Innehåll: Vol. 10, No 1, 1997

NORDISK ARKITEKTURFORSKNING – NORDIC JOURNAL OF ARCHITECTURAL RESEARCH

Nature as Healer:

Therapeutic Benefits in Outdoor Places

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The aim of this paper is to present and compare the results of three studies which looked at places ealing and stress-reduction. In the tudy – Carolyn Francis and Clare er Marcus, "Restorative Environments: Environment and Emotional Well-Being" (1991, 1992) a sample of 154 students at five different U. S. universities were asked – "Think about some time in your life when you were feeling especially stressed, low or depressed and you chose to go to a particular place or setting as a result. Describe this place, the elements and qualities which were meaningful to you and what happened to you there." In a second study – Margaret Barnes, "A Study of the Process of Emotional Healing in Outdoor Spaces and the Concomitant Landscape Design Implications" (1994) a similar instrument was used but the sample of 65 was specifically asked about outdoor spaces, 75% of the sample comprised non-students, and encompassed a wide age range. The third study – Clare Cooper Marcus and Marni (Margaret) Barnes, "Gardens in Health Care Facilities: Uses, Therapeutic Benefits, and Design Recommendations" (1995) questioned a sample of 143 staff, patients and visitors using gardens and outdoor spaces in hospital settings about their motivations for using such spaces and how they felt after spending time there.

The burgeoning incidence of stress-related illness and attendant costs to both society and individuals, is an issue of concern in realms from the institutional to the private.

Simultaneously there is an increasing rejection of the model of health which posits separation of mind (and emotion) from body and bodily experience. Several recent studies have endeavored to increase our understanding of the role that *settings* can play in peoples' "self-help" choices when responding to stress or other emotional upsets in their lives. It is important for designers and environmental policy makers to comprehend, as fully as possible, the healing role that places may play in peoples' lives.

In a study of the use of outdoor space in hospitals, 95% of those interviewed (N = 143) reported a positive change in mood after spending time outside (Barnes and Cooper Marcus, 1995). When asked what specific qualities seemed to be helpful in triggering this mood change, more than two-thirds mentioned elements of the plant world

Table 1. Percent of Respondents Who Named These Qualities as Helpful in Attaining a Mood Change in Four Hospital Garden Settings

	Percent
Trees and Plants flowers, colors, greenery, heritage trees, being in nature, seasonal changes	69
Features involving auditory, olfactory, or tactile sensations birds/squirrels, wind/fresh air, water, quiet, light/sun, shade, fragrances	58
Psychological or social aspects peaceful, escape from work, openness/large, privacy/secret places, oasis, companionship, watching others, knowing it is here	50
Visual qualities relating to more than plant materials attractive landscape design, views, variety of elements, textual contrast/quality, differing shapes/sizes	26
Practical Features seating, well-maintained, accessibility, vending machines, smoking allowed, pathways	17
No answer or "don't know" (Number of respondents: 143)	8

Source: Cooper Marcus and Barnes, 1995.

(trees, flowers, colors, seasonal change, greenery); these were essentially aspects which attracted the eyes. More than half also mentioned elements which stimulated other senses (sound, smell, tactile); these were features such as bird-song, the sound of water from a fountain, fresh air, fragrances, etc. (See Table 1.) Typical responses were:

> I come out here between appointments. I enjoy the air, the feel of the sun, the privacy... It gives me the strength to deal with things. I feel calmer, less stressed.
>
> (Middle-aged, male outpatient)

> My level of stress goes way down. I go back to work refreshed... It feels like something is alive here in the middle of a city that seems dead.
>
> (Young female employee)

> I feel more normal here. I felt really depressed in there (i.e., the hospital). You come out here and it's more holistic, more natural... There's time to forget.
>
> (Female inpatient)

> I work in the Intensive Care Unit, which is like a hellhole... Sitting out in the warm sun is like therapy for me. I can relax, gather my thoughts...
>
> (Female employee)

Responses suggested that the above mentioned natural elements were critical because:

They represented a complete contrast to the experience of being *inside* a hospital.

They stimulated the senses, and that seemed to be a precursor to a calming or centering experience.

Less often mentioned, but significant was the fact that "Someone" (the hospital administration, the gardeners, volunteers) cared enough to provide and maintain the plants, flowers, etc. in such a space.

