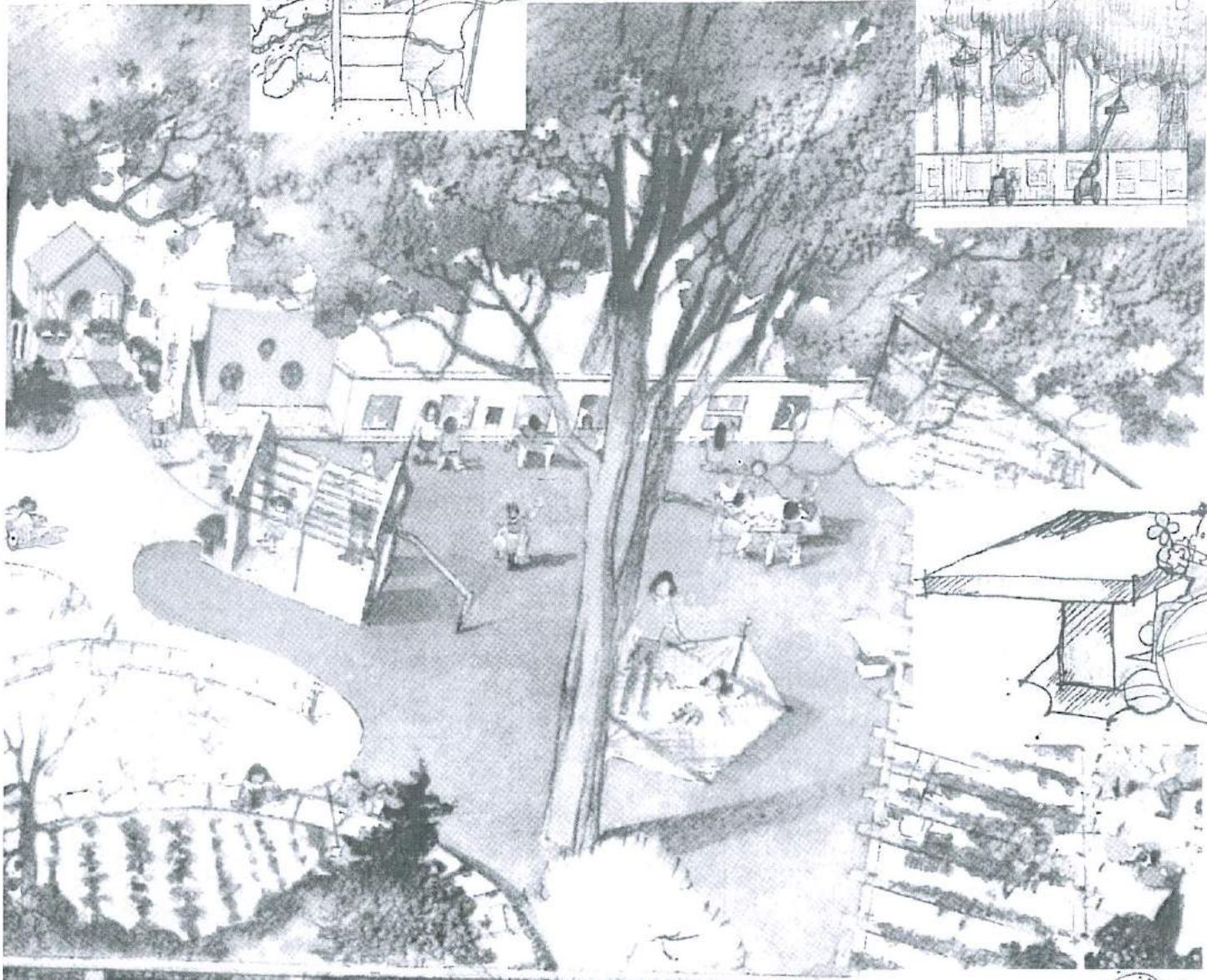
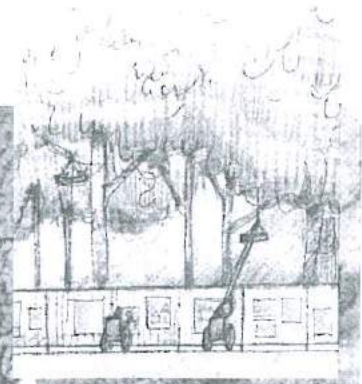
Although originally a standard of excellence in the design of therapeutic rehabilitation spaces, this existing playground conforms to neither current construction or safety standards nor theories about disabled children. Most significantly, disabled individuals are now encouraged to actively exploit the abilities they do possess, rather than merely compensate for their disabilities. Also research indicates that it is important for children to creatively interact with moveable, variable materials during unstructured play, especially with natural materials. To be able to use these materials—earth, rocks, water, plants—in a natural environment is even more effective.

PROJECT TEAM

In 1994 a project team was created to find a landscape architecture firm to redesign this outdoor space for the Rusk children. In a collaborative effort, this team included recreational therapists, occupational therapists, physical therapists, teachers, horticultural therapists, physicians, as well as representatives from the Plant Maintenance and Construction Department of NYU Medical Center. Everyone who worked with the children at Rusk was included in decision-making capacities.

The team selected the firm of Johansson and Walcavage, which had designed several public and private playgrounds in New York, including the renowned Battery Park City playground. With that selection, the project received a design





Rusk Institute Therapeutic Playgarden. Johansson and Walcavage, Landscape Architects. Rendering by Thomas Schaller. Sketches are primarily by Vincent Chiu with assistance from Sonja Johansson and Kirk Jaskoviak.

grant from the New York State Council on the Arts. The Council called the project's conceptual framework and the partnership with Johansson and Walcavage "inspiring" and said the project would become a model of its kind.

A series of meetings was set up between the landscape architects and the children's treatment team to discuss how the Rusk team worked with the children to achieve their goals and what were the challenges and problems encountered which might be overcome with the new PlayGarden design. The landscape architects also visited the pediatric unit during regular sessions to gain additional insights to addressing the distinct needs of the Rusk children.

