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Nature as clinical psychological intervention:
evidence, applications and implications

"As psychologists we have heard little about gardens, about foliage, about forests and farmland. But our research in this area has brought us in touch with a broad range of individuals for whom these are salient and even, in their own terms, life-saving concerns" (Kaplan & Kaplan, 1989, pg. 198)

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ABSTRACT

This dissertation assesses the field of nature-assisted mental healthcare with a view to generally evaluating its relevance for clinical psychological intervention. Research in this area has principally been the domain of the environmental psychologists, landscape planners, public health and outdoor education researchers, with clinical practice having been steered largely by developments within social and therapeutic horticulture, occupational therapy, adventure and wilderness-based therapies and the eclectic practices of a small number of psychologists, psychiatrists and psychotherapists who intentionally integrate nature-assisted strategies within their clinical repertoire . A surge of recent interest in the field is currently to be witnessed – within academic, clinical and public domains – a trend, which is presumed to herald the further expansion of nature-based approaches within mental healthcare, including disciplines of applied psychology. This dissertation reflects on these current developments from the perspective of - principally - clinical psychological intervention, drawing on both an analysis of the available evidence and its clinical implications, in addition to attempting to theoretically situate the human psyche within an expanded eco-systemic framework which includes relations with the non-human, natural world as potential psychologically relevant level of system. On the basis of these findings and speculations, this work concludes that there is substantial empirical, anecdotal and theoretical evidence to warrant that practicing psychologists attend to the therapeutic potential available in this domain in terms of integrative practice. The need for further extensive research in order to justify and substantiate this claimed potential is highlighted - and some tentative suggestions are given as to directions such research might take.

INTRODUCTION

The sowing of the seeds of a thesis

"*Psychology, with its impressive repertoire of theories and scientific research methods, has shown little interest in studying human transactions with natural environments. In this regard, environmental psychology is a small and peripheral subfield within psychology*." (Ulrich, 1993)

In 2006, whilst studying for my Master's degree in psychology at Århus University, I participated in a 3-month long clinical seminar on systemic approaches within psychotherapy with Assistant Professor, Michael Thastum.

I was greatly inspired by the adaptation of general systems theory to family therapy and by constructivist and social constructionist ideas of self, meaning (and consequent potential therapeutic

change), as held within the sphere of relations and language (e.g. Carr, 2000; Anderson, 1997; Cecchin, 1987). Having been inspired by systems thinkers such as Bateson (1979) and Capra (1996), and with a long-standing personal interest in human-nature relationship from the perspective of human health, well-being, development and learning, (not to mention an avid concern for issues of environmental sustainability and preservation), I pondered at the relative absence of the non-human world as psychologically relevant level of system within clinical, counselling, health, educational and occupational disciplines of applied psychology.

It struck me that relationship between the human psyche and the non-human, biological world could perhaps be of greater therapeutic relevance for psychologists. In particular, I speculated as to whether the level of the natural environment might have a more substantial role to play the theory and practice of psychotherapy.

Of course, I was aware of the existence of therapeutic modalities such as animal-assisted-, wilderness, adventure- and horticultural therapies, so I was confident that such a hypothesis might be initially investigated via an assessment of theoretical and empirical literature from such fields, not to mention a selection of anecdotal reports sourced in various clinical settings. I was further aware of the existence of a handful of clinicians, who explicitly referred to the integration of nature-based strategies within their psychological and psychotherapeutic practice (e.g. Burns, 1998; 2005; Berger 2006; Rust, 2004, Cohen, 1997; Clinebell, 1996, etc). I was also familiar with the field of ecopsychology[1], whose main thesis is to ”bridge our culture’s longstanding historical gulf between the psychological and the ecological” (Roszak, 1992) by resituating the human psyche within a profoundly ecological paradigm. Furthermore, I had been inspired by the numerous anecdotal stories of ‘nature’s healing influence’ I had heard over the years: personal narratives of recovery from depression, grief, burnout syndrome, existential crisis etc. where contact with natural settings feature as subjectively valued elements of positive therapeutic change.

Thus, my impulse developed into an intention, and my intention into an endeavour: to assess whether a theoretical and clinical expansion of the parameters of psychological intervention methodology - to reach out beyond “the city limits” (Roszak, 1995) to a wider level of system that embraces the non-human, natural world – might be a valid hypothesis.

From these initial speculative seeds, a theoretical or conceptual research endeavour[2] has grown. Its primary aim is to assess the effects of exposure to natural environments on mental health, with a view to determining the extent to which the integration of nature-based therapeutic contexts and strategies within a broader framework of psychological treatment and mental health-promoting interventions might be justified.

To achieve this aim, I intend to provide a critical overview of relevant theory, research and clinical practice relating to known and hypothesised beneficial processes and effects arising in the meeting of the human psyche and the natural world, and which are/can be strategically applied to enhance human mental health and well-being and relieve mental distress. This will include a brief overview of both identified and potential areas of clinical psychological intervention. After ‘turning the soil’ through this

[1] Ecopsychology can be broadly defined as a contemporary, fringe movement of psychology that explores ways in which psychology can contribute to the solution of environmental problems, recognises the human psyche as an integral part of the web of nature and “seeks to redefine sanity within an environmental context” (Brown, 1995). According to Holmes, ecopsychology “is not a desciptive or empirical psychology as it is an ethical and practical outlook in response to the present environmental crisis” (Holmes, 2003). For a competent and critical analysis of the status of ecopsychology in relation to mainstream psychology, the reader is referred to Reser, 1995.

[2] “skrivebords forskning” – Zachariae, 1998

investigative endeavour, I will then proceed to reflect on whether these theories, findings and practices justify a greater integration of nature-assisted approaches within clinical psychological/psychotherapeutic intervention. This is the "groundwork" of my research process (Barker et al., 1994) and will constitute the main body of this work.

To supplement (and counter-balance) this endeavour, I will then provide a short critique of the research in this field and make some very preliminary and tentative suggestions as to future directions research might take.

Finally, I will return to my initial investigative impulse to explore whether there might be reasonable grounds to attempt a conceptual and practical expansion of the concept of therapeutic level of system within clinical psychological treatment modalities. It is my hope to provide a tentative formulation as to a meta-theoretical/theoretical framework, which might go some way to legitimising the *concept* of nature as relevant psychological parameter. Obviously, this is a bold presumption and I would ask the reader to meet this aspect of my research aim in the spirit it is intended – i.e. as the mere exercising of theoretical creativity.

However, I am reminded here of Reason and Rowan's words, that "scientific research needs to be seen for what it truly is; a way of preventing me from deceiving myself in regard to my creatively formed subjective hunches which have developed out of the relationship between me and my material world" (Reason & Rowan, 1981)[1]. Obviously, the investigation that is this thesis is also an attempt to prevent me from "deceiving myself" on the basis of my creatively (and intuitively) formed "subjective hunches".

Having made my positioning explicit from the outset, let me now investigate as to whether these hunches and hypotheses might be supported empirically, clinically and theoretically. If I should find that I am *not* deceiving myself, it is my hope that this work might, in some small way, contribute to the theoretical and interventional development of nature-based perspectives within applied clinical psychological disciplines[2].

Finally, I would like to stress that this entire thesis also represents a form of "groundwork" – i.e. *this is an intentionally wide-ranging investigation*, whose main objective is to broadly mine the field for applied psychological relevance.

[1] Cited in Coolican, 2004

[2] Although I refer to clinical psychology as focus discipline throughout this thesis, I would also like to simultaneously embrace the relevance of these findings for other relevant fields such as health psychology and counselling psychology.

CHAPTER 1

NATURE AND MENTAL HEALTH

1.1 INTRODUCTION TO THE FIELD OF INQUIRY

"*There is already considerable anecdotal, theoretical and empirical evidence that contact with nature is a real asset in the promotion of health for people. Such contact with nature should therefore implicitly be highly valued as part of public health strategies*."

(Burls, 2007, *Journal of Public Mental Health*, p. 26)

Over the past 25 years or so, a body of empirical evidence has accumulated which suggests that our relationship to the natural world has significant positive influence on psychological and physical health. Some of the beneficial physiological effects described include: faster recovery from surgery and illness (Frumkin, 2001; Ulrich, 1984), reduced health problems in prison inmate populations (Moore, 1982; West, 1986)[1] recovery from mental fatigue (Berto, 2005; Hartig et al., 2003; Herzog et al., 2002; Kaplan, 2001; Kaplan & Kaplan, 1989), alleviation of stress symptoms (Whitehouse et al., 2001; Ulrich et al., 1991; Hartig et al., 2003), lowering of levels of aggression (Kuo, 2001; Kuo & Sullivan, 2001a; Kuo & Sullivan, 2001b; Hartig et al., 2003), use of nature as coping resource (Gulwadi, 2006; Nielsen & Hansen, 2006; Wells & Evans, 2003; Hartig et al., 1991), promoted sense of subjective well-being (Pretty et al., 2007; Burns, 2005, Kaplan 2001) and enhanced positive affect (Pretty et al., 2005; Hartig et al., 2003; Van der Berg et al., 2003[2]; Kuo, 2001; Russel & Mehrahbian, 1976[3]). At first glance, it appears at first glance that there is a promising evidence-based fundament to support claims that therapeutic focus on our relationship with the non-human, natural world is worthy of our attention as psychologists.

A potted history of green mental healthcare

That direct contact with green spaces and immersion in natural environments might have relevance for psychological health is not a new idea (Cooper Marcus & Barnes, 1999; Grahn, 2005; Grahn et al., 2007). An early recorded example of the intentional integration of nature as therapeutic element within mental health settings is that of Sultan Bayezid II of the Ottoman Empire (1481-1512), who was responsible for the building of a hospital specially designed for the mentally-ill, where treatment modalities included gardens, water therapy, music therapy and aromatherapy (Abramsson & Tenngart, 2003).

Towards the end of the 17th century, observations of and reflections on the health-giving effects of natural settings led doctors to develop the first formalised medical theories on how nature actually improves health. The rather obscure *pythogentic* theory (also known as the theory of *miasma)* pertained to the connection between fresh air, greenery, light and water and better health (Parsons, 1991). Later, during the 18th century many hospitals, including mental hospitals, in US and Europe

[1] Cited in Burns, 2005
[2] Cited in Van der Berg et al.; 2007
[3] Cited in Burns, 1998; 2005

were built with large park-like gardens in the belief that this would support healing processes. In 1797, mental health reformer Niels Ditter Reigels proposed that the old Sankt Hans Mental Asylum in Copenhagen be relocated to a farm in the countryside, where there would be access to both rural and garden settings (Gerlach-Spriggs et al., 1998). Riegels is reported to have stated that, "it would ideally be in the teaching of these gardens that the very best medicine would be found" (Ibid). In 1820, Sankt Hans was actually moved to such a location[1].

American doctor, Benjamin Rush, who has been of great inspiration within the field of horticultural therapy, was an adamant supporter of gardening as therapy for patients with mental health problems (Sempik & Aldridge, 2006) and Grahn has highlighted the work of Swedish doctor and psychotherapist, Poul Bjerre (1876-1964), who incorporated exposure to natural environments within treatment programmes for the mentally ill and those in crisis (Grahn, 2005). That natural settings have been perceived of as therapeutically valuable in recovery from traumatic crisis, is also indicated by the reports of successful and widespread use of gardening practices in rehabilitation of traumatised soldiers returning from the front after the 2nd World War (Gerlach Spriggs et al., 1998).

Within the field of psychiatry, there is a long tradition of utilising farming and gardening activities as an integrated and legitimate aspect of treatment and care (Sempik & Aldridge, 2006). However, with the rapid rise in use of pharmaceutical-based treatments and the modernisation of mental hospitals in the second half of the 20th century, many hospital gardens and care farms were closed (Ibid). Another explanation for this trend, is provided by Abramsson and Tenngart, who report that many gardening projects within mental hospitals were closed during the 1960's, on the grounds of claims that patients were being used as cheap labour (Abramsson & Tenngart, 2003). However, there remains a strong horticultural therapy movement in many countries (with organising bodies such as *Thrive,* in the UK, and the *American Horticultural Therapy Association* in the US) - although most such projects have a pronounced social focus and are often attached to occupational therapy programmes as adjunct settings within general rehabilitation programmes. There is also a visible tradition for nature-based rehabilitation in Germany, with over 120 horticultural therapy and treatment centres for rehabilitation, somatic and psychiatric purposes (Sempik & Aldridge, 2003b). In Scandinavia, it is Sweden that most prominently represents such a tradition, with over 30 healing garden/horticultural therapy institutions across the country, including the well-publicised *Alnarp Rehabilitation Garden,* Malmø, which was established as a research and treatment project in 2002 at the *Swedish Agricultural University* in Malmø (Grahn, 2005; Abrammson & Tenngart, 2003; Stigsdotter & Grahn, 2003). Alnarp specialises in the rehabilitation of stress-related disorders within a nature-based clinical setting and incorporates healing garden principles[2] (Cooper Marcus & Barnes, 1999a) with strategies drawn from horticultural and other occupational therapies[3], in addition to various psychotherapeutic approaches such as solution-focused therapy (Welen-Andersson, 2006).

Of course, the field of green mental healthcare extends beyond horticultural therapy and healing garden contexts to include other modalities such as wilderness therapy, adventure therapy and animal assisted therapy, not to mention the eclectic practices of various psychotherapists and psychologists who explicitly incorporate nature-assisted strategies and contexts within their clinical repertoire (e.g. Berger & McLeod, 2006; Rust, 2004, Burns, 2005; 1998; Cohen, 1997; 1995, Clinebell, 1996). The psychologist and hypnotherapist, Milton Erickson, acclaimed practitioner and father of many branches of psychotherapy, including strategic family therapy, solution-focused and brief therapies, often

[1] Interestingly enough, this mental hospital is currently in the process of re-establishing an emphasis on the healing effects of natural environments with the re-development of its patient garden facilities (Bäckström et al., 2005).
[2] A place of passive being, relaxation and restitution rather than place of activity (Grahn, 2005).
[3] For example, art, craft and culinary activities are present as elements within the therapeutic repertoire.

assigned his clients activities that focused on systematic interaction with nature (Burns, 1998). Erickson's high regard for the healing powers of nature stemmed from his own personal experience of using "interactive encounters with nature" to recover from poliomyelitis (Ibid). Jay Haley has also highlighted the significant psychotherapeutic potential that lies in human relationship with natural environments, devoting an entire chapter of his influential work, *Ordeal Therapy*, to therapeutic uses of the great outdoors (Haley, 1984[1]).

A green wave of interest

Within the last few years, interest in the field of nature-facilitated mental healthcare has increased significantly within Denmark. A 'green wave' of therapeutic interest seems now to be breaking on our shores. The media appears to have been charmed by ideas of healing gardens and the concept of natural restorative environments, with countless articles appearing in a wide range of media[2]. For example, the front page of a January issue of the Danish newspaper *24-timer*, bore the headline "*Spending time in nature helps women with eating disorders*" and referred to the PhD work of Hans Jørgen Fisker, from Copenhagen University, who is studying the effects of wilderness therapy programmes on this clinical population (Fisker, 2008[3]; Fisker & Carstensen, 2006). And a recent edition of the Danish Psychological Society's magazine, *Psykolog Nyt,* contained an article on the use of adventure therapy, carrying the title "*Naturen som medspiller*"[4] (Steensgaard, 2008). Indeed, professional and academic activity has been growing intensely over the past few years, starting with the headhunting of Associate Professor and specialist in healing landscape design, Ulrikka Stigsdotter, to the Forest and Landscape Department of KVL, Copenhagen University, from the Swedish University of Agriculture in 2006 to lead the development of Denmark's first healing garden research centre in Hørsholm. In autumn 2006, the largest hospital in Denmark, *Rigshospitalet*, opened a healing garden in its grounds, and as earlier noted, one of the major psychiatric hospitals in the country, *Sankt Hans* in Roskilde, is currently in the process of establishing a garden for therapeutic use (Bäckström et al., 2005). Various private initiatives have sprung up around the country and various others are on the way[5]. It appears that such nature-based approaches to mental healthcare have captured the hearts and minds of both the public and professional sector.

It is especially in the area of stress prevention, management and recovery that nature's effects have received most attention. Existing theory and research in this area indicates that nature-based strategies and contexts have a particular value in terms of clinical application within this field (Kaplan & Kaplan, 1989; Hartig et al., 1991; Parsons, 1991; Kaplan, 1995; Ulrich, 1999; Stigsdotter & Grahn, 2003; 2004; Hartig, 2004; Hartig & Marcus, 2006; Guwaldi, 2006). WHO estimate that by the year 2020, stress will most likely be the major cause of illnesss (Pretty, 2006), and according to Professor Tage Søndergard Kristensen of the *Danish Institiute for Working Environment*[6], around 10-12% of all Danes may be described as currently suffering chronic stress (Rotne, 2007). Nielsen and Hansen (2007) report even higher levels of experienced stress[7] in the Danish population (44% in 2000 as compared to 35% in 1987). In the light of such figures and projections, which paint an alarming picture as to general levels of stress and its related disorders in post-modern societies (e.g. Johannisson, 2006; Ekman & Arnetz, 2006; Agervold & Dalsgaard, 2006; Rotne, 2007), it is clear why interest in the utility of nature-based

[1] Cited in Burns, 1998

[2] e.g. *24 Timer*, 14th January, 2008; *Landskabsarkitektur*, September 2007; Politiken, 26th August, 2007;*Urban*, 12th September 2006; *Haven*, November 2004, *Psykologi*, February, 2006.

[3] PhD thesis scheduled to be published May, 2008

[4] Translation: "Nature as team player".

[5] For example, Odsherreds Terapihave (Nykøbing Sjælland), Haverefugiet (Slagelse), Mariendals Haver (Århus Kommune), Livshaven (Fyn). A transdisciplinary network has also recently been establised: *Nordisk Netværk for Livskvalitet og Udemiljø.*

[6] Arbejdsmiljøinstituttet

[7] Figures obtained from the Danish National Institute for Public Health, Copenhagen (Nielsen & Hansen, 2007).

strategies as compliment to existing strategies of primary, secondary and tertiary stress management has arisen.

However, although it seems that stress regulation and restoration might currently represent the most likely potential clinical avenue for the development of nature-based strategies within applied psychological prevention and treatment modalities, research, theory and clinical practice pertaining to psychological benefits of *human psyche-nature* interaction is represented in other areas of mental healthcare. This includes therapeutic initiatives as applied to cognitive disorders such as ADD (Taylor et al, 2001) and dementia (Hartig & Cooper Marcus, 2006; Gigliotti & Jarrot, 2005; Dahlenborg, 2005; Schmidtbauer et al., 2005; 1998; Cohen-Mansfield & Werner, 1999[1]; Zeisel & Tyson, 1999), eating disorders (Berman & Davis-Berman, 1995; Fisker & Carstensen, 2006), anti-social behaviours such as aggression (Worsham & Goodvin, 2007; Berger, 2006; Kuo & Sullivan 2001a), depressive symptomology (Mind, 2007; Townsend, 2006; Burns, 1998) and the rehabilitation of trauma victims (Linden & Grut, 2002). I am curious as to the merit and validity of these reported alternative areas of application and eager to assess their potential interventional value for clinical psychologists,

However, it must be emphasised from the outset that such a task is far from straightforward. The intentional use of nature within mental healthcare covers a vast and eclectic range of context (both natural and social), therapeutic modality and client group. One might say that the many different existing 'green' therapeutic approaches constitute a veritable jungle (if you will excuse the pun). To conceptually integrate research, theory and practice in order to decipher processes of change or draw conclusions as to the validity of presumed effect is certainly a challenging task. In order to make this task easier, it is deemed necessary to provide some clear guidelines as to conceptual and clinical parameters, which will be utilised in this study.