In this study, we were specifically interested in the use of gardens in a hospital setting – who used these spaces and with what outcomes. Since these were gardens, it is perhaps hardly surprising that sensory stimulation and green elements featured significantly in responses. In another study, conducted a few years earlier, we posed a question to a sample of university students regarding places of emotional healing[1] (Francis and Cooper Marcus, 1992). In this case, we asked them to recall an occasion when they had been feeling particularly stressed, upset,

Places		Percent
Natural Settings *		40%
- with water	(22%)	
- without water	(18%)	
Designed Outdoor Settings		31%
- campus, sports facility, private garden, yard, etc.	(19%)	
- urban park**	(12%)	
Enclosed Spaces		18%
- own room, home, etc.	(17%)	
- other	(1%)	
Urban and Built Settings (e.g., mall, movie theater, bar, store, church) ***		12%
TOTALS		100%
		n=154

Source: Francis and Cooper Marcus, 1992.

* Largely undesigned natural settings accessible to the public, in or near urban areas – e.g., beach, nature preserve, regional park, trail, etc.

** Small city or neighborhood park.

*** All those cited were indoors.

Table 3. Significant Elements and Qualities of Places Chosen by University Students When Feeling Stressed

Types of Elements or Qualities	No. of Mentions	% of Total Sample Who Mentioned
Natural elements	106	69%
Sensory qualities	97	63%
Evokes safety/comfort	94	61%
Provides privacy/solitude	79	51%
Viewpoint, expansive scale	43	28%
Urban milieu	42	27%
Opportunities for movement *	36	23%
Opportunities for exploration/challenge	6	4%

Source: Francis and Cooper Marcus, 1992.

* Jogging, running, walking, driving.

stricken, and they had gone to a particular place that helped them feel better. Subjects were asked to describe the place, what happened to them there, and what specific elements or place-qualities seemed to ameliorate their change of mood. In this case, subjects were free to describe any place at any particular stage in their life. We selected the word "place" since it is neutral in terms of indoor/outdoors, and in terms of designed/not designed.

The results of this study indicated a marked preference for outdoor settings (77% of the sample of 154 students). (See Table 2.)

When asked to describe the actual elements or qualities which seemed to contribute to their change of mood, four broad characteristics stood out. (See Table 3)

1. *Natural elements*, including vegetation, water, animals, birds, and weather conditions. For example, a young woman recalls sitting by a waterfall in Iowa when feeling stressed as a teenager:

> There was a grove of trees across the stream which was quite wild... I sat with my back to a tree and the water at my feet – shade, quiet, the low babble of the waterfall as it fell over the 12 – 18 drop. The woes of female teen pressure were soothed in this place.

2. *Sensory qualities*, including sounds, quietness, tactile sensations, darkness, colors, smells. A young woman describes what she does when upset:

> I run on the beach till I'm gasping for air... Eventually I sit on the cold

sand... I stare out at the ocean, which is so big it can consume me and my problem.... The waves crash into my brain, they seem to fill my senses until they overflow; the stress is pushed out.

3. *Qualities evoking safety and comfort*, such as familiar, secure, tranquil, comforting, nostalgic. They tended to be cited more of indoor places such as the subject's home or room. A midwestern woman in her thirties recalled spending time in her bedroom during a period of grief, ten years earlier:

> It was after my mother's death, and my bedroom had a quilt made by *her* mother on the bed. It was quiet and a little dark... slight darkness, I think, is very calming when one is very upset. The quilt made by my mother's mother out of fabrics my mother recognized and clothing and curtains from *her* youth, was a loving reminder of the continuity of life.

4. *Opportunities for privacy and solitude*, which included finding a private place in a public setting and seeking solitude in a secluded place. A young woman reported:

> A road in my neighborhood has steep hills so I could walk off my problems... The place provided solitude and enclosure... The thick vegetation played a large part in distracting me... new growth, scents, flowers, and rustling leaves gave me many things to look at and observe.

This statement illustrates how a number of different qualities would be cited in one response.

5. *Viewpoint with expansive scale* was important to many people as a setting in which they found solace through "getting things into perspective." Some found this on a rooftop of a city building, others in more rural settings. For example, a 25-year old man describes a location in his small hometown in Pennsylvania:

> The physical qualities which touched my mood were the view, and specifically the expanse of sky and enormous cloud patterns... one isolated tree in a distant field was symbolic to me of myself at the time – alone, empty, lonely, etc. Combined with the big spaces all around, I often felt very small and... insignificant. The sense of transience was strong and this made my feelings seem less burdensome.