CONCEPTUAL FRAMEWORK

The new project, as defined by the rehabilitation team, suggested that the standard play experience *not* be the main focus of the play yard, but that this little corner of a bustling and noisy area of New York City be transformed into a naturalistic, interactive PlayGarden. The concept would be to integrate the man-made play and learning features into a natural garden framework. It is a dramatic departure from past handicapped accessible playgrounds. Children are allowed, and encouraged, to explore and enjoy activities and materials at their own pace and in their own individual ways. The PlayGarden becomes a clinic where the occupational and physical therapists can work with the children in nature to meet the children's clinical goals.

Sensory Integration

At the youngest ages, children rely on touching, feeling, and using their senses to provide information about the world. Children with disabilities, however, often are unable to accurately integrate the colors, lights, sounds, and textures received through their senses. One of the goals of rehabilitation is to develop and stimulate all senses to help these children organize this information to enable them to learn and function effectively in their environment.

Tactile

The new PlayGarden offers tactile experiences by encouraging the children to feel the sun's heat and to explore freely the various surfaces and

textures, such as grass, dirt, sand and water, wood, stone, bark, leaves, and flowers.

Auditory

Auditory senses are stimulated through the interactive chimes, the sound of babbling water, the street noises, gentle breezes through the grasses, children's voices inside the shrub tunnel, the bees buzzing, and birds singing.

Visual

Visual skills are stimulated by children tracking the path of water dripping, fish swimming, pennants flying and light and shadows changing. Sizes, shapes, colors, openings, and enclosures are varied to encourage a wide range of spatial and visual experiences for the children.

The diversity of *scents* and *tastes* available in the PlayGarden is endless—the damp earth, the dusky rose, the spicy tomato vine, and sweet honeysuckle. The children's garden in raised beds will include herbs, spices, and tastes of all the cuisines of the world.

Vestibular System Integration

Children also need to be able to integrate and adapt information they receive from movement, gravity, and their relationship with the earth. They need to know what is upside-down and right-side-up; whether they are moving, how fast, and in what direction. Children with disabilities often have had inadequate opportunities to develop and integrate these perceptual, motor and coordination skills.

The new PlayGarden incorporates diverse topography and play equipment designed to challenge and engage a child's eye-hand-foot coordination, balance, spatial awareness, body positioning, motor planning skills, sense of movement and gravity, fine motor coordination and manipulation, and levels of arousal with a graduated range of experiences. The undulating grassy slope, bridges, and tunnels allow children to move through nature and experience its variety first hand. Slides, steps, and ramps of different sizes are built into the hillside to encourage children to get out of their wheelchairs for active climbing and sliding. Children will be able to change their perspective from high to low, through energy and motion, in time and space.

Cognitive Integration

A vast range of interactive objects and experiences are integrated into the PlayGarden to help synthesize the children's cognitive skills with their physical functioning. There is water running down a rock-edged channel where children can create their own waterfalls. Planning skills, sequencing, cause and effect understanding, and initiation are all cognitive skills challenged in the Village Center. Here, young children will plant flowers in the window boxes on the house facades and develop their cognitive and fine muscle abilities in the "busy boxes" hidden behind the front doors.

The PlayGarden, indeed, offers a safe environment in which the child can explore, experiment, make decisions, and learn independently, without the need for help unless warranted.

Environmental and Science Education

Horticultural therapists will use the PlayGarden to integrate science and environmental education classes into preschool curriculum. The program goals include: to foster awareness and appreciation of the natural world, to provide an understanding of ecological and natural concepts, and to instill a sense of stewardship for the earth.

The horticultural therapists will help children experience and explore environmental concepts and relationships between the natural elements of air, water, earth, and light on plants, animals, and people. They will watch these elements change through the seasons and experience the passage of time. They will be able to manipulate their environment, transform it, dismantle it, and recreate it to learn about the nature of the world. The children will plant seeds, water them, and watch them grow. They will be on the alert for beneficial and predatory insects. They will harvest their plants and use them in special projects.

The PlayGarden projects will, in addition, help them develop critical-thinking and science skills including observation, sorting, categorizing, questioning, experimenting, investigating, and communicating. Through seeds, plants, and flowers, children can easily experience language concepts of light/dark, light/heavy, soft/hard, soft/rough/smooth, small/large, etc. They can learn to express their curiosity and awe while

watching nature perform its magic.

Social Development

The PlayGarden will support positive interpersonal interaction and socialization between children with different abilities and different ages and between boys and girls and children and adults. There are spaces available for small groups and very young children, quiet play and introspection, large group activities, and very active play. There are storage facilities for games, equipment, and tables and chairs, and there are benches and seating areas throughout the garden.

The diversity of the physical elements in the PlayGarden help to arouse curiosity and trigger the imagination. There are opportunities for the development of self-esteem and social skills; the environment becomes a resource for imaginative and cooperative play, providing the props and stage.

In addition to the social and physical benefits to be gained, however, the restorative properties of nature, which research has proven effective, are of central importance to the purpose of the PlayGarden. There, the emotional wounds of the children and families who are undergoing difficult ordeals can begin to heal. By their presence alone, children will benefit from this place of refuge, and through play, parents can begin to learn to adjust to the new physical and mental capacities of their children in a nurturing and comforting environment.

Footnotes

¹Portions of this paper are excerpted from Development Office documents at New York University Medical Center. 1995.

²Portions of this paper were presented at the American Horticultural Society's Children and Garden Symposium in Pasadena, California. June 1995.

³Portions of this paper were also presented at the American Horticultural Therapy Association Annual Conference in Montreal, Canada. July 1995.

What's a Nice Guy like Me Doing in a Place Like This?

A Landscape Architect and Recovering Alcoholic's Thoughts on Designing Therapeutic Landscapes

Robert Benson, MLA

Addiction treatment facilities are cloistered environments that preserve anonymity and confidentiality where patients take the first steps in their return to normalcy. Emphasis is placed, not on regaining control of out-of-control lives, but on uncovering and exploring the roots of present predicaments, taking "ownership" of one's life and actions, and accepting responsibility for their results. An integral part of this process is focused, often excruciating attention on patients' physical, mental, and emotional condition in sequestered, nonjudgemental settings where they can examine their motives and zero in on the real causes of their addiction problems. Patients are of all ages and from all walks of life.

MY NAME IS ROB. I'M AN ALCOHOLIC.

