

A Look at the Ecotherapy Research Evidence

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Abstract

Ecotherapy is an umbrella term for a gathering of techniques and practices that lead to circles of mutual healing between the human mind and the natural world from which it evolved. It includes horticultural therapy, wilderness excursion work, time stress management, and certain kinds of animal-assisted therapy. This article provides an overview of research into ecotherapy's treatment efficacy and argues for a psychology of place designed to reconnect people psychologically with the world a place at a time.

Introduction

“Ecotherapy” is an umbrella term for treatment modalities that include the natural world in relationships of mutual healing and growth, and as such is a form of applied ecopsychology (Buzzell & Chalquist, 2009). Ecotherapeutic methods do not represent a cure for the woes of industrial civilization, nor can they be judged by expectations more appropriate to a body of knowledge and practice examined by many years of research. Nevertheless, initial indications and a growing body of evidence present an astonishingly hopeful picture of the efficacy of ecotherapeutic practices.

Below appears a short summary of this evidence. The following studies were drawn from a large pool and are limited by space requirements to green infrastructure and exercise, nature in healthcare settings, animal-assisted therapy, horticultural therapy, and outdoors restoration. The conclusion of this article touches on some of the themes common to these realms of human-nature interaction.

Green Infrastructure and Exercise

As of the 1980s, we who live in highly industrialized nations began spending more than 90% of our lives indoors (National Research Council, 1981); by various estimates our time outside has since shrunk to 1%–5%. This is a first in all of human evolutionary history.

Little wonder, then, that the built environment significantly impacts personal and social well-being. The quality of housing, neighborhood, noise, crowding, indoor air, and light all connect to mental health (Evans, 2003; Lepore, Evans, & Schneider, 1992). In the suburbs, too, with their standardized units, tiny yards, and micromanaging housing associations, happiness and self-efficacy do not necessarily rise higher than in the city, and isolation and loneliness can set in upon arrival (Adams, 1992; Tallman, 1969). Many studies have tracked the relationship between the built environment and increased stress and decreased task ability and motivation, including replications of crowding studies on learned helplessness (Baum, Calesnick, & Gatchel, 1982), college dorm crowding and social withdrawal (Baum, Gatchel, Aiello, & Thompson, 1981), and the impact of noise on problem-solving skills (Boman, 1994), depression (Gatchel, McKinney, & Koebernick, 1977), difficulty studying and relaxing (Ng, 2000), and even skin conductance (Gatchel & Proctor, 1976). At home, a recent study so strongly linked depression with exposure to a common household mold (Lawton, 2007) that psychotherapists had better learn how to assess for it.

At work, office noise decreases the ability to solve problems (Evans & Johnson, 2000); ultrafine particles from some brands of laser printer go deep into the lungs, their deadliness comparable to that of cigarette smoke (Macey, 2007); and employees surveyed in the United Kingdom attributed a significant number of symptoms to bad indoor air; this finding is true for both sexes and for people with and without allergies (Lahtinen, Sundman-Digert, &

Reijula, 2004). Outside the office, longer commute times diminish motivation, concentration, and proofreading skills (Schaeffer, Street, Singer, & Baum, 1988; Wener, Evans, Phillips, & Nadler, 2003).

So what *does* work in favor of health? So far most of the research on what advertisers refer to as “green” or “sustainable” homes and workplaces has focused on the economic benefits; for example, a study shows that increasing home energy efficiency provides a 30%–50% a year return on the investment, which is much better than that on most stocks, bonds, and money market funds (Bazerman & Hoffman, 1999). Likewise, a 2003 study out of Texas A&M University demonstrates that just adding flowers and plants to a workplace makes a tangible increase in productivity, to the tune of a 15% rise in innovative ideas and more creative, flexible problem-solving than that of control groups without greenery nearby (PR Newswire, 2003). In educational and other settings, researchers have found that participants held more positive perceptions for a task and reported decreased boredom in a room with windows than in a room without windows (Kim, 1998; Stone & Irvine, 1994).

Other studies have focused on mental health and quality of life. In one 2-year study in New York City, lighting streets attractively was shown to promote friendlier social interactions after dark within a high-crime, low-income neighborhood; visits to a nearby library increased as well (Tillett, 1999). Depressive symptoms decreased in men over age 65 once they began a program of regular walking in the neighborhood (Berke, Gottlieb, Moudon, & Larson, 2007).

England's Countryside Agency has initiated a 30-year Community Forests Programme to bring half the nation's population (as of 2006) in the vicinity of at least 1 of 12 community forests. Their idea is to establish woodlands and other verdant spaces in sustainable urban living arrangements which so far have attracted considerable investment and financial support. They involve inhabitants in planting trees and restoring barren sites, regenerate local economies, restore local ponds, rely on renewable energy to cut carbon use, and increase woodland cover (Talbot, 2006). Locals also manage the Healthy Soils Restoration project and form green barriers to keep developing towns from consuming adjacent villages. Alliances with primary and mental healthcare trusts help sponsor walks, festivals, artisan fairs, and other activities—including thousands of training events—to promote mental and physical health.

In two studies at the University of Essex, 108 people gardened, walked, ran, cycled, and got involved in conservation activities. Of these, 94% reported benefits to their mental health: “I feel bet-

ter about myself and have more of a sense of achievement”; “It improves my depression, helps me be more motivated, and gives me satisfaction in doing things”; “I feel refreshed and alive.” 90% of participants who went on a nature walk reported an elevation in self-esteem, whereas 44% of those who walked through an indoor shopping center reported reduced self-esteem. Participants in other outdoor activities reported less anger and tension and improved mood (Mind Publications, 2007).

Walkability and mixed use of neighborhoods have been reported to enhance the sense of community and one's perceived value to it (Glynn, 1981; Nasar & Julian, 1995) and to promote higher physical activity and lower obesity levels (Salens, Sallis, Black, & Chen, 2003). The likelihood of obesity declines with time spent per day in mixed-use landscapes, but rises with time spent per day in a car (Frank, Andresen, & Schmid, 2004). Furthermore, a growing collection of research demonstrates exercise to be as effective in some cases as antidepressants (Halliwell, 2005; Richardson et al., 2005). This could prove a boon not only to the estimated 93% of United Kingdom physicians who have prescribed antidepressants because of a lack of alternative treatment options (Hairon, 2006), but also to concerned physicians everywhere.