1.2 DEFINING THE FIELD OF INQUIRY

"*Ecotherapy should be recognised as a clinically valid treatment for mental distress*." (*Mind*, 2007)

In a recent report by the British mental health organisation, *Mind*[2], an appeal is made for "a new green agenda for mental health" which would incorporate what is termed as "ecotherapy" into existing treatment options for mental health users (*Mind*, 2007). This appeal is based largely on the results of two commissioned research projects studying the effects of green activity and exercise on mental health users in *Mind* groups around the UK (*Mind*, 2007), in addition to research from the *University of Essex*, which indicates that exercise in natural settings or whilst viewing pictures of natural settings have distinct positive mental health outcomes (improved mood and self-esteem) over and above that of urban settings or exercise alone (Pretty et al., 2007; Pretty et al., 2005[3]). The *Mind* report also draws attention to the work of other researchers in the field, whose studies on the general restorative and stress-reducing effects of nature (Grahn & Stigsdotter, 2003; Whitehouse et al., 2001; Hartig et al., 2003) lend further support to their appeal that mental healthcare practitioners and institutions explicitly incorporate the benefits of nature contact in their prevention and prescription policies. Even the bastion of allopathic medical discourse, the *British Medical Journal*, has given editorial space to expounding the positive potential that lies in the development of an eco-therapeutic framework for treatment of mental health problems (Burls & Caan, 2005).

[1] Cited in Dahlenborg, 2005
[2] The British mental health charity, whose activities and organisation resemble that of the Danish *Psykiatrifonden*
[3] These studies and most others cited in this introduction will be reviewed in detail in Chapter 2.

Ecotherapy as emerging clinical modality

Ecotherapy is a term often encountered in the literature (Mind, 2007; Burls, 2007; Burls, 2004, Burls & Caan, 2005; Burns, 1998; Conn, 1998; Clinebell, 1996). However, it is used to describe a rather diverse range of therapeutic modalities. These range from the counselling of individual clients within a psychotherapeutic context (e.g. Berger & McLeod, 2006; Berger, 2006; Rust, 2004; Burns, 2005; 1998, Clinebell, 1996) to 'green care farms' (Pretty, 2006; Sempik & Aldridge, 2006), 'green exercise' (Pretty et al., 2005) and green gyms (Reynolds, 2002). Unfortunately, *ecotherapy* is also frequently used synonomously in the literature with terms such as *animal-assisted therapy, adventure therapy* and *wilderness therapy*.

"*The term ecotherapy has been critiqued and discussed as one that may not be fully endorsed by all schools of thought in therapy*" (Burls, 2007).

Not only is there a lack of clarity in relation to what *ecotherapy* encompasses in the way of modality, it is also used as a label for a range of approaches reflecting different theoretical positions. For example, pastoral counsellor, Howard Clinebell uses the term to describe "the healing and the growth that is nurtured by healthy interaction with the earth" (Clinebell, 1996). He applies Wilson's 'biophilia hypothesis' (the presumed genetically rooted affiliation humans have for the natural world – Kellert & Wilson, 1993), as the theoretical fundament of his individual-oriented therapeutic approach; an approach that employs processes of conscious re-establishing of "emotional bonds" with the earth to achieve therapeutic benefit, for example by 'prescribing' clients time in nature, (e.g. eliciting a commitment to daily walks in mindful silence in natural surroundings) (Clinebell, 1996). Clinical psychologist, George Burns, has also utilised the term *ecotherapy* to describe an essentially positive psychological, integrative, nature-guided approach to psychotherapy (Burns, 1998). In fact, Burns uses several different terms *ecotherapy*, *ecopsychotherapy* and *nature-guided therapy* synonymously. However, he admits to preferring the term *ecopsychotherapy,* on the grounds that it best reflects a dynamic interchange between the human mind and the environment and a fundamental reciprocity between human health and the health of natural systems that he wishes to convey (Burns, 1998). Burns utilises a range of ecotherapeutic strategies[1] in largely psychotherapeutic settings with individual clients and couples (Ibid).

Public health researcher, Ambra Burls, has utilised the term *contemporary ecotherapy* to describe a horticultural and social therapeutic approach (and therefore group-based) with a conservational slant ("green stewardship"), whose aim is not only to improve the mental health and social inclusion of individual service users, but also "to benefit the environment in line with current biodiversity principles" and empower communities in the process (Burls, 2004; Burls, 2007).

I would like to point out here that Burns, Clinebell and Burls all refer to a therapeutic paradigm which aims at mutually enhancing the health of both people and their natural environments as *interdependent* systems, and thus introduce a distinctly environmentally-ethical and ecopsychological[2] perspective to the concept and term *ecotherapy*. Similarly, ecopsychologist Theodore Roszak argues that "professional psychology can play a role in the environmental crisis of our time" (Roszak, 1992) and psychotherapist Ronan Berger's call for the inclusion of nature within psychotherapy is inspired, not only by the beneficial effects on mental health, but because it provides a viable response to the

[1] See Chapter 2 for a description of these strategies.
[2] See page 5.

"rupture between human communities and the natural world"(Berger and McLeod, 2006)[1]. Researchers at the *University of Essex*, whose results have provided the basis for Mind's afore-mentioned "green agenda for mental health" report (Mind, 2007), have also highlighted the link between wider environmental ethics and human health, claiming that emotional benefits of green spaces can be utilised as argument for environmental conservation (Pretty, et al., 2005).

"*Ecotherapeutic approaches are directly relevant to the achievement of wider environmental and public health aims, with a high level of added value embodied in the social inclusion outcomes they could generate*" (Burls, 2007, p. 30).

Others branches on the tree of 'green' mental healthcare or *ecotherapy* take a distinctly more instrumental or functional perspective on the therapeutic value of nature i.e. its usefulness or value in promoting the health or alleviating the mental suffering of individual human beings, rather than from a vision of the interdependence of personal, community and planetary health. From such a perspective, nature is perceived more or less pragmatically as providing an optimal environment to enhance *human* psychological growth, restoration and healing. These approaches include horticultural therapy/social and therapeutic horticulture (Sempik et al. 2003; Simson & Straus, 1998; Schmidtbauer, Grahn & Lieberg, 2005, Ulrich, 1999), healing gardens[2] (Stigsdotter & Grahn, 2002; Cooper Marcus & Barnes, 1999), various schools of wilderness[3] and adventure therapy (Davis-Berman & Berman, 1989; Schoel & Maizell, 2002), animal-facilitated therapeutic practices (Antonioli & Reveley, 2005; Katcher & Wilkins, 2000[4]; Katcher & Wilkins, 1993; Worsham & Goodvin, 2007), green care and green farms (Sempik & Aldridge, 2006; Pretty, 2006), health-promoting environments (Stokols, 1992), evidence-based health design (Dilani, 2001), not to mention the salutogenic use of urban green spaces, such as parks and gardens (Stigsdotter, 2005; Nielsen & Hansen, 2006; 2007).

The distinction between macro- and micro-level approaches

Burls has provided a useful description of the above two perspectives: *ecotherapy* at the "micro-level" (focused on individual health outcomes) and *ecotherapy* at the "macro-level" (incorporating public and environmental health outcomes), both of which are situated within the wider concept of "*ecohealth*", by which she means an expansion of the definition of health to include our relationship to a wider level of system i.e. both human and non-human communities (Burls, 2007). This has been termed a *socio-ecological* approach to health by other writers (Maller et al., 2005; Brown, 1996[5]). Maller and collegues have also made a distinction between *personal* and *community* levels of benefits to health and well-being (Maller et al., 2002). However, they too highlight the reciprocity of these levels (Ibid).

The exploration of mental healthcare from the perspective of the mutual interconnectedness of human and ecological health is clearly a most laudable and timely venture. Indeed, concepts of the interdependence of human-health and ecological-health are gaining more and more attention within mainstream psychology and public health sectors (e.g. Hartig & Staats, 2007; Burls, 2007; Berger & McLeod, 2006; Mellen, 2006; Burls & Caan, 2005; Hartig et al. 2001; Vorkinn & Riese, 2001; Du Nann

[1] Berger has developed a psychotherapeutic approach called nature therapy as both a specific model of therapy and "as a source of concepts and practices that can be integrated into any therapeutic model". (Berger and McLeod, 2006; Berger, 2006)

[2] An example of such an approach is provided by the well-publicised *Alnarp Rehabilitation Garden* in Malmø, Sweden, whose focus is the psychological rehabilitation of clients with work-related burnout disorders[2] with a view to workplace reintegration (Grahn et al., 2007; Grahn, 2006; Stigsdotter & Grahn, 2003).

[3] However, many practitioners of wilderness therapy identify themselves with a distinctly ecopsychological perspective (e.g. Cohen, 1997; Harper, 1995; Greenway, 1995).

[4] Cited in Worsham & Goodvin, 2007

[5] Cited in Maller et al., 2005

Winter, 2000). In fact, it must be noted that many of the clinicians currently utilising and exploring nature-assisted approaches within their practice and writings make their commitment to a macro-level approach quite explicit (Berger, 2006; Berger & McLeod, 2006; Rust, 2004; Burns, 1998; Conn, 1998; Bragg, 1997; Clinebell, 1996; Cohen, 1995). In the following discussion, I would therefore like to acknowledge Burl's assumption that drawing upon nature-facilitated contexts and practices in the service of individual mental healthcare, may often lead to "natural capital outcomes" such as protection of biodiversity for future generations (Burls, 2007)[1]. Although I will be primarily addressing nature-based therapeutic approaches at the micro-level rather than the macro-level, I would like to emphasise, that I personally endorse the perception of *human* psychological and *ecosystemic* value as profoundly reciprocal spheres of value. As Thomas Berry so succinctly puts it, "*We cannot have well humans on a sick planet*." (Berry, 2007).

This stated, let us return once again to the subject of definition and the question of whether *ecotherapy* can provide us with a workable remit for this study.

From the above discussion, it should be evident that *ecotherapy* is a conceptual term containing multiple definitional nuance and referring to a rather broad spectrum of clinical approaches. Due to this state of affairs, and also because I will be largely concentrating on dimensions of *micro-level* process/outcome in the following overview (individual mental health outcomes achieved through the employment of a range of 'natural' strategies within various nature-based settings – Burls, 2007), I have decided to employ the terms *nature-assisted*, *nature-guided, nature-based* or *nature-facilitated* in this connection, rather than *ecotherapy*. As I will also be approaching this study in terms of general mental health-promotion, reaching beyond concepts of therapy and treatment to encompass more positive psychological and "salutogenetic" perspectives on psychological intervention (Antonovsky, 1987), the prefixes outlined present themselves as more appropriate terminology.

Furthermore, it is necessary to define which nature-assisted therapeutic and health-promoting *approaches* will be included in this study. As previously highlighted, the range of green mental health interventions is wide and it would be impossible to do descriptive justice to the whole field, within the confines of this study. Therefore, I have chosen to exclude references to research that involve the therapeutic effect of intentional human-animal contact (*animal-facilitated therapy* and *use of companion animals*) and focus rather on applications, empirical evidence and hypotheses, which allow us to focus principally on the meeting of the human psyche with natural and cultivated green spaces.

What is nature?

As to providing a definition of what is actually meant by 'nature' (are we talking of greenhouses, gardens, parks, wilderness, forests, farmland?), I will purposefully be less specific. The problem of definition must be acknowledged here for the concept of nature is an expansive one, encompassing "plants, objects (such as rocks), events (such as storms), and of course animals" (Kahn & Kellert, 2002). Environmental writers and researchers have provided many different definitions of what 'nature' actually is[2]. Indeed, Mausner has pointed out that definitions in the literature are often unclear, with no distinction being made, for example, between "natural elements" (or features) and "natural environments" (Mausner, 1996). Mausner has attempted a categorisation of natural environments into "totally natural" (wild and unspoilt nature, e.g. the ocean, a desert), "civilised natural"(e.g. a forest with

[1] Not to mention a range of social benefits such as social inclusion and community strengthening (Burls, 2007)
[2] For readers interested in a more detailed description of the range of different human perceptions and constructions of nature, I would recommend Van den Born et al., 2001.

hiking trails), "quasi-natural"(parks and gardens), "semi-natural" (e.g. outside dining at a restaurant) and "non-natural environments", concluding that individual concepts of nature are best understood within a complex "kaleidoscope model" (Ibid). Even when we talk of more specific natural settings (i.e. focus on just one of Mausner's categories), such as the 'garden' or 'wilderness', the dilemma of definition is still present. Kaplan and Kaplan, for example, have addressed the inherent difficulties that lie in an attempt to arrive at a definition of the term 'wilderness' (Kaplan & Kaplan, 1989) and a garden may contain many qualitatively different features (Stigsdotter & Grahn, 2002). Therefore, although I will attempt to make explicit what type of nature is being referred to throughout the following discussion, I will not limit myself to a particular universal operational definition.

Burns has wisely advised us to be careful not to over-romanticize the concept of nature (Burns, 2005). Of course, nature is not just rose-gardens and waving fields of corn; it also holds the potential to "destroy us - coldly, cruelly, relentlessly", as Freud[1] once put it. Strongly negative feelings are just as likely to be elicited in nature as positive feelings. The theory of *biophilia* contains an acknowledgement of the existence of *biophobia* – a classic example being the almost universal and instinctive fear of spiders and snakes (Kellert & Wilson, 1993). Therefore, my definition of nature encompasses only those environments, which might be considered - and are generally experienced – as "safe" (Staats & Hartig, 2004) and having "a positive emotional or aesthetic value" (Burns, 2005). In other words, natural settings, which have been described in studies as generally preferred (Kyle et al., 2004; Herzog et al., 2000; Kaplan et al., 1998; Newall, 1997; Purcell et al., 1994; Orians, 1986[2]) or in terms of being "favourite places"(Korpela et al., 2001).

Of course, I am acutely aware of the confounding influences represented by my embracing of such a broad spectrum of parameters - including landscape type and scope, style of garden[3], particular garden "rooms" (Grahn, 2005; Stigsdotter & Grahn, 2002)[4], whether contact with nature is incidental or intentional, not to mention differing cultural views of what the term 'nature' actually represents (Larsen, 1996[5], Gentin, 2006).

Note also that there are several possible levels at which our therapeutic and salutogenetic 'meetings' with nature might take place: from simple viewing of nature, to being passively in the presence of nature to actively participating within a natural context (Burls, 2007). These levels are considered equally significant for the purposes of this study. Thus, the particular *form* of nature contact will range from the viewing of natural scenery through a window (Hartig et al., 2003; Kaplan, 2001) to "a space for passive or quasi-passive activities such as observing, listening, strolling, sitting, exploring, and so on" (Cooper Marcus & Barnes, 1999), in addition to other more purposeful activities, such as running, walking and gardening (Mind, 2007; Pretty et al., 2007; 2006; 2005; Priest, 2007; Reynolds, 2002; Burns, 1998; 2005). As much of the experimental literature draws on exposure to symbolic representations of nature, (e.g. Pretty et al., 2005; Berto, 2005; Van der Berg et al., 2003; Ulrich et al., 1991), photographs and video simulations of natural scenery will also be included. Let me summarise the different classes of nature as independent variable present within the empirical, clinical and theoretical literature[6]:

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[1] Cited in Roszak, 1995

[2] Orians' analysis of preferred aesthetic configurations of natural settings demonstrated that most people prefer landscapes that have been described as savannah-like environments - cited in Ulrich et al., 1991

[3] For example the psychological effects of an orderly Japanese Zen garden will presumably be very different from an English cottage garden.

[4] The Swedish researchers, Grahn and Stigsdotter have described eight basic types of natural area within parks and gardens, associating these different characteristics with different psychological states and regulatory/restorative needs of individuals (e.g. Stigsdotter & Grahn, 2002).

[5] Cited in Oustrup, 2007

[6] Maller and colleagues (2002) have utilised such a listing of independent variables (type of nature contact) to structure their presentation of the health benefits of nature (i.e. viewing nature, being passively in the presence of nature, active participation in nature, contact with animals, contact with plants and therapeutic practice in nature).

- *reported preferences for natural environments based on interviews*
- *experimental designs utilising photographs or video simulations of nature*
- *viewing natural scenes from windows*
- *passive being in nature: contemplation/observation and quasi-passive solo activity*
- *active doing in nature: participating in horticultural or conservational activities in nature* or *nature-based recreation and exercise*
- *nature-assisted therapy*

All these versions of nature as independent variable are deemed of relevance in the service of this investigative endeavour, as my intention is to explore the range of direct and indirect beneficial psychological processes and effects arising from interaction with and exposure to non-human (and non-animal) natural settings and their implications for the field of psychological intervention.

A final note on definition: I would also like to point out that studies referring primarily to beneficial *mental* health outcomes rather than *somatic* health outcomes will be in focus. There is some interesting data available in the literature (see for example Ulrich, 1999) relating to positive somatic health outcomes with nature contact such as faster recovery from surgery (Ulrich 1984; Ulrich et al. 1993) and improved pain relief (Ulrich et al, 1999; Miller et al., 1992[1]; Ulrich, 1984). A seminal and oft-cited study in this field is that of Roger Ulrich, which demonstrated that cholecystectomy patients with views of a small copse[2], as opposed to a brick wall, exhibited shorter post-operative stays, lower consumption of analgesics and fewer negative evaluations from hospital staff for patients (Ulrich, 1984). Although the relevance of such studies for the field of health psychology are not to be denied, due to the limits of this paper, I will maintain a primary focus on *psychological* effects of relevance to clinical interventional modalities.

It is within such a set of definitional parameters that I propose to now assess the literature, with the aim of establishing the extent to which contact with nature may actually confer mental health benefits and by which psychological processes they are proposed to confer them. Thereafter I will attempt to conclude as to the scope of therapeutic potential within applied clinical psychological practice.

[1] Cited in Ulrich, 1999
[2] A small area of woodland.

CHAPTER 2

OVERVIEW OF THEORY, RESEARCH AND PRACTICE

"*What studies show over and over again is that nature is, in fact, important to people. Exploring why and how it is important has been an enlightening quest.* " (Kaplan & Kaplan, 1989)

In order to generally justify the claim for "a green agenda for mental healthcare" (*Mind*, 2007), and to specifically assess the extent to which there is a fundament on which my central hypothetical construct might rest (i.e. that clinical psychological intervention, and in particular, psychotherapy, might potentially benefit from the expansion of clinical and conceptual repertoire), we initially need to:

- *ascertain the extent to which contact with natural environments makes an empirically verifiable difference to mental health outcome by reviewing available research*
- *investigate the anecdotal domain of nature-assisted clinical practice*
- *outline relevant theoretical perspectives on the therapeutic and salutogenetic uses of nature*

In this chapter I will attempt to provide such an overview of relevant theory, research and clinical practice in order to support or disqualify the above appeal and chart the *potential* for integration of natural environments, as setting and strategy, within established applied clinical psychological contexts.

