

IMPACT OF URBAN NATURE: A THEORETICAL ANALYSIS

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ABSTRACT

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The stresses and strains of the urban environment are widely acknowledged. The means for recovery, for recuperation, are perhaps less evident. In particular, the role of environmental configurations in this process is often neglected in the measurement of quality of life.

The urban natural environment can provide the setting for such restorative experiences, both physically and conceptually. A theoretical analysis is presented that focuses on the importance of fascination and coherence as essential processes in the powerful effects of the nature context. When these are both afforded by the setting, many of the benefits available in more remote natural settings may be available in the nearby urban context as well. The bits and pieces of urban nature are significant not only in terms of active recreational encounters. The view of trees and birds, the thought of spring to come, and the plans for summer's window box can all help in the restorative experience.

INTRODUCTION

Why do cities have parks? Why are thousands of new trees planted each year? Why do people grow flowers and have house plants? Why are landscapes the subject of picture postcards, motel art, and cigarette advertisements? Are fall color tours just a gimmick invented by chambers of commerce?

There is substantial indication that the natural environment matters to people. But the natural settings discussed here are not the distant mountains and beaches, canyons and primeval forests. Rather, the focus is on nature-at-the-doorstep. The urban natural environment can provide a setting for restorative experiences, both physically and conceptually. The purpose of this essay is to explore some of the properties of the natural environment that play this special role. This analysis is then applied to an examination of the kinds of involvements that are necessary to experience these properties.

Urban life is rarely described as peaceful. It can be characterized by such

adjectives as 'alive', 'vibrant', 'exciting', 'colorful', 'teeming', and 'bustling'; it may also be 'rushed', 'hassled', 'noisy', 'crowded', 'stressful', and 'too fast'. But 'tranquility' is rarely mentioned. Yet people long for peacefulness and calm; they need it and miss it.

Natural settings, by contrast, are often proclaimed for their capacity to instill a sense of peace and serenity. They are not usually described as hectic or rushed. Somehow, tranquility is more readily achieved in the natural context. But such settings need not lack in excitement, vibrancy, awesomeness, or sensory richness. In the presence of nature it seems possible to combine the exciting and the serene.

The role of the natural environment is neither simple nor uniform. Experience is intimately related to functioning and experiences vary widely in families, communities, and cultures. Whether one fears the unknown or seeks it may be strongly affected by one's prior knowledge. Further, nature plays different roles for young and old. The search for adventure is more characteristic of youth; the yearning for tranquility may require the accumulation of frazzle. Given such complexities, it may be presumptuous to propose a theoretical analysis of the role of the urban/natural environment. At best such an analysis will be incomplete; it may be oversimplified as well.

Perhaps it is appropriate to digress a moment to consider the basis for the theoretical conjectures. Fortunately, empirical support for the psychological importance of the natural environment is developing (Knopf, 1983). In addition, there is no lack of indirect evidence. For instance, a quick browse in a bookstore suggests the importance of nature. Not only are there many beautifully illustrated and photographed books about natural environments, there are also plenty of how-to books to provide advice about such topics as recognizing wild plants in the city, growing edibles from pits and seeds, and organizing the community to preserve its open space. (For a fuller discussion of some of the indirect and empirical evidence related to the importance of the urban/natural environment, see R. Kaplan, 1983.)

Evidence comes in other forms as well. For some, credibility is enhanced through research results; for others, however, first-hand accounts are the most convincing. It is doubtful that many have taken up fishing because of empirical evidence documenting the wholesomeness of the activity. And despite a dearth of empirical support, literally millions of people nurture house plants and bedeck their walls with representations of nature. Both observations and experiences are necessarily components of theories.