In January of 1988 at age forty-five, I admitted myself for twenty-eight days of therapy at a chemical dependency treatment center in the midwest. I have been "clean and sober" for over eight years. I was lucky, experiencing no permanent physical or emotional damage as a result of over ten years of problem drinking.

I am a "user" in a dual sense, i.e., I am a substance abuser, as well as a temporary resident of an addiction treatment facility. My experiences in such a place have led me to write this, the as yet incomplete "journal" of a recovering alcoholic and critique of his experiences as they were generated and affected by the environment in which they occurred. I am an "insider," looking both in and out?

FIRST DAY

I admit myself to a treatment center with a blood alcohol level of 0.37! I will spend the next two days in bed being "detoxed" i.e., dried out, under close medical supervision. I am fed mega-doses of tranquilizers to control skyrocketing blood pressure as my body withdraws from the influence of alcohol. At one point my systolic reading climbs to over 200.

THIRD DAY

In pajamas and bath robe I am allowed out of bed for the first time, and shakily make my way to the lounge. The room is large, but overcrowded with tables, chairs, and people, all of which, I shall discover, have legs. I feel uncoordinated, weak, and disoriented, and trip over a piece of the furniture. Someone catches me just before I hit the floor. What am I doing here?!?

FOURTH DAY

I am sitting, now clad in casual clothes, in one of the chairs over which I had tripped the day before, and am feeling much better. Suddenly a young woman in her early thirties at the next table has a seizure, and falls to the floor in convulsions. The nurses rush to help. Fortunately, she does not injure herself, but I am shocked even though I have seen convulsions before. My sense of well-being evaporates, and again I wonder why I am here.

SEVERAL DAYS LATER

An older woman in her sixties slips and falls on her way to the lab for tests. She spends the next several days in a wheelchair, and then graduates to crutches, on which she hobbles around for the rest of her stay on "the unit." She also sustains a badly broken nose and a black eye from her fall.

The Importance of Barrier-Free Site Design

Addicts often have physical disabilities, however temporary, resulting directly from substance abuse. They include, but are not limited to, confusion, disorientation, difficulty concentrating, chronic fatigue, malnutrition, broken limbs, confinement to a wheelchair, the use of crutches, and more serious conditions, which may have required prior hospitalization. Environments for addiction treatment, therefore, are often convalescent environments, whether they are in-or-out of doors, and must be accessible and free of obstructions. The provisions of the Americans with Disabilities Act are doubly applicable in such places.

FOURTH DAY

Group! Twice each day for the next twenty-four days, I am prodded and prod others to reveal inner thoughts and long-hidden or blocked-out secrets, acknowledge and express feelings, admit faults of character and confess, and sometimes vent raw emotion. Each session lasts one and one half to two hours without interruption. It is a time-consuming and exhausting process, this breaking down of barriers and walls, with revelatory and sometimes unspeakable thoughts and past misdeeds laid bare for all to see and comment upon. The process culminates in family week, when one is confronted with the past—and its consequences by relatives and friends. The event usually takes place in small rooms with counsellors and other patients present. When my turn comes, I am left physically and emotionally spent. This is feedback with a vengeance!

The Need for Release

Therapeutic outdoor spaces can induce a sense of openness or relief in patients, who spend the majority of their days and nights semi-confined in

treatment facilities. This is one of their most valuable characteristics, at least for the users. Positive interaction (as opposed to the confrontations which characterize time spent in group) between patients and such environments can be encouraged by provision of areas for recreation which can be enjoyed by nonathletic or older patients as well as the younger and more physically fit. Patients undergoing treatment experience full-time, systematic attacks on "old," addiction-producing behaviors and specific personality traits, rather in the manner of military bootcamp. In such a highly structured, pressure cooker environment, an occasional breather is both necessary and welcomed at regular intervals.

FIFTH DAY

Most of the patients, if they are ambulatory, go in small groups to the hospital cafeteria for meals. We are also taken on supervised walks about the grounds and to the fitness center in full view of an often interested public. It is like being part of a freak show. Our prescribed hour of programmed physical activity includes lifting weights (a questionable or impossible activity for many), riding stationary bicycles, and silly aerobic exercises led by extremely young male and female jocks. We get used to being stared at on our way to and from by other patients, visitors, and even hospital staff members, who obviously know who we are—the ones on Seven West. We encounter curious, even shocked looks, politely averted eyes, frank stares, and even occasional snickers. Some of us feel embarrassed or ashamed—the Scarlet Letter syndrome, perhaps, except that "A" stands for Alcoholic or Addict. We also feel alienated, resentful, and robbed of our identities. We also feel exposed, vulnerable, and out of place.

The Need for a Sense of Shelter and Protection

Recovering alcoholics and addicts do not like being on display. The previous reference to the cloister also applies in the creation of in or outdoor environments in which privacy is possible through clearly defined physical boundaries—courtyards, pergolas, gazebos, small sitting areas, vegetation, water—even walls or decorative

fences. These, individually or in combination, provide a sense of orientation, sequestration, and safety, but it is critical that patients feel enclosed and protected, rather than imprisoned, especially those who are there voluntarily. Goals should include a strong sense of spatial ownership to promote individual or group identity, and the deterrence of prying eyes.

Other facilities involving both active and passive recreation should receive consideration when practical or appropriate. Little space is required for basketball or volleyball, small social gathering places, council rings, or generous seating areas for outdoor groups. These can foster the development of friendships and camaraderie among the friendless, competition, and even positive behavior modification by at least partial elimination of the sense of isolation chronically felt by substance abusers. Portable tables and chairs allowing voluntary, more intimate contact in smaller groups are also desirable for both indoor and outdoor spaces.

FOURTEENTH DAY

Family and friends are permitted to visit the unit for two hours in the afternoon. My visitors are surprised and pleased at my greatly improved physical appearance, and without exception, all comment upon it. Otherwise, they are feeling awkward and embarrassed, and conversation is forced or difficult at best. Toward the end of visiting hours, when I return to the room I share with three other men, I am asked to leave again by one of them who wants to use the room to have sex with his girlfriend (bedroom doors are allowed to be closed for private conversation with visitors during this time). With some feelings of trepidation I refuse, and once again wonder what's going on here. I later find out that another "roommate" smuggled in drugs (sewn into his underwear), which eluded the standard search of personal belongings during the admitting process. Addicts can be quite devious.