Nature in Healthcare Settings

An analyst sitting in his chair all day long is more aware of the faintest flickers of arousal in the seat of his sexuality than of the massive discomfort in the same seat brought by the chair: its wrongly built back, its heat-retaining fabric, its resistant upholstery and formaldehyde glue. His animal sense has been trained to notice only one set of proprioceptions to the exclusion of the psychic reality of the chair. A cat knows better. (Hillman, 1992, p. 114)

Much of the initial research on healing in healthcare settings involved hospital inpatients, who preferred pictures of natural settings to posters or urban artwork (Baron & Greene, 1984; Carpmann & Grant, 1993). Understandably, patients with Seasonal Affective Disorder (SAD) preferred brighter rooms than other patients (Heerwagen, 1990). Food and fruit fragrances inhaled from bottles or pumped secretly into patients' rooms resulted in decreased self-reports of depressive mood (Schiffman, 1992). According to Dr. Gary E. Schwartz, some scents produce changes in blood pressure comparable to those achieved through meditation; spiced apple in particular reduces blood pressure (Hiss, 1990). Exposure to natural views made for improved attention and less attentional fatigue after breast cancer surgery (Cimprinch, 1993),

more complete recovery from it (English, 2006), and, in other patients, lower blood pressure and better postoperative recovery (Coss, 1990). Patients with trees instead of walls to look at also faced shorter postoperative stays and fewer moderate to strong painkillers (Ulrich, 1984). Patients who looked at pictures of open water felt less postoperative anxiety than patients with a white panel or no picture to look at (Ulrich & Lunden, 1990).

A body of research has finally begun to foreground the counseling environment too, from the symbolic importance of office furniture and design, to the beneficial and meaningful presence of plants (Carpman & Grant, 1984) and animals (see the section “Animal-Assisted Therapy” below). Although taking clients outside can run into confidentiality problems, I have heard of psychotherapists bold enough to do it anyway after securing the client’s permission.

In terms of in-session work, nature-oriented guided imagery has been found to promote deeper relaxation (as assessed by heart rate and subjective self-rating) than imagery without natural images (Segal, 1999). Clinebell (1996) has pulled together a generous collection of ecotherapy case studies and intervention suggestions for using nature-based techniques to good effect with individuals, couples, and groups. Clinical psychologist George Burns has linked ecotherapeutic interventions with decreases in depression and relationship conflicts (Huppert, Keverne, & Baylis, 2006). On the somatic therapy side (body as nature), acupuncturist Dianne Connelly (1986) has found a deep homesickness lurking beneath what often manifests as physical complaints.

Ecotherapeutic findings also hold implications for our views of human development. Although we know that 2-year-olds the world over love enclosed playroom nooks similar to those naturally found outdoors around bushes and in trees (Legendre & Fontaine, 1991) and that infants between 9 and 18 months spend more time interacting with physical objects than with their parents (up to 80%–90% of their waking time between 12 and 33 months of age; Clark-Stewart, 1973), an old cultural blind spot hides the importance of the environment from past and present developmental theories. Psychoanalyst Marianne Spitzform introduces a renewed emphasis on the nonhuman world in child development through case vignettes and a discussion of the implications for psychotherapy (Spitzform, 2000).

Since the work of Karen Horney (1937), ignoring the cultural factors active behind individual pathology has grown increasingly untenable. Drawing on ecopsychology, Riebel (2001) has traced psychological parallels between eating disorders, which involve the misuse of enormous quantities of food by millions

of sufferers, to pathological traits at the root of the environmental crisis, including dissociation from the body, emotional numbing, narrow focus on individualistic and materialist concerns, and misuse of the natural world’s substances to soothe distress. Loraine Fish (2007) discusses the contradiction that lies in analyzing addiction as a purely personal disease while various forces in Western culture continue to push for nonessential overconsumption of substances, things, and activities. Rust (2005) has done deep work with what she calls “*ecolimia nervosa*” by using storytelling techniques to explore the hungers for meaning and for connection to the nonhuman world, hungers that when ignored literalize themselves into eating disorders. I have asked: What if we reimagined personality disorders as ecocultural disorders: narcissism as a mirroring of elitism, borders protested against by Borderline Personality permeability, perfectionism as personalized imperialism, avoidant disorder as collective fear writ large (Chalquist, 2007a)?

It would seem that the environment itself has begun to speak loudly in human wounding, from SAD to Multiple Chemical Sensitivity (MCS; also called Idiopathic Environmental Illness, or EI). Full-spectrum light alleviates the depressive symptoms of SAD (Rosenthal & Blehar, 1989; Spezzano, 2007), a condition that tends to impact urbanites more than villagers (Booker & Hellekson, 1992). Symptoms of MCS include skin rashes, nausea, and extreme sensitivity to synthetics and chemicals. They recall those of Gulf War Syndrome and complaints about dental amalgams, silicone breast implants, electrical hypersensitivity, sick building syndrome, and painter-related encephalopathy (Henningsen & Stefan, 2003). Women tend to exhibit EI more often than men.

Women in particular who present with EI have been evaluated in terms of psychosomatic and even psychotic disorders (Hausteiner, Mergeay, Bornschein, Zilker, & Förstl, 2006) and, in the view of at least two psychoanalysts, have become a contemporary version of the hysterics of Freud’s time (Carveth & Carveth, 2003). Other researchers have pointed out that, because the burden of proof falls on the sufferers, patients are continually forced to explain and legitimize their illness (Chircop & Keddy, 2003). Others hold EI as a symbolic, if unconscious (at first), shouldering of the sufferings of a world whose skin is burned by the same toxins that afflict EI’s victims (Green, 2002).

Animal-Assisted Therapy

Animals do more than share a planet with us and provide us with amusement and food. Writers like Paul Shepard (1996) have

argued that we depend on them psychologically for our sense of humanness:

Like amusing, wise, terrible, curved mirrors, animals prefigure human society. The lion, for example, shares a primordial ecology with humankind, a long history of symbolic power linked to our own feelings “in the blood.” Likewise, the bird is spirit and the snake is the earth of our most elemental self, our mundane world, and our imagination. (p. 10)

For veterinarian and anthropologist Elizabeth Atwood Lawrence, the importance of animals to us includes how they show up in our symbolic life:

Natural history observations may be a starting point, but they are strongly molded by cultural constructs and by our need to affiliate with the rest of creation through metaphor. Signifying by means of animals takes place at deep levels of human consciousness, emanating from the same type of psychic experience as myth, poetry, and religion whose language is also symbols. (Kellert & Wilson, 1993, p. 334)

This seems true to the extent that animals are prized in and of themselves apart from their usefulness to humans. Signifying by means of animals is a capability present even in young children as in the case of the ones who while raising a goldfish reasoned about a frog by analogy to the goldfish, not to humans (Inagaki, 1990). In a set of interviews with men familiar with black bears, Myers and Russell found that the bears had become part of the interviewees’ social identity to the degree that the animals were perceived as possessing their own subjectivity rather than appearing as objects to be projected onto. “Given rich experience, our basic social abilities can reach across species boundaries in interaction, affecting identity in ways that precede and surpass the influence of a particular culture” (Clayton & Opatow, 2003, p. 89).