A FRAMEWORK FOR INTERPRETING THE ROLE OF NATURE

One way to understand the environment is to examine its stimulus properties. Following Gibson's (1950, 1979) version of an ecological approach, Wohlwill (1983) identifies a series of stimulus attributes that differentiate the natural environment from the man-made. The natural

environment is characterized in this perspective by irregularity of lines and curvilinear rather than rectilinear edges, by the "continuous gradation of shape and color" as opposed to the "sharp discontinuities and abrupt transitions" of the nonnatural domain, and by "irregular, rough textures". Furthermore, Wohlwill describes natural environments as relatively less intense with respect to motion and the movements have greater regularity and predictability. While these attributes are acknowledged to be speculative and probabilistic, they are nonetheless proposed as significant perceptual differences.

Such an examination considers natural environments as equivalent. Whether the natural setting consists of grasslands, forest, conifers, or palms is ignored. Generalizing across settings, however, runs contrary to considerable research that identifies nature content as a significant determinant of perceptual differentiation (S. Kaplan, 1977, 1979a). In fact, many of the content domains that humans identify readily and care about deeply in the natural context provide sharp contrasts to the stimulus attribute characterization.

Trees serve as perhaps the best example. They are a dominant element of the natural environment and their importance to the urban/natural setting has been shown repeatedly (cf. R. Kaplan, 1983). Yet a tree has sharp discontinuities in shape (trunk) and color (trunk versus foliage). Lawns, parkland and other pastoral settings have also repeatedly been demonstrated as highly preferred natural settings, presumably because of their regular smooth texture (Ulrich, 1974; S. Kaplan, 1979b; Balling and Falk, 1982). Gardens (R. Kaplan, 1973, 1983) are yet another major area of nature content. Here again, there are strong contrasts and regularities of lines and edges. And if one extends the natural world to fauna, a discussion of content domains would certainly include the birds and squirrels that many urban dwellers delight in viewing (Frey, 1981).

Even an analysis which includes such content categories, however, is not sufficient. The human experience of nature is sensitive to the parts as well as the whole, but it is also sensitive to the arrangements and juxtapositions of the elements which make up the environment. A broad framework for such a 'process' analysis, based on informational properties of the environment which are salient to human functioning, is proposed by Kaplan and Kaplan (1978, 1983). Using a somewhat different approach, Kaplan and Talbot (1983) have suggested some processes that help account for the "psychological benefits of a wilderness experience". It is appropriate to explore whether similar processes might serve to account for the restorative capacity of the urban/natural environment.

Fascination

Much of one's life is spent in paying attention, heeding the demands of the situation, and struggling to ignore the distractions that abound. One con-

sequence of such efforts is fatigue. But there are also situations in which attention is undemanding, or effortless; rather than increasing fatigue such situations may be contributing to a sense of rest and well-being.

The difference between the effortful and effortless attention does not seem to be a matter of expending physical energy. Sitting at a meeting for hours at a stretch, mindful of the discussion and of the dynamics of the situation, requires effort, but little energy. Similarly, even the most automatic and powerful of cars does not reduce the attentional demands of urban driving. However, it is possible even in a fatigued state to venture forth and pursue activities that require considerable physical energy. Fatigued and irritable from the day's efforts, people opt for tasks that vary considerably in their energy requirements. Jogging, swimming, gardening, playing with one's children, and watching television illustrate this wide range.

What characterizes effortless attention is interest or fascination. William James (1892), who introduced this perspective of two kinds of attention, offered various examples of categories of things that hold one's attention. S. Kaplan (1977, 1978; Kaplan and Talbot, 1983) has extended this discussion of attention and fascination, especially with respect to natural environments.

While some sources of fascination are likely to be universal, many others are the result of experience and individual choice. Activities can become effortless through familiarity even though they were effort-demanding initially. One person's fascination may be no more than a chore to another.

In the natural environment, and even in the urban/natural environment, fascination can be found in patterns that instill dramatically different reactions. Some natural settings provide excitement. Storms, for example, can have such fascination; they are difficult to ignore. Waterfalls, rapids and crashing waves are likely to provide excitement. The appearance of migratory birds is a potential source of excitement, but is likely to require some familiarity to have its full effect.