2.1 THE LITERATURE: AN ORIENTATION

Literature search methodology

A combination of search methods has been employed to find relevant literature, including both non-systematic and systematic searches utilising electronic databases and the traditional procedure of mining the literature lists referenced in focus articles (chain search methodology). Libraries and databases I have made use of include: *Århus University, Institute of Psychology* and the *State Library* archives (SOL), www.bibliotek.dk and *PsycInfo*. I have also drawn upon a network of contacts within relevant research institutions[1].

Much of the literature gleaned by these methods is from the field of environmental psychology (articles mainly from: *The Journal of Environmental Psychology* and *Environment and Behaviour*). With regards clinical, counselling and psychotherapeutic journals, I have carried out a more concentrated search in each of the separate following publications: *Journal of Consulting and Clinical Psychology, Journal of Clinical Psychology, British, Journal of Clinical Psychology, Journal of Counselling Psychology, Journal of Psychotherapy Integration, Journal of Abnormal Psychology, Psychotherapy, Psychotherapy Research* and *Clinical Psychology Review.* Furthermore, I have also searched: *British Journal of*

[1] e.g Ulrikka Stigsdotter, KVL, Copenhagen University; Ambra Burls, Anglia Ruskin University; John Pickering, Warwick University; Alnarp Rehabilitation Garden, Svensk Landbrug Universitet, Malmø.

Psychology, American Psychologist, Psyke & Logos, Health Psychology and *Journal of Health Psychology*.

Search words used in various combinations:

natural environments, natural settings, green spaces, horticulture, gardens, wilderness, nature-based, nature-facilitated, nature-assisted, ecological, eco-systemic, nature contact, nature exposure, green, biophilia
and
psychology, psychotherapy, counselling, therapy, nature therapy, ecotherapy, rehabilitation, clinical psychology, counselling psychology, health psychology

A significant amount of relevant research has been sourced from fields beyond psychology, i.e. medicine, public and environmental health, horticultural therapy, landscape architecture and environmental planning. Therefore, references from journals as diverse as the *British Medical Journal, The Lancet, American Journal of Preventative Medicine, Journal of Therapeutic Horticulture, Health Promotion International, Journal of Environmental Health Research, Urban Forestry and Urban Greening* and *Journal of Environmental Planning and Management* are also included. This of course, tells us a great deal about general perceptions of the therapeutic significance of nature within clinical psychological disciplines – an observation which I would like to return to in a later section on the role of nature in psychology[1].

I have further been informed by the work of public health researchers, Cecily Maller and her colleagues at *Deakin University*, Australia, who have reviewed the literature in this field, and concluded that there is considerable anecdotal, theoretical and empirical evidence to support the idea that nature confers substantial benefits for human mental health and well-being (Maller et al., 2005; 2002). Although some of the research they refer to incorporates modalities beyond the scope of this thesis (e.g. animal assisted therapy), many of the studies they list have been informative to me in the collection of relevant material for the following analysis[2].

There are relatively few books published on the subject of nature-based mental health care and even fewer that focus on areas of clinical psychological and psychotherapeutic practice. However, the following selection of books have provided valuable information towards this project: *The Experience of Nature* (Kaplan & Kaplan, 1989), *The Biophilia Hyptothesis* (Kellert & Wilson, 1993), *Healing Gardens* (Cooper Marcus & Barnes, 1999a), *Tänkvarda Trädgårdar* (Schmidtbauer et al., 2005), *Horticulture as Therapy* (Simon & Straus, 1998), *The Healing Fields* (Linden & Grut, 2002), *Nature-Guided Therapy* (Burns, 1998), *Ecotherapy* (Clinebell, 1996), *Identity and the Natural Environment* (Clayton & Opotow, 2003). As the only clinical psychologist who has written extensively on this theme, I am particularly indebted to George Burns' description of the role of nature-based strategies in his own psychotherapeutic practice (Burns, 1998; 2005).

A major source of anecdotal evidence comes from the action research programme at *Alnarp Rehabilitation Garden*, which has, since it's onset in 2002, generated a great deal of information (and media attention!) outlining clinical experience and ongoing theoretical development (Grahn et al., 2007; Grahn et al., 2006; Grahn 2007a; Grahn & Stigsdotter, 2003; Stigsdotter & Grahn, 2003). However, as

[1] see Chapter 4.
[2] However, I would point out that the 'Maller et al. reviews' take a universally uncritical standpoint on the literature and lack, for example, commentary on methodology and hence, an evaluation of the reliability and validity of included studies.

yet, no empirical data has been published in a scientific journal, which might allow us to assess the merits of their healing garden-based treatment programme for clients suffering from invalidating stress-related disorders (Grahn, 2007b).

The distinction between direct and mediated effects of nature

Before we embark on this investigative journey, let me emphasise a central distinction to be found within the literature, i.e. the difference between attempts to study the *direct* or *unmediated* effects of human contact with natural environments as opposed to assessments of nature's role as an integrated element within a multi-modal therapeutic approach or in terms of optimal setting for other activities and processes (e.g. adventure therapy – Berman & Davis-Berman, 1995). As far as the latter category is concerned, any attempt to elucidate the *directly* causal role of nature in mental health outcomes is far from straightforward. In such cases, nature must be embraced as one of a many therapeutically potent variables. I would like to make this distinction explicit before we commence with this literature overview.

Literature referring to immersion in nature-based settings often depicts group-based natural encounters and thus presents us with the sphere of social influence as confounding variable in terms of attempting to identify the specific role of nature in mental health promotion. However, any attempt to limit the research focus to include only studies on the unmediated psychological influence of nature on the individual, would lead to the necessity of discarding a great deal of valuable and highly relevant material. For example, such a limitation would require us to jettison the entire field of social and therapeutic horticulture, for it is the *social* interactions and outcomes, in addition to the occupationally-oriented activities of social and therapeutic horticulture approaches, which are widely accepted amongst researchers in the field as being largely causal in relation to beneficial outcomes (Sempik & Aldridge, 2006; Sempik et al., 2003a). It would also require that we exclude some valuable data from adventure therapy as this approach is based on a therapeutic rationale of team-based (and thus relational), experiential outdoor challenges integrating "group-level processing and individual psychotherapy sessions as part of an overall therapeutic milieu" (Newes, 2001). Wilderness therapy, which is closely related to adventure therapy[1], is also often group-based (Kaplan & Kaplan, 1989; Greenway, 1995). Furthermore, valuable initiatives currently blossoming in the UK, such as 'walking for health' (Priest, 2007) and conservation-oriented therapeutic projects for mental health users (Burls, 2007; Reynolds, 2002) are quite clearly group-based therapies. If my aim is, as stated in the introduction, to assess the prospects for integration of natural environments within clinical psychological interventions, it would obviously make no sense to disregard the existing practice which actually describes experiences of the therapeutic use of nature. Most traditions of psychotherapeutic intervention have, after all, emerged from the sphere of clinical experience rather than research (Hougaard, 2004).

Social factors are obviously not the only dimension of extraneous influence we encounter when attempting to assess nature's direct mental health influences. Another important contributory factor present in much of the relevant literature is that of meaningful activity and occupation (Sempik & Aldridge, 2006; Stigsdotter & Grahn, 2002; Simon & Straus, 1998). Of course, horticultural therapeutic

[1] The terms wilderness and adventure therapy are often used synonymously in the literature. However, they can be distinguished from each other on the basis of their origins and theoretical positioning. Adventure therapy as an approach is sourced in experimental learning theory and concepts of supporting development and change by bringing people out of their "comfort zone" through challenging experiences and thereafter processing new learning via group processes of reflection (Gass, 1993). Nature is seen as optimal environment for providing such developmental challenges (Berman & Davis-Berman, 1995). Wilderness therapy has developed is characterised by a more eco-psychological and meta-physical stance and is less focused on intentional activity and more on the meeting of the individual with the vastness of wild places – abandoning "civilisation" for a while in the quest to find a more authentic level of self (Harper, 1995).

practices place their *raison d'etre* on the psychological benefits to be attained through such meaningful activity in garden settings (Simon & Straus, 1998).

Furthermore, the influence of non-specific factors must also be embraced in any assessment of nature's therapeutic effects. As one of the aims of this study is to draw conclusions as to the clinical relevance of natural settings, with specific reference to the domain of psychotherapy, I must obviously embrace the possibility that processes of human-nature interaction may be facilitated by an accompanying therapist, with all that infers in terms of non-specific factors such as the quality of the working alliance and the "myth" or "rationale of therapy" (Frank, 1982; Beutler et al., 2004).

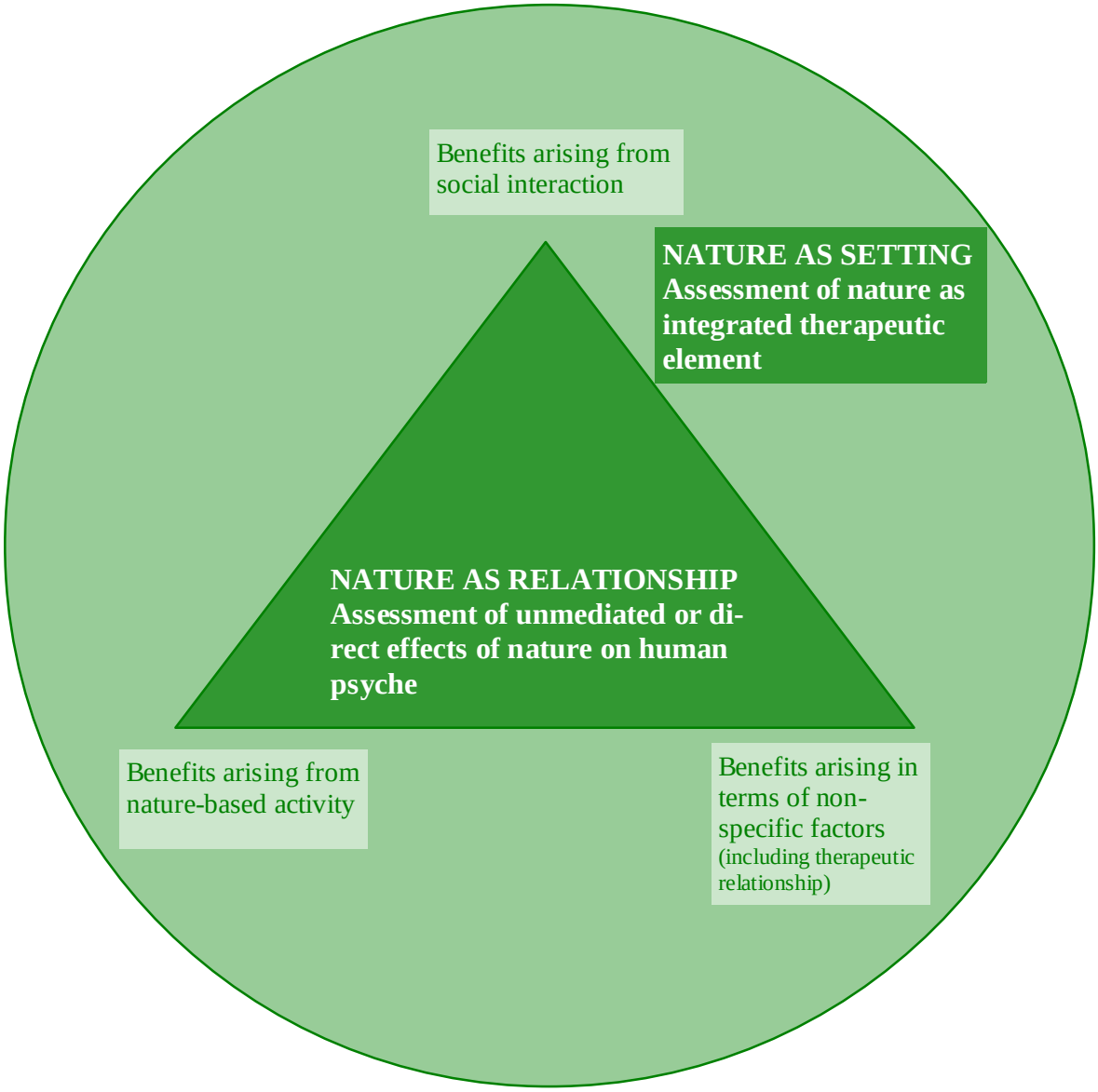
I will meet the challenge (posed by the inevitable presence of extraneous influencing factors) on two levels: firstly, by committing myself to making explicit the various confounding influences present in each study I review. Secondly, I will from the outset, embrace a research focus, which contains two mutually validating levels of analysis:

1. to elucidate what is specifically psychologically beneficial about nature *per se*. In other words, the ontology of the *meeting with*, *being in, viewing of, participating with* or *moving through* nature in more or less direct, unmediated or 'pure' relationship - and its implications for (especially) the practice of applied clinical psychological modalities,
2. to assess the benefits and therapeutic suitability of natural environments from the perspective of nature as *integrated element* within a particular practice of mental health promotion or even merely in terms of suitable therapeutic setting. The inevitable influence of any number of extraneous variables is consciously embraced from this perspective and thus, the role of nature on positive outcome can only be inferred or viewed as indirect/mediated.

However, let me emphasise that it is my main priority to ascertain whether direct interaction with nature is causal in terms of positive mental health outcomes, i.e. *does nature make a difference?* It is my presumption that convergence of evidence from both of the above approaches in the literature might contribute to a better understanding of the *specifically* beneficial value to be gained from drawing on human-nature interaction as psychological interventional practice.

The following diagram (figure 1.) is an attempt to portray this distinction between the assessment of nature is in terms of *setting / integrated therapeutic element* (circle) and assessment in terms of nature as *affecting us via direct relationship* (triangle). Interestingly, several writers have drawn attention to the fact that nature can be conceptualised both as therapeutic setting and therapeutic relationship (Berger and McLeod, 2006; Kuhn, 2001). This is a delineation I find most useful in terms of being able to semantically sort the rather unwieldy and amorphous body of theoretical, empirical and anecdotal data, which characterises the field. One might say this is a distinction, which might help us to see the 'wood for the trees'.

Figure 1.
A view of the literature in terms of assessment of nature as directly influencing factor or mediated influencing factor

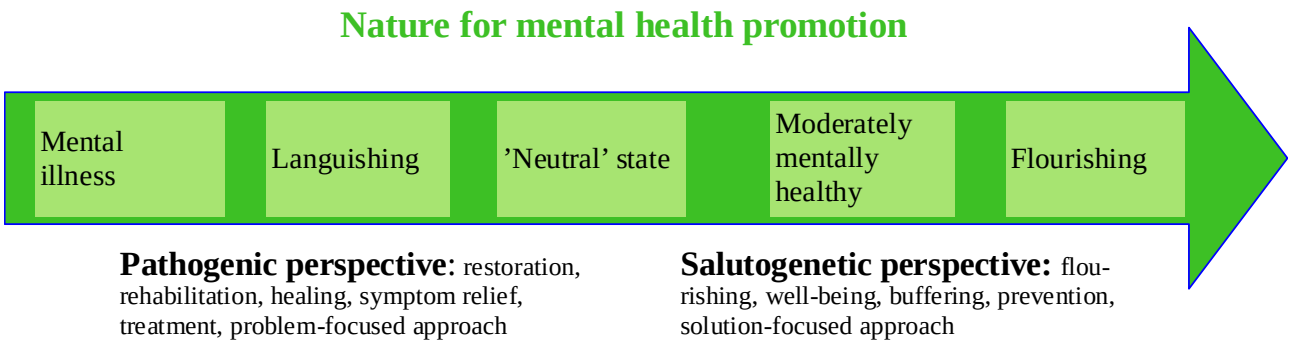


I intend to draw upon this model in the following literature review, beginning with evidence that alludes to the concept of exposure to nature as more or less *directly* related to beneficial mental health outcomes (2.2 and 2.3), and thereafter continue with a listing of data which might be better categorised in terms of situating nature as integrated therapeutic element or facilitating context for various other therapeutic processes, and thus providing rather more inferred or indirect evidence of the beneficial mental health effects of nature (2.4).

I have further found it useful to conceive of nature's alleged benefits, as ranging across a continuum of mental health-promotion (see figure 2.), from restoration/symptom relief to flourishing and well-being (Keyes, 2002). Such a paradigmic synthesis of pathogenic and salutogeneic perspectives is inspired by the positive psychologists (e.g. Keyes, 2002; Seligman et al., 2004; Harrington & Linely, 2005; Everly &

Feldman, 1984[1], etc). Keyes, for example, has operationalised this continuum as a range of different states of mental health spanning from actual pathology to states of "languishing" (by which he means an absence of mental health), to "moderate mental health" and at the most resourceful end of the scale, the optimal state of "flourishing" (Keyes, 2002). I propose that this model provides a structure, which might adequately embrace the spectrum of alleged health-promoting/healing process and effect claimed within the literature on nature-assisted mental healthcare, in addition to providing a suitable methodology for ordering the literature.

Figure 2.
Nature for mental health promotion (inspired by Keyes, 2002)



2.2 NATURE FOR RESTORATION AND REGULATION OF PSYCHOLOGICAL RESOURCES

The role of nature in terms of *restorative* properties and processes is one of the central themes to be identified within the literature (e.g. Kaplan & Kaplan, 1989; Hartig, 2004; Ulrich, 1999; Hartig et al, 1991). Coming mainly from the field of environmental psychology, this perspective focuses on *directly* beneficial influences of natural environments in terms of elicitation of psycho-physiological processes of restitution, relief and recovery in situations of depleted psychological resources or mental illness. This perspective harmonises well with the traditional focus of clinical psychological treatment, which has long been one of moving those who are showing signs and symptoms of mental distress toward a neutral point where pathology or dysfunction is relieved or eliminated (Seligman et al., 2004). The concept of natural settings as providing possibilities for psycho-physiological restoration is the oldest and perhaps the most active topic of relevant research to be found in this field, with whole editions of *The Journal of Environmental Psychology* (Hartig & Staats, 2003) and *Environment and Behavior* having been devoted to it (Hartig, 2001). Due to the established status of the restorative literature, I will begin my investigation within its theoretical and empirical realms.

Perceptions of nature as restorative

According to the results of several studies, people tend to express the belief that nature is inherently restorative and exhibit a tendency to gravitate towards natural settings, especially in periods when psychological and physical resources are depleted (Kaplan & Kaplan, 1989; Herzog et al., 2002; 2003; Van de Berg et al., 2007).