The Need to Focus on the Issues at Hand

Despite the marriages, which can and do occur among patients, opportunities should not be provided that permit individuals to isolate them-

selves from the group, or engage in the surprisingly frequent "shipboard romances" that happen under such intimate circumstances. Easy surveillance must be possible by professional staff, but there is no need for, nor should patients perceive the design equivalent of "guard towers." Radial or symmetrical layouts with clear lines of sight, or configurations with strong central focuses could work well in treatment settings. Although this is not 1984, some abridgment of personal freedoms is necessary for obvious reasons. Private areas need to be designed with the feel of privacy, rather than the literal reality—this represents a new challenge in barrier-free site design, especially in such a unique context. Obviously, this consideration is especially relevant in an outdoor setting.

TWENTY-EIGHTH DAY

Graduation and re-entry to normal life. For once in my life I am speechless as I accept the small bronze medallion which marks both an end and a beginning. The treatment center, for all its unpleasant associations, is both a point of departure and a "nest" to which I can return at any time if I am feeling overwhelmed by the struggle for sobriety. I am relieved at being released, but reassured by the knowledge that, in either case, I can go home again...

Design for Recovery

The well-conceived therapeutic landscape, whether it be indoors, outdoors, or under glass, courtyard or pavilion, can do much to facilitate the initial steps towards recovery from addiction. Contemplation, mild athletic activity, crafts, gardening, etc., can create a sense of self-worth, accomplishment, or at least some progress in lives long devoid of positive feelings and influences, whether the "product" is pushups or a patch of petunias. Release of pleasure-inducing endorphins from sources other than alcohol or drugs is extremely important in repatterning behavior and reinforcing the sense of relief, pride, and improved well-being that most substance abusers, especially alcoholics, experience very quickly at the onset of the recovery process (this is known as the "pink cloud" phenomenon). On the other hand, the galloping insecurities felt by those in

early recovery invests even the small personal successes possible in any therapeutic landscape with special significance, although larger successes may have to be placed on hold for the future. One small step can, indeed, be a giant leap in the fight for sobriety.

Above all, therapeutic landscape spaces must “draw power to the individual” by providing at least a limited array of choices and opportunities for accomplishment that are seemingly outward oriented, but in actuality, inwardly focused on the individual’s ability to regulate his or her own life. Recreation in the sense of re-creation (which is what treatment for addiction is all about) can provide new and revelatory experiences for the homeless, the hopeless, and the “sick and tired”—categories into which many substance abusers (uncomfortably) fit. There are also similar benefits to be had, if on a smaller scale, for the city-dwelling gardener, the exiled-to-outdoors couch potato, or the former athlete clinging to memories of past glory while downing “just one

more.” To divert, distract, relax and amuse (activity-based feelings, which can be linked to normalcy and the sense of well-being usually associated with nature and the out-of-doors) must be a high priority—one in which aesthetic principles may have to play a subordinate role at times. The appropriate product of a therapeutic landscape is a set of experiences that are interconnected, not organized; structured, but not rigid; practical and life affirming, not exercises in the application of theory. Therapeutic landscape designers must set aside their preconceptions in these matters, and their designs must respond to individual as well as group needs in recovery environments. If both introspection and interaction can be encouraged, it then becomes possible for the designer to assume the role of facilitator, rather than tyrant, in the creation of recovery-oriented spaces—spaces that can, at their best, *impel*, not compel patients to discover for themselves a pathway to health.

The Healing Gardens of Makahikilua

The Landscape as a Healer

Calley O'Neill

The Gardens of Makahikilua will be the first landscape of its kind to be realized.

As such, it has the opportunity, within an institutional framework, to become a significant prototype of a comprehensive, ecological landscape, incorporating the essential elements of food production, solar energy, rare aesthetics and deep healing environments: that is, the landscape as healer. In Hawaiian culture this might well be *Lokahi*—that exquisite triadic union of humanity, nature, and the divine in harmony—which will unfold the abundant and infinite healing potential of the forces of the earth, the inner being, and the cosmos. In that, “The Healing Gardens” represent the necessary integration of earth healers and healers of humanity, in a landscape form, which is at once cultural and historical, sociological, ecological and sustainable, economical and productive, beautiful, deeply healing, and highly spirited. As “The Healing Gardens” are based on community values and participation, they may have their most profound impact as a direct educational center for all those, young and old who visit and come to know and use them. Gardens are teachers of ancient, timeless wisdom. It is the hope of the designers that these gardens may provide a safe haven filled with people each day practicing hula, tai chi, yoga, walking, gardening, and exercise.

We are rooted in the belief that this landscape, as an active interface to the community, will provide fundamental and exceptional support to the primary mission of North Hawaii Community Hospital—to actively improve the health status of the people in this region. In that, it will thrive as a model for hospitals, hospices, birthing clinics, health centers, schools, day care centers and li-

braries throughout Hawaii and around the world.

INSPIRATION: THE ANCIENT HAWAIIAN PLANTERS

Aina—the land (derives from the Hawaiian verb or noun *ai*—meaning “that which feeds”), is a term coined by an agricultural people of the highest order, who created a highly developed horticulture based on ingenuity, remarkable powers of observation, extensive botanical and climatic knowledge, well honed engineering skills, and a diversity of agricultural methods, including extensive plant selection, wet and dry taro cultivation, agriculture, soil building through specific mulching, lunar planting and mauka-to-makai (mountain to ocean) exchanges. The Hawaiians, who were gardeners rather than farmers, built a sophisticated culture without the immense benefit of seasonal flooding and soil renewal that formed the basis of many highly developed ancient societies. The Hawaiians developed the cultivation of *kalo* or taro—(*Colocasia esculenta*) to a higher degree than any other culture in the world, and their diet was the best in all Polynesia (Handy, Handy, and Pukui 1972).