Given the importance of animals to optimal human development (see also Louv’s discussion of curing childhood “Nature Deficit Disorder”, 2005), the healing presence of animals for children should not be surprising. In one study, including a dog in the inpatient psychiatric treatment of children and adolescents showed significant improvements in all dimensions of the Basler-Befindlichkeits-Skala (BBS) measure compared to a control group: increased vitality, emotional balance, extraversion, and alertness (Prothmann, Bienert, & Ettrich, 2006). In another study (Kay, 1984), the presence of animals helped highly aggressive children calm down and cooperate more while showing less

antagonism and greater social competence. A study by Ross et al. (1984) uncovered similar findings for emotionally disturbed and handicapped children, as has research with animal-assisted treatment in outpatient therapy leading to more social interactions and less physiological stress (Fine, 2000). Results have been promising enough and replicated often enough with different populations that Lefkowitz, Prout, Bleiberg, Paharia, and Debiak (2005) have proposed an animal-assisted therapy (AAT) model for survivors of sexual abuse suffering from posttraumatic stress. They anticipate decreased anxiety, lower physiological arousal, increased social interaction, and decreased number of therapy sessions.

Animal-assisted therapy has also been used successfully with the elderly, including special care unit (SCU) Alzheimer’s patients whose agitation and aggression decreased when a dog came visiting them, a result not affected by the severity of their dementia nor repeated with patients visited by a handler but no dog (Churchill, Safaoui, McCabe, & Baun, 1999). In similar studies, behavioral disturbances decreased on the Nursing Home Behavior Problem Scale over three days (McCabe, Baun, Speich, & Agrawal, 2002), on the BEHAVE-AD Scale accompanied by improved cognitive scores on the Minimental Status Exam (Kanamori et al., 2001), and as reported by pilot-study observers (Richardson, 2003). Banks and Banks (2002) found decreased loneliness in long-term care residents after 6 weeks of AAT compared to a control group. Even fish in an aquarium have produced better nutritional habits and weight gain, greater alertness and social interaction, and less lethargy and agitation in SCU residents (DeSchraver & Riddick, 1990; Edwards & Beck, 2002).

Animal companionship has helped patients recover from heart attacks (Freidmann, Katcher, Lynch, & Thomas, 1982) and has been provided as preventive medicine against the risk of cardiovascular disease (Anderson & Reid, 1992). Participants with moderate depression interacted with dolphins in a controlled trial and found themselves less depressed as measured on the Hamilton Rating Scale and the Beck Hopelessness Scale after only 2 weeks of treatment compared to a control group (Antonioli & Reveley, 2005). In a systematic and controlled study (Berget, Braastad, & Ekeberg, 2008), patients diagnosed with schizophrenia, anxiety, affective disorders, and personality disorders showed significant improvement in coping ability, self-efficacy, symptom reduction, and quality of life after spending 3 hours twice a week working with farm animals for 12 weeks. A phenomenological study (DeMares, 2000) reaching beyond the goals of health and wellness examined joyful peak experiences triggered by spontaneous encounters with dolphins, orcas, and belugas, and thereby offered

some examples of the ecstasy and aliveness to be found when species encounter each other in conditions of attentive, respectful freedom.

Horticultural Therapy

Since the days of Freud, therapy for the mind—and for the soul too, if we take the etymology of “psychology” seriously—has been known as the “talking cure.” From the beginning it sought to reconnect the patient or client with the roots of an instinctual nature repressed by the demands of civilization (Freud, 2005).

Horticultural (or gardening) therapy’s tending of this goal, for the most part without words, has proved effective for curtailing stress and obesity (Nielsen & Hansen, 2006); treating alcohol addiction (Benson, 1996) and substance abuse (Cornille, Rohrer, Phillips, & Mosier, 1987); decreasing vulnerability to drug abuse in violent offenders (Richards & Kafami, 1999); fostering emotional restoration (Barnes, 1996; Betrabet, 1996); enhancing self-esteem in partially blind adults (Martin-Yates, 1990) and in children (Williams & Mattson, 1988); easing the trauma of refugee displacement and resettlement (Tristan & Nguyen-Hong-Nhiem, 1989); dealing with service-provider burnout (Smith, 1986); and transplanting more traditional psychotherapeutic goals outside the consulting room (Schwebel, 1993).

Horticultural therapy (HT) also holds great potential for decreasing and even reversing the isolation felt by the elderly. A case study by Debra Fetherman involved three horticultural therapists at three different HT program sites in the northeastern U.S. Observers found client residents to be more actively engaged with each other and their local communities; furthermore, they demonstrated more effective emotional expressiveness and higher levels of enjoyment of their lives (Fetherman, 2005). Therapeutic gardening has brought similarly positive results to patients with dementia (Gigliotti, Jarrott, & Yorgason, 2004; Matchwick, 2007).

HT helps the community too, particularly when it involves growing fruits and vegetables locally, thus decreasing dependence on chemically treated food products seized from exhausted, nitrate-singed soils and trucked or flown in from thousands of miles away.

Outdoors Restoration

The psychologically restorative effects of excursions into the wilderness (Greenway, 1995) have been documented time and again. This thematic analysis, described in a dissertation, reflects a typical finding: Participants’ encounters with the natural world brought a sense of balance and relief from everyday stressors

and also rekindled a sense of belonging and connection with the world at large. Participants felt a sense of awe and wonder that included an awareness of nature as beyond their control. Many understood their connection with nature as a central need in their lives (Zeller, 2006). Another dissertation reports that a sample of fatigued and stressed college students displayed psychological restoration across all psychological and physiological dimensions tested after they walked in the woods (Hartig, 1993).

A study of inmates in a Michigan prison found that they used the infirmary 24% more often when assigned a cell facing a courtyard than prisoners with a cell facing farmland (Moore, 1981). A more recent meta-analysis (Bedard, Rosen, & Vacha-Haase, 2003) suggests that wilderness therapy is also more effective than traditional programs at promoting self-esteem, behavior change, and interpersonal skills in juvenile delinquents. Other studies with other populations have produced positive results for stress mitigation and recovery (Parsons, Tassinari, Ulrich, Hebl, & Grossman-Alexander, 1998).

A group of 104 landscape architecture undergraduates at the University of Guelph answered questions about sound preferences in favorite restorative places. The results tabulated with the Perceived Restorativeness Scale (PRS): wind in trees (100%), songbirds (95%), crickets (80%), and children laughing (80%) (Graham, 2004). 1,238 Norwegian undergraduates imagined themselves to be either in a nature or city environment (study 1), then viewed videos of a forest, a coast, a city, and a mountain while imagining themselves there (study 2). In a confirmation of previous research (Korpela, Hartig, Kaiser, & Fuhrer, 2001), ratings for both studies scored natural environments higher than cities on all measures (Laumann, 2001). 106 participants of roughly 21 years of age who viewed a frightening movie and then were shown a video of either a natural or a built environment not only perceived the former as more beautiful, but also felt greater improvement in mood and somewhat better concentration while viewing it (Van den Berg, Koole, & Van der Wulp, 2003). For 112 young adults who drove to the research field site and performed demanding tasks there, afterward, diastolic blood pressure dropped more rapidly when participants sat in a room with views of trees than when they sat in a room without a view. Walking in a nature reserve changed their blood pressure more than walking in urban settings; performance on a test of attention scored better and anger decreased while positive feelings increased, whereas in the urban settings the opposite occurred (Hartig, Jamner, Davis, & Garling, 2003).