[1] Cited in Donaldson & Bligh, 2006

In a range of interview-based studies asking people to recommend places in which healing and stress-alleviation might be optimised, respondents typically refer to natural settings (Olds, 1985; Francis & Cooper Marcus 1992[1]; Barnes, 1994; Korpela & Hartig, 1996; Herzog et al., 2002; 2003; Grahn & Stigsdotter, 2003; Frerichs, 2004[2]; Regan & Horn, 2005). A nationwide study in Holland, Frerichs reported that 95% of respondents believed that visiting nature was the most effective way of recovering from stress (Frerichs, 2004) and environmental psychologists, Korpela & Hartig, have provided data indicating that 'favourite places'[3] characterised by natural features of "greenery, water and scenic quality" are those associated with highest levels of perceived restorativeness and enhanced positive emotion (Korpela et al., 2001; Korpela & Hartig, 1996). In a recent study, investigating how environmental preferences vary with states of mental fatigue, it was found that in comparing groups of "no attentional fatigue" and "attentional fatigue" (measured before a morning lecture and after an afternoon lecture), a population of 103 college students consistently expressed the belief ($p<0.001$) that a one-hour walk in a forest would facilitate attentional recovery better than a walk in the city centre (Hartig & Staats, 2006). Interestingly, those participants with highest levels of attentional fatigue rated the restorative potential of a forest walk significantly higher than those who were less fatigued (Ibid).

In a study by Grahn & Stigsdotter, 953 randomly selected interviewees were posed the question: "*What would you recommend a close friend to do if he or she felt stressed or worried*?" The majority of respondents placed "*to take a walk in a forest*" as their first choice[4], followed by "*to listen to restful music*" and "*to rest in a silent and quiet park*" (Grahn & Stigsdotter, 2003). Furthermore, results of a postal questionnaire survey of 1200 adult Danes[5], report that positive evaluations of the effects of nature are statistically signficiant in response to the statement "green areas provide a good context to relieve stress" (Nielsen & Hansen, 2005). Several researchers have interpreted the above tendency as representing an important adaptive function, i.e. that of psychological restoration (Ulrich, 1983; Kaplan & Kaplan, 1989; Hartig et al., 1991; Kaplan, 2001; Van de Berg et al., 2007), and that the desire for contact with nature represents "more than naïve rural romanticism: it may even reflect an evolutionary heritage" (Van de Berg et al., 2007). According to such theorising, throughout the course of evolution, the ability to find appropriate environments ensured, not only basic safety and accessibility to food and shelter, but also the possibility for psychological restoration, and therefore would have been positively selected for (Kaplan & Kaplan, 1989, Ulrich, 1983; 1993)[6]. The so-called "biophilia hypothesis" takes the concept of evolutionary adaptation even further, proposing "*a human dependence on nature that extends far beyond the simple issues of material and physical sustenance to encompass as well the human craving for aesthetic, intellectual, cognitive and even spiritual meaning and satisfaction*." (Kellert & Wilson,1993). In other words, *biophilia* is claimed to be an inherent aspect of human evolutionary heritage, manifesting as an affinity for nature in terms of behavioral and emotional response, and which not only contributes to our physical survival, but also to our psychological and existential well-being (Maller et al., 2002)[7].

[1] Cited in Cooper Marcus & Barnes, 1999 (Barnes, 1994 is also cited in this book)
[2] Cited in Van de Berg et al., 2007
[3] Interestingly enough, those places perceived as restorative are often reported as in the terminology of 'favourite places', indicating a link between place attachment and the opportunities a place provides for stress regulation (Korpela, 1991; Korpela & Hartig, 1996; Korpela et al., 2001). I will return to the concept of place attachment as indicating the emotional value of natural environments for humans in chapter 4, in which the theme of relationship between humans and nature is addressed in more detail.
[4] Mean value: 1.14, SD 1.78
[5] Referring to Nielsen & Hansen, 2006
[6] I will expand on evolutionary perspectives of the human-nature relationship in Chapter 4.
[7] I will return to explore the concept of biophilia in greater detail in terms of human-nature relationship in Chapter 4.

Ulrich's theory of stress recovery

According to the theory of 'psycho-physiological stress recovery "of Roger Ulrich[1], environments that afford opportunities for restoration from stress contain certain visual stimulus characteristics that directly elicit generalised states of positive affect, reduce demands for vigilance and via parasympathetic stimulation help return autonomic arousal levels to normal (Ulrich, 1983; Ulrich et al., 1991). Inspired by Zajonc's *theory of preferenda* (Zajonc, 1980[2]), Ulrich posited that perception of gross structural properties of the visual array - such as particular patterns of vegetation (i.e. those characterised by savannah-like landscapes), the presence of water, in addition to moderate depth, moderate complexity and the presence of a focal point - are thought to rapidly evoke automatic positive affective and parasympathetic physiological responses (with associated feelings of calmness, relaxedness, pleasantness and fascination – Ulrich, 1983) . In other words, this theory supposes that certain natural features elicit primary limbic-mediated processes of affective and physiological response leading to stress restorative outcomes. Ulrich hypothesised that we have evolved to instinctively 'tune in' to scenery that induces such positive responses, because this adaptive strategy would have been significant for the survival of our early ancestors (Ulrich, 1983). Pigram supports this hypothesis, claiming that we have "*a genetically coded pre-disposition to respond positively to natural-environmental content*" (Pigram, 1993[3]). This evolutionary perspective on the stress-regulating effects of certain natural surroundings, is shared by several other authors, who have described innate cognitive processes of affordance perception, which determine appropriate affective, physiological and behavioural responses to landscape (Herzog et al., 1997; Appleton, 1996; Coss, 1991[4]). Hartig and Evans have referred to these as "preference responses", which although not longer of such relevance to human survival, still "retain benefit value in that they signal positive states (e.g. aesthetic, satisfaction, lack of anxiety)" (Hartig & Evans, 1993[5]).

Ulrich and colleagues have tested this theory of stress restoration in an experimental setting, in which 120 participants first watched a disturbing film depicting an industrial accident, and then 'recovered' from this experience whilst watching either a video of natural settings or one of urban traffic (Ulrich et al., 1991). Recovery time was assessed using a battery of physiological measurements, i.e. *frontalis* muscle tension, galvanic skin conductance, heart period and pulse transit (which is described as "a non-invasive measure which correlates with systolic blood pressure). Results clearly showed that physiological recovery was more rapidly and more completely achieved in conditions where subjects were exposed to scenes depicting natural landscapes. Changes in self-reported affect, as measured using the brief state affect questionnaire, the *Zuckerman Inventory of Personal Reactions* (Zuckerman, 1977[6]), converged with the physiological results, confirming that faster rates of affective restoration could be correlated with viewings of the nature video (Ibid). The researchers claim that use of such multi-modal combination of measures provides greater convergent validity (Ulrich et al., 1991).

In a later experimental study by a research team also including Ulrich, stress recovery and immunisation were found to vary as a function of virtual roadside environment viewed. 160 college students were exposed to different simulated auto-drives (natural and non-natural settings) both following and preceding two qualitatively different stressors (Parsons et al., 1998). The inclusion of stressors both before and after exposure to different environmental variable, allowed the testing of two

[1] Also referred to as 'Affective/Aesthetic Theory' (Ulrich, 1983)
[2] Cited in Hartig et al., 1991
[3] Cited in Burns, 2005
[4] Cited in Stigsdotter, 2005
[5] Cited in Burns, 1998
[6] Cited in Ulrich et al., 1991

hypotheses, i.e. firstly, that participants viewing non-natural scenes would show "greater autonomic activity indicative of stress" and secondly, that those viewing the natural drive would experience improved recovery from stress and amelioration in terms of future stressors (Ibid). Both passive and active stressors were included within the experimental design (watching a disturbing video or completing a set of tests of cognitive performance) in order to improve the ecological validity of results. A battery of physiological measures was taken throughout the experiment (blood pressure, ECG, electrodermal activity as well as EMG recordings of somatic facial activity indicative of negative affect). Findings from this study confirm the above hypotheses i.e. increased sympathetic responses were recorded in participants viewing urban visual scenery and for those participants exposed to natural scenery, faster stress recovery and greater stress-immunising responses were recorded. The strongest support for their hypothesis came from cardiovascular and electrodermal measurements indicating a sympathetic mediating effect on stress. The researchers thus claim a "sympathetic-specific mechanism" underlying the effectiveness of natural scenes in fostering stress reduction and buffering against future stressors (Ibid). Interestingly, unlike previous studies by the same researchers (Ulrich et al., 1991; Parsons et al., 1991[1]), this study did not indicate a correlation between affective modulation and stress recovery/immunisation.

The positive effects of natural images on reported, and measured, levels of stress have been likewise demonstrated by Heerwagen (1990)[2]. In this study, a dental waiting room was equipped with murals of natural scenes or with a blank wall on alternate days. Heart rate measurements and patient self-report of mood and perceived stress showed lower levels of stress when the natural mural was present in the waiting room. In a recent study, De Kort and collegues have assumed the stress restorative properties of nature, manipulating degrees of immersion in a mediated environment to find how this effects restoration from stress (De Kort et al., 2006). These researchers hypothesised that the more immersive a projection of nature was (in terms of different screen size), the greater the stress reducing effects it would have on subjects (n=80). Their results showed that level of immersion to (i.e. size of) an image of nature is significantly related to capacity for stress reduction (measurements of heart period and skin conductance taken throughout the entire experiment). The authors have speculated whether 'full immersion' as provided by a real natural environment might have greater stress-reducing effects than simulated nature (Ibid).

Attentional restoration in natural settings

Based on a series of studies into the effect of nature on human psychology, environmental psychologists, Stephen and Rachel Kaplan, have developed a theory of stress restoration with a decided emphasis on cognitive functioning and the concept of stress as mental fatigue. Founded on the results of extensive and long-term action research[3] into the effects of both wilderness programmes and "nearby nature" on human psychology, they proposed that natural settings provide optimal environments for recuperation in situations where resources of higher cognitive functioning/executive functioning have become depleted (Kaplan & Kaplan, 1989; Kaplan 1995). Inspired by the work of William James, and his distinction between voluntary and involuntary attention (James, 1892[4]), the Kaplans theorised that the capacity for so-called 'directed attention' requires great effort/energy (i.e. inhibiting information irrelevant to the task in hand) and that this attention is a finite resource (Kaplan & Kaplan, 1989; Kaplan, 2001). In other words, mental capacity of this nature can become fatigued - a

[1] Cited in Parsons et al., 1998
[2] Cited in Morris, 2003
[3] This wilderness programme lasted over a decade (Kaplan & Kaplan, 1989).
[4] Cited in Kaplan & Kaplan, 1989

state, which Hartig has described as “cognitive overload” (Hartig, 2004), and is hypothesised as being a factor in aetiology of stress-related pathology (Kaplan, 1995).

Interestingly, stress-related psychological disorders are often characterised by a range of symptoms representing depletion of higher cognitive functioning (Netterstrøm, 2007; Bruhn, 2002) - such as lowered concentration, inability to makes decisions and decreased short-term memory. For example, that stress patients often find it difficult to make decisions (Milsted, 2006) and demonstrate general lowered functioning in other higher cognitive capacities, has been linked to neo-cortex paralysis by Bruhn (2002). ART as a hypothesis seems to harmonise well with such cognitive aspects of stress symptomology.

The Kaplans proposed that natural settings provide an optimally restorative context because they allow a different form of cognitive functioning to take over, a form of effortless, involuntary attention, which they termed “*fascination”* and which allows the directed attention system (DAS) - by which they mean neo-cortical processes of executive functioning such as sorting impressions, evaluating, prioritising and planning - to rest and recover (Kaplan & Kaplan, 1989; Grahn, 2006). *Fascination* is supposedly engaged by objects or events or by processes of aesthetic appreciation, exploration and reflection of the environment. According to the Kaplans, restorative environments are further characterised by “*extent”* (i.e. that the environment is large enough to encourage exploration and yet coherent enough to allow the client to make sense of it as a connected whole), “*compatibility”* (i.e. that there must be a fit between person’s resources, needs and inclinations and the demands of the environment[1]) and an experience of distance due to a change in scenery as well as an escape from aspects of normal everyday life: a sense of “being in a whole other world” (Kaplan & Kaplan, 1989). This last element is termed “*getting away”* and can be defined as escape from informational burdens (cognitive, sensory, affective and relational), from general distractions and from the pursuit of given goals and purposes (and hence also away from usual demands on directed attention, e.g. work related demands). The Kaplans’ theory is known as the ‘A*ttention Restoration Theory*’ (ART) and much of the literature on restorative environments is built directly on this theoretical fundament (Hartig et al., 2003).

Hartig and collegues have validated these four aspects of ART as being more closely associated with natural than urban environments using the *Percieved Restorativeness Scale* (Hartig et al., 1997). The *Perceived Restorativeness Scale* (PRS), has been tested in several earlier studies for its reliability and validity (Hartig et al., 1991; Korpela & Hartig, 1996; Korpela et al., 2001). It is based on 5-point Likert type scales of being away, fascination, extent/compatibility and coherence (Hartig et al., 1991). Laumann and colleagues have also developed a set of rating scale measures of the perceived restorativeness of environments based on the Kaplans’ four-factor structure. Same group ratings of natural versus urban settings have shown significantly higher scores of perceived restorativeness in the case of natural environments and therefore may be also interpreted as yielding results in agreement with the Kaplan’s theory (Laumann et al., 2001).

Thus we have charted the major early theory/research on nature’s effects on human mental health. It should be noted that one of the major differences between Ulrich’s theory of stress restoration and the Kaplan’s is that of temporality. Ulrich believed that psycho-physiological response to natural environments was instantaneous (Ulrich, 1983). In ART however, restoration is described as a process extending over a longer period of time and involving several phases. These phases are the “clearing of

[1] That natural settings might offer an ideal balance between environmental demands and personal needs/resources is of course interesting in relation to stress theory and will be expanded on later – see page 35.

the head", "recovery of directed attention capacity", the "facing of matters on one's mind" and the final stage is that of "reflecting on future priorities and plans" (Kaplan & Kaplan, 1989)[1].

Substantial empirical evidence does exist to support the theory that natural environments may provide better opportunities for restoration of attentional functioning than urban settings (Berto, 2005; Herzog et al., 2002; Herzog et al., 1997; Hartig et al., 2003; Van der Berg et al., 2003[2]; Tennessen & Cimprich, 1995; Kaplan, 1995; Cimprich, 1993[3]; Hartig et al., 1991). Berto has tested recovery from mental fatigue by asking participants to perform a sustained attention task and thereafter view photographs of various environments (natural/restorative, non-restorative or geometrical patterns). They were then re-tested on the sustained attention task. Only those participants who had been exposed to photographs of natural scenes improved their performance on the final testing (Berto, 2005). Tennesen and Cimprich have also provided empirical support for ART, in a study in which groups of 72 university students underwent directed attention tests either under conditions involving natural views, partly natural, or non-natural views from a dormitory window (Tennessen and Cimprich 1995). Using a battery of objective and subjective measures, including various standard neurocognitive measures[4] along with a subjective rating of attentional functioning (*The Attentional Functional Index* - Cimprich, 1992[5]), the authors were able to statistically verify the significance of natural views on increased capacity to direct attention. Personal ratings of attentional functioning were also higher in those students experiencing natural views during the tests. The authors also measured mood state using the *Profile of Mood States* (POMS – McNair et al. 1981[6]) in an attempt to ascertain if attentional functioning would be influenced by a depressed mood state. Interestingly, they found that mood state was *not* affected by type of view from a window; neither was attentional performance affected. However, self-appraisals of functional performance were negatively influenced by mood state.

In a study of post-operative attentional deficits in women recovering from breast cancer surgery, Cimprich found considerable improvements in concentration (as measured by "standard neurocognitive instruments") between a group receiving only standard post-operative care and a group receiving both standard post-operative care and "gentle nature-based activities" such as sitting in a park over a period of three months (Cimprich, 1993[7]).

Attention Restoration Theory has also formed the fundament for an intriguing study focusing on the effect of nature exposure on children with *Attention Deficit Disorder* (Taylor et al., 2001). Children with ADD were exposed to leisure activities in different environmental settings and thereafter attentional functioning was assessed using parental ratings. Both within- and between-subject data was correlated. Results indicated that exposure to green outdoor settings showed the strongest causal relationship to decreased ADD symptomology, defined as increased attentional functioning/lessening in severity of symptoms. The authors of this study were particularly aware of the potential effects of confounding variables (e.g. physical exercise, outdoor setting) and thus multiple alternative explanations for their findings were thoroughly tested. Cross analyses showed that it was indeed exposure to green settings that was most strongly correlated with reported positive outcomes on cognitive functioning (Ibid). Furthermore, using a longitudinal research design, which utilised pre- and

[1] I cannot help but remark as to the startling correspondence between these phases and Cullberg's crisis theory (Cullberg, 1979). I will return to comment further on this correspondence in the concluding stages of this chapter (section 2.6).
[2] Cited in Van der Berg et al., 2007
[3] Cited in Tennessen & Cimprich, 1995
[4] Digit Span Forward, Digit Span Backward, Symbol Digit Modalities Test; Necker Cube Pattern Control Test
[5] Cited in Tennessen & Cimprich, 1995
[6] Cited in Tennessen & Cimprich, 1995
[7] Unfortunately, attempts to track down the original study have proved fruitless. However, Tennesen & Cimprich (1995), Maller and colleagues (2002) and Burns, (2005) have all cited the study.

post-relocation measures of "naturalness" (based on natural views from all rooms in the home) and children's cognitive functioning (utilising the *Attention Deficit Disorders Evaluation Scale* ADDES – McCarney, 1995[1]), Nancy Wells found that cognitive functioning in deprived children (n=17) improved significantly following relocation to housing with significantly improved levels of access to natural settings (Wells, 2000). Changes in housing quality was presented as an alternative explanatory variable but statistical analysis found that it could only explain 4% of the variance on the post-move ADDES score (Ibid). Thus, as the authors conclude, "the effects of natural elements within the home environment have a profound effect on children's cognitive functioning".

Restorative effects of nature exposure are also implied in an exploratory study of psychological aspects of public use of forests in Denmark, Hansen-Møller and Oustrup have produced interview material pertaining to processes of "mental recharging" in forest settings. Interviewees in this small-sample, qualitative pilot study described time in the forest as time to "relax, think about something completely different". One respondent describes how after an hour in the forest after work, he was "mentally charged…all the problems you have had during the day, they are diverted" (Hansen-Moller & Oustrup, 2004). Of course, 'recharging' at the cognitive level lies at the heart of the above outlined *Attention Restoration Theory.* It must be noted how closely this response resembles the initial "clearing of the head" phase of ART described above (Kaplan & Kaplan, 1989).