By contrast, many other circumstances that hold fascination produce a sense of tranquility. They are calming and quieting: the rustle of leaves, a sunlit raindrop, the view of the woods or of a flowering meadow. While a sense of tranquility is perhaps more readily afforded in the urban/natural setting, the tranquil and the exciting may be hard to separate. A calm setting may, in a moment, be windblown and turbulent. Sighting several less common birds on a nearby tree may lead to a burst of excitement and be followed by a sense of peacefulness.

Coherence

In addition to fascination, Kaplan and Talbot (1983) propose coherence as a second major facet of settings that facilitate a restorative experience. Coherence is the result of organization, of finding a way to put pieces together into a meaningful whole.

Such coherence applies at various levels of concreteness. At the immediate perceptual level, for example, the scene along a commercial strip is difficult to grasp as a whole. A drive in the country, by contrast, fosters coherence as there is greater predictability from one glimpse to the next (S. Kaplan, 1979b). One way in which such coherence is readily aided in the urban/natural context is by patterns that seem orderly. In fact, one sometimes refers to orderly situations as well-organized. The manicured lawn with the neatly trimmed edge, the groomed garden where each plant is carefully tended, the brook which does not overflow its banks are seen as orderly, coherent patterns.

At a more conceptual level, Kaplan and Talbot describe coherence as "encompassing the imagined as well as the seen. It requires that there is more than meets the eye . . . a continuation of the 'world' beyond what is immediately perceived." Here coherence involves a sense of being "in a whole other world". Even a small park can achieve such a state. For some gardeners, the garden constitutes 'another world', a place far removed from the pressures and problems of the day.

To be in 'another world' requires both coherence and fascination. Clearly this must be an engrossing and absorbing situation. But such a linkage should not be considered inevitable. In some contexts fascination and coherence are quite separable. One's attention can be held by situations that do not 'hang together'. Comparably, there are many meaningful, orderly circumstances that are not intrinsically intriguing. It is the thesis of this essay, however, that when fascination and coherence occur together, restorative experience is more likely.

KINDS OF INVOLVEMENT

Given the emphasis in the description so far on fascination and coherence, it is clear that the setting itself is an important component of a restorative experience. In other words, the framework proposed here concerns the interaction of setting and person and suggests that certain environmental contents are likely to bring fascination and coherence with them. It is not clear from this description, however, what the role of the individual is in such environments. Is presence in the setting sufficient to reap the benefits? Or is some involvement or commitment on the part of the individual essential?

In a humorous though incisive fashion, Frisbie (1969) examines many of the ways in which different kinds of involvement can be found in the nearby natural environment. Thus, for example, a backpack with the essentials and a walking stick can transform a hike through a nearby natural area into an adventure to the far away. The very preparation for such a miniature adventure, imagining what one might encounter, has impact and intrigue.

Embedded in Frisbie's colorful collection of experiences are distinctly different kinds of involvement that can enhance the powerful effect of the natural environment encounter. Although he does not specify these, it may be useful to examine three such types of involvement: active, observing, and conceptual.

Active participation

One of Frisbie's themes involves the importance of getting somewhere, of active involvement with the out-of-doors. Similarly, an essential component of gardening is the active interaction with the natural setting. Such participation fosters a sense of a larger coherence — a relatedness to things that are important and that transcend the moment. One might feel a bond to early explorers or settlers, or even to the larger natural system. It is not surprising, then, that when one is pursuing such activities one loses oneself in this other world, forgetting for the while the dire, the imminent, and the demanding.

Active involvement might also entail less intense pursuits. A neighborhood walk or visit to a nearby park can be sufficient encounters with the natural world to foster tranquility and a sense of coherence.

Observing

The notion of active participation implies a contrast to passive forms of involvement. There is no neat separation, however, between the active and passive interactions one has with the natural world. Though a neighborhood walk may constitute a more active form of involvement, one might stop and notice the flowers in a neighbor's yard or a nest of a paper wasp. Although such forms of nature encounter would probably be considered passive, it is clear that the mental activity could be substantial. It is thus perhaps more appropriate to describe such encounters as 'observing'.