As for children, long ago Friedrich Froebel, the inventor of kindergarten (“child garden”) who spent a lot of time outdoors in his

youth, grew up to believe that children learning empathy with the rest of creation also enjoyed increased feelings for life (Froebel, 1898). More recently, Lynch found that urban interviewees from Argentina, Australia, Mexico, and Poland demonstrated a seemingly universal hunger for trees (Lynch, 1977; similar findings are reported by Ward, 1978). As Roger Hart explains, neglecting children's normal rural needs can impair their healthy development as adults, including their capacity for feeling responsible for the environment (Hart, 1979). 68 school-age African American, Latino, and Asian children raised in lower-income New York inner-city neighborhoods and transferred to a summer camp for four 12-day sessions showed significantly higher self-esteem on the Piers Harris Children's Self-Concept Scale and described themselves more positively at the end of their stay (Readdick & Schaller, 2005).

Greenery can also buffer rural children against stress. A study of 337 rural children in grades 3 through 5 found the impact of life stress to be lower among children in the midst of natural features of the landscape than among those with little nature nearby (Wells & Evans, 2003).

A recent study in England showed that the more kinds of plants and animals inhabiting a park, the better people feel about visiting it. According to Zoologist Richard Fuller of the University of Sheffield, this suggests that people are remarkably sensitive to the biodiversity in their surroundings and that "successful management of urban greenspaces should emphasize biological complexity to enhance human well-being, in addition to biodiversity conservation" (Fuller, Irvine, Devine-Wright, Warren, & Gaston, 2007, pp. 390–394).

The Nature of Evidence

Here we have a relatively new field with ancient roots and an impressive set of preliminary research findings. Potentially disconfirming studies remain surprisingly few in number by comparison. It is important to bear in mind that the research we possess had to work against what might be termed the *Factor of Imperial Drift*: Research most likely to be funded and published supports rather than challenges the status quo. Had today's social and environmental scientists been at work during the late Roman Empire, a period so often compared to our own, the journals of the time would have bulged with papers like, "Effects of Positive Thinking on Frontier Combat Outcomes," or "Seating Placement and Coliseum Cheering Decibel Levels," interspersed with ads for nutritional supplements for gladiators.

The possible savings in medical costs alone by using ecotherapeutic methods are enough to crack open the imagination.

The "savings" of lives and relationships and landscapes remain beyond calculation. In fact, the Eden Mind project in Cumbria, England, hopes to bring ecotherapy to 30 million people normally excluded from healthcare benefits (Legg, 2007). At what point, then, is it decided that enough research has been done to justify the use of ecotherapeutic methods?

The claims of various certifying bodies notwithstanding, there is no such point. Even if decisions about treatment did not depend more on politics and finance than on considerations of public safety, research knowledge constantly evolves beyond established conclusions. It rests with the informed public to experiment with something new in the absence of contraindications. In the case of ecotherapy, this requires no risky drugs, surgery, or controversial diets.

Another question is often raised: Is scientific evidence even relevant to natural approaches to healing? After all, looking at ourselves and the world as objects and things played a part in how we and the world became so sick and disengaged.

Ecotherapy grapples with the effects of social and institutional trends which psychoanalyst Erich Fromm described as "necrophilic" (death-loving) (2002). As Andy Fisher observes, mainstream psychology remains too entrenched in mind-body and self-world dualisms to explore the lived relationship between the human and the nonhuman, as is true for most environmental psychology and its frankly technocratic agenda (Fisher, 2002). Research methods striving desperately to seem objective share these blind spots. At their worst, they also carry their religious/scholastic legacy of obsessive ritualism, adherence to canonical sources, prizing of proper form over creativity or relevance, worship of control, stultifying literal-mindedness, expulsion of nonconformists, rampant nominalism, and fear and hatred of subjectivity. It could be argued that unchecked empiricism is itself a kind of trauma, a defensive intellectualized retreat from encountering the world's richness on its own terms. In addition to posttraumatic stress disorder (PTSD), we probably need a category for PSTD: Positivist Science Trauma Disorder.

Nevertheless, we need not give up quantitative forms of research if we bear in mind that they deal with their topics from the outside, just as many forms of qualitative research (phenomenology, case studies, and the like) deal with them from the inside. The key is keeping the focus steady on the center, the lived relationship between us and the rest of nature, a relationship neither only subjective nor only objective, but overarching and irreducibly alive: what could be called a "transjective" reality co-created in the very acts of researching, conserving, analyzing, and

healing. Taking priority over any more partial view, sustained contact with this ever-mysterious, undomesticatable, in-between reality provides ecotherapeutic methods with their power to heal. As William James (1999) said it so well, "...the rigorously impersonal view of science might one day appear as having been a temporarily useful eccentricity rather than the definitively triumphant position which the sectarian scientist at present so confidently announces it to be" (p. 545).

In Conclusion: Coming Home to Earth

I would like to summarize what I see as some common themes emerging from research conducted in the areas noted above:

1. Disconnection from the natural world in which we evolved produces a variety of psychological symptoms that include anxiety, frustration, and depression. These symptoms cannot be attributed solely to intrapsychic or intrafamilial dynamics.
2. Reconnection to the natural world—whether through gardens, animals, nature walks outside, or nature brought indoors—not only alleviates these symptoms, but also brings a larger capacity for health, self-esteem, self-relatedness, social connection, and joy.
3. Reconnection also works across treatment modalities to replace a pathological sense of inner deadness or alienation from self, others, and world with a rekindling of inner aliveness and enjoyment of relatedness to self, others, and world.

One way to preserve the relational focus is by tending the stories that bind us to the places where we live. Such "terrapsychological" fieldwork and research calls for the deep study of the presence or soul of place, including the things and creatures within its ambit (Chalquist, 2007b). In an era of displacement, the experience of place remains what it has always been to our species, consciously for primal peoples and unconsciously for us: a facet of identity (Knez, 2005; Proshansky, 1978); a center of belonging and "finding oneself" (Korpela, 1989); a template for kinship ties (Beverly & Whittemore, 1993); a testing ground for wayfinding (Lynch, 1972); a sacred site with social, historical, and spiritual roots (Mazumdar & Mazumdar, 2004; McLuhan, 1996); a source of deep healing (Gesler, 1992; Perluss, 2004); a reality to rescue from the abstract idea of space (Casey, 1998); and a nexus of story, image, recurrent motif, and metaphor (Kearns, 1997; Ryden, 1993; Seamon, 1984) joining us to the land while shaping the personally felt stories and events we tend to think of as ours alone (Chalquist, 2007b). Until recently, much of the early research on the presence

of place reflected our alienation from it: places judged important only as sites of activity, as good to rest in or hide from predators, as recreational, and so on. But a place lives as a totality with a total character not reducible to any of its measurable properties without losing its concrete nature (Norberg-Shulz, 1979), and our places cannot heal until we learn to experience them more completely (Walter, 1988); I would add, until we learn to see our personal story as a subplot or weave in the larger story of place. Are we ready for that? Can we finally transform the ancient split at the root of the environmental crisis, a wall that divides self and Other and person and place?