Extending Attention Restoration Theory

However*, Attention Restoration Theory* has been criticised by Ulrich and colleagues, who state that firstly *fascination* is not an exclusive property of restoration, but can equally be associated with "involuntary attention to potentially dangerous stimuli" and secondly, that to define the precursory state for restorative experiences purely in terms of need for recovery from mental fatigue is too simplistic a theoretical standpoint (Ulrich et al, 1991). According to Ulrich and colleagues, the components of restoration are far more complex:

"*In contrast to a stress response, restoration or recovery involves numerous positive changes in psychological states, in levels of activity in physiological systems, and often in behaviours or functioning, including cognitive functioning or performance.*" (Ulrich et al., 1991)

A desire to reveal a more nuanced picture of restoration as psychological process has led to several studies utilising a multi-factorial or convergent approach (Hartig et al., 1991; Hartig et al., 2003). These studies attempt to chart multiple components of restoration and thus describe processes of restoration in broader terms than merely that of attentional recovery. In a key study, which was designed to test *both* the Kaplans' and Ulrich's theories of restoration, Hartig and colleagues drew upon converged results from both a quasi- experimental field study and a true experiment, in which multi-method assessments of attentional, affective and physiological restoration in natural, urban and control settings were executed (Hartig et al., 1991). In the first study, participants took part in one of two forms of vacation, i.e. wilderness quest (n=25) or urban (n= 18) and with a control group consisting of participants who continued their normal daily routine (n= 25). All participants were "similar in background characteristics", which is a strength of this research design, as previous studies of this type have usually compared participants in wilderness therapy groups with non-participants, and therefore self-selection as an alternative hypothesis for any resultant outcomes is often implied. Another strength of this study was its longditudinal research design with both pre- and post- testing plus a long-term follow-up phase. The results indicated significantly higher levels of cognitive and affective restoration

[1] Cited in Wells, 2000 - who claims that both the reliability and validity of the ADDES have been extensively established.

after spending time in natural settings, as measured by self-report of affective state utilising the *Zuckerman Inventory of Personal Reactions* (ZIPERS: Zuckerman, 1977[1]) and the *Overall Happiness Scale* (OHS: Campbell et al., 1976[2]) and a proof reading task as behavioural measure of cognitive restoration (Hartig et al., 1991). The wilderness vacationers showed statistically significant higher scores on the OHS and on the proof-reading tests following exposure to natural settings. However, there were no differences in reported mood using ZIPERS. One interesting conclusion claimed by the authors, was that overall happiness scores, from the long-term follow up data indicated proactive or stress-buffering effects connected to the restorative wilderness experience, i.e. that such experiences might strengthen coping in the face of future stress (Hartig et al., 1991).

In the second study, whose intention was to explore findings from the first study under more controlled conditions, subjects (n=34) underwent 40 minutes of tasks designed to induce attentional fatigue, after which they were exposed to one of the following conditions: walking in an urban environment, walking in a natural environment or passive relaxation (Ibid). A true experimental design was used with random selection of college students to each group. Dependent variable measurements used were again the *Zuckerman Inventory of Personal Reactions* and the *Overall Happiness Scale* for affective restoration, and a proof-reading task for mental restoration. Blood pressure and pulse rate were also recorded pre- and post-experimental condition. Furthermore, the *Perceived Restorativeness Scale* (PRS – see above) was employed to measure subjective evaluations of restoration following the walk or control condition. Results showed significantly higher improvements in mood and positive affect for the natural environment group, and lower levels on the ZIPERS anger/aggression scores (i.e. decreased negative affect). The behavioural measure of recovery from mental fatigue revealed "a stronger positive impact of the natural setting" which corroborated findings from the first study (Ibid). There were no significant differences between the groups on physiological indices, but the researchers claim that this was most likely due to procedural causes, with post-test measurements occurring too long after treatment experiences were completed (50 minutes). They admit that it would have been better to record blood pressure and pulse rate throughout the entire experiment.

Hartig and colleagues conclude that the converged results of these two studies "provide relatively strong evidence that experiences in natural settings have restorative outcomes" (Ibid). In particular, they support the Kaplan's theory that restorative effects are partly due to recovery from cognitive fatigue. Although they report that exposure to natural environments generally has an immediate positive influence on affect and mood states, they highlight an interesting temporal phenomenon. Immediately after wilderness experiences, it was found that participants often reported decreased mood, feeling initially rather negative about returning to everyday life. However, tests after a 3-week period showed that the nature groups reported higher levels of happiness (which led to their hypothesis as to the stress inoculating effects of treatments involving nature exposure). Thus, the relationship between nature contact and mood/positive affect is not a straightforward one and offers an obvious candidate for further investigation.

Hartig and a team of researchers have later demonstrated similar convergent validity across a range of affective, cognitive and physiological parameters (Hartig et al., 2003). Participants (n=112) were either subjected to mentally taxing tasks[3] or no-task conditions, and thereafter assigned to either:
a group who were asked to sit in a room with natural views for 10 minutes and thereafter take an hour-long walk in a nature reserve *or* a control group who were assigned sitting in a room with no views,

[1] Cited in Hartig et al., 1991 – this inventory has been proven to have good validity and reliability.
[2] Cited in Hartig et al., 1991
[3] Necker Cube Pattern Control (see Tennesen & Cimprich, 1995) and memory loaded search task (Smith & Miles, 1987)

followed by a walk in an urban setting. Measures of systolic and diastolic blood pressure, along with recordings of emotion (using the ZIPERS and the OHS, as in the previous experiment – Hartig et al., 1991) and attention were repeated throughout the experiment. The findings clearly indicated faster recovery from states of arousal and greater restoration of attentional capacity in the natural setting group (Ibid). In the natural environment group, positive affect increased and negative affect decreased, which was opposite to that reported by the urban walk group. Those participants assigned the nature walk group, who had not completed a pre-walk task showed significantly higher levels of happiness than any other group. However, there was no statistical significance to be found between reported happiness after natural and urban walk in those participants who had completed a pre-test task[1]. Although positive associations are reported as being rather "conservative", as compared to quasi-experimental or correlational experiments, the advantages with regards validity must be appreciated.

That claim that natural settings have the effect of improving emotional state is further supported by a field study of patient-use of hospital gardens, Cooper Marcus and Barnes found that 95% of 143 respondents reported a positive change of mood after spending time outdoors, from feeling depressed, stressed and anxious to feeling calmer and having a more balanced outlook on their situation. Assessments were made on the basis of survey questionnaires (demographics, knowledge of garden, satisfaction with garden and effects on mood), behavioural observations and semi-structured interviews of patients and staff using the *Post-Occupancy Evaluation* method. The semi-structured interviews revealed that patients attributed these mood changes to the presence of specific natural qualities of the garden, including the peace and privacy offered, the chance to "escape" from the inside of the hospital[2], the aesthetics of the natural features and the stimulation of the senses arising from seeing greenery and colour, hearing birdsong and the sound of running water or smelling the fragrance of the fresh air, etc. (Cooper Marcus & Barnes, 1995). However, as only garden-users were targeted in this study, it can be criticised for bias sampling. Furthermore, the extent to which garden users experienced social interaction with other patients and staff is not available and therefore must be acknowledged as a possible confounding factor.

"*Restoration involves positive changes in emotional states, i.e. reduced levels of negatively toned feelings such as fear or anger, and increases in positively toned affects"* (Ulrich et al., 1991).

Using the same methodology as the above study, Whitehouse and colleagues have also studied patterns of and reasons for usage, personal effects on mood and effect on general satisfaction of a children's hospital garden. However, Whitehouse and colleagues ensured a random sample from the entire hospital population of staff and patients (Whitehouse et al., 2001). The survey and interview data revealed that 90% (n=52) of adult users expressed that they had experienced a positive change in mood as a result of using the garden. The main reasons given for visiting the garden, were to relax, rest and deal with the stress associated with their child's hospital admission. The interviews revealed that many parents and staff felt that the garden was a particularly meaningful place for a variety of personal reasons – e.g. for purposes of bereavement and coping with stress and strain.

That we might draw upon natural environments for purposes of returning to more positive levels of affective state at times of psychological distress, is supported by the results of a study in which statistically significant higher levels of mood improvement or "affective restoration" (measured using the

[1] Unfortunately, the researchers do not propose an explanation as to this finding. We might speculate along the lines that participants were in some way 'disturbed' cognitively or emotionally by performance on these tasks, preventing them from deriving potential benefits from nature immersion. For example, anxiety as to performance might prevent participants from being present in the experience. Such a hypothesis obviously merits further investigation and might well provide a possible theme for future research.

[2] Note how this corresponds with the ART element of "being away" – Kaplan & Kaplan, 1989

Profile of Mood States and ratings of overall happiness/overall stress[1]) in natural settings were obtained (Van der Berg et al., 2003). The experiment exposed college student participants (n=106) to a frightening (i.e. an affectively stressful rather than cognitively stressful) video followed by a video simulating a walk through a natural environment (two versions) or an urban environment (two versions).

"*Emotion regulation is not only an inner homeostatic experience, but one that involves interaction with the environment*." (Korpela et al., 2001).

These studies imply that a tendency to gravitate to natural contexts in times of stress or distress might be explained on the basis of emotional regulatory benefits provided by such behaviour. Of course, Ulrich's original psycho-evolutionary theory implied as such (Ulrich, 1983) and Korpela and colleagues have speculated that we actually become emotionally attached to certain "favourite places" precisely because they allow us the opportunity to restore emotional balance[2] (Korpela & Hartig, 1996; Korpela et al., 2001). Hansen-Møller and Oustrup have explored the emotional significance of exposure to forests in a study based on in-depth qualitative interviews of six people living close to a forest near Copenhagen (Hansen-Moller & Oustrup, 2004). Using Kvale's (1994) thematic analysis procedure to analyse transcripts, emotional aspects based on respondent's "feelings sensations and ideas related to forests as part of everyday living experiences" were identified[3]. One of their major conclusions is that forests may "serve as a refuge for recharging at the emotional level" (Ibid).

Thus, the concept of natural settings as providing opportunities for systemic regulation and restoration of *emotional* resources appears to be as strongly indicated as that of regulation and restoration of cognitive resources. The relevance of such findings in terms of possibilities for psychological intervention cannot be overlooked[4].

Sensual dimensions of restoration

"*The garden is unique in that it can activate all the senses*" (Stigsdotter & Grahn, 2002)

It is worth highlighting here how prominently the *aesthetic aspects* of nature feature in restoration theories - having been associated both empirically and theoretically with decreases in physiological indicators of stress, the cognitive state of *fascination* and enhanced positive affect (Van der Berg et al., 2003; Williams & Harvey, 2001; Ulrich, 1983; 1991; Cooper Marcus & Barnes, 1995; Kaplan & Kaplan, 1989). Other sources have referred to the importance of stimulation from auditory, olfactory and tactile aspects of natural environments (e.g. Kaplan & Kaplan, 1989; Cooper Marcus & Barnes, 1995; Stigsdotter & Grahn, 2002; Dahlenborg, 2005). The research clearly alludes to the role of sensual dimensions in processes of restoration and symptom relief. Indeed, the universal importance of sense stimulation as fundamental pre-requisite for health-promoting and healing processes and outcomes in nature cannot be understated. It seems quite reasonable to propose that we cannot be *changed* by nature unless we have made *contact* with nature – and that this occurs via the perceptual doors of sight, smell, touch, taste and hearing. As Burns puts it, our perceptual facilities are quite simply the "intermediaries of any interaction with nature" (Burns, 1998). Indeed, our sensing of the world is the fundamental prerequisite condition for any process by which the world affects us - it is only through the medium of our senses that we meet, participate in, relate and are affected by our experienced world

[1] This was measured in scores of 1-100 from 1=not at all happy/stressed to 100 =cannot be happier/less stressed (Van der Berg et al., 2003)
[2] This hypothesis also describes processes of regulating concepts of self – this aspect will be explored further on page 33.
[3] Physical/functional and symbolic connotation aspects were also extracted from the interview material (Hansen-Møller & Oustrup, 2004). However, I will focus purely here on the findings relating to emotional significance.
[4] See section 2.6, which describes known and potential clinical applications based on such findings.

(Sewall, 1995). Thus, it should come as no surprise that nature's beneficial effects are often linked in the literature to dimensions of the senses (e.g. Holmström, 2006; Van der Berg et al., 2003; Stigsdotter & Grahn, 2002; Burns, 1998; 2005; Cooper Marcus & Barnes, 1995; Ulrich, 1983; Kaplan & Kaplan, 1989): references to sensory pleasure, aesthetic appreciation, awe, wonder and fascination all pertain to precursory mechanisms involving the senses.

Sight is the faculty of human sensory perception, which has been most closely identified in the literature with the positive mental health impacts of natural settings. Indeed, Ulrich's early theory of stress restoration rests on the hypothesis that it is aesthetic features of the landscape, which trigger beneficial psycho-physiological responses (Ulrich, 1983; 1984; Ulrich et al., 1991)[1]. There is evidence that one of the main reasons people feel drawn to natural settings is because they simply find them beautiful (Van der Berg et al., 2007). In fact, the aesthetic value attributed to natural settings seems to be a universal phenomenon (Purcell et al., 1994). In two earlier studies in which people were asked why natural areas are important to them, one of the most frequent responses was 'appreciation of beauty'[2] (Talbot et al., 1987[3]; Kaplan & Kaplan, 1989) and according to Rachel and Stephen Kaplan, gardeners report that the fascination they feel for nature's beauty is one of the main reasons for pursuing their hobby (Kaplan & Kaplan, 1987[4]).

Interestingly, in the above study by Van der Berg and her collegues, ratings of beauty of each environmental setting were also incorporated into the research design (Van der Berg et al., 2003). It was found that natural settings were consistently rated as more beautiful than urban settings. Mediational analyses showed that the perceived beauty of environments was correlated with greater levels of mood improvement (Ibid). This finding provides support for an earlier study, in which a link was found between the rated and reported scenic beauty of a place and perceived restorative potential (Purcell, Peron & Berto, 2001[5]). Hansen-Møller & Oustrup also touched on the importance of beauty in their study charting the emotional meaning of forests (Hansen-Møller & Oustrup, 2004):

"*And especially if the sun shines through those pale green treetops. It is just so beautiful and it pleases me…*" (Ibid)

That beauty might well be an essential aspect of the restorative effects of natural settings is implied indirectly by a study by Ouellette, Kaplan & Kaplan, in which questionnaire responses (n=521) pertaining to the perceived restorative benefits of a monastery retreat experience were obtained (Ouellette et al., 2005). Factor analysis of reasons for coming on the retreat yielded general results in support of the Kaplan's ART model, with *Beauty* emerging as one of the major reported beneficial effects (interpreted by the authors as supporting the *Fascination* and *Extent* aspects of the ART model)[6].

In an intriguing paper, Joye has compared research from artistic disciplines demonstrating positive psychological effects of exposure to fractal properties - with the effects of exposure to natural fractal complexity (Joye, 2006). He hypothesises that fractal patterns might be responsible for therapeutic influences of natural settings on human emotional states, echoing the theorising of Purcell et al. (2001), who have stated that it "*may be that variations in both preference and the restorative value of scenes*

[1] It should also be noted, that much of the supporting evidence on nature's restorative properties are based on experimental designs in which participants are only presented with *only* visual representations of natural environments.
[2] Along with 'enjoyment'
[3] Cited in Kaplan & Kaplan, 1989
[4] Cited in Kaplan & Kaplan, 1989
[5] Cited in Van der Berg et al., 2007
[6] ART factors of *Being Away* and *Compatibility* were also identified as reasons for coming on the retreat (Ouellette et al., 2005)

depends on their underlying geometry, with high preference and restorativeness being associated with fractal and low preference and restorativeness being associated with, for example, underlying Eulicidian geometry typical of built environments" (Purcell et al., 2001). Fractal properties of nature have been experimentally linked to preference for natural landscapes (Hagerhall et al., 2004). In a study by Wise and Taylor, complexity of natural fractal dimension (using photographs depicting forest v savannah-like landscapes – with savannah scoring higher on fractal complexity) were linked to both greater reported preference and greater stress-reducing effectivity, as measured by Galvanic Skin Conductance following exposure to stressful mental tasks (Wise & Taylor, 2003[1]).

Beyond aesthetic stimulation, positive mental health benefits appear to be elicited via other sense modalities. Note, for example, how participants in the above study by Cooper Marcus and Barnes attributed the positive effect on mood to sensory aspects of experiencing a garden such as hearing birdsong and smelling the fragrances (Cooper Marcus & Barnes, 1995). That natural environments might improve mental health by providing valuable possibilities for multi-sensory stimulation, has been frequently postulated by both researchers and clinicians within the field of nature-based intervention (Dahlenborg, 2005; Grahn, 2005; Burns, 2005). For example, Burns places great emphasis on the therapeutic possibilities provided by capitalising on sensory experiencing in natural settings. His eclectic 'nature-guided' clinical rationale draws heavily on sensory awareness methodology, by which he invites clients to expose themselves mindfully to sensory impressions such as the beauty of a sunset, the sound of birdsong or the smell of a rose, so that automatic states of relaxation, pleasure, happiness, positive memories, states of fascination etc. may be elicited in the service of generating positive mental health outcomes and healing psychological suffering (Burns, 2005; 1998).

Grahn has drawn on the *Sensory Integration Theory* of Jean Ayres to explain the positive psychological, and especially, rehabilatory effects of contact with nature (Grahn, 2006; Grahn et al., 2000) and Helle Nebelong (2002[2]) has hypothesised that being in nature might enhance mental health in accordance with the same principles of multi-sensory stimulation as employed in the psychological interventions known as the *Snoezelen*[3], a method which is widely used in treatment of individuals with developmental disorders such as dementia[4].

Although methods of multi-sensory stimulation have been significantly related to positive mental health outcomes across a range of clinical populations (for example, MSS has been found to improve short-term levels of mood, cognition and behaviour in adults with moderate to severe dementia -Wareing et al., 2001) - there remains a gulf in the data on nature-assisted therapeutic approaches which needs to be crossed. Unfortunately, I have found no published empirical data referring to the specific and directly *multi-sensory* effects of nature on human psychology. I would propose that this is a field, which clearly offers itself as a candidate for future research[5].

[1] Cited in Joye, 2006
[2] Cited in Dahlenborg, 2005
[3] see Hulsegge & Verheul, 1987 – www.rompa.com
[4] It must be noted here that claims of Snoezelen's beneficial application in treatment of dementia have been discounted in a recent study by Chung & Lai (2008).
[5] In this connection it should be noted that PhD student Anna Jeppson is currently investigating the sensory effects of natural environments on release of oxytocin in patients recovering from stress-related disorders at Alnarp (Stigsdotter, 2007). This project is inspired by the work on oxytocin's effects by Uvnäs Moberg (2006).

Restoration, reflection, meaning and coherence

"*A deeply restorative experience is likely to include reflections on one's life, on one's priorities and possibilities, on one's actions and one's goals. Here too the functional benefits are great.*" (Kaplan & Kaplan 1989)

Several researchers have alluded to the Kaplan's theorised attentional state of *fascination* as conducive to states of reflection (Herzog et al., 1997; 2002; Talbot et al., 1987; Kaplan & Kaplan, 1989). That natural restorative environments might have the power to induce reflection was noted first by Kaplan and Kaplan, who stated that they "would never have suspected, had it not emerged so clearly in our data" (Kaplan & Kaplan, 1989). They reported that research participants in their studies often referred to nature as a place, which allowed them to "think and to forget their worries, to regain sanity and serenity and to enjoy solitude" (Kaplan & Kaplan, 1989).

Herzog and colleagues have later speculated as to a differentiation between *hard* and *soft fascination* in attentionally-restorative processes (Herzog et al., 1997; 2002), hypothesising that it is exclusively in natural settings, that states of *soft fascination* arise, and that it is this *soft fascination*, which is a pre-requisite condition for reflection (Ibid). Thus, according to Herzog and colleagues, although we may experience restoration as a result of other activities in other settings (i.e. exercising or being entertained), we cannot attain states of reflection so easily in other restorative settings. That exposure to nature might be especially conducive to states of reflection is an important aspect of their potential therapeutic worth because reflection is, according to the Kaplans, a necessary component of processes of self-discovery and changes in self-concept (Kaplan & Kaplan, 1989).