A study by Barnes (1994) used a similar instrument to that used by Francis and Cooper Marcus, but a broader sample. Of the total sample of 65, three-fourths were not students; one-fourth were in various therapeutic and psychology-based professions, and one half were in varied fields (media, theater, art, education, writing). The mean age was 42. The attempt here was partially to test whether the results of the Francis and Cooper Marcus study (1992) were biased because the sample in that study was entirely of students in environmental fields (mostly landscape architects). The emphasis on nature experiences might be biased by the background of those surveyed. This was found not to be the case. Table 4 illustrates that, when describing places of solace outdoors, approximately the same proportion in each of the two studies chose a natural setting (beach, forest, national park, etc.) and approximately the same chose a designed outdoor space.

The higher proportion going to a natural setting in the Barnes study may be attributed to the older age group and greater access to cars in order to go to more distant settings.

When the two studies are compared as to which elements or qualities were cited as being especially important in facilitating a change of mood, there are also close parallels (See Table 5).

However, it is important to note that Francis and Cooper Marcus used an open-ended question (which was content-analyzed) whereas Barnes offered respondents a checklist. Another study using an open-ended question might be a fairer comparison. Also of note is that Francis and Cooper Marcus asked the respondents to recall any places, whereas Barnes asked only about outdoor places. Nevertheless, we feel that the tentative comparisons cited above begin to suggest that a sample of landscape architecture students is not necessarily biased "towards" nature.

Mood Change

To access participants' mood change when in their healing place, they were asked – "What happened to you there?" (Francis and Cooper Marcus, 1992) and "Describe the way you felt when you left" (Barnes, 1994). The narrative responses in the former study were content analyzed and the overall tone relegated each response into one of four categories – attaining a state of calm or balance, gaining perspective, staying with the feelings,

Table 4. Selection of Natural versus Designed Exterior Sites

	Francis and Cooper Marcus Study	Barnes Study
Natural Settings	57%	64%
(with water)	[54%]	[59%]
(without water)	[46%]	[41%]
Designed Outdoor Settings	43%	36%
(campus, sports facility, yard, etc.)	[60%]	[57%]
(urban park)	[40%]	[43%]

Table 5. Rank Order of Environmental Elements Mentioned as Significant in Healing Places

Francis and Cooper Marcus Study	Barnes Study
1) private place in a public setting	1) private place
2) meteorological elements	2) water
3) water	3) meteorological elements
4) trees, plants	4) trees, plants
5) viewpoint	5) viewpoint
6) other natural elements	6) sounds, music
7) movement	7) other natural elements
8) presence of other people	8) movement
9) sounds, music	9) presence of other people
10) darkness	10) darkness

Table 6. Categories of Mood Change Noted in Two Studies

	% of total Sample	
Mood Change	Francis and Cooper Marcus Study (N = 154)	Barnes Study (N = 65)
Attaining a state of calm or balance	39%	71%
Thinking things through, putting them into perspective	35%	63%
Staying with feelings	14%	33%
Being distracted	9%	17%
Unclear	3%	—
Total	100%	

and being distracted (the two authors did this separately and found a 90% rate of agreement). In the Barnes study, the same categories were adopted and relegated by the author alone. However the numbers in each category were assessed differently in these two studies. Francis and Cooper Marcus determined the predominant mood change in each response; Barnes, on the other hand, evaluated responses and found that each one fell into one or more categories. Hence, the percentages in the table cannot be compared, but significantly the rank order remains the same.

Stages in the Mood Change Process

A number of studies of emotional healing in outdoor places indicate that people tend to go through a series of changes. In a ten-year study of the experience of young people on therapeutic backpacking trips, Kaplan and Talbot found a sequential pattern of change as noted in the daily journals of participants (Kaplan and Talbot, 1983).

A phenomenological study of the wilderness experience by psychologists and wilderness leader Fran Segal uncovered a similar pattern of change (Segal, 1988). In Barnes (1994) and Cooper Marcus and Barnes (1995), a similar series of stages was noted; in reconsidering the data in the Francis and Cooper Marcus study (1992) (as prompted by Barnes' findings), we discerned a comparable process. In summary, these stages are:

The journey – a change of location from one that was associated with stress, grief, anger, etc., to a place that the person knows – consciously or unconsciously – will help evoke a better state of mind or allow room for a new experience.

