

## The Urban Forest as a Source of Psychological Well-Being\*

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**ABSTRACT** That nature has a special role in people's lives has long been suspected but only recently documented. And the understanding of the way in which nature plays this role is more recent still. It turns out that an important component of this special role is nature's capacity to restore the mind and spirit, to allow one to recover from mental fatigue and to become once again comfortable, civil, and effective. The enormous importance of this restorative potential is perhaps best illustrated by what happens without it. Untreated mental fatigue leads to risky and impulsive action, to irritability and distractibility, and to disinclination to reflect on the implications of one's actions. Urban forests have the great and not always realized potential to function as sorely needed restorative environments, thus making possible the management of this pervasive social and individual malady.

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The belief that Nature plays a special role in terms of its effects on the human mind is by no means of recent origin. Thoreau (1854), for example, showed remarkable insight into the impact of nature experiences on human well being. Olmsted (1865), another astute observer of the human species, understood the need for fatigued urban dwellers to recover their capacity to focus in the context of nature; he showed this in his writing as well as in his design of parks.

Much as this humanistic insight into the role of nature is both thoughtful and profound, in some quarters it carries little weight. Unfortunately the impact of these poetic accounts has been largely restricted to the realm of arts and letters. In order for such insights to have an impact on land management, resource utilization, and other areas of policy and planning, a more scientific underpinning is required. While solid analysis, based on empirical support, is still in its infancy, considerable progress in this direction has been made in recent years.

Rachel Kaplan and I first became involved in this area when we were asked to look at the psychological effects of a community garden (R. Kaplan 1973). Subsequently we were asked to evaluate a wilderness program that was being supported by the Forest Service. This more or less accidental involvement led to our study of the Outdoor Challenge program over a ten year period (Kaplan and Kaplan 1989). Despite the many differences in age groups and contexts, the gardening and wilderness studies showed remarkable similarities in the capacity of a nature experience to have a healing effect.

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## WHAT DOES NATURE HEAL?

Generating empirical support and creating a useful analytic framework for understanding the psychological role that nature plays are clearly important goals. An essential first step is to determine what it is that nature heals. The belief that nature is indeed healing has many adherents; without a more focussed understanding, however, progress in research and theory is seriously hampered. Perhaps a useful beginning would be to examine this issue intuitively. If we could identify what it is that leads people to seek a break, a vacation, or a little time outdoors, it may be easier to understand what nature heals.

Koch's (1956) description of two of his colleagues provides some useful imagery for our topic. Both colleagues were faced with a pile of papers to grade. One of these individuals is described as sitting down at his desk, picking up a paper, reading it through rapidly, making a few marks on it, putting it down, and picking up the next one, and so on. The other individual's behavior might be described as follows: He enters his office, is reminded of the pile of papers on his desk, and decides that he could deal with the challenge better with the help of a mug of coffee. Upon his return with the coffee, it occurs to him that he had almost forgotten that there is a colleague he has been meaning to talk with, so off he goes again. Finally back in his office, he observes that the pile of papers is still there. It then occurs to him that he is not entirely sure where he has parked his car; he decides that he should really check that out before doing anything else. Koch concludes with two admissions, namely that both of these individuals are in fact the same person -- himself.

It is not difficult to empathize with Koch's unfortunate "colleague." Surely all of us have had days like that at one time or another. It has become common in both lay and professional circles to label any such temporary decline in mental effectiveness as a symptom of "stress." But what Koch is talking about does not fit any of the usual ways of identifying stress. There are no signs of rapid heartbeat, palmar sweating, or other autonomic indicators. Calling the second individual's distracted behavior "stress," may, in fact, lead to a failure to understand what is going on. Let me offer a different interpretation by suggesting that we provisionally call his condition "mental fatigue."

Many people are familiar with mental fatigue, with feeling "worn thin," not because of bad things, but simply as a result of too many things. Unlike stress, which is defined as a reaction to harm or threatened harm, people can become mentally fatigued by doing what they like to do, but for too long without a break.

There are many consequences of a fatigued state of mind. Impatience and greater distractibility are common symptoms. So is increased irritability. The fatigued individual doesn't necessarily notice the change, but co-workers and family have little trouble recognizing it. One is bothered by things that normally wouldn't have been an issue. Staying with dull but necessary tasks becomes more challenging. In fact, much of what was once easy is now hard. And as if all that weren't enough, there is a tendency to lose the bigger picture, making it harder to remember that it all fits together somehow and makes some kind of sense.