This hypothesis has later been suitably expanded by Korpela, Hartig and colleagues, who have provided empirical support for the theory that people are instinctively and intentionally drawn to utilise particular physical localities ("favourite places", most often described as being natural settings) to self-regulate both emotional state (*as described on page 30*) and concepts of self (Korpela & Hartig, 1996; Korpela et al., 2001). Drawing on the self-regulation theory of Vuorinen (1990[1]) and cognitive-experiential self-theory of Epstein (1991[2]), Korpela and colleagues have theorised that processes inherent in psychological restoration in natural settings support the maintenance of psychological balance – i.e. they allow to us to function adaptively in relation to the maintenance of self-concept/self esteem and emotional balance (Korpela et al., 2001). For example, participants in these research studies typically report the effects of being in natural places as "attaining a state of calm and balance" and "thinking through or gaining perspective on problems" (Ibid). Korpela and colleagues (1996; 2001) have theorised as to how processes of self-regulation in natural setting might be achieved by linking the postulate of *Attention Restoration Theory* – i.e. that natural settings can provide favourable levels of compatibility and coherence (an aspect of extent) (Kaplan & Kaplan, 1989) - with the principle of self-concept regulation described by Epstein's cognitive-experiential self-theory (Epstein, 1991[3]), which states that we need to maintain a sense of coherence in relation to our environments in order to feel that the world is meaningful (Korpela et al., 2001).

"*Maintenance of a coherent conceptual system is a fundamental aspect of environmental self-regulation, one that may rely on opportunities for reflection in non-distracting circumstances to which one may withdraw*." (Korpela & Hartig, 1996)

[1] Cited in Korpela et al., 2001
[2] Cited in Korpela et al., 2001
[3] Cited in Korpela et al., 2001

Thus, they articulate the idea that it is the alleged *contemplative* opportunities offered by restorative experiences in natural environments that provide conditions for processes of making sense - of our selves and our worlds. In other words, it appears that we may be able to more readily reflect on our situation, our priorities and our place in the world in restorative settings (Korpela et al., 2001). And if nature does, as much of the above literature claims, provide suitable conditions for the elicitation of restorative processes, we can speculate that natural settings may thus provide an appropriate context in which people might generate greater levels of personal meaning and coherence[1].

Stress theoretical perspectives

Inspired by the above speculations, let me take a brief detour into the realm of psychological stress theory and research, with a view to highlighting a few conceptual angles of potential relevance[2]. For example, the above-hypothesised processes of self-regulation, via alleged contemplative states arising in restorative settings (Korpela & Hartig, 1996; Korpela et al., 2001), seem to be highly compatible with Antonovsky's concept of *Sense of Coherence* (Antonovsky, 1987).

Sense of Coherence, which consists of components of *comprehensibility*, *manageability* and *meaningfulness*[3], has been claimed to support mental health and well-being, by mobilising general resistance resources and moderating ones appraisal of stressors (Ibid). Combining the above theorising (i.e. increased reflection in restorative settings) with Antonovsky's theory, it seems reasonable to speculate that, the opportunity to reflect on personal matters in natural settings might well support individuals in positively moderating appraisals of life situations. Such processes can be hypothesised as enhancing sense of coherence, which may strengthen resilience in the face of stress.

It seems I am not the only one to speculate along these lines. Researchers at *Alnarp Rehabilitation Garden*, at the Swedish University of Agriculture, for example, have used measures of *Sense of Coherence* in their research on patients with burnout and stress-related depression (Grahn et al., 2006). These researchers report a significant difference of $p < 0.001$ in terms of increased scores on *Sense of Coherence* measures after completion of a 14-16 week programme of garden-based stress rehabilitation (Ibid). In a study of teachers' use of restorative environments in coping with work-related stress, Guwaldi (2006) has also drawn on SOC as operationalised measure of perceptions of personal competence, efficiacy and control (Antonovsky, 1993[4]). Her findings showed, as could be predicted, that teachers with lower SOC scores were those who reported higher level of stress and vice versa, there was no correlation between SOC score and preference for natural settings for restorative purposes (as compared to other settings such as home or a café). However, a difference was found between patterns in the way teachers with high and low SOC scores actually utilised nature as restorative environment. Those with high stress/low SOC scores described their reasons for gravitating to natural settings in times of stress in terms of 'getting away' and provision of opportunities to go inwards and reflect. Those with higher SOC scores utilised nature for 'microrestorative' purposes and described values such as movement, positive distraction and sensual experience (Ibid). This finding supports the theory that it may be individual level of "psychological capital" (Csikszentmihalyi, 1990)

[1] I will be extending this discussion somewhat in section 2.4 , where I will be outlining the potential role of metaphor in nature-assisted therapies.
[2] However, I am in no way claiming that this analysis is exhaustive.
[3] Interestingly, issues of existential meaning have been linked to stress aetiology and maintenance by both Prætorius (2007) and Diedrichsen (2006), leading me to hypothesise that opportunities for reflection and construction of personal meaning in natural settings might be a relevant aspect in terms of stress prevention and alleviation in addition to more straightforward processes of affective, cognitive and physiological stress restoration.
[4] Cited in Guwaldi, 2006

that guides the tendency to draw upon restorative properties available in natural settings, as I have outlined earlier.

Note too, that the *manageability* component of SOC infers the experience of possessing the resources to live up to the demands of the environment (Antonovsky, 1987). Could exposure to safe and preferred natural environments be thus connected to subjective experiences of enhanced manageability? Common to most transactional models of stress is a conceptualisation of strain arising when there is an excess of environmental demands relative to the personal resources needed to cope with those demands (Netterstrøm, 2007; 2002; Bruhn, 2002; Cooper et al., 2001; Hartig, 2004; Gulwadi, 2006), i.e. that there is a mismatch in person-environment fit. Such a theory harmonises well with the concept of natural settings as psychologically restorative because, according to several theorists, restoration occurs precisely because of a decrease in demands from the environment or, that demands reach a state of balance with regards resources (Grahn, 2005; Kaplan, 2001; Kaplan & Kaplan, 1989). Indeed, this appears to be the heart of the so-called, 'compatibility' dimension of the above *Attentional Restoration Theory* (Kaplan & Kaplan, 1989). We might postulate therefore, that restorative experiences are also experiences of enhanced *manageability* in terms of the central parameter of Antonovsky's SOC (Antonovsky, 1987).

The concept that exposure to natural settings might provide opportunities to achieve a health-promoting/maintaining balance between resource and environmental demands, seems relevant at various levels of human functioning, not only in terms of aspects of attentional resources and demand. Inspired by psychologist, Harold Searles (1960), Stigsdotter & Grahn have theorised as to how the de-emphasis on social relations attainable in natural settings, may enable a therapeutically-appropriate reduction in emotional and relational demands (Stigsdotter & Grahn, 2002). Searles has hypothesied that nature can provide a more straightforward, non-judgemental and non-ambiguous alternative to human communication. He posited that the forms of 'interaction' offered by nature would provide opportunities for an individual to see his or herself from new perspectives, which would lead to positive mental states, especially in situations of psychological crisis[1] (Searles, 1960) - a theory which, incidentally, seems to support ideas of regulation of self-concept through restorative processes in favourite places, as outlined by Korpela and colleagues (Korpela et al., 2001).

The research team at *Alnarp Rehabilitation Garden* have theorised as to how this 'striking a balance' between environmental/relational demands and personal resources might explain the therapeutic effects of healing gardens (Grahn, 2005; Stigsdotter & Grahn, 2003). They propose that the garden environment with its different 'rooms'[2] (which according to Grahn & Stigsdotter provide different levels of demands) can be differentially applied in accordance with the individual needs of each client (Stigsdotter & Grahn, 2003). Grahn has noted how clients whose "psychological resources"[3] are low exhibit heightened sensitivity to demands (informational, relational and emotional) from their environments. These clients, who are typically suffering from burnout and other stress-related disorders, are "very vulnerable and emotionally apathetic" and need to be alone in peace in order to "find themselves" again (Grahn, 2005). According to Grahn, the relatively non-demanding context of a wilder, uncontrolled type of garden[4] can provide the optimal therapeutic environment for such clients (Ibid).

[1] Harold Searles was one of the first psychologists to refer to human relationship with nature as significant, theorising as to nature's role with regards normal development and the development of schizophrenia (Searles, 1960).
[2] A description of these garden rooms can be found in Grahn, 2005.
[3] "psykiska kraften" (Grahn, 2005)
[4] "kravlös natur" (Grahn, 2005)

Masters student, Lise Nevstrup-Andersen, has undertaken a qualitative research study[1] on the subjective meaning of gardening activities and environment on therapeutic process at Alnarp, and provided some limited qualitative support for this theory (Nevstrup Andersen, 2007). One client reported feeling that she was able to return or escape to a kind of "childhood land[2]", where "one does not have to play any roles, or be there for others, one can just be oneself". Another client emphasised the therapeutic significance of being in a place where no demands were made of her, describing a feeling of being "carried by invisible hands" (Ibid).

An alternative lens through which to perceive the above resource/demand relationship is to incorporate the concept of control or mastery. An environment where demands are in balance with personal resources might be said to be an environment in which an individual enjoys mastery. Of course, the stress literature contains many references to the significance of control or mastery of one's environment in terms of experienced stress (e.g. Netterstrøm, 2006; Zachariae, 2006; Kobasa, 1982, Karasek, 1979[3]).

According to Ulrich, heightened appraisals of environmental control arising in healing garden settings (where one is free to self-determine level of active participation according to own needs) may be one of the most significant elements of their healing and restorative properties (Ulrich, 1999). Francis has collected data, through interviews, on the meaning of gardens in peoples lives and found that one of the central components explaining the significance is control, claiming that "the garden is a place that people can directly shape and control in a world and environment largely outside their direct control" (Francis, 1987[4]).

Returning to the work with clients suffering chronic stress-related disorders at *Alnarp Rehabilitation Garden*, the role of control has actually been operationalised in their research methodology[5] via the inclusion of self-assessment questionnaires measuring the psychological resource of 'Mastery'. This is an open-ended, interview-based measure designed to assess the "extent to which one regards one's life-chances as being under one's own control in contrast to being fatalistically controlled", designed by Pearlin & Schooler and used in their seminal study on coping in the face of social stress (Pearlin & Schooler, 1978). Results show a significant difference on mean scores of mastery at the level of $p<0.002$ as measured before and after the treatment programme (Grahn et al., 2006).

Of course, the above theorising, coupled with the earlier outlined body of research demonstrating stress regulating and restorative effects of contact with nature, leads us to the rather obvious proposition that intentional use of nature may be seen in terms of appropriate coping strategy or the drawing upon an appropriate "coping resource" (Hartig et al., 1991; Pearlin & Schooler, 1978). In an interview-based study of hospital garden use by Whitehouse colleagues (*see page 29*), one of the main reasons visitors gave for using the garden was to regulate levels of experienced stress related to having a child admitted to hospital (Whitehouse et al., 2001). We might interpret this behaviour as the exhibition of an effective coping strategy – mainly in terms of emotion-focused coping (Lazarus, 1999[6]). Emotion-focused coping describes intra-personal and interpersonal strategies exercised to help deal with stressful situations and experiences, such as adjusting emotional reactions and cognitive

[1] Based on narrative interviews with three female patients at Alnarp (suffering from symptoms of chronic stress/burnout).
[2] Translated from the Swedish, "Sagoland".
[3] Cited in Jones & Fletcher, 2003
[4] Cited in Kaplan & Kaplan, 1987
[5] Research methodology also included cataloguing changes in team member's diagnosis of patients (using Structured Clinical Interview and a "diagnosis of somatic morbidity"), measures of Sense of Coherence (Antonovsky, 1987), Occupational Self Assessment (OSA) Function and OSA Environmental Function, as recorded before and after the treatment programme (Grahn et al., 2006).
[6] Cited in Agervold, 2006

appraisals (Agervold, 2006). Such a description seems to harmonise well with outlined concepts of restoration and regulation of emotional and cognitive resources in natural settings. We might ask ourselves whether theories of self and emotional regulation in nature (Korpela & Hartig, 1996; Korpela et al., 2001) be thus usefully be reframed in terms of strategies of emotion-focused coping? Likewise the idea that people intentionally seek contact with natural environments in order to think things through, evaluate their life situation or simply to get away from it all (Kaplan & Kaplan, 1989), also seem to indicate emotion-focused coping. We have already listed research indicating a widespread belief in the restorative powers of nature (e.g. Frerichs, 2004; Herzog et al., 2002; 2003; Korpela et al., 2001). Could these findings be suitably be reformulated in terms of an innate 'knowledge' that time in nature may be used for purposes of coping with stress and distress?

The possibility that natural environments might represent a source of coping (formulated as both a behavioural strategy and a distinct resource) is a significant one, for coping is an essential element of any model of stress (Agervold, 2006). Concepts such as compatibility with one's environment, balance between demands and resources, the provision of opportunities for reflection (appraisal) leading to greater coherence, restoration of attentional functioning, enhancement of positive affect, physiological relaxation, etc – these all do seem to point in the direction of natural environments providing enhanced opportunities for coping. Interestingly, Grahn and colleagues view the programme for clients with burnout and stress-related depression offered at *Alnarp Rehabilitation Garden* as providing clients with new ways of coping in the face of stress (Grahn et al., 2007).

"*Successful rehabilitation (at Alnarp) is based on being able to permanently leave behind one's previous, inadequate stress management patterns and to acquire new strategies more appropriate and sustainable*." (Grahn et al, 2007)

Ulrich has a similar view of the potential of gardens, emphasising that "by fostering patients' ability to cope with stress and promoting restoration from stress, gardens potentially can improve various health outcomes" (Ulrich, 1999). Burns has described the aim of nature-guided therapy to "help clients develop effective self-management strategies that they can use not only to overcome current problems, but to better equip themselves to face future life issues" (Burns, 1998).).

Needless to say, the potential value of nature-based strategies and contexts with a view to stress intervention is clearly a central one. I would posit that clinical relevance stretches across the entire spectrum of primary, secondary and tertiary stress management (Murphy, 2003) and I will be returning to nature's relevance in terms of stress intervention once again when I explore salutogenetic aspects of the stress-nature connection in the following section.

2.3 NATURE FOR FLOURISHING, WELL-BEING AND STRENGTHENING OF RESOURCES

"*Nature matters to people. Big trees and small trees, glistening water, chirping birds, budding bushes, colourful flowers – these are important ingredients in a good life.*" (Kaplan, 1983, pg. 155).

A positive psychological perspective is to be identified within the literature and which situates nature within a distinctly "salutogenetic" paradigm (Antonovsky, 1987), where natural environments are seen in terms of the direct conferring or strengthening or resources and of being conducive to states of "flourishing" (Keyes, 2002; 2003; Frederikson, 2005). The beneficial influences of natural environments

are defined here in terms of buffering and preventative effects, and more positively-focused strategies for the maintenance and promotion of mental-health, via explicit enhancement of positive states, emotions, meaning and experiences (Seligman et al, 2006).

For example, in a paper published in the *Review of General Psychology*, positive psychologists Shelly Gable and Jonathan Haidt list the use of green spaces as an important strategy for enhancing well-being and optimal flourishing (Gable & Haidt, 2005). Furthermore, in the positive psychological textbook, *The Science of Well-Being*, published by Oxford University Press, a whole chapter has been devoted to the role of the natural environment in promotion of psychological well-being and the prevention of ill-health (Burns, 2005). Indeed, clinical psychologist, George Burns, has claimed that his nature-guided psychotherapeutic approach is fundamentally a "wellness" and solution-focused approach, in which positive psychological states arising in contact with natural settings are embraced as "legitimate therapeutic goals" (Burns, 1998; 2005; Burns & Street, 2003). Stigsdotter has referred to healing gardens and green urban spaces as essentially being "health-promoting" or "salutogenic environments" (Stigsdotter, 2005) and the term "instorative benefits"[1] of nature has been utilised by environmental psychologist, Terry Hartig, to refer to the "deepening of adaptive abilities and the building of strengths" (Hartig, 2007; Hartig et al., 1996).

Viewing the already reviewed data through a positive psychological lens already strongly indicates a role for natural environments in the general enhancement of psychological resources and the achievement of optimal human functioning and life quality (Burns, 1998; 2005; Kaplan 2001; Baum, 1991[2]; Leather et al., 1998; Kaplan & Kaplan, 1989). I would like to pursue this perspective further, by intentionally 'flipping the paradigmic coin' and assessing nature-based strategies and contexts in terms of influence on psychological "flourishing" (Keyes, 2002; Frederiksen, 2005) and their implied preventative or buffering effects. At this point, I would refer the reader back to the mental health continuum described earlier (*See Figure 2. page 21).* The following evidence can be perceived as representing a different positioning upon this continuum (moving towards a more salutogenetic perspective).

Nature for optimal functioning and flourishing

"*Health, happiness and well-being can be the products of the pleasurable sensory stimulation that we derive from nature. In this way we are very directly dependent upon nature for the maintenance of our psychological and physical equilibrium*." (Burns, 1998)

In their comprehensive "well-being manifesto for a flourishing society", positive psychologists, Marks and Shah (2005) have referred to the "limited independent effect" of natural environments on our subjective well-being. Indeed, various researchers have empirically demonstrated that there is a significant connection between views of or access to nature, and improved levels on specific

[1] Although, I believe that Hartig has attempted here to define the more positive psychological or salutogenic effects of nature with the term 'instorative', I feel obliged to criticise his choice of vocabulary. The word 'instorative' simply does not exist in the English language. However, the word 'instauration' does exist as a synonym for 'healing' or 'curing' and is therefore conceptually indistinguishable from the term 'restoration'. Thus, in my opinion, Hartig's choice of what can only be described as a misnomer is rather unfortunate, as it has consequently been uncritically and widely adopted by various researchers (e.g. Stigsdotter & Grahn, 2003; Holmstrøm, 2006; Nevstrup Anderson, 2007). For example, Stigsdotter & Grahn have referred to the "Instorative School", defined as a combination of passive restorative/healing effects in tandem with active horticultural projects taking place in garden settings (Stigsdotter & Grahn, 2003).

[2] Cited in Burns, 1998

dimensions of psychological well-being[1], such as positive affect/enhanced mood (Pretty et al., 2005; Kaplan R, 2001; De Vries et al, 2003; Whitehouse et al., 2001; Leather et al., 1998; Browne, 1992[2]).

Others have positively correlated exposure to natural environments or views of nature to salutogenetic or stress-preventative effects on mental health (Grahn & Stigsdotter, 2003; De Vries et al., 2003; White & Heerwagen, 1998; Ulrich et al., 1991; Nielsen & Hansen, 2007). A large-sample (n=1200) survey by Nielsen and Hansen (2006) revealed an almost universal perception (93% of respondents) that time spent in nature has a positive effect on health and well-being. On further questioning, 68% of respondents attributed this to direct positive effects on mood state, and 67% referred to enhanced coping in the face of stress (Ibid).