In 2001, 59% of a representative sample of the population thought protecting the environment was more important than producing energy (CBS News Poll, September 4, 2001). 56% of a different sample said protecting it was more important than encouraging economic growth (ABC News Poll, August 1, 2001), and 61% of another sample agreed that "protecting the environment is so important that requirements and standards cannot be too high and continuing environmental improvements must be made regardless of cost" (CBS/*NYTimes* Poll, March 13, 2001). Public support of policies that protect the environment tends to be very high (Clayton & Opatow, 2003; Saad, 2001; Winter & Koger, 2004) whether or not it finds its way into the mainstream news.

Above the poverty level, reports of personal happiness are completely unrelated to financial income or material possessions (Csikszentmihalyi, 1999; During, 1991; Langer, 1983; Myers, 1992; Perkins, 1991). Happiness is more a by-product of valuing relationships with one's embodied self, with other people, and with the world and being willing to act on them as life priorities in a community context. By contrast, those opposed to environmental policies and programs focus less on community needs than on arguments from the level of individual rights (Clayton & Opatow, 2003) as though the two were irrevocably opposed.

Researchers like Kahn and Kellert (2000) have found biocentric reasoning in children all over the world. Although many raised in built environments find nature to be fearful or dirty at first, emotional affinity developed by spending time in natural settings correlates strongly with later pro-environmental behaviors and commitments (Kals, Schumacher, & Mondada, 1999). Moreover, the earth-based affinities of parents are often learned by their children (Hoyt, 2006). Positive experiences with nature have been found to lead to exemplary community service in adulthood (Bellotti, 2006).

We have more than a century's worth of psychologies that developed in settings of urban alienation and mechanistic thinking: psychologies, inevitably, of departure and isolation. As

yet, we have no psychologies of homecoming: of how to enjoy fulfilling, healthy, embodied lives on a planet revised as a sensitive being with needs of its own. Ultimately we may find that healing the ancient split between self and Earth by revitalizing our felt ties to a world ensouled is less a matter of fostering new attitudes or habits than of uncovering a latent love for the world, a love ineradicable so long as we remain truly human.

REFERENCES

Adams, R. (1992). Is happiness a home in the suburbs? The influence of urban versus suburban neighborhoods on psychological health. *Journal of Community Psychology, 20*(4), 353–372.

Anderson, W., & Reid, C. (1992). Pet ownership and risk factors for cardiovascular disease. *Medical Journal Australia, 157*, 298–301.

Antonoli, C., & Reveley, M. (2005). Randomised controlled trial of animal facilitated therapy with dolphins in the treatment of depression. *British Medical Journal (International ed.), 331*(7527), 1231.

Banks, M., & Banks, W. (2002). The effects of animal-assisted therapy on loneliness in an elderly population in long-term care facilities. *Journal of Gerontology. Series A, Biological Sciences and Medical Sciences, 57*, M428–M432.

Barnes, M. (1996). Designing for emotional restoration: Understanding environmental cues. *Journal of Therapeutic Horticulture, 8*, 11–14.

Baron, J., & Greene, L. (1984). Art in hospitals. *British Medical Journal, 289*, 1731–1737.

Baum, A., Calesnick, D., & Gatchel, R. (1982). Individual differences in coping with crowding: Stimulus screening and social overload. *Journal of Personality Social Psychology, 43*, 821–830.

Baum, A., Gatchel, R., Aiello, J., & Thompson, D. (1981). Cognitive mediation of environmental stress. In J. Harvey (Ed.), *Cognition, social behavior, and the environment* (pp. 513–533). Hillsdale, NJ: Erlbaum.

Bazerman, M., & Hoffman, A. (1999). Sources of environmentally destructive behavior: Individual, organizational, and institutional perspectives. *Research in Organizational Behavior, 2*, 39–79.

Bedard, R., Rosen, L., & Vacha-Haase, T. (2003). Wilderness therapy programs for juvenile delinquents: A meta-analysis. *Journal of Therapeutic Wilderness Camping, 3*(1), 7–13.

Bellotti, C. (2006). *Contact with nature and the experience of interconnectedness: Exploring the natural world as inspiration for community service*. Unpublished doctoral dissertation, California Institute of Transpersonal Psychology, Palo Alto, CA.

Benson, R. (1996). 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. *Journal of Therapeutic Horticulture, 8*, 88–91.

Berget, B., Braastad, B., & Ekeberg, Ø. (2008). Mental health cultivated on the farm. *Science Daily*. Retrieved March 31, 2009, from <http://www.sciencedaily.com/releases/2008/04/080411082957.htm>

Berke, E., Gottlieb, L., Moudon, A., & Larson, E. (2007). Protective association between neighborhood walkability and depression in older men. *Journal of the American Geriatrics Society, 55*(4), 526–533.

Betrabet, G. (1996). The garden as a restorative environment: A theoretical perspective. *Journal of Therapeutic Horticulture, 8*, 15–20.

Beverly, E., & Whittemore, R. (1993). Mandinka children and the geography of well-being. *Ethos, 21*(3), 235–272.

Boman, E. (1994). *Aftereffects of noise*. Unpublished master's thesis, Uppsala University, Uppsala, Sweden.

Booker, J., & Hellekson, C. (1992). Prevalence of seasonal affective disorder in Alaska. *American Journal of Psychiatry, 149*, 1176–1182.

Buzzell, L., & Chalquist, C. (2009). *Ecotherapy: Healing with nature in mind*. San Francisco: Sierra Club Books.

Carpman, J., & Grant, M. (1984). Inpatient preferences for hospital room artwork (Research Rep. No. 32). Patient and Visitor Participation Project, Office of the Replacement Hospital Program, University of Michigan, Ann Arbor, MI.

Carpman, J., & Grant, M. (1993). *Design that cares: Planning health facilities for patients and visitors*. Chicago: American Hospital Publishing.

Carveth, D., & Carveth, J. (2003). Fugitives from guilt: Postmodern de-moralization and the new hysterias. *American Imago, 60*(4), 445–479.

Casey, E. (1998). *The fate of place: A philosophical history*. Berkeley: University of California Press.

Chalquist, C. (2007a, March). *Going out as going in: Sharing Terra's psychology*. Paper presented at the "Nature and Human Nature" conference, Santa Barbara, CA.

Chalquist, C. (2007b). *Terrapsychology: Re-engaging the soul of place*. New Orleans, LA: Spring Journal Books.

Chircop, A., & Keddy, B. (2003). Women living with environmental illness. *Health Care for Women International, 24*(5), 371–383.