For many people days like this come far too often. There are reasons to believe that this is a pervasive, but largely unrecognized problem.

### **Mental Fatigue and Attention: A Theoretical Analysis**

Mental fatigue is a useful label for this syndrome, but it is also somewhat misleading. It does allow one to distinguish this area of difficulty from physical fatigue on the one hand and stress on the other. The difficulty, however, is that the name suggests that the mind as a whole has fatigued, and this is not the case.

A useful handle on what is going on here comes from a distinction made by the great American psychologist and philosopher, William James (1892). He distinguished between two kinds of attention, which in modern terms, might be referred to as "directed attention" and "fascination." Directed attention is what it takes to get through a difficult or boring task. It is the kind of attention we call upon when working in a distracting surrounding or when trying to make a decision about a complex situation. It takes effort, and it is susceptible to fatigue.

Fascination, by contrast, is effortless. It is the kind of attention that is called forth by exciting events or interesting tasks. Far from being hard work, it is often difficult to tear our attention *away* from something fascinating.

Thus the basic distinction revolves around three themes. Directed attention is effortful, it is subject to voluntary control, and it is susceptible to fatigue. Fascination, by contrast, is at the opposite pole on each of these dimensions. In terms of our analysis of "mental fatigue" then, it is more useful to name the syndrome in terms of what is actually becoming fatigued -- hence we call it Directed Attention Fatigue.

It may seem strange that so important an aspect of the human mind as directed attention should be so fragile. Yet, in evolutionary perspective, this apparent limitation might have been quite reasonable. To be able to pay attention by choice to one particular thing for a long period of time would make one vulnerable to surprises. The capability of being vigilant, of being alert to one's surroundings may have been far more important than the capacity for long concentration. Further, much of what was important to the evolving human -- wild animals, danger, caves, blood, to name a few examples -- was (and still is) innately fascinating and thus does not require directed attention. It is only in the modern world that the split between the important and the interesting has become extreme. All too often the modern human must exert effort to do the important while resisting distraction from the interesting. Thus the problem of fatigue of directed attention may well be of recent vintage.

### **Some Implications of Directed Attention Fatigue**

How serious a problem is directed attention fatigue? If it is a minor annoyance, a mere snuffle in the sea of health, it hardly requires major consideration. If, however, people suffering from fatigued directed attention are seriously impaired, or if it is a pervasive problem, then it becomes a matter with implications for policy and planning. One way to think about the issue of seriousness is in terms of the impact directed attention fatigue can have on basic psychological processes.

Directed attention fatigue has many, substantial impacts on the capacity to think. It leads to difficulty in sustaining a line of thought; one is readily deflected or distracted. There is limited ability to analyze, to plan, to decide. Not only are these abilities diminished, the interest in a reflective stance declines also. There is a strong bias toward acting rather than thinking. It is difficult to listen to the opinions of others. Thoughtfulness is replaced by impatience. In fact, a major cost of directed attention

fatigue may be the tendency toward acting impulsively, toward taking unnecessary risks. Recent findings on pilot errors, for example, implicate the role of disturbed sleep patterns, a clear cause of directed attention fatigue (Moore-Ede 1993; Public Citizen 1992).

Not only are thinking and taking action implicated; feelings are influenced as well. Individuals suffering from directed attention fatigue tend to be irritable. Research evidence suggests that they are resistant to helping others in need (Cohen and Spacapan 1978). And although this syndrome is distinct from stress, persisting directed attention fatigue can certainly lead to stress. Over extended periods of directed attention fatigue, as one becomes progressively less competent, the awareness of one's reduced ability to handle difficult situations is bound to grow. Then the anticipation of potential harm, a classical basis for the stress reaction, becomes a likely consequence.

Even if directed attention fatigue can have potentially serious consequences it need not become a matter worthy of consideration if it is a relatively rare condition. Quite to the contrary, however, it is far from rare. Although frequently unnoticed or mislabeled, it is widespread. The number of conditions that can lead to directed attention fatigue is, unfortunately, substantial. Leading the list of individuals for whom directed attention fatigue is a likely pattern are those suffering from serious illnesses as well as the caretakers of the ill. While to date directed attention fatigue has only been documented in cancer patients (Cimprich 1990) and AIDS caregivers (Canin 1991), there is every reason to believe that this phenomenon is quite general. People experiencing grief over a major loss, whether it be a significant other, a job or one's home, are also highly susceptible. Overwork, sleep loss, and coping with prolonged attention-demanding situations (like urban traffic, for example) also lead to fatigue of this important capacity.