ECOLOGICAL METHODS

The organic gardening techniques will represent the best of east and west, and old and new. Bio-intensive raised-bed gardens will be built with hand tools and nurtured through composting, green manuring and mulching, companion planting, interplanting, floral and herbal borders, and the proliferation of beneficial worms, soil organisms, birds, frogs, and geckos, without the

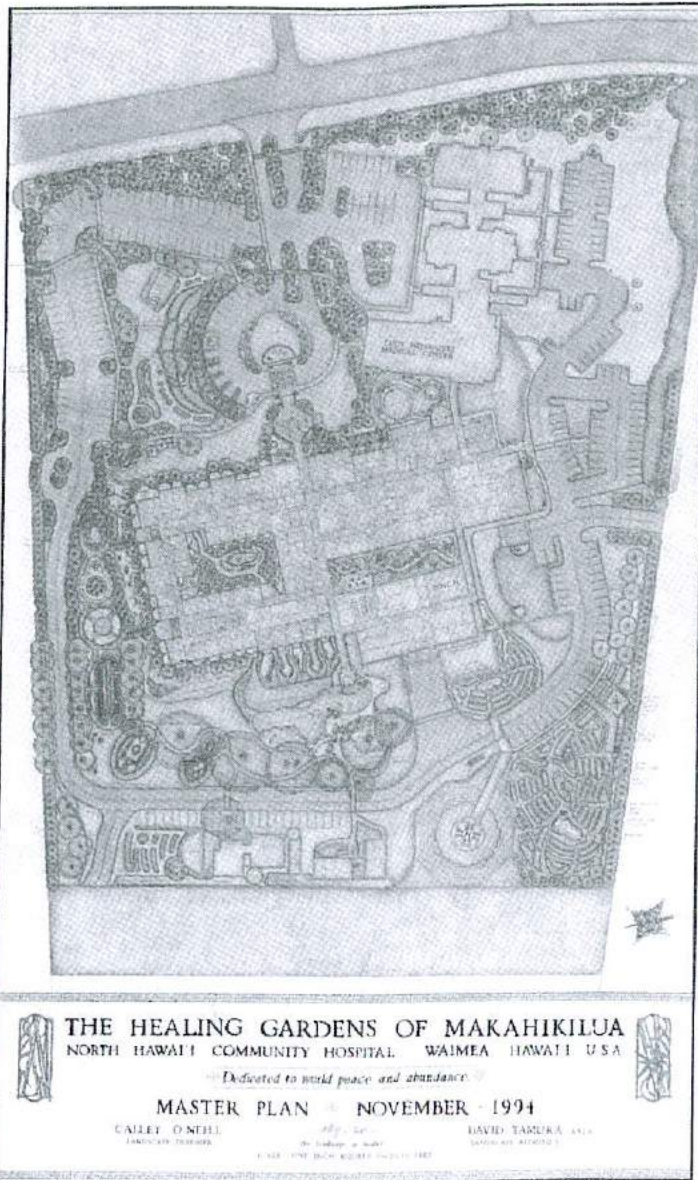
use of chemical fertilizers or biocides. Garden tools for maintenance will be either human or solar powered, eliminating noise and pollutants from the patient area.

THE HEALING GARDENS OF MAKAHIKILUA

Landscape Components Native 'Ohi' a Grove Reconstruction

Written accounts by early European travelers and native Hawaiian testimony describe Waimea at the time of contact as a verdant plains covered with a dense forest called the Ulu La'au (ulu—to grow, la'au—every plant that grows in the earth, particularly large trees, the forest). The native forests sheltered numerous clearings of small cultivated residential and horticultural plots, as picturesque and productive as any agricultural fields in the world.

By the early 1800s, the dramatic effects of the prolific sandalwood trade (Iliahi, *Santalum paniculatum*), the pulu trade (the hairlike growth on the Hapu'u tree fern), cattle grazing, logging, and pest infestations caused drastic depopulation in Waimea, abandonment of horticultural fields, and deforestation. In just one century from contact, the native forest ecosystem and its bird life had vanished. While it may not be possible to restore the native forest, one can recompose native plant communities to create the new generation of forest ecosystems. Around the hospital, the beloved 'ohi'a lehua (*Metrosideros kermadecensis*) will return as the dominant canopy tree, with a lush understory of



trees, shrubs, ferns and vines that will be self-maintaining, requiring only initial mulching, and irrigation. The grove will mature in approximately 150 to 300 years.

The Self-sufficient Hawaiian Garden

Using the techniques of the ancient Hawaiians and local Hawaiian expertise; a garden of taro, sweet potatoes, yams, bananas, sugar cane, and breadfruit will provide food, beauty, and a rare demonstration of local food self-reliance. A hale (thatched house) will serve as a gathering place for cultural and ceremonial activities. To offer pedestrians protection from the misty tradewinds, there will be a surrounding covered walkway planted primarily with the maile vine (*Alyxia olivifol-mis*) and green ti (*Cordyline terminalis*), frequently used for medicine, lei making, hula skirts, traditional capes and sandals, and to wrap food for baking.

Under the direction of Po'okela Kahuna La'au Lapa'au o Hawai'i Papa Henry A. Auwae (Dean of Hawaiian Herbal Masters), a large La'au Lapa'au garden will supply many important Hawaiian herbs, which are scarce at this time.

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Kipaaloha: The Garden of Welcome

Kipaaloha will greet visitors with reassuring color and design, according to the principles of Feng Shui (the ancient Chinese art of designing a harmonious environment) which will enhance the flow of natural currents of invisible energy—Ch'i (cosmic breath), which meanders along

curving paths, improving our health, life and destiny. The half circle reflecting pond fronts the main entrance to bring health and protective energies into the hospital's spine. Living fish stimulate Ch'i, and red fish offer protection against fire.

Curved beds of native plants are a living lei of aloha. The half circle plantings fronting the lobby display traditional good luck plants from Hawai'i and around the world.

The Keiki (Children's) Garden

On the lee side of the lobby is the children's garden, with its ground level elements hidden from adult view. A sand bowl and a 6' trampoline allow children to fall "up" onto a soft mondo grass retainer. Other elements include German dance chimes, hopscotch, Konane (Hawaiian "checkers"), a porch swing, climbing rope, rocking horses and nontoxic plants of interest to children of all ages: poha and ohelo berries, mulberries, pineapple, guava, strawberries, herbs, and edible flowers.