Churchill, M., Safaoui, J., McCabe, B., & Baun, M. (1999). Using a therapy dog to alleviate the agitation and desocialization of people with Alzheimer's disease. *Journal of Psychosocial Nursing, 37*, 16–22.

Cimprinch, B. (1993). Development of an intervention to restore attention in women treated for breast cancer. *Cancer Nursing, 16*, 83–92.

Clark-Stewart, K. (1973). Interactions between mothers and their young children: Characteristics and consequences. *Monographs of the Society for Research in Child Development, 38*(6–7), 1–109.

Clayton, S., & Opatow, S. (2003). *Identity and the natural environment: The psychological significance of nature*. London: MIT Press.

Clinebell, H. (1996). *Ecotherapy: Healing ourselves, healing the earth*. New York: Haworth Press.

Connelly, D. (1986). *All sickness is homesickness*. Columbia, MD: Center for Traditional Acupuncture.

Cornille, T., Rohrer, G., Phillips, S., & Mosier, J. (1987). Horticultural therapy in substance abuse treatment. *Journal of Therapeutic Horticulture, 2*, 3–8.

Coss, R. (1990). *Picture perception and patient stress: A study of anxiety reduction and postoperative stability*. Unpublished paper, University of California, Davis, CA.

Csikszentmihalyi, M. (1999). If we are so rich, why aren't we happy? *American Psychologist, 54*(10), 821–827.

DeMares, R. (2000). Human peak experience triggered by encounters with cetaceans. *Anthrozoös, 13*(2), 89–103.

DeSchraver, M., & Riddick, C. (1990). Effects of watching aquariums on elders' stress. *Anthrozoös, 4*(1), 44–48.

During, A. (1991). Asking how much is enough. In L. Brown (Ed.), *State of the world* (p. 156). New York: W. W. Norton.

Edwards, N., & Beck, A. (2002). The influence of animal-assisted therapy on nutritional intake in individuals with Alzheimer's disease. *Western Journal of Nursing Research, 24*(5), 697–712.

English, J. (2006). *The everyday lives of breast cancer survivors*. Unpublished master's thesis, Graduate Department of Geography and the Centre for the Environment, University of Toronto, Ontario, Canada.

- Evans, G., & Johnson, D. (2000). Stress and open office noise. *Journal of Applied Psychology, 85*, 779–783.
- Evans, G. (2003). The built environment and mental health. *Journal of Urban Health, 80*, 536–555.
- Fetherman, D. (2005). *An exploration of the meaning and effects of horticultural therapy on human health and well-being*. Unpublished doctoral dissertation, Marywood University, Scranton, PA.
- Fine, A. (2000). Animals and therapists: Incorporating animals in outpatient therapy. In A. Fine (Ed.), *The handbook on animal assisted therapy: Theoretical foundations and guidelines for practice* (pp. 179–211). New York: Academic Press.
- Fish, L. (2007). *Nature, culture, and abnormal appetites: An ecopsychological analysis of addiction*. Unpublished doctoral dissertation, Union Institute & University, Cincinnati, OH.
- Fisher, A. (2002). *Radical ecopsychology: Psychology in the service of life*. New York: SUNY.
- Frank, L., Andresen, M., & Schmid, T. (2004). Obesity relationships with community design, physical activity, and time spent in cars. *American Journal of Preventive Medicine*. Retrieved March 31, 2009, from <http://www.ajpm-online.net/web-files/images/journals/amepre/special.pdf>
- Freidmann, E., Katcher, A. H., Lynch, J. J., & Thomas, S. A. (1982). Animal companions and one-year survival of patients after discharge from a coronary care unit. *California Veterinarian, 8*, 45–50.
- Freud, S. (2005). *Civilization and its discontents*. New York: W. W. Norton.
- Froebel, F. (1898). *The education of man*. New York: D. Appleton.
- Fromm, E. (2002). *The anatomy of human destructiveness*. New York: Henry Holt.
- Fuller, R., Irvine, K., Devine-Wright, P., Warren, P., & Gaston, K. (2007). Psychological benefits of greenspace increase with biodiversity. *Biology Letters, 3*(4), 390–394.
- Gatchel, R., & Proctor, J. (1976). Physiological correlates of learned helplessness in man. *Journal of Abnormal Psychology, 85*, 27–34.
- Gatchel, R., McKinney, M., & Koebernick, L. (1977). Learned helplessness, depression, and physiological responding. *Psychophysiology, 14*, 25–31.
- Gesler, W. (1992). Therapeutic landscapes: Medical issues in light of the new cultural geography. *Social Science Medicine, 34*(7), 735–746.
- Gigliotti, C., Jarrott, S., & Yorgason, J. (2004). Harvesting health: Effects of three types of horticultural activities for persons with dementia. *Dementia, 3*, 161–180.
- Glynn, T. (1981). Psychological sense of community: Measurement and application. *Human Relations, 34*, 789–818.
- Graham, C. (2004). *Designing landscapes for psychological restoration: Adding considerations of sound*. Unpublished doctoral dissertation, University of Guelph, Guelph, Ontario, Canada.
- Green, T. (2002). *The breath of gaia: Environmental illness as a vehicle to consciousness*. Unpublished doctoral dissertation, Pacifica Graduate Institute, Carpinteria, CA.
- Greenway, R. (1995). The wilderness effect and ecopsychology. In T. Roszak, M. Gomes, & A. Kanner (Eds.), *Ecopsychology: Restoring the earth, healing the mind* (pp. 122–135). San Francisco: Sierra Club Books.
- Hairon, N. (2006, March 9). PCTs poles apart over depression services. *Pulse*. Retrieved April 29, 2009, from <http://www.pulsetoday.co.uk/story.asp?storycode=4009074>
- Halliwell, E. (2005). *Up and running? Exercise therapy and the treatment of mild to moderate depression in primary care*. London: Mental Health Foundation.
- Hart, R. (1979). *Children's experience of place*. New York: Irvington.
- Hartig, E., Jamner, L., Davis, D., & Garling, T. (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology, 23*, 109–123.
- Hartig, T. (1993). *Testing restorative environments theory*. Unpublished doctoral dissertation, University of California, Irvine, CA.
- Hausteiner, C., Mergeay, A., Bornschein, S., Zilker, T., & Förstl, H. (2006). New aspects of psychiatric morbidity in idiopathic environmental intolerances. *Journal of Occupational & Environmental Medicine, 48*(1), 76–82.
- Heerwagen, J. (1990). Affective functioning, "light hunger," and room brightness preferences. *Environment and Behavior, 22*, 608–635.
- Henningsen, P., & Stefan, P. (2003). New environmental illnesses: What are their characteristics? *Psychotherapy and Psychosomatics, 72*, 231–234.
- Hillman, J. (1992). *The thought of the heart, the soul of the world* (p. 114). Dallas, TX: Spring.
- Hiss, T. (1990). *The experience of place: A completely new way of looking at and dealing with our radically changing cities and countryside*. New York: Knopf.
- Horney, K. (1937). *The neurotic personality of our time*. London: Kegan Paul, Trench, Trubner.
- Hoyt, K. (2006). *Physical environment socialization: Development of attitudinal and aesthetic response towards built and natural environments*. Unpublished doctoral dissertation, University of California, Sacramento, CA.
- Huppert, F., Keverne, B., & Baylis, N., (Eds.). (2006). *The science of well being*. New York: Oxford University Press.
- Inagaki, K. (1990). The effects of raising animals on children's biological knowledge. *British Journal of Developmental Psychology, 8*, 119–129.
- James, W. (1999). *The varieties of religious experience* (p. 545). New York: Modern Library.
- Kahn, P., & Kellert, S. (2000). *Children and nature: Psychological, sociocultural, and evolutionary investigations*. Cambridge, MA: MIT Press.
- Kals, E., Schumacher, D., & Mondada, L. (1999). Emotional affinity toward nature as a motivational basis to protect nature. *Environment and Behavior, 31*, 178–202.
- Kanamori, M., Suzuki, M., Yamamoto, K., Kanda, M., Matsui, Y., Kojima, E., et al. (2001). A day care program and evaluation of animal-assisted therapy (aat) for the elderly with senile dementia. *American Journal of Alzheimer's Disease and Other Dementias, 16*, 234–239.
- Kay, D. (1984). Animal affection and student behavior. In R. K. Anderson, B. L. Hart, & L. A. Hart (Eds.), *The pet connection* (pp. 101–104). Minneapolis, MN: CENSHARE, University of Minnesota.
- Kearns, R. (1997). Narrative and metaphor in health geographies. *Progress in Human Geography, 21*(2), 269–277.
- Kellert, S., & Wilson, E. (Eds.). (1993). *The biophilia hypothesis* (p. 334). Washington, DC: Island Press.
- Kim, I. (1998). *Subjective responses to daylight, sunlight, and view in college classrooms with windows*. Unpublished doctoral dissertation, Texas A&M University, College Station, TX.
- Knez, I. (2005). Attachment and identity as related to a place and its perceived climate. *Journal of Environmental Psychology, 25*(2), 207–218.
- Korpela, K. (1989). Place-identity as a product of environmental self-regulation. *Journal of Environmental Psychology, 9*(3), 241–256.
- Korpela, K., Hartig, T., Kaiser, F., & Fuhrer, U. (2001). Restorative experience and self-regulation in favorite places. *Environment and Behavior, 33*, 572.
- Lahtinen, M., Sundman-Digert, C., & Reijula, K. (2004, February). Psychosocial work environment and indoor air problems: A questionnaire as a means of problem diagnosis. *Occupational and Environmental Medicine, 61*(2), 143–149.
- Langer, E. (1983). *The psychology of control*. Beverly Hills, CA: Sage.