Although not the principle focus of my study, general preventative effects in terms of somatic health have also been demonstrated. A classic and oft-cited example in this category, with great health psychological relevance, is the study by Moore (1981[3]) in which prison inmates with a view of forests and farmland were found to utilise medical services less often than those with a view of the prison yard, implicating a preventative effect inherent in natural views. Furthermore, in a large socio-demographic survey of perceived general health (n=250782), researchers found that the percentage of green space in a person's local environment was significantly correlated with positive appraisals of perceived health (Maas et al., 2006).

Let me also draw attention to a Swedish study, which assessed differences in physical health levels, playing behaviour, motor skills and attentional functioning of children in a nature nursery school (where children spent most of their time outdoors in a rural environment) as compared to an urban-based day care institution (Grahn et al., 2000[4]). One of the most significant findings of this study was the large difference between levels of sickness amongst children in each institution (8% for the urban day-care institution and 2.8% for those attending the nature nursery school). Interestingly, children attending the nature-based institution demonstrated significantly higher levels of performance on measures attention/concentration using the *Attention Deficit Disorders Evaluation Scale* (McCarney, 1995[5]), in addition to improved motor coordination and more imaginative playing behaviour (Grahn et al., 2000). It should be noted, that this study lends empirical support to Taylor and colleagues' data, which indicated significant improvements in ADD symptomology after exposure to play opportunities in green outdoor settings (Taylor et al, 2001). I would suggest, that the results of this study implicate a significant role for natural environments in terms of optimal psycho-physiological functioning and flourishing.

Nature's influence on well-being

"*Well-being, by its very nature, requires an integrated approach, one that embraces mind, body, society and environment*." (Huppert, Baylis & Keverne, 2005)

Granted, well-being is not a simple construct to define: attempts to chart its make-up have exposed a wide range of dimensions: for example, Marks and Shah list various components (satisfaction, pleasure, enjoyment, curiosity, growth, autonomy, purpose, meaning, social contribution, engaging in pro-social behaviour etc.) within three main categories of life satisfaction, personal development and

[1] Well-being is of course a complex, multi-dimensional concept, which aims to convey a person's overall happiness and satisfaction with life. A more detailed definition is given on page 40.
[2] Cited in Maller et al., 2002
[3] Cited, amongst others, in Morris, 2003 and Kaplan, 2001
[4] Note that the original Swedish study, *Ute på Dagis*, was carried out in 1997. This citation refers to a Danish translation.
[5] Cited in Wells, 2000, who claims that both the reliability and validity of the ADDES have been extensively established.

social well-being (Marks & Shah, 2005). Ryff and Keyes have conceptualised and operationalised well-being in terms of six dimensions: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-aceptance (Ryff & Keyes, 1995).

I would like to draw upon a rather universal definition of well-being in the following section of this review, and will thus be guided by the general dimensions of *life satisfaction, personal development* and *social well-being*, as described by Marks and Shah (2005). The following studies are thus included on the basis that they refer to one or more of these dimensions of well-being.

There is evidence that simply having a view of nature can positively influence well-being and levels of satisfaction (e.g. Kaplan, 2001; Leather et al., 1998). Job satisfaction and well-being at work have been found to be significantly correlated with whether workers have access to a window or not (Finnegan & Solomon, 1981[1]) and Rachel Kaplan has demonstrated that natural elements or landscapes (as viewed through a window) provided "micro-restorative opportunities" that contribute significantly to resident's satisfactions with their neighbourhood and with diverse aspects of their sense of well-being (Kaplan, 2001). Using a postal survey methodology (188 useable surveys out of 564 sent), respondents were asked to describe the content of views from their apartment in addition to answering questions aimed at recording diverse aspects of well-being (degree of mental fatigue, positive mood states, level of functioning and residential satisfaction). Views of nature through windows was found to be a particularly "strong factor" in well-being and residential satisfaction and Kaplan concludes that content of views from the home does "make a difference"(Ibid).

Leather and colleagues have focused on the interaction between levels of job stress and window views of nature in an occupational context, concluding that sunlight and views of nature buffer against stress experienced at work, whilst at the same time positively affecting self-reports of general well being and job satisfaction (Leather et al., 1998)[2]. Note that well-being was here measured using the *General Well Being Questionnaire* (Cox et al., 1983[3]) which features factors related to degree of being "worn out " and "uptight and tense" - a rather different approach to well-being measurement than that taken by the positive psychologists (e.g. Ryff & Keyes, 1995).

It makes sense to question whether the above results from 'window view studies' have more to do with the presence of a window than the view through the window. Several studies have shown that it is indeed the natural content of window views that is most significantly correlated with positive health outcomes (e.g. Kaplan, 2001; Moore, 1981[4]; Leather et al, 1998; Tennesen & Cimprich, 1995). Of course, experimental research studies in which natural landscapes have been linked to greater positive outcome than urban landscapes support such findings (e.g. Hartig et al., 2003; 1991; Herzog et al., 2000; Newall, 1997; Purcell et al., 1994; 2001). Kaplan has concluded, on the basis of a thorough overview of research into the psychological effects of window views, that it is more conceivable that views from windows have more to do with the natural content seen through the window than the window itself (Kaplan, 2001).

Spending time in natural settings (as opposed to just viewing it through a window) has also been linked to greater levels of psychological well-being and general flourishing. For example, it has been demonstrated that people suffering conditions of poverty have a more positive outlook on life, express greater life satisfaction if they are able to access green spaces easily in everyday life (Kuo, 2001). Frey

[1] Cited in Kaplan, 2001
[2] Note that here we can see how processes involving positive changes in affect and stress regulation are actually part and parcel of each other.
[3] Cited in Leather et al., 1998
[4] Cited in Morris, 2003 and Kaplan, 2001

has reported how access to nearby nature positively affects reports of life and neighbourhood satisfaction and that this result is independent of social status or class (Frey 1982, 1984[1]). In the previously-outlined study by Whitehouse et al. (2001) it was demonstrated that the use of a healing hospital garden generally increased levels of well-being for the majority of users, as measured by descriptive reports of mood improvement. Another noteworthy aspect of this study was the increase in customer satisfaction as correlated with garden use, indicating a tendency to more positively evaluate hospital services and facilities as a result of contact with the garden environment.

Maller and collegues (2002) have referred to a study of elderly residents in a retirement home, in which it was found that contact with plants and exposure to natural settings positively affected measures of psychological well-being, environmental stimulation, self-expression, motivation to exercise and level of social interaction and networking activity (Browne, 1992[2]). However, as it has been impossible to get hold of the original literature, which was presented at a national symposium on horticulture and human well-being in Oregon in 1992, I am obliged to view these results from this study with reservation. Yet, the indication that contact with nature might improve sociability is a particularly intriguing one. In a series of studies, Kuo, Sullivan and colleagues have demonstrated that access to green spaces in urban housing areas ("nearby nature") makes us more likely to engage in social relationships (Coley et al, 1997; Taylor et al., 1998) and reduces anti-social behaviours such as aggression and criminality (Kuo & Sullivan, 2001a; 2001b). This is obviously an area warranting further analysis.

The role of positive emotions and enhanced mood

"*Some part of me came alive, when I was taken to the garden*…" (Oliver Sacks, 1984[3])

Research results presented so far do seem to indicate that contact with nature has a direct and unmediated positive effect on our emotions and mood state. In fact, many of the previously reviewed studies demonstrate this tendency (Nielsen & Hansen, 2006; Gigliotti & Jarrot, 2005; Pretty et al., 2005[4];Hartig et al., 2003; Kaplan, 2001; Cooper Marcus & Barnes, 1995, Hartig et al., 1991; Ulrich et al., 1991, etc.)[5].

Other examples taking a distinctly salutogenetic perspective include an experimental design by Larsen and colleagues in which the positive mental health effects of plants in the workplace were studied. It was found that subjects' (n=81) questionnaire-elicited reports of positive mood, attitudes to work and levels of comfort were significantly higher when plants were present in the office environment (Larsen et al. 1998).

The earlier-outlined research on restoration seems to indicate the ready attainment of more peaceful mood states in natural settings (e.g. Korpela et al., 2001; Whitehouse et al., 2001; Cooper Marcus & Barnes, 1995; Kaplan & Kaplan, 1989). These findings are supported by a study by the Kaplans, in collaboration with the American Horticultural Society, in which the experience of states of peace and tranquillity in gardens was given as the most common reason gardeners found their hobby satisfying

[1] Cited in Kaplan & Kaplan, 1989
[2] Cited in Maller et al., 2002 and Morris, 2003
[3] Cited in Frumkin, 2001 and referring to an account by Sacks on his recovery from a serious leg injury. After three weeks in a hospital ward, he was eventually taken into the garden. According to Sacks, the positive effect on his mood was dramatic.
[4] Described in the introduction. I will be covering this study in detail on page 45.
[5] Although mood and positive affect are different entities as described by Frederiksen, they are often used synonymously in the literature (Frederikson, 2005).

(Kaplan & Kaplan 1987[1]): Horticultural therapy researchers, Butterfield and Relf (1992[2]), have also reported that gardening helps people to feel tranquil and at peace.

Ulrich reports of a quasi-experimental study by Whall and colleagues (1997) which demonstrated significantly lower levels of agitation and aggression in a patient group with late-stage dementia who were bathed in a room full of nature-like sensory stimulation (i.e. large pictures of natural scenes and sounds of "birds and babbling brooks") - as compared to a group who were bathed in the same room without the nature sounds and pictures (Ulrich, 1999).

Russel & Mehrahbian (1976[3]) have earlier demonstrated that pictures of pleasant natural views would lead to more pleasurable emotional states. Interestingly, the authors associated these mood-enhancing effects with an increase in health-oriented behaviours and a reduction in desire to engage in unhealthy behaviours such as smoking and drinking. The link between improved affective state in terms of attractive scenery and consequent positive behaviour is an interesting one, and one worthy of further exploration in terms of public health strategies of prevention.

"Contact with nature has long been demonstrated to promote healthy patterns of behaviour and thus serves a preventative role against the onset of health problems" (Burns, 2005).

After 25 years of incorporating nature-assisted strategies in his practice, clinical psychologist, George Burns, claims that "contact with nature enhances happiness" and that it is the elicitation of positive emotions and states that seem to arise in contact with the multitude of sensual stimuli available in natural environments, that provide the *force de major* of nature-based approaches (Burn, 2005; 1998). In this way, Burns situates his interventions within a distinctly positive psychological paradigm where it is the supposed capacity for natural settings to provide pleasurable experiences that enhance mood and elicit positive emotions, that are ascribed key therapeutic and salutogenetic value (Ibid). Burns has developed the *Sensory Awareness Inventory* (SAI) as a method to correct the mismatch between what people are doing and what the actually enjoy doing (Burns, 2005; 1998). This solution-focused, client-centred methodology is, according to Burns, helpful in creating positive sensory experiences, which can be capitalised on for the purposes of therapy (Burns, 1998). Of course, sensory pleasure, positive emotions[4] and positive mood states are not identical entities, but they often co-occur, and certainly, pleasurable experiences can lead to positive mood states and emotions (Frederikson, 2005).

"*Through experiences of positive emotions, then, people transform themselves, becoming more creative, knowledgeable, resilient, socially integrated, and healthy individuals*" (Frederikson, 2005).

The positive mental health consequences of practices that enhance positive emotions have been clearly highlighted by researchers within the field of positive psychology (e.g. Seligman et al., 2002; Frederikson, 2000). For example, interventions based on Frederikson's "*Broaden and Build*" model have demonstrated substantial mental health benefits (Frederikson, 2005). Higher cognitive functioning, and particularly creative thinking are positively influenced by their cultivation of positive emotions (via what Frederikson describes as the "broadening of momentary though-action repertoires") and what is more, that they seem to be self-reinforcing, growing in what she describes as "upward spirals" of positive emotion (Frederikson, 2001[5]). Positive emotions seem to have the effect of

[1] Cited in Kaplan & Kaplan, 1989
[2] Cited in Maller et al, 2002
[3] cited in Burns, 1998
[4] According to Frederikson, positive emotions require cognitive appraisals or assessments of the meaning of an experience (2005).
[5] Cited in Foster & Lloyd, 2007

regulating negative emotions, or "un-doing" their detrimental effects, as measured in terms of physiological recovery from anxiety-related sympathetic arousal (Frederikson et al., 2000[1]). Frederikson and her colleagues have also empirically linked the intentional cultivation of positive affect to increased resilience, coping, subjective well-being and the demonstration of "enduring personal resources" (Frederikson, 2005). All in all, such approaches seem to contribute to optimal human flourishing. It is noteworthy, in relation to this thesis, that Frederikson has referred to the effects of nature in stimulating positive affect and thus contributing to processes of flourishing (Frederikson, 2000). It seems reasonable to hypothesise, that the enhancement of positive emotions and mood state, via sensory, or other positive experiences/activity, in natural settings might be causally related to beneficial consequences for mental health and be drawn upon in terms of therapeutic rationale (Frederikson, 2005; 2000; Burns, 2005).

"*Certain nature scenes evoke contentment.*" (Frederikson, 2000)

An additional interesting theoretical perspective that should be noted in this context is how alleged positive emotions and states arising from contact with nature may directly act to buffer against the effects of stress and alleviate symptoms of chronic stress. We know that positive emotions such as happiness represent powerful mediating factors between stress and health (Semmer, 2003). Seligman et al (2005) talks of positive emotions leading to greater resilience and "a heightened ability to bounce back from negative experiences" and Frederikson has also highlighted the role of positive emotions in enhancing resilience and personal resources (Frederikson, 2005). Such findings lead me to speculate as to the extent to which the stress buffering effects of positive emotions and mood states might be attainable via intentional use of nature-based interventions.

Nature as buffer to stress

The stress buffering effect of views or actual contact with natural settings has been highlighted by a number of studies (Nielsen & Hansen, 2007; Guwaldi, 2006; Grahn & Stigsdotter, 2003; 2004; De Vries et al., 2003; White & Heerwagen, 1998; Leather et al., 1998; Ulrich et al., 1991). For example, Grahn & Stigsdotter, have found a statistically significant causal relationship between the use of green urban spaces and lower levels of self-reported experiences of stress, regardless of socio-economic background, sex or age (Grahn & Stigsdotter, 2003). Neither did this study, in which a randomly selected group of 953 Swedish citizens answered questions as to health and use of urban green spaces, show that effects were correlated with particular lifestyle, i.e. choice of housing, inner city or suburban dwelling. As the authors conclude, "*People living in the city center suffer more from stress than do people living in suburbs, but it appears to be the use of urban open green spaces that accounts of the level of stress, not the location of the dwelling per se*"(Ibid). The findings indicate that the more often a person spends time in contact with nature within such green urban spaces, the less often he or she experiences symptoms of stress (defined by the authors as a general feeling of being chased, harassed and stressed), irritation and fatigue[2]. The implications of distinct stress-buffering effects provided by access to nature are noteworthy here. Furthermore, this study found that having a garden (or having easy access to a garden) showed an even stronger causal relationship, with those not having a garden reporting significantly higher levels of stress.

Buffering effects of nature contact are likewise implied in a further study by Stigsdotter & Grahn (2004), which focused on working peoples' (n=656) use of green spaces in the workplace and levels of

[1] Cited in Frederikson, 2005

[2] These three strongest factor variables were extracted using factor analysis to create a new variable defined as Level of Stress (LS)

reported stress. Drawing on questionnaire responses from a randomly selected population, results showed a significant correlation between lower reported incidence of stress and views/access to a garden in breaks within the workplace (Ibid). Incidentally, reports of well-being or flourishing ("trivsel") in the workplace were also included in this study. A positive correlation between views of/access to gardens was found, with a level of significance of $p<0.0001$ (Ibid).

On the basis of a questionnaire survey of 1200 Danish adults, Karsten Hansen and Thomas Sick Nielsen, from the *Forestry and Landscape Department* of KVL, Copenhagen University, have shown a significant relationship between easy access to green urban areas and higher frequency of their use and lower levels of reported stress (Hansen & Nielsen, 2007; Nielsen & Hansen, 2006; 2005). Although, conceding to the possibility that these effects may well be attributable to characteristics of the neighbourhood and lifestyle variables sourced in socio-economic factors, they conclude that there is reason to believe that "short distances to green areas, especially in urban settings, may contribute to reduced levels of stress" (Nielsen & Hansen, 2006).

"*The data speak to the question of whether natural settings 'inoculate' against stress, attentional demand, and the like*." (Hartig et al., 1991)

In earlier an outlined article (*see page 23*), Parsons, Ulrich and colleagues experimentally demonstrated the stress immunising effects of exposure to simulated natural roadside environments in a study designed to explore the mediating effects of nature on commuter stress (Parsons et al., 1998). We should also note the convergent positive restorative findings of Hartig and colleagues, which are alleged as implying nature's potential in processes of stress-buffering via enhancement of positive affect (Hartig et al., 1991). And in an earlier study, which assessed the effects natural settings on levels of self-reported stress, Kaplan and colleagues found that access to views of nature at work was "related to lower levels of perceived job stress and higher levels of job satisfaction" (Kaplan et al., 1988[1]). Interestingly, in a paper that attempts to link ART with Ulrich's stress-recovery theory of restoration, Stephen Kaplan defines directed attention as a "key psychological resource" which can be regulated via contact with restorative environments to avoid the development of pathological expressions of stress (Kaplan, 1995).

In a noteworthy study by Wells and Evans, the hypothesis that nearby nature might confer stress-buffering or stress-moderating effects on children (n=337) living in rural areas was investigated (Wells & Evans 2003). Using measures[2] of parent-reported psychological distress (*Rutter Child Behaviour Questionnaire* – Rutter et al., 1970) in addition to children's own reports of global self-worth (*Global Self-Worth* subscale of the *Harter Competency Scale* – Harter, 1982) and life stress (using the *Lewis Stressful Life Events Scale* – Lewis et al., 1984), achieved statistically significant data to support their hypothesis, with results demonstrating that impact of reported life stress was significantly lower in those children with high levels of nearby nature as compared to those with lower levels (Ibid). It should be noted that hierarchical regression analyses were employed to control for the effects of families' socio-economic status. The authors concluded on the basis of their findings that "children with a high degree of exposure to nature seem to be protected from the impact of life stress" and most significantly, "this buffering appears to be greatest for those at most risk" (Ibid).

[1] Cited in Kaplan & Kaplan, 1989
[2] All measures used in this study are cited in Wells & Evans, 2003

Nature as enhancing the positive effects of exercise

That nature may enhance the positive mental health effects of exercise is evident from the results of a series of nature-based exercise research studies coming out of the *University of Essex* over recent years, and which I have referred to in the introduction (Mind, 2007; Pretty et al., 2007; 2005). In the first, particularly well-designed piece of research, Jules Pretty and his colleagues utilised measurements of cardiovascular response, mood improvement and self-esteem as dependent variables. This study demonstrated statistically significant positive psychological effects on mood and self-esteem of what they term "green exercise" i.e. the synergistic effects of exercise in natural environments (Pretty et al., 2005). The aim of this study was to assess both physiological and psychological effects of exercise conducted on a treadmill whilst exposed to photographs depicting either rural or urban settings, with photographs being further subdivided into categories of pleasant and unpleasant scenes. Subjects (n=100) were randomly allocated to one of five experimental conditions (the four types of photograph above and a control group who exercised with no image). Physiological measurements (before- and after readings of blood pressure and continuous monitoring of heart rate) were combined with psychological tools measuring mood (Profile of Mood States – POMS - McNair et al., 1984[1]) and self-esteem (Rosenberg Self-Esteem Questionnaire – Rosenberg, 1989[2]) to assess the combined effect of exercise and views of particular scenes. Although, both pleasant rural and urban scenes showed significant results in terms of improved mood and self-esteem, viewing rural, pleasant scenes during exercise showed the most consistent improvements in mood. However, the most noteworthy finding of this study (particularly for health psychologists) is the result showing that only those participants viewing pleasant rural scenes exhibiting significant reductions in blood pressure. The implications in terms of cardiovascular health are obviously to be emphasised. Note that there were no statistical differences in measures between any of these groups before the interventions, showing that effects were a direct result of experimental interventions.