Sensory awareness – being aware of new sights, sounds, smells, etc. and becoming engaged by these sensory experiences.

Self-centering – refocusing on internal emotional processes, finding inner strength, putting one's problems into perspective.

Spiritual connection – a deeper awareness of the connectedness between self and the environment, a sense of wholeness or belonging, a sense of release.

It is intriguing to note that these emotional changes are reported by participants on seven- and eleven-day wilderness trips (Kaplan and Talbot, 1983; Segal, 1988), as well as by those seeking a brief respite from a stressful situation, which may last only 30 – 60 minutes (Francis and Cooper Marcus, 1992; Barnes, 1994). In the above mentioned studies, all four stages were often alluded to. In the hospital study, where time in the garden was often as brief as 15 minutes, the first three stages were often referred to, though rarely the fourth (Cooper Marcus and Barnes, 1995). When Barnes compared the responses of those in natural and designed outdoor settings, she found that approximately the same proportions alluded to self-centering and spiritual connection, but that a higher proportion of those in natural areas referred to sensory awakening, presumably because of a richer sensory environment and fewer negative distractions.

Highly pertinent to this discussion of healing places and the stages experienced in mood change is the work of Herbert Benson et al (1994) on the relaxation response. This refers to a collection of physiological changes in subjects who are deeply relaxed, and which contrasts to those triggered in an emergency or stressful situation, popularly referred to as the "fight-or-flight" response. In Western culture, techniques have been developed to elicit the relaxation response; these include autogenic training, hypnotherapy, and visualization exercises. In recent decades, Eastern spiritual practices such as Zen meditation, yoga, Tai-Chi, and Transcendental Meditation have been embraced in the west and have been shown to produce the same physiological changes. Benson lists four basic elements necessary in eliciting the relaxation response:

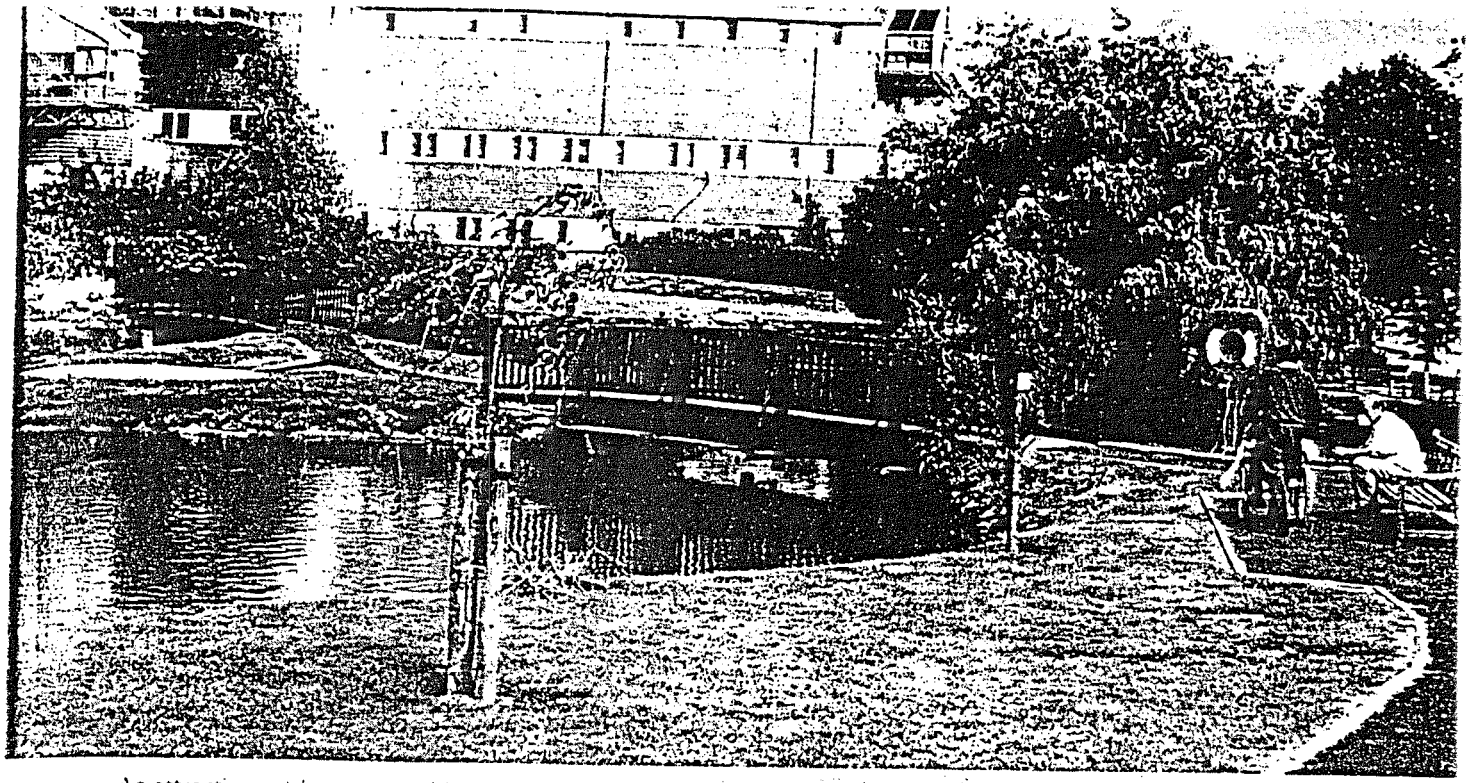
A quiet environment with limited environmental stimuli.