- Laumann, K. (2001). Rating scale measures of restorative components of environments. *Journal of Environmental Psychology, 21*(1), 31–44.
- Lawton, W. (2007, September 2). Link found between household mold and depression. *Medical News Today*. Retrieved March 31, 2009, from <http://www.medicalnewstoday.com/articles/81038.php>
- Lefkowitz, C., Prout, M., Bleiberg, J., Paharia, I., & Debiak, D. (2005). Animal-assisted prolonged exposure: A treatment for survivors of sexual assault suffering posttraumatic stress disorder. *Society & Animals, 13*(4), 275–296.
- Legendre, A., & Fontaine, A. (1991). Small-scale enclosed areas are most popular zones in playrooms—The effects of visual boundaries in two-year-olds' playrooms. *Children's Environments Quarterly, 8*, 1–16.
- Legg, M. (2007). £18m to fight mental health discrimination. *News & Star*. Retrieved July 28, 2007, from <http://www.newsandstar.co.uk/news/viewarticle.aspx?id=525832>
- Lepore, S., Evans, G., & Schneider, M. (1992). Role of control and social support in explaining the stress of hassles and crowding. *Environment and Behavior, 24*, 795–811.
- Louv, R. (2005). *Last child in the woods: Saving our children from nature deficit disorder*. Chapel Hill, NC: Algonquin Books of Chapel Hill.
- Lynch, K. (1972). *The image of the city*. Cambridge, MA: MIT Press.
- Lynch, K. (1977). *Growing up in cities*. Cambridge, MA: MIT Press.
- Macey, R. (2007, August 1). Printer particles as bad as cigarettes. *The Sydney Morning Herald*. Retrieved March 31, 2009, from <http://www.smh.com.au/news/technology/printer-particles-as-bad-as-cigarettes/2007/07/31/1185647903291.html>
- Martin-Yates, T. (1990). A comparison of the effects of horticultural therapy and pet therapy on self-esteem and well-being of adults with visual disabilities. *Journal of Therapeutic Horticulture, 5*, 47–58.
- Matchwick, C. (2007, July 6). *The sunshine walk—Does developing a sensory garden help clients with dementia?* Paper presented at the annual conference for Psychology Specialists Working with Older People (PSIGE), British Psychological Society, University of Nottingham, Nottingham, UK. Retrieved July 28, 2007, from [http://www.bps.org.uk/media-centre/press-releases/releases\\$/psige-section/garden-access-benefits-dementia-sufferers.cfm](http://www.bps.org.uk/media-centre/press-releases/releases$/psige-section/garden-access-benefits-dementia-sufferers.cfm)
- Mazumdar, S., & Mazumdar, S. (2004). Religion and attachment: A study of sacred places. *Journal of Environmental Psychology, 24*, 385–397.
- McCabe, B., Baun, M., Speich, D., & Agrawal, S. (2002). Resident dog in the Alzheimer's special care unit. *Western Journal of Nursing Research, 24*, 684–696.
- McLuhan, T. (Ed.). (1996). *Cathedrals of the spirit: The message of sacred places*. New York: Harper Perennial.
- Mind Publications. (2007). Available from <http://www.mind.org.uk>
- Moore, E. (1981). A prison environment's effect on health care service demands. *Journal of Environmental Systems, 11*, 17–34.
- Myers, D. (1992). *The pursuit of happiness: Who is happy and why*. New York: William Morrow.
- Nasar, J., & Julian, D. (1995). The psychological sense of community in the neighborhood. *Journal of the American Planning Association, 61*, 178–184.
- National Research Council. (1981). *Indoor pollutants* (p. 537). Washington, DC: National Academy Press.
- Ng, C. (2000). Effects of building construction noise on residents: A quasi-experiment. *Journal of Environmental Psychology, 20*(4), 375–385.
- Nielsen, T., & Hansen, K. (2006). *Do green areas affect health? Results from a Danish survey on the use of green areas and health indicators*. Copenhagen, Denmark: Danish Centre for Forest, Landscape and Planning, University of Copenhagen.
- Norberg-Shulz, C. (1979). *Genius loci: Towards a phenomenology of architecture*. New York: Rizzoli International.
- Parsons, R., Tassinary, L., Ulrich, R., Hebl, M., & Grossman-Alexander, M. (1998). The view from the road: Implications for stress recovery and immunization. *Journal of Environmental Psychology, 18*, 113–139.
- Perkins, H. (1991). Religious commitment, yuppies values, and wellbeing in post-collegiate life. *Review of Religious Research, 32*, 244–251.
- Perluss, E. (2004). *Landscape archetypes: Islands, valleys, mountains, and deserts*. Unpublished doctoral dissertation, Pacifica Graduate Institute, Carpinteria, CA.
- PR Newswire. (2003). *University research indicates flowers and plants promote innovation, ideas; Key findings shed light on environmental psychology of the workplace*. Retrieved March 31, 2009, from http://www.accessmylibrary.com/coms2/summary_0286-19323252_ITM
- Proshansky, H. (1978). The city and self-identity. *Environment and Behavior, 10*, 2.
- Prothmann, A., Bienert, M., & Ettrich, C. (2006). Dogs in child psychotherapy: Effects on state of mind. *Anthrozoö, 19*(3), 265–277.
- Readdick, C., & Schaller, G. (2005). Summer camp and self-esteem of school-age inner-city children. *Perceptual and Motor Skills, 101*(1), 121.
- Richards, H., & Kafami, D. (1999). Impact of horticultural therapy on vulnerability and resistance to substance abuse in incarcerated offenders. *Journal of Offender Rehabilitation, 29*(3–4), 183–193.
- Richardson, C., Faulkner, G., McDevitt, J., Skrinar, G. S., Hutchinson, D. S., & Piette, J. D. (2005). Integrating physical activity into mental health services for persons with serious mental illness. *Psychiatric Services, 56*(3), 324–331.
- Richardson, N. (2003). Effects of animal-assisted therapy on agitated behaviors and social interactions of older adults with dementia. *American Journal of Alzheimer's Disease and Other Dementias, 18*, 353–358.
- Riebel, L. (2001). Consuming the earth: Eating disorders and ecopsychology. *Journal of Humanistic Psychology, 41*(2), 38–58.
- Rosenthal, N., & Blehar, M. (1989). *Seasonal affective disorders and phototherapy*. New York: Guilford Press.
- Ross, S., Vigdor, M., Kohnstamm, M., DiPaoli, M., Manley, B., & Ross, M. (1984). The effects of farm programming with emotionally disturbed and handicapped children. In R. K. Anderson, B. L. Hart, & L. A. Hart (Eds.), *The pet connection* (pp. 120–130). Minneapolis, MN: CENSHARE, University of Minnesota.
- Rust, M. (2005). Ecolimia nervosa? *Therapy Today, 16*(10), 11–14.
- Ryden, K. (1993). *Mapping the invisible landscape: Folklore, writing, and the sense of place*. Iowa City, IA: University of Iowa Press.
- Saad, L. (2001). Americans mostly "green" in the energy vs. environment debate. *Gallup Poll Monthly, 426*, 33–37.
- Salens, B., Sallis, L., Black, J., & Chen, D. (2003). Neighborhood-based differences in physical activity: An environment scale evaluation. *American Journal of Public Health, 93*, 1552–1558.
- Schaeffer, M., Street, S., Singer, J., & Baum, A. (1988). Effects of control on the stress reactions of commuters. *Journal of Applied Social Psychology, 18*, 944–957.
- Schiffman, S. (1992). Aging and the sense of smell: Potential benefits of fragrance enhancement. In S. Van Toller & G. Dodd (Eds.), *Fragrance: The psychology and biology of perfume* (pp. 51–62). London: Elsevier.
- Schwebel, A. (1993). Psychological principles applied in horticultural therapy. *Journal of Therapeutic Horticulture, 7*, 3–12.
- Seamon, D. (1984). Emotional experience of the environment. *American Behavioral Scientist, 27*(6), 757–770.
- Segal, P. (1999). *The effects of nature-oriented and non-nature-oriented guided imagery content on relaxation*. Unpublished doctoral dissertation, Hofstra University, Hempstead, NY.