## **WHAT HELPS: RESTORATIVE ENVIRONMENTS**

In order to rest directed attention, it is necessary to find an alternative basis for maintaining one's focus. Fortunately there is such a source, and, equally fortunately, it is widely available. Fascination, the other form of attention, is itself resistant to fatigue and permits directed attention to rest.

There are many sources of fascination. Fascination can come from content, and that content can be of various kinds. It can be noisy, like watching auto racing, or quiet, like walking in a natural setting. Fascination can also come from *process*. Recognizing despite uncertainty and difficulty, like birdwatching, is an example of a process that allows one to pay attention without effort. Predicting despite uncertainty, as practiced by gamblers, provides another process example. Quiet fascination, characteristic of certain natural settings, has a special advantage in terms of providing an opportunity for reflection, which can further enhance the benefits of recovering from directed attention fatigue. I will refer to such opportunities for reducing directed attention fatigue as "Restorative experiences" or "Restorative environments."

Fascination is thus a central component of a restorative environment. By itself, however, it is not sufficient. Three additional components have been identified (Kaplan and Kaplan 1989).

1. *Being away* is useful, but by itself does not guarantee a restorative environment. People often use "getting away" as a shorthand for going to a restorative place. Nonetheless, there are many places that are "away" but would not permit the necessary rest of directed attention. A prison cell provides a vivid example.

2. The environment should have *extent* rich enough and coherent enough so that it constitutes a whole other world. Restorative environments work best when one can settle into them, when they provide enough to see, experience, and think about that they take up the available room in one's head.

3. There should be substantial *compatibility* of the environment with one's purposes and inclinations. In other words, the setting must fit what one is trying to do and what one would like to do. Compatibility is a two way street. On the one hand, a compatible environment is one where one's purposes fit what the environment demands. At the same time the environment must provide the information needed to meet one's purposes. Thus in a compatible environment one carries out one's activities smoothly and without struggle. There is no need to second guess or to keep a close eye on one's own behavior. What one does comfortably and naturally is what is appropriate to the setting (Kaplan 1983).

### **The Role of Pleasure and Enjoyment**

All other things being equal, an environment that is enjoyable is likely to be more restorative than one which is not. There is, however, reason to doubt that enjoyment is a requirement of a restorative experience. At present there are no research results bearing on this question, so the issue is not clear. A few anecdotal findings, however, may offer some useful perspective.

A colleague who suffers from Multiple Sclerosis continued to fish for a number of years despite his handicap because of his great love for the sport. Ultimately, however, he found the amount of help required from his fishing buddies was more than he could tolerate. The trip turned out to be distinctly disagreeable and quite distressing. It was thus with great surprise that upon his return to work the following week, he found himself at his desk working with greatly enhanced focus and effectiveness.

Another colleague, whose husband had died recently, characteristically was paying more attention to the needs of others than to her own, and I was concerned that she might tend to be insensitive to the problems created by directed attention fatigue. She was, in fact, upset to find herself less energetic and competent than usual. Because of this, although resistant to the idea of "indulging" herself by taking daily nature outings, she agreed to give it a try. She subsequently reported that they do help, that they work best when one is alone, and that being sad does not undermine their effectiveness.

### **Environmental Dimensions**

There are some environmental properties that should be kept in mind in planning for a setting that will be effectively restorative. (1) *Proximity*: People hesitate to go out of the way for restorative experiences, despite their importance. (2) *Scale*: A setting need not be large to be effective. (3) *View*: Having an engaging view of nature is important. This turns out to be true whether the view is from the window or while on a trail in a natural area. (4) *Preference predictors*: A substantial amount of work on environmental

preference has pointed to the importance of mystery, legibility, complexity and coherence (Kaplan and Kaplan 1989). The relationship of these predictors to the restorativeness of a setting has not yet been demonstrated, but anecdotal evidence suggests this is a likely possibility.

### **Social and Cultural Dimensions: The Issue of Legitimacy**

Even when an individual is convinced that recovery from DIRECTED ATTENTION FATIGUE is important, and appropriate environments are available, pursuit of restorative experiences might still not occur. An important factor in this failure of self help is the social climate in which we live. There is little social support available for such behavior. On the contrary, our culture tends to frown on so-called "frivolous" activities. This is perhaps a carry over of the puritan point of view, a perspective that Mencken characterized as "The haunting fear that someone, somewhere, may be happy." The tendency to frown on not obviously productive activities was neatly captured by a donor of a park bench at a park near where I live. The inscription on the plaque reads:

Park Bench Donation: "Gary L. Krause --  
You should be home studying."