A comfortable posture.

A mental device – sound, word or phrase repeated silently, or fixed gazing at an object (candle, symbolic object). The purpose of this is to encourage a shift from focused, logical thought to a more diffuse, receptive awareness.

Passive attitude – if distracting thoughts take one away from the verbal repetition or gazing, they should be disregarded and one's attention should return to the technique (Benson, Beary and Carol, 1994, p. 38).

Historically, Benson et al note that native mystics, poets (e.g., Wordsworth) and writers (e.g., Thoreau) have elicited what we would now call



An attractive outdoor area at this new hospital is shared with the local small town as a park (St. Mary's Hospital, Newport, England)

the relaxation response by immersing themselves in nature.

Interestingly, a comparable process to that described by Benson et al in "The Relaxation Response" seems to take place during Zen meditation practice: first, a move or "journey" to a special place (a meditation hall or zendo); second, focusing on sitting posture and breathing (sensory awareness); third, barely noting thoughts, images, feelings passing through the mind and letting them go (centering); and finally, a dropping-away of ego-consciousness and the experience of inter-connectedness with all matter. This latter stage is the aim of many meditation practices though rarely, or only briefly, experienced. During meditation practice and in peoples' responses reported in Cooper Marcus and Barnes (1995), Barnes (1994), and Francis and Cooper Marcus (1992), the three stages *after* "the journey" were not necessarily distinct but rather flowed back and forth in time. However, the general trend or natural psychological progression was to move through the four stages described, in the order one through four.

The Findings in Theoretical Context

In these three small, focused studies, an interactional approach was adopted. The relatively small samples, simple research design, and limited environmental settings of these studies generated findings that are indicative rather than definitive. Nevertheless, the findings are in line with those generated by studies in the three major areas of existing research: environmental evaluations, outdoor recreation motivations and benefits of contact with nature as identified and described in a comprehensive review by Hartig (1993). Research on *environmental evaluation* has largely focused on comparing photographic scenes varying in naturalness with those displaying more naturalness generally being preferred. In the study of hospital gardens, we found that natural elements were those most associated with a positive mood change in the estimation of those interviewed. In the study of

restorative environments, natural settings were selected by most – but not all – subjects when asked where they went to relieve stressful emotions. These findings have much in common also with the body of research which had looked at *motivation for outdoor recreation.* As in many of those studies, our findings indicated that the use of a natural setting involved both *escape from* a stressful environment or situation, and the *pull towards* an environment which offered the hope of facilitating a positive mood change or greater psychological well-being. Findings from the three studies presented here also suggest that the greater the stress, the stronger the desire to escape.

Our findings also corroborate a range of existing research on the *benefits of nature experience.* Most of this research indicates that primarily visual experiences of nature can yield psychological and physiological outcomes. Nature views have been shown to have value in a variety of settings from homes (e.g., R. Kaplan, 1985), to hospitals (e.g., Ulrich, 1984), to work places (e.g., Young and Bemis, 1979), to prisons (e.g., Moore, 1982). Much of the research in this category used photographic simulation methods or views out from a building; the findings thus focus on the *visual* experience of nature. Our studies recalling experiences *within* actual naturalistic settings emphasize the significance of multi-sensory experience (sounds, temperature, smells and so on) in effecting psychological benefits.