Much of the pleasure and interest that street trees provide stems from such observing. There is no data to indicate how many times a day street trees are noticed. They are certainly noticed when a mark appears on the trunk designating that the tree is too ill to save. Few things help define seasons as readily as the faithful progression shown by deciduous trees. And even if the tree itself is taken for granted, the wildlife it supports is likely to be watched intently.

One of the most pervasive interactions people have with their natural surroundings comes from the view from the window. It is hardly surprising that windowless environments are problematic (cf. Verderber, 1983). At work, at school, in the hospital, and at home it is comforting to maintain one's relatedness to the larger context. The mind can wander to that world beyond the walls. And if there are natural elements to be seen as part of that view, it is all the better.

In the context of the residential environment there is some empirical support for the importance of the view from home. Not only do residents prefer seeing the natural world, but what they see is closely related to their satisfaction with the neighborhood they live in (R. Kaplan, 1981, 1983). The sight of parked cars is predictably unappreciated. But the availability of trees and woods to be seen is a far more important predictor of satisfaction than one might have surmised.

In such encounters the effortless attention dominates. One does not force oneself to look at new leaf buds, or even to get angry at the messy flowers and seeds the trees shed. These things hold one's attention with no voluntary control. Similarly, watching the water in a pond, or the kids trying to catch the frogs by the pond's edge, has a fascination of its own. Such natural elements also often have a readily perceptible coherence. Street trees form a relatively orderly pattern. Landscaping around residences and, where available, around commercial establishments also provide a coherent pattern.

Conceptual nature

Another level of involvement with nature, and one that is easily overlooked, is conceptual. It is related to one's knowledge and imagining, even in the absence of the physical setting itself. Thus, for example, Frisbie suggests that knowledge of the habitat and a recognition that the planned outing is not without the possibility of danger are important elements in accruing the restorative benefits of the local 'wilderness'. The experiences he describes, though calling for active participation, are intensified by knowledge. In fact, much of the adventure stems from the stories one tells oneself, from the ability to relate the outing to real and potential experiences that it may generate. Knowledge also makes it more likely that one will venture forth properly prepared.

This more conceptual encounter with nature can also keep one in contact with things fascinating and engaging in their absence. Thus, even the act of planning one's garden or window box in the dead of winter can permit the mind to wander to a situation that is coherent and whole. Similarly, the knowledge that a park is available is in itself a source of great satisfaction (R. Kaplan, 1980). The opportunity for walks is important to residents independent of the actual use one makes of their availability (R. Kaplan, 1981). It is hardly surprising that urban residents so frequently challenge impending development of nearby woods or countryside given the conceptual significance of such areas.

SUMMARY AND CONCLUSIONS

Sleep is a restorative activity. Humans — and other animals — depend on it and seek it regularly. Sleep, however, does not fulfill all our recuperation requirements. For some, vacations to distant places are a feasible outlet. But even if one can afford such a change of scenery and of activities for a prolonged time, there is the need for restorative experiences of a briefer and more frequent duration.

Clearly restorative experiences are not dependent on the natural environment. The presence of nature content, however, seems to increase the likelihood of recuperative effects. Not only in recreational activities, but even in settings where one may observe and in conceptual involvement, natural

elements have the capacity to hold one's attention and to provide a strong sense of organization. Thus the combination of the content and processes enhance the restorative experience. The possibility for both effortless attention and coherence to be called upon simultaneously is a powerful benefit available in the context of nature.

The effect of the content and process is, furthermore, likely to be greatest where interaction with nature is possible at several levels. Frisbie's exciting and challenging adventures readily combine the active, observing, and conceptual. Even a neighborhood walk can call upon both active involvement and opportunities for noticing and observing. In the area of gardening, where there is a beginning empirical basis, it is clear that strong satisfactions accrue from each of the levels of interaction. The physical aspect of the activity (e.g., working in the soil), the opportunities to observe (e.g., seeing plants grow), and the more cognitive components (e.g., the planning involved) are all part of the fascination (R. Kaplan 1983).