The Hawaiian Fern Garden

On the north side of the lobby, is a sitting area in a display of native Hawaiian ferns and plants of the montane mesic forest. The garden will be developed as a native stream bed understory, with 'ohi'a, and hapu'u tree ferns (*Cibotium glaucum*) providing the canopy. Leaf mould and compost will be the only nutrient supplements. More rare species may be added to the collection as the grove stabilizes and matures.

PT/OT (Physical and Occupational Therapy) Garden

The PT/OT garden is a mini-parcourse with seven exercise stops, including a multipurpose bicycle to activate the water in the pond. The path will be composed of a variety of materials that deviate from level in one direction and another, including stairs and a curb to allow for patient mobility in a variety of real-life situations. On the inside of the circuit are a series of ergonomically designed earth forms and body bridges for reconstructive rest and stretching postures, around a lawn which accommodates 16 students and an instructor in full supine stretches. The large earth cone is for inversions or

upright relaxation, with a smooth, black heat stone on the south side and a cool, white stone on the north. The lush border is a riot of color for overall stimulation and energy enhancement. Adjacent to the OT entrance is a small bio-intensive vegetable, flower, and herb garden; a versatile workshop; and a sizeable OT storage area.

Courtyards

The patient courtyard garden has 18 entrances, coupled with the need for patient privacy. The design focuses on a central pond with the feeling of an old tropical town plaza. Coping stones, pond and path lanterns, and walkway will be hand carved of gray stone from Bali; with generous seating in the sunniest aspect of the courtyard. A river of lavender and yellow perennials run alongside the bed with a canopy of 'ohi'a, mamane, and tree ferns. Bamboo sleeve screens provide privacy between rooms.

The Botanical Lace: Patient Room Gardens

These 27 Feng Shui, semiprivate gardens are accessible to the patient, ohana (extended family) and staff rooms via sliding glass doors, providing fresh air and sunshine.

Together, the gardens form a "botanical lace" to moderate temperatures; pump oxygen; create privacy, a lovely view, and the sounds of nature; muffle noise and pollution; and create an easy focal point for patient contemplation and relaxation. Bamboo screens planted with pua-maile (*Stephanotis floribunda*) and gardenias afford privacy.

Birthing Gardens

Each of the five birthing suites (LDRP's: labor, delivery, recovery, postpartum) will open to a private birthing garden where a laboring woman and her family can walk, stretch, sit and breathe outdoors in privacy. The gardens, separated by 'ohi'a and eucalyptus fencing, will nearly triple the size of each LDRP. Metake or Japanese arrow bamboo (*Pseudosasa japonica*), a 6' high moss rock wall, and surrounding moso bamboo grove (*Phyllostachys pubescens*) will maximize sound absorption. Each garden will have a sounding water element, a labor post, chaise lounge, sitting areas, low voltage mushroom luminaires, and a perennial border in pinks, lavenders, and blues.

Regenerative Parcourse 2001

A fun walking/jogging circuit with wide paths and twenty-one graduated stops for stretching and aerobics will feature a bamboo water-wheel to aerate the main pond, a recirculating stream, fountain, waterfall, and irrigation sprinklers activated by the participants' exercising motions. The course would allow for a range of stamina, ability, and ages.

The Spectral Garden Rooms

Separate color gardens will provide comfortable sitting areas within blooming displays reflecting the healing qualities and scents of the featured hue. Each garden room will have a different color, shape, size, sound, feel, look, scent, art and architecture, children's area, ergodynamic earth form or seat, parcourse stop, meditation/prayer space, and a rich botanical complexity within a concisely ordered whole. Each garden will center on the living presence of water, essential for beauty, tranquility, and sound; aquatic food production (water cress, water chestnuts, lotus root); nutrient rich irrigation water; and oases for frogs, birds, fish, and pollinating insects.

Manaolana (The Garden of Hope, Literally, The Garden of Floating Thoughts)

The Chapel Garden will have only white blossoms, symbolic of universal oneness, peace, and purity. Its essence is in a natural outdoor chapel under 75-year-old bluegum eucalyptus trees. Within is a water garden, Mahealani (Garden of the Full Moon Night), with white lilies and lotuses, a water wheel, and Japanese style bridge.

The Bio-intensive Mini-Farm

Near the kitchen, one may stroll through a curving vegetable garden on a four-fold crop rotation of compost enriched beds. Beds are planted on a triangular matrix system, creating a living mulch to conserve water and soil, while providing four to sixteen times the yield of conventional farming with just a fraction of the energy, water, and fertilizer. After several rounds of "double digging," only mulching, light aeration, and the natural proliferation of earthworms are required to sustain soil fertility. Various cultural beds will be planted with Chinese, Japanese, Filipino, and European herbs and vegetables. Perennial beds—

including asparagus, strawberries, pineapples, lilikoi, poha, rhubarb, Okinawan and Malabar spinach, ong choy, the winged bean, and chayote—will surround the annuals. Flower selection will emphasize companion and pest-deterrent species. The harvest will provide the hospital with plentiful organic vegetables, fruit, and edible flowers. Nutritional, culinary, and medicinal herb gardens will supply fragrance, color, texture, and the liveliness of beneficial insects, as well as seasonings, aromatic and healing herbs, teas, bath herbs, and medicines for the hospital.

Permaculture and the Mini Orchards

Fruit and nut trees will provide bananas, dwarf papayas, avocados, loquats, cherimoya, starfruit, macadamia nuts, and citrus. "Thalas" (drip-lined saucers of macadamia nut hulls or bark chips) below conserve water and nutrients. Focus is on creating tree places for human enjoyment, as well as production and permaculture research.

Ka Hale Ani Ani: The Solar Greenhouse and Ani Ani Landscape Utilities

A solar greenhouse will be constructed for heat-loving plants, propagation, interior plant rotations, and an organic gardening library. A utility area will store garden equipment and recycling bins for glass, paper, cardboard, aluminum, and plastic. The composting arena will have a drop-off point for community donations of leaves and grass clippings. A potential water catchment system/reservoir could be the source of cost and chloramine-free irrigation water. The garden lighting, irrigation, mowers, and weed eaters will be solar powered. Inside the hospital, houseplants and soil microorganisms in the pots will absorb CO₂, CO, and other gases and vapors and will replace them with O₂ to help modify temperature and humidity, balance ions and purify the air.