Finally, a considerable body of research on the *benefits of a wilderness experience* indicates a variety of reported personal, emotional, cognitive and social outcomes (Levitt, 1988). Some of this work has involved putting subjects through a number of cognitively fatiguing tasks and then measuring the degree of restoration after a wilderness experience, or exposure to nature (R. Kaplan and S. Kaplan, 1989; Mang, 1984; Hartig et al, 1991). Existing research posits various psychological models for explaining the restorative benefits of environments. The Kaplans (1989), Mang (1984) and Hartig et al (1991) conclude that a restorative environment replenishes the capacity for concentration; the experiments on which they base this conclusion involved pre- and post-test tasks involving mental fatigue. The studies by Ulrich et al (1991), on the other hand, report restorative environments as facilitating stress-reduction and emotional balance; in many of their experiments, subjects viewed stress-arousing material, such as a film on industrial accidents. In the naturalistic studies reported here, we employed only self-reports in documenting prior mood and change of mood. From what subjects reported, it seemed that emotional restoration was a more significant outcome than was replenishing the capacity for cognitive attention or concentration.

Planning and Design Implications[2]

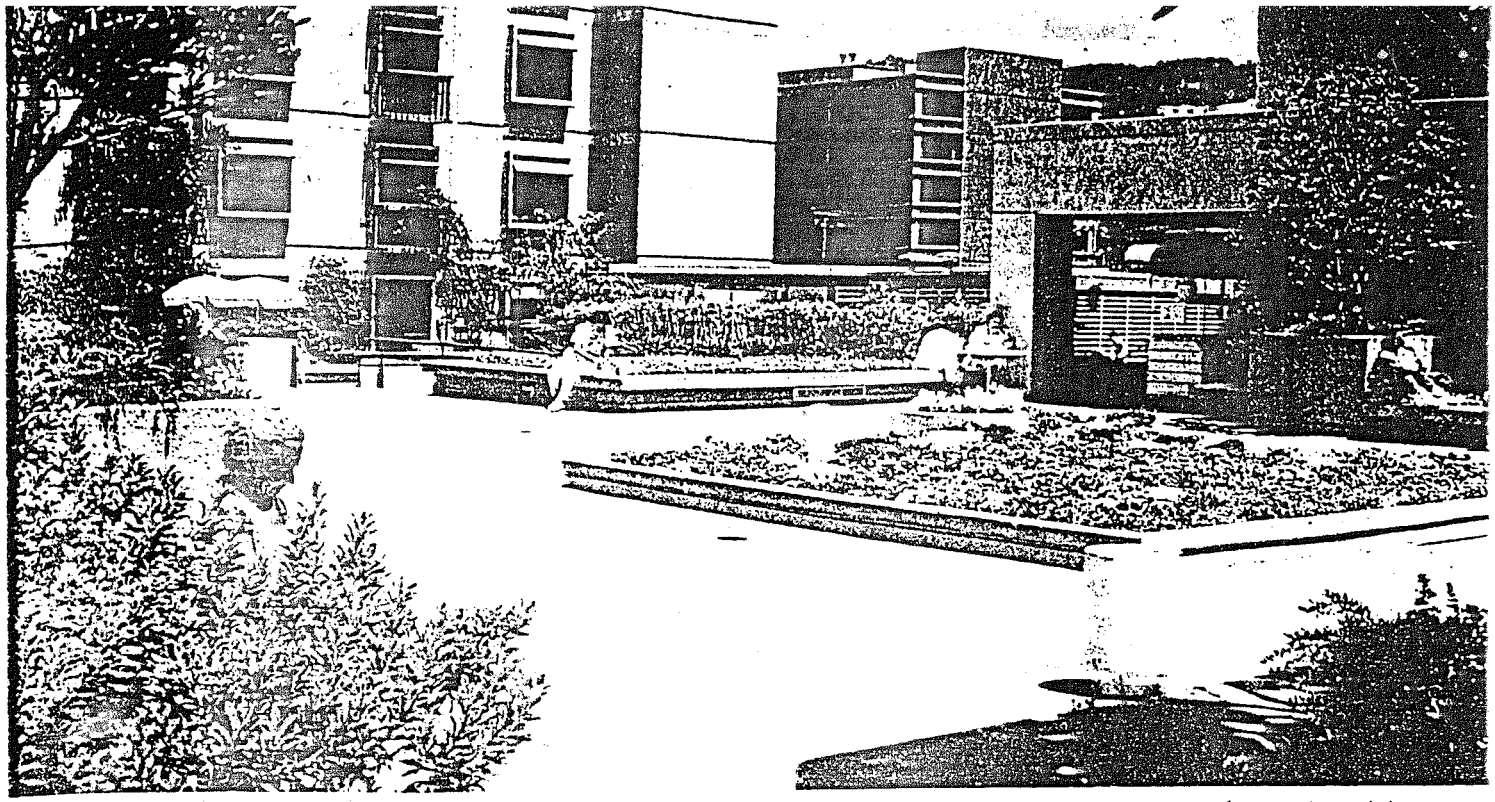
There is now a significant body of evidence to indicate that when faced with a stressful or emotionally upsetting experience, many people seek solace in natural surroundings (both designed and preserved). The first broad recommendation therefore is:

- Settings in which people potentially experience varying degrees of stress should be well-supported with healing places. These settings would include hospitals, prisons, workplaces, and universities.

The studies of restorative places and of hospital gardens indicate that use of a healing place involves a voluntary movement from a stressful place or situation to a place that is likely to facilitate a shift to a calmer mood. Knowledge that the place exists is a key issue. In the hospital study, we were shocked to discover that people at the information desk rarely knew of the existence of usable outdoor space, nor was there graphic or written information offering directions to patients and visitors.

- Provide way-finding information for potential healing place users, especially in settings where the length of stay may be relatively brief (e.g., hospital patients). Students on a campus or employees in a corporate setting, for example, will be more likely to discover places for themselves over a longer time period, thus directions are less critical.

Equally important to the knowledge that a place exists is ease of access to it. In the hospital study, the garden most heavily used (of four studied) was one which was large, visible, and central to the medical complex such that people passed through it constantly from one department to another. The least used was a roof garden which had no signs to it, and was a "terminus" location rather than a place one naturally passed by or through. In the study of restorative places, after subjects had described an occasion when they had gone to a healing place, they were asked: "Have you ever been in a situation where you wanted to go to a similar place or setting but there was no such place acces-



Used mostly by the staff for brown bag lunches and short breaks, this attractive roof garden makes use of space that might otherwise have been a bleak roof-top (Alta Bates Medical Center, Berkeley, California).

sible to you?" – 56% (87 people) said that they had experienced such a situation, mostly because there was no place nearby with the desired qualities. A woman in her thirties reported:

> I was depressed about a relationship. I wanted to get away from my apartment, but there was no other place where I could escape to... I felt frustrated which added to the problem, trapped within my apartment which trapped me within my problem.

When asked how they felt this lack, [illegible] cribed strong feelings ranging [illegible] being annoyed, to feeling angry, [illegible] rate, "ready to explode". All the emotions recorded expressed variations on the theme of "being trapped". These findings suggest a third, basic recommendation:

- Ensure that potential healing places are easily accessible to people living or working in high density urban areas, workplace environments, institutions, and places of higher learning.

A significant implicit component of people's descriptions of restorative settings and of users' accounts of the key elements in hospital gardens, was the complete *contrast* between this setting and the one where stress and difficult emotions were triggered (hospital building, office, university building, apartment, etc.).

- A key design goal should be to create a new setting, or preserve an existing setting, which provides as great a contrast as possible to the built environment.

All three of the studies quoted extensively above indicate that sensory stimulation is a key component of a shift to a calmer, more balanced mood. Hence,

- Provide lush, varied, colorful planting; trees whose foliage moves easily; features which attract birds and butterflies; a soothing water feature; contrasts of sun and shade, open and closed perspectives; a pathway system which encourages exploration and movement, and so on.

Some people seek complete privacy in a healing place; others seek a private place with a view out to other people ("prospect-refuge"), while a few may

come to a place for social interaction. Hence,

• Provide a variety of sub-settings from small, enclosed one-person spaces, to private spaces which are not completely secluded, to fixed or movable furniture which allows for pairs or larger numbers to converse together.

Descriptions of a viewpoint from which to "get things into perspective" featured frequently in accounts of healing places. Hence,

• Preserve and enhance public access to natural viewpoints (cliffs, hills, escarpments, etc.); create settings with extensive views in newly-designed built environments (roof gardens, terraces, hillside parks, etc.).