- Shepard, P. (1996). *The others: How animals made us human* (p. 10). Washington, DC: Island Press.
- Smith, R. (1986). Understanding and overcoming burnout. *Journal of Therapeutic Horticulture, 1*, 15–24.
- Spezzano, M. (2007). *The efficacy of bright light treatment on the symptoms of seasonal affective disorder on a college-aged population*. Unpublished doctoral dissertation, Northcentral University, Prescott Valley, AZ.
- Spitzform, M. (2000). The ecological self: Metaphor and developmental experience? *Journal of Applied Psychoanalytic Studies, 2*(3), 265–285.
- Stone, N., & Irvine, J. (1994). Direct or indirect window access, task type, and performance. *Journal of Environmental Psychology, 14*, 57–63.
- Talbot, T. (2006). Multi-purpose forests. *Green Places, 30*, 28–30.
- Tallman, I. (1969). Working-class wives in suburbia: Fulfillment or crisis? *Journal of Marriage & the Family, 31*(1), 65–72.
- Tillett, L. (1999). *Lighting the street in an urban neighborhood*. Unpublished doctoral dissertation, City University of New York, New York, NY.
- Tristan, J., & Nguyen-Hong-Nhiem, L. (1989). Horticultural therapy and Asian refugee resettlement. *Journal of Therapeutic Horticulture, 4*, 15–20.
- Ulrich, R. (1984). View through a window may influence recovery from surgery. *Science, 224*(4647), 420–421.
- Ulrich, R., & Lunden, O. (1990, June 27–30). *Effects of nature and abstract pictures on patients recovering from open heart surgery*. Paper presented at the International Congress of Behavioral Medicine, Uppsala, Sweden.
- Van den Berg, A., Koole, S., & Van der Wulp, N. (2003). Environment preference and restoration: How are they related? *Journal of Environmental Psychology, 23*(2), 135–146.
- Walter, E. (1988). *Placeways: A theory of the human environment*. Chapel Hill, NC: University of North Carolina Press.
- Ward, C. (1978). *The child in the city*. London: Architectural Press.
- Wells, N., & Evans, G. (2003). Nearby nature: A buffer of life stress among rural children. *Environment and Behavior, 35*(3), 311–330.
- Wener, R., Evans, G., Phillips, D., & Nadler, N. (2003). Running for the 7:45: The effects of public transit improvements on commuter stress. *Transportation, 30*, 203–220.
- Williams, P., & Mattson, R. (1988). Horticultural activities and demographic factors influence children's self-esteem. *Journal of Therapeutic Horticulture, 3*, 39–54.
- Winter, D., & Koger, S. (2004). *The psychology of environmental problems*. Mahwah, NJ: Erlbaum.
- Zeller, J. (2006). *An exploration of the psychologically restorative qualities of the natural world*. Unpublished doctoral dissertation, Massachusetts School of Professional Psychology, Boston, MA.

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