Garden of the Four Noble Plants and Three Friends (Emergency Entrance Garden)

This garden will function primarily on a deep, or psychological level. The simple narihara bamboo or Japanese Temple bamboo (*Semiarundinaria fastuosa*) grove provides an atmosphere of tranquility and welcome in an otherwise stressful environment.

The four noble plants are: bamboo, orchid, chrysanthemum, and plum. The three friends are Buddha, Confucius, and Lao Tsu symbolized by the bamboo, pine, and plum.

CONCLUSION

People can be made to feel divine or degenerate by their surroundings. The Healing Gardens of Makahikilua have been designed to be "a balanced and self-renewing environment containing all the ingredients necessary for human biological prosperity, social cooperation, and spiritual stimulation" (Mc Harg). The project is a community-based, comprehensive, replicable model of a fine art ecological landscape, which will demonstrate the necessary reunification of beauty and utility, ecology and economics, quality, and permanence as applied to urban, suburban, and rural situations. This is indeed the time to mobilize the abundant collective intelligence, creativity, and latent healing abilities of our people and our planet. In a time when near term global trends point to catastrophic food, soil, water, and population crises, The Healing Gardens of

Makahikilua project a compelling image of the future that is deeply healing, abundant, and sustainable. The Healing Gardens are a meditation and a prayer for harmony with the bounty and healing power of this living Earth. Inspired originally by the visionary Paul Mitchell, the master plan is dedicated to "World Peace and Abundance." *E ola ka'aina! E ola ka poe o Hawai'i nei!* So that the land may live! So that the people of Hawai'i may live and thrive!

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NOTE: *At the time this article was published, the Healing Gardens of Makahikilua, while they are inspiring similar projects around the world, remain in the preliminary stage only at the brand new North Hawaii Community Hospital.*

NOTES ABOUT CONTRIBUTORS

Marni Barnes, MLA, LCSW, is with Deva Designs, Palo Alto, Calif. She was educated at the University of California–Berkeley in Social Welfare and Landscape Architecture. Marni designs and researches environments that are harmonious within nature and healing to people. Marni has recently published *Gardens in Healthcare Facilities: Uses, Therapeutic Benefits, and Design Recommendations*, and she is co-authoring a book on therapeutic gardens.

Margarette Beckwith, ASLA, is principal of Beckwith Chapman Associates, a design firm in Oxford, Ohio. A landscape architect with design experience spanning private practice and academia, she received her Master-of-Landscape Architecture degree from the University of Michigan–Ann Arbor. She is particularly interested in the design of restorative gardens and landscapes for the cognitively impaired. With an emphasis on historic precedent and current research, her investigation has resulted in publications and presentations on the subject of designing gardens for people with Alzheimer's disease.

Rob Benson, MLA, is professor of landscape architecture at Ball State University. He earned his Master of Landscape Architecture degree from Harvard University in 1967. His subject areas are landscape architectural design, history, planting design, and literary landscapes. He is a landscape architect and recovering alcoholic. For more than five years, he has facilitated a weekly growth group for other recovering alcoholics and their families in the same hospital in which he received treatment. He looks forward to continuing in his own recovery, one day at a time.

Gowri Betrabet is a doctoral student in architecture (environment–behavior studies) at the School of Architecture and Urban Planning, University of Wisconsin–Milwaukee and has a

Bachelor's degree in Architecture from Bangalore University in India. She is pursuing her deep interest in the different facets of human–nature relationships through an exploration of the nuances of restorative environments at different scales.

Nancy K. Chambers, HTR, has been a practicing horticultural therapist for 20 years and has received many awards for her work. Since 1986, she has been Director of the Enid A. Haupt Glass Garden/Horticultural Therapy Program at the Howard A. Rusk Institute of Rehabilitation Medicine, New York University Medical Center. She also consults on program development and accessible gardening for special populations.

Ronald A. Durham, BS, HTR, received his Bachelor of Science degree in Ornamental Horticulture from Delaware Valley College of Science and Agriculture. He has twenty years experience as a horticultural therapist treating patients ages 13 and up in partial hospital, in-patient, intensive out-patient, and out-patient settings. He is also a member of the Board of Directors of AHTA, treasurer and former board member of the Delaware Valley Chapter of AHTA, and is the owner and operator of Estate Gardener (a design and build landscape firm).

Mara Eckerling has an undergraduate degree in History from the University of Illinois (1983) and a JD from John Marshall Law School (1987). She started her study of landscape architecture at the University of Illinois, and is now in her last year in the Masters of Landscape Architecture program at University of Massachusetts. Previously, she worked as an attorney in the Illinois Attorney General's office. Her masters project is on restorative gardens.

Susan Gilster, RN, BGS, NHA, developed the Alois Alzheimer Center and currently serves as the Executive Director. This was the first free-standing Alzheimer's disease facility in the United States. Gilster has participated in numerous research projects, many of which have been national in scope. She has over 60 national and international presentations on health care, Alzheimer's disease, and administration and has authored more than 35 publications on a variety of health care topics.

Karen L. Haas, HTR, is a registered horticultural therapist for The Holden Arboretum, Kirtland, Ohio. As coordinator of the horticultural therapy program, she promotes using horticulture as a tool to improve the mental and physical well-being of people with disabilities. In 1994, she received the Rhea McCandless Professional Service Award from the American Horticultural Therapy Association. She holds a Bachelor of Science degree in Horticultural Therapy from Kansas State University.

Sonja Johansson and Donna M. Walcavage are registered landscape architects and principals of Johansson & Walcavage, Landscape Architects. Sonja Johansson received her Master of Landscape Architecture degree from the Harvard Graduate School of Design. She has been a designer of playgrounds for over 30 years. Donna M. Walcavage received her Bachelor of Science degree in Landscape Architecture from Pennsylvania State University. Together they established the firm Johansson & Walcavage in the late 1970s. The Johansson & Walcavage firm has focused on design for specific users, whether creating play spaces for infants or comfortable benches for the elderly. They enjoy collaborating with other design professionals, clients, and the public. They have designed such playgrounds as Pierrepont Playground and Hudson River Park at Battery Park City in New York City.