### **EMPIRICAL SUPPORT**

Thoreau, Olmsted, and many others who have written of nature's role in mental health were surely speaking from first hand experience. They did not address the issue of mental fatigue, nor cast the need for restorative settings in terms of the consequences of overuse of directed attention. The theoretical analysis proposed here offers a different kind of input, suggesting a framework for understanding why nature may be a powerful agent in healing. Further corroboration for both the poetic, the anecdotal, and the theoretic, however, would be most desirable. This section offers an overview of some of the empirical research that addresses this issue.

A number of studies point to the beneficial effects of a nature view on physical and mental health. Studies have been carried out in a variety of settings, including hospitals (Ulrich 1984; Verderber 1986), prisons (Moore 1981; West 1986), and home ((Kaplan 1985). Recent studies in the workplace indicate that a view of nature leads to fewer ailments and higher job satisfaction (Kaplan 1993).

There have also been studies that explicitly measured directed attention. The first of these was carried out by the Irvine group (Hartig, et al. 1991). Hartig et al. compared wilderness vacationers with two other groups: urban vacationers and a nonvacationing control group. Following their trip, the wilderness group showed a significant improvement in their ability to proofread, a task that is highly demanding of directed attention. Comparable improvement was not found for the other groups. In a second study, participants first completed a task that led to directed attention fatigue. The next 40 minutes were spent either walking in an urban setting, walking in a natural setting, or reading magazines (random assignment), followed by completion of a series of tasks. The results supported the hypothesis; there was superior proofreading on the part of natural environment group.

Another study employing specific measures of directed attention looked at mental fatigue in recovering cancer patients. Cancer patients are generally instructed in self-care when they leave the hospital. They not only tend to have difficulty remembering such information; some even deny that they ever received it. It has also been observed that cancer patients with a clean bill of health from a medical point of view often suffer persisting coping problems of many kinds, including marital difficulties and severe limitations in returning to their former activities (Obrist and James 1985).

Feeling that these observations suggested serious mental fatigue problems, Cimprich (1990, 1992) studied recovering breast cancer patients, using a wide range of attentional and other measures. Participants were randomly assigned to either the experimental or control group. The former involved having each person sign a contract agreeing to participate in three restorative activities (of at least 20 minutes each) per week. The control group was not told about restorative activities until the study was completed. While the notion of restorative activities was explained in broad terms with numerous examples, participants generally selected nature-based activities (such as walking in nature and gardening) to fulfill their contracted time.

Cimprich reported that the participants in both groups showed severe attentional deficits shortly after surgery. The experimental (restorative) group showed gradual but steady improvement in their capacity to attend over the four times they were measured during the twelve weeks following surgery; the control group did not. Further in the restorative group participants went back to work sooner and were more likely to go back full time. Another striking difference was the inclination of members of the restorative group to start new projects (like learning a language or losing weight). No new projects were reported by the control group participants. And finally, experimental group members showed significantly greater gains on quality-of-life ratings.

What is particularly remarkable about this study is the effect of a very modest intervention (three activities of at least 20 minutes a week) on a problem that, according to the literature in this area, has the capacity to undermine people's lives for a matter of years.

## CONCLUSIONS

*Cost-Benefit Perspective:* Restorative experiences involve large benefits for a relatively small investment with few negative side effects. Performing such activities is a way to help otherwise impaired individuals regain their effectiveness and go on with their lives. Restorative activities may play a preventive role by reducing work pressures and encouraging reflection, a mental bookkeeping activity with long-term implications for health and effectiveness. Such small differences can have remarkably large effects.

*Special Landscapes:* If everyone who could benefit from the restorative potential of nature experiences were to put this knowledge to use, it could create an enormous pressure on the landscape. It thus behooves us to consider ways in which each kind of special landscape could be designed or managed to serve as a restorative environment. This may be a particularly challenging task for certain kinds of landscapes, such as those emphasizing water conservation or fire safety. On the other hand, it is likely to be well worth the effort, since meeting this challenge could bring increased public acceptance as a substantial fringe benefit.

*Institutional Implications:* A comparable challenge faces experts knowledgeable about institutional influences on the landscape. Legal, political/ administrative and economic factors have the potential, if approached with insight and ingenuity, both to protect landscapes with restorative potential, and to foster their creation. If restorative settings are even half as significant as preliminary research suggests, such efforts will be well rewarded.

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