Safety and security featured importantly in descriptions of healing places, especially for women. This becomes especially salient in remote, natural settings (wilderness, beach, regional or national park, etc.) where there is a potential conflict for women, in particular, between seeking solitude and feeling secure.

• Provide places of solitude reasonably closed to well-used pathways, and/or with enough visibility so that a person there alone does not feel vulnerable.

Besides greenery, trees, and vegetation, the most frequently cited natural element in healing Provide places of solitude reasonably close to well-used pathways, and/or with enough visibility so place descriptions was water (fountain, pool, lake, stream, river, waterfall, ocean).

• Protect and enhance public access to natural water features (river, stream, sea, lagoon, etc.) close to urban areas. In designed settings, incorporate a water element (pool, fish pond, fountain); the sight and sound of moving water appears to be especially soothing.

When planning or modifying an environment where restorative places may already exist (e.g., a neighborhood, university campus, small town, etc.), it is important to solicit input from the experts (i.e., those already living or working there). While some components of healing places are described above, we cannot assume that we can always recognize or second-guess which specific places will be healing for some people. A Swedish study, for example, found that designers and planners all chose "green" places as their personal favorites, but when engaged in professional work, their main concerns were with buildings and streets, and the green structure of a community did not have a high priority (Berglund, 1996).

• Ask a representative sample of the potential user-population to identify and describe places they go to for emotional healing, or what they perceive as sacred places, or favorite places, or places they would never want to see removed or changed (See Hester, 1990, for techniques). It would be important to select a sample varied by gender, cultural background, age, and – possibly – sexual orientation. The study of restorative places (Francis and Cooper Marcus, 1992) indicated gender differences in places sought for healing (for example, water, vegetation, and other people were mentioned more frequently by women than men; opportunities for movement and physical exertion were mentioned twice as often by men than women). The Barnes' study (1994) suggested nearby accessibility was more significant for student-age and retired adults than for adults aged 25 – 60. Small sample student studies employing the restorative environments questionnaire in Vancouver, Canada in 1996 suggest that ethnicity and place of upbringing may be significant factors with regard to type of healing places sought. For example, one study comparing Hong Kong-born Chinese and Native Canadians found that the latter always sought natural settings while the former more often sought distraction in urban settings (Freeze, Lai and Mussell, 1996). Finally, a New York study of the places where people felt "at home" outside of their residences found that among others, sexual orientation was an important variable; gay men and lesbians sought places among their own kind and avoided places where there was real or imagined discrimination (Manzo, 1995). Thus, this variable also may affect the type of healing place selected.

Future Research

In view of the degree of stress and the serious toll inflicted by stress-related illnesses in most western countries, we feel that more research in the area of healing places is critical. However, we need studies also that start from a non-place oriented position, asking, for example: "At times when you are stressed or upset, what do you do...?", to try to discern how important *place* is in the larger scheme of things.

There appears to be ample evidence from laboratory and naturalistic studies that a nature experience *does* indeed reduce stress. What is especially needed now are, firstly, studies which focus on the specific nature elements and qualities that appear to be critical so that designers and planners will be

better informed. And secondly, we need much more information on how variables such as gender, sexual orientation, socio-economic class, place of upbringing, and cultural background affect people's choice of healing places. What kind of healing place, for example, would a person of Turkish, Yugoslav, or Pakistani background be most like to seek out and can they find such places when living as immigrants in Germany or Sweden, or Britain? If a wild natural area outside the city is a primary choice for healing, where does a low-income, inner-city resident go instead? How can we reconsider the planning of neighborhoods so that the differing healing places sought by men and women are given equal importance? In what ways do children and adolescents use the physical environment for healing when upset or under stress? These are large questions but ones that those of us in the field of environment and behavior research need to address. The toll inflicted by stress and illness on individuals – not to speak of national economics – demands that the study of healing places be given high priority.

Notes

1. The words "healing" and "restorative" are used interchangeably in this paper.
2. These are suggested by the findings of the three studies reported in this paper. A much more detailed set of recommendations (together with case studies) will appear in Clare Cooper Marcus and Marni Barnes, *Healing Gardens: Therapeutic Benefits and Design Recommendations* (New York: John Wiley and Sons, Inc., 1998)

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