David Kamp, ASLA, is the founding principal of Dirtworks, a New York City landscape architectural firm nationally recognized for its work in the design of gardens serving the special-

ized needs of health care facilities. Kamp recently completed a Loeb Fellow in Advanced Environmental Studies at Harvard University. His studies included research into nature's influence on the physical and emotional needs of health care patients.

Nadine Kenline, HTR, is a horticultural therapist at Friends Hospital in Philadelphia, Pennsylvania.

Carole Labrecque, BS, CSLA, is a graduate of the School of Landscape Architecture at the University of Montreal. She has been a practicing landscape architect with a private firm. Her involvement in therapeutic gardens started three years ago with the development, in collaboration with Lucie Tremblay, of a new approach to prosthetic gardens for aging people living in institutions. The concept of the Evolutive Prosthetic Garden was presented at two conferences on treating specific needs of the elderly. Labrecque is now working on the practical application of the concept.

Rob McCartney, MS, is the Horticulturist for Sea World of Ohio. He directs all landscape and grounds management operations, including lawns, trees, floral displays, and pest control. Rob is the recipient of the International Society of Arboriculture Award for Academic Achievement and has received awards on Sea World's re-creation of a prehistoric environment for dinosaurs. He holds Bachelor of Science degrees in Education and Landscape Horticulture and a Masters degree in Horticulture, all from Ohio State University.

Elizabeth R. Messer, MLA, is the Director of the Misericordia Gardens Developmental Training Program, a horticultural therapy program at Misericordia Home in Chicago, Illinois. The program at Misericordia, established by Messer, emphasizes the therapeutic experiential qualities of the landscape as well as the educational, vocational, and therapeutic experiences within a production-oriented greenhouse. Design concepts and theories used by Messer's landscape architecture firm are often

generated by this horticultural therapy setting. She holds a Master of Landscape Architecture degree from the University of Pennsylvania and both a Bachelor of Architecture degree and a Bachelor of History of Art & Architecture degree from the University of Illinois. This paper represents her fifth in a series of investigations on the perceptions of the intangible landscape.

Robin C. Moore, MLA, is professor of landscape architecture at the School of Design, North Carolina State University in Raleigh. He is president of the International Association for the Child's Right to Play, past chair of the Environmental Design Research Association, and a principal in the design and planning firm of Moore, Iacofano and Goltsman. He is the author of *Plants for Play* (1993), and *Childhood's Domain: Play and Place in Child Development* (1986, 1992), and is the coauthor of the *Complete Playground Book* (1993), the *Play For All Guidelines* (1987, 1992), the *Play For All CD* (1995), and *Natural Learning* (in press).

Calley O'Neill is the principal designer with Team Earth Works, Inc. in Kamuela, Hawaii. Her work has reflected a planetary vision since the beginning of her career as an artist. Her art, which spans two decades, finds its expression in public mural paintings, easel paintings, and landscape designs. In these artistic expressions, her vision is literally incorporated into ecological fine art that stands on its own merits but also serves the purpose of nourishing and healing the Earth and its inhabitants. O'Neill's commitment to "food and energy self-sufficiency," which underlies these landscapes, provides the foundation for her thesis in *The Healing Gardens of Makahikilua—The Landscape as Healer*. The Healing Gardens reintegrate ecology and economics, beauty and abundance, and quality and performance.

Weeks Ringle, ASLA, is currently a landscape architect with Americorps VISTA at the East Tennessee Community Design Center in Knoxville, Tennessee. *Growing Citizens* was her design thesis at the University of Virginia, where she received her Master of Landscape Architecture degree in May 1995. The project earned a merit award from the Virginia Chapter of the American Society of Landscape Architects. The author wishes to thank Professors Elizabeth Meyer and Warren Byrd for their encouragement and guidance.

Virginia McGrath Salamy, RN, MLA, MS Architecture is a design consultant specializing in healing environments. Her expertise focuses on bringing nature and its character into the built environment to promote wellness.

Scott C. Scarfone, ASLA, is a practicing landscape architect and professional horticulturist. A graduate of West Virginia University, Scarfone holds degrees in landscape architecture and geography, with an emphasis on planning. Scott has designed nine healing gardens and is in process with three others. Scott is currently serving as president for the Maryland Chapter of the American Society of Landscape Architects.

Lucie Tremblay, RN, BSc, MSc, started her career as a practical nurse. Since then, she has completed her Masters degree in Administration in Health Care Services at the University of Montreal. She is now Assistant Director of Nursing in a long-term health care hospital. Her involvement with aging people has led her to publish many articles and to do a number of conferences on how to improve the quality of life for elderly living in institutions. Subjects treated include physical violence against aging people, environmental adaptations for people with cognitive deficits, and *The Evolutive Garden for the elderly*.

NOTES



Continue learning... become involved

The American Horticultural Therapy Association (AHTA) offers two membership opportunities through which **anyone** can continue to learn about horticultural therapy and can become involved in this exciting realm.

For the professional or aspiring horticultural therapist...

There is AHTA membership, with benefits ranging from a monthly eight-page newsletter and an annual journal to educational programs and a Professional Registration Program to a Discount Purchase Program...through which significant discounts are made available exclusively to AHTA members by national companies (for gardening books, gardening tools and equipment, seed, plants, and bulbs).

- Student \$25
- Associate \$35
- Individual \$50
- Registered \$75
- Institutional \$150

For the interested individual or aspiring supporter...

There is Friends of Horticultural Therapy membership. The Friends organization supports and promotes the profession of horticultural therapy by disseminating public information, by supporting (through grants) research, publications, and educational events, and by helping new programs to develop. The benefits of Friends membership include a six-page newsletter, educational programs, the same Discount Purchase Program described above, and the satisfaction that accompanies making a difference.

- Regular \$25
- Family \$50
- Contributor \$100
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For more information, contact
AHTA
362A Christopher Avenue
Gaithersburg, MD 20879

Phone: (301) 948-3010

Fax: (301) 869-2397

AMERICAN HORTICULTURAL THERAPY
ASSOCIATION
362A Christopher Avenue
Gaithersburg, MD 20879, USA

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