Trees and flowers, landscaped areas, and even very small parks provide opportunities for mind-filling moments. They provide patterns that humans attend to effortlessly and, in the process, they permit moments of recovery from the strains of the day.

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REFERENCES

- Balling, J.D. and Falk, J.H., 1982. Development of visual preference for natural environments. *Environ. Behav.*, 14: 5-28.
- Frey, J.E., 1981. Preferences, satisfactions, and the physical environments of urban neighborhoods. *Doct. Diss.*, University of Michigan, Ann Arbor, MI, 160 pp.
- Frisbie, R., 1969. *It's a wise woodsman who knows what's biting him*. Doubleday, New York, NY, 205 pp.
- Gibson, J.J., 1950. *The Perception of the Visual World*. Houghton Mifflin, Boston, MA, 235 pp.
- Gibson, J.J., 1979. *The Ecological Approach to Visual Perception*. Houghton Mifflin, Boston, MA, 332 pp.
- James, W., 1892. *Psychology: The Briefer Course*. Holt, New York, NY, 476 pp.
- Kaplan, R., 1973. Some psychological benefits of gardening. *Environ. Behav.*, 5: 145-162.
- Kaplan, R., 1980. Citizen participation in the design and evaluation of a park. *Environ. Behav.*, 12: 494-507.
- Kaplan, R., 1981. *Nearby nature and satisfaction with multiple-family neighborhoods*. Prepared for Planning Department, City of Ann Arbor, MI, 35 pp.
- Kaplan, R., 1983. The role of nature in the urban context. In: I. Altman and J.F. Wohlwill (Editors), *Behavior and the Natural Environment*. Plenum, New York, NY, pp. 127-162.

- Kaplan, S., 1977. Tranquility and challenge in the natural environment. In: *Children, Nature and the Urban Environment*. U.S. For. Serv. Gen. Tech. Rep., NE-30, pp. 181-185.
- Kaplan, S., 1978. Attention and fascination: the search for cognitive clarity. In: S. Kaplan and R. Kaplan (Editors), *Humanscape: Environments for People*. Republished by Ulrich's Books, Inc., Ann Arbor, MI, pp. 84-90.
- Kaplan, S., 1979a. Concerning the power of content-identifying methodologies. In: *Assessing Amenity Resource Values*. U.S. For. Serv. Gen. Tech. Rep. RM-68, pp. 4-13.
- Kaplan, S., 1979b. Perception and landscape: conceptions and misconceptions. In: *Proceedings of Our National Landscape Conference*. U.S. For. Serv. Gen. Tech. Rep. PSW-35, pp. 241-248.
- Kaplan, S. and Kaplan, R., 1978. *Humanscape: Environments for People*. Republished by Ulrich's Books, Inc., Ann Arbor, MI, 480 pp.
- Kaplan, S. and Kaplan, R., 1983. *Cognition and Environment: Functioning in an Uncertain World*. Praeger, New York, NY, 287 pp.
- Kaplan, S. and Talbot, J.F., 1983. Psychological benefits of a wilderness experience. In: I. Altman and J.F. Wohlwill (Editors), *Behavior and the Natural Environment*. Plenum New York, NY, pp. 163-204.
- Knopf, R.C., 1983. Recreational needs and behavior in natural settings. In: I. Altman and J.F. Wohlwill (Editors), *Behavior and the Natural Environment*. Plenum, New York, NY, pp. 205-240.
- Ulrich, R.S., 1974. Scenery and the shopping trip. *Mich. Geogr. Publ.* 12, Department of Geography, University of Michigan, Ann Arbor, MI, 176 pp.
- Verderber, S.F., 1983. Windowlessness and well-being in the hospital rehabilitation environment. *Doct. Diss.*, University of Michigan, Ann Arbor, MI, 287 pp.
- Wohlwill, J.F., 1983. The concept of nature: a psychologist's view. In: I. Altman and J.F. Wohlwill (Editors), *Behavior and the Natural Environment*. Plenum, New York, NY, pp. 5-38.