In a later study, Pretty and colleagues studied the effects of various forms exercise in natural countryside settings on health and psychological well-being (n=263) and found further empirical support for their earlier experimental findings that green exercise offers significant mental health benefits over and above that of either nature or exercise alone (Pretty et al., 2007). General psychological health was measured using the "industry standard" General Health Questionnaire (Goldberg, 1978[3]). Self-esteem and mood state were measured pre- and post activity using the same measures as in the previous study (i.e. Rosenberg Self-Esteem Questionnaire and POMS). A statistically significant improvement was found in terms of self-esteem ($p<0.0005$) and statistically significant overall mood improvement. No difference was found between the type of activity carried out. An interesting finding of this study was that participants with initially low values of self-esteem showed greater improvements in self-esteem scores following green exercise than those who initially recorded higher values of self-esteem As the authors point out, "this implies that people with poor self-esteem would benefit even more from green exercise activities" (Ibid). The significance of this finding for clinical psychological practice is obviously not to be denied[4].

[1] Cited in Pretty et al., 2005
[2] Cited in Pretty et al., 2005
[3] Cited in Pretty et al., 2007
[4] I will be returning to reflect on these findings in section 2.6.

2.4 NATURE AS INTEGRATED ELEMENT OF THERAPY

I would like now to draw attention to the literature, which situates nature as facilitative clinical setting or integrated element of a particular therapeutic approach *(see Figure 1., 20),* such as horticultural therapy, wilderness therapy or civic environmental projects for mental health users. This will cover mainly literature from the field of nature-assisted clinical *practice* as applied to a diverse range of mental health problems, from burnout and stress-related depression (Grahn et al., 2006; Stigsdotter & Grahn, 2003) to rehabilitation of traumatised refugees (Linden & Grut, 2002). This is data from which it is far more difficult to draw valid conclusions as to the positive influences of nature *per se* on mental health, but from which we may infer nature's contributory effects as integrated element in a multi-modal approach.

Healing gardens and horticultural therapy

Horticultural therapy, or social and therapeutic horticulture as it is often now referred to (Sempik & Aldridge, 2006), has been and is employed in a wide variety of clinical contexts. Lewis has reported settings ranging from hospitals to geriatric centres to drug rehabilitation programmes (Lewis, 1990[1]) and in a recent overview of the field of social and therapeutic horticulture in the UK, Sempik & Aldridge report 1500 garden-based projects, of which 339 are described as serving clients with "mental health needs", 144 for individuals exhibiting "challenging behaviours" and 74 for rehabilitation of problems centring on substance abuse (Sempik & Aldridge, 2006). Other applications listed include learning difficulties, physical disabilities and the unemployed (Ibid). Let me emphasise once more, that it is the *social* interactions and outcomes, in addition to the occupationally-oriented activities of social and therapeutic horticulture approaches, which are widely accepted amongst researchers in the field as being largely causal in relation to beneficial outcomes (Sempik & Aldridge, 2006; Sempik et al., 2003). Claims as to the *specific* causal role of nature in terms of the mental health benefits of horticultural therapy are thus still largely hypothetical, anecdotal or based on principles of convergence (e.g. drawing on theory and research from the literature on restoration).

The reader will by now be very familiar with the work at *Alnarp Rehabilitation Garden* in Sweden. A poster presented at a COST 39 Conference at the *Royal Agricultural College in Copenhagen* in 2006[2], depicted a significant level of recovery and workplace reintegration in connection with Alnarp's 14-16 week programme of combined horticultural therapeutic modalities for treatment of burnout and stress-related depression[3] (Grahn et al., 2006). According to this poster presentation, prior to entering the treatment programme, patients had been unable to work or study for an average of two years. The researchers state that, currently, approximately 80% of patients (n= >100) have been able to return to study or full/part-time work after undergoing this programme of nature-assisted treatment (Ibid). Yet, it must be said that, although the results on the restorative applications of healing garden therapy are promising, without the existence of more concise (or published) research data it has been difficult to evaluate how valid these results actually are. Furthermore, because this research programme draws on such a wide range of different therapeutic modalities and does not employ a control group, it is doubtful whether the above findings can be used to draw conclusions as *exclusive* effects of nature contact in mental health outcome. I will be returning to comment generally on research design, and specifically on research methodology employed at Alnarp, in Chapter 3.

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[1] Cited in Maller et al., 2002.

[2] As of today's date, no data has been officially published, although the researchers have presented results at various conferences e.g. COST E39 Research Conference, Copenhagen, 2006 and OPENspace Conference, Edinburgh, 2007.

[3] Described as a combination of "nature therapy, pet and horticultural therapy".

There are accounts in the literature referring to use of gardening in the improvement of life quality, well-being and general psycho-physiological functioning of individuals suffering from Alzheimer's (e.g. Dahlenborg, 2005; Zeisel & Tyson, 1999; Cohen-Mansfield & Werner, 1999[1]; Whall et al., 1997[2]). For example, horticultural therapy practices have been utilised with success in therapeutic contexts for elderly with Alzheimer's, with positive psychological benefits having been linked to evocation of pleasant and meaningful memories from the past and that gardening offers decreased cognitive demands and heightened sensory stimulation (Schmidtbauer et al., 2005; Dahlenborg, 2005; Zeisel & Tyson, 1999). Zeisel and Tyson conclude that use of what they term "Alzheimer's treatment gardens" leads to general enhancement of well-being and life quality for such individuals (Zeisel & Tyson, 1999).

Significant improvements in observed levels of engagement and affect have been demonstrated in a study of the effects of horticultural therapy (as compared to that of traditional indoor activities usually offered to these clients) on 48 dementia patients in public day care programmes in Canada (Gigliotti & Jarrot, 2005). Observations of affect and behaviour were charted using a modified dementia care mapping technique (based on scales from the Bradford Dementia Care Group, 1997[3]) and short seven-item interviews questioning participants' opinions of the activities. A statistically significant difference ($p < 0.001$) was found between mean time engaged in horticultural activities, (78% engagement), as compared to traditional activities (28%). Correspondingly, measures of non-engagement were also recorded, with horticultural participants showing much lower levels of inactivity (14%) as compared to those involved in the traditional activities (60%). These results were also statistically significant ($p < 0.001$). Levels of recorded positive affect were also significantly higher in the horticultural therapy groups ($p < 0.001$).

Some evidence exists as to the use of horticultural projects in the treatment of clients with symptoms approximating Post Traumatic Stress Disorder and in stress-related crisis rehabilitation[4] (Linden & Grut, 2002; Grahn, 2005; Gerlach-Spriggs et al., 1998). For example, the "*The Natural Growth Project*" - a horticultural and psychotherapeutic initiative in the UK – is aimed at psychological treatment of asylum seekers and refugees who have experienced torture (Linden & Grut, 2002). The evidence here is based on case study descriptions and journal recordings of psychotherapists working in the project. The treatment rationale of this project is founded on the assumption that working therapeutically with such ethnic clinical populations is facilitated, both in terms of therapeutic relationship and content, by utilising a garden setting:

"*For many the outdoors can be more conducive than the closed room for sharing their painful stories*." (Linden & Grut, 2002)

This approach, in which a psychotherapist gardens alongside her client as co-facilitator of the healing process, is reported to provide various levels of therapeutic benefit: for example, it is claimed that incorporating gardening into the therapeutic repertoire facilitates easier communication and provides a context where cultural differences are less of a barrier (Ibid). The therapeutic value of drawing on symbols available in the garden to elicit personal narratives is strongly emphasised and the garden is described as a "metaphorical environment" (Ibid).

[1] Cited in Dahlenborg, 2005
[2] Cited in Ulrich, 1999
[3] Cited in Gigliotti & Jarrot, 2005
[4] It should be noted that Prætorius has described symptoms of post-modern stress as representing those of PTSD (Prætorius, 2007).

The use of metaphor is, of course, a generally well-established technique within psychotherapy (Barker, 1985; Burns, 2007a) and has been applied to modalities as far ranging as family therapy, narrative therapy, acceptance and commitment therapy, solution-focused therapy, hypnotherapy and cognitive behavioural therapy (Burns, 2007a). Referring to a study by Ferrara (1994), Christine Perry notes how an average of three metaphors per hundred words may arise in the course of one hour of therapy stating that, "such frequent use of figurative language in therapy indicates that metaphor can play a powerfully significant role in the therapeutic process" (Perry, 2007).

Clinical psychologist, George Burns stresses the particular therapeutic value of metaphors available in natural environments, which he refers to as "experiential metaphors" (Burns, 1998). In his practice, Burns draws on nature-based assignments with the intention of supporting clients in the generation of relevant metaphors to be utilised in the therapeutic process, e.g. he might offer a homework task involving finding a natural object with personal symbolic significance or participating in a nature-based activity, which might elicit metaphors to support the client's reframing, acceptance and understanding of current process, e.g. a client's climbing of a mountain becomes an experiential metaphor to describe his journey through existential crisis (Ibid). Welen-Anderson, one of the leading therapists at *Alnarp Rehabilitation Garden*, has likewise talked of the power of symbols and metaphors available in features of and interaction with the environment -"when words are not sufficient" - which may intentionally and unintentionally support therapeutic processes (Welen-Anderson, 2006). Nature is full of metaphors, which we may draw upon to help us understand and heal ourselves, and our experiences. Burns talks of a favourite eucaplyptus tree in his native Australia, half-dead and rotten, blackened by earlier bush fires, yet part of it still alive, still bearing green leaves, "a symbol of triumph against the odds", which he may draw upon in times of trouble (Burns, 2007b). Indeed, much of the anecdotal and qualitative research literature in this field refers to the therapeutic potential of the "metaphorical environment" (e.g. Worsham & Goodvin, 2007; Priest, 2007; Linden & Grut, 2007; Burns, 1998; Clinebell, 1996) [1]. Sewall has talked of the psychological value, in terms of personal insight and understanding[2], of mindfully attending to the natural world so as to allow meaning and metaphor to arise within the space between ourselves and nature - thus allowing us to "read the signs" and tell the "story" (Sewall, 1995). That nature as source of metaphor, may be engaged in terms of therapeutic material, strikes me as an exciting area, calling out for further theoretical and empirical development.

Nature-guided psychotherapy

As far as I know, Burns is the only clinical psychologist who has written extensively on the benefits to be achieved via integration of nature-assisted therapeutic strategies within psychotherapy (Burns, 1998; 2005). In his book, *Nature-Guided Therapy: Brief Integrative Strategies for Health and Well-Being,* Burns describes how, during nearly 30 years of clinical psychological practice, he has "become aware of how working with the practical applications of nature-guided therapy has brought about a shift in … therapeutic paradigm" (Burns, 1998). Focusing largely on multi-modal sensory experience and being mindfully present in nature as therapeutic resources, and employing solution-focused techniques such as the *Sensory Awareness Inventory* to elicit experiences of sensory enjoyment, pleasure or comfort and personal meaning, Burns reports various anecdotal cases of positive therapeutic outcome with clients presenting with a range of pathological symptoms and mental health problems i.e. marital and other relational problems, depression, anxiety disorders, stress disorders, substance abuse and even enhanced coping in the face of terminal illness (Burns, 1998). In addition to working with

[1] I would have liked to explore the role of Jung's archetypes and the collective unconscious in this context, but have intentionally chosen to exclude this theme due to lack of space. I would refer interested readers to Aizenstat (1995) for a treatment of this topic.
[2] She also talks of the importance of attending to the natural world as vehicle for establishing a meaningful, ethical and dynamic relationship with the non-human world (Sewall, 1995).

techniques of enhancing sensory awareness in nature, Burns describes assigning his clients nature-based assignments, activities and even "natural ordeals" as strategic intervention, based on principles sourced in Haley's ordeal therapy (1984[1]).

"*I've sent more than one depressed man to go and dig and plant a flower garden for someone*" (Erickson, 1980[2])

Burns' therapeutic approach has also been greatly inspired by the work of Milton Erickson (Burns, 1998). Milton Erickson was a pioneer of many psychotherapeutic traditions, including strategic family therapy, solution-focused and brief therapies (Carr, 2000). Erickson often assigned his clients activities that focused on systematic, sensory-based interaction with nature and even claimed that nature healed him from the ravages of polio (Ibid). Burns reports a case of positive clinical outcome achieved by Erickson via a strategy of nature-based contemplation. In this case study, Erickson supported a man to release patterns of alcohol addiction by giving him a "homework" task in the nearby Botanical Gardens, which entailed contemplating the survival qualities of the cactus! Note that this is an example of the metaphor in nature utilised for therapeutic purposes – a concept I introduced in the previous section.

There are a number of other eclectic examples of clinical practice (both anecdotal and empirical sources), which intentionally integrate nature as context and strategy (e.g. Berger, 2006; Berger & McLeod, 2006; Clinebell, 1996). Psychotherapist Ronan Berger PhD, head of the *Center for Nature Therapy* in Tel Hai, Israel, has outlined a group- and individual-based nature-assisted therapeutic approach, based on "principles of creativity and ritual in nature" for use with principally children with psychosocial and learning difficulties, but also in connection with more traditional psychotherapeutic applications, such as depression (Berger & McLeod, 2006; Berger, 2006). Berger describes his approach as an integrative, post-modern, systemic approach, drawing from a number of therapeutic sources, such as experiential, Gestalt, narrative, art, drama and transpersonal psychology (Berger & McLeod, 2006). In a study by Berger, facilitators of a 9-month long, nature-based programme for children with severe learning difficulties and behavioural problems (n=7) were asked to describe the extent to which they perceived nature as a valuable therapeutic element for children involved. Qualitative follow-up research based on open-ended questionnaires and three hour long interviews with facilitators revealed, after data analysis based on principles and techniques of grounded theory, that facilitators perceived nature as having a significant impact on the process by offering a setting in which children exhibited more pro-social behaviour, more creativity and a noteworthy improvement in both verbal and non-verbal positive communication. More specifically, facilitators reported a decrease in aggressive behaviour, greater expressions of personal and group responsibility, more caring and empathic behaviour towards each other and increased self-esteem/self-confidence (Berger, 2006).

Clinebell's model of *ecotherapy* is based on both educational and health-promoting intentions, with a therapeutic rationale that rests on the application of techniques to raise 'ecological consciousness' (in terms of human connection with and "rootedness" within the natural world and its life-sustaining biological systems). It is proposed by Clinebell, that raising awareness of expanded concept of self (he talks in terms of "an ecologically-based personality model" and "eco-self position"), and the encouraging of a more caring and nurturing attitude to the natural world, may lead to the automatic transcendence of personal problems. In this way, Clinebell's approach can be interpreted in terms of

[1] Cited in Burns, 1998 - interestingly, Haley included a chapter on "using the great outdoors" in his seminal book on ordeal therapy as form of psychotherapy .
[2] Cited in Burns, 1998

positive psychological principles of mental health through service and altruism, or aspects inherent in what has been termed "the meaningful life" (Duckworth et al., 2005; Seligman, et al., 2004).

Clinebell provides a range of case studies from his own and others' practice indicating uses of an ecotherapeutic approach in treatment of clients with stress, depression and marital problems. For example, Clinebell reports a positive therapeutic outcome of assigning a nature-based task (to walk for 20 minutes a day in a beautiful park with his wife) to a client suffering from personal and marital burnout. However, as the cases provided by Clinebell are purely anecdotal, their use in terms of providing an evidence-base as to nature's effects on mental health outcomes are obviously severely limited. Indeed, according to an evidence hierarchy described by Zachariae[1], evidence provided by such anecdotes are "particularly poor" in terms of the support they lend to the development of solid evidence-base for the field (Zachariae, 2007).

However, I do believe that the eclectic practices of clinicians, such as Berger and Clinebell, can be drawn upon in terms of clinical and theoretical inspiration, and of course, also in terms of sourcing themes worthy of future research, which might further the development of the field.

Social psychiatric projects

The earlier outlined research on green exercise lies behind some trends towards group-based, nature-assisted psychotherapeutic approaches currently being developed, especially in the UK and Australia (e.g. Burls, 2007; Priest, 2007; Reynolds, 2002; Maller et al., 2002). Pretty and collegues have demonstrated how exercise in nature may lead to improved mental health as compared to exercise in more traditional indoor settings (Pretty et al., 2007). Priest has qualitatively described mental health benefits of walking in natural settings in a clinical population (n=14), concluding that it was the particular combination of exercise, social interaction and contact with natural settings, which led to enhanced well-being for mental health users (Priest, 2007). Individuals suffering a range of mental health problems[2] reported that they found participation to be meaningful and therapeutic across a range of subjective parameters, including those which stressed the particular value of natural settings as compared to everyday, urban settings (Priest, 2007).

Using an ethnographic research approach to facilitate an understanding of "the context of events and their meanings", together with the employment of grounded theory principles to analyse the data, Priest identified various parameters of personal experiential meaning, well-being and aspects of therapeutic effect of these regular group walks in natural settings. One of the themes that emerged from the data was the perception of a sense of mastery, control and self-sufficiency in such a context. This obviously lends support to earlier reflections on the significance of experience of control and mastery attainable in natural settings. Also valued by participants were experiences of being "close to nature" and a sense of oneness and compatibility with the natural surroundings.

"Being closer to what is more natural helped people to feel better in a number of ways. People appreciated many and varied aspects of being outdoors, immediately apparent as they stopped to look at the birds, commented on the flowers and reacted together when coming upon a beautiful view" (Priest, 2007)

[1] Zachariae draws here upon the American Academy of Neurology, 2004 and Evans, 2003 (Zachariae, 2007)
[2] The group consisted of those with psychotic symptoms, traumatic reactions, alcohol abuse and generally "distressing life situations".

Of course, some of the major themes to arise from Priest's study centre on the perceived social benefits of the project, which were described in terms of "feeling a part of something", "appreciation of others" and "feeling connected with others". This study is therefore distinctly limited in terms of providing evidence as to the causal effect of contact with nature as isolated variable on reported increases in psychological well-being. Another weakness of this study, which must be noted, is the lack of a comparison group allocated walking in an alternate, non-natural setting or inclusion of a normative group in the study design.

Comparison was however a feature studies by Oxford Brookes University evaluating motivational factors and mental health outcomes of two so-called social psychiatric "G*reen Gym*" projects, in which participation in outdoor conservation projects was compared with traditional indoor gym activity (Reynolds; 2002; 1999). Not only was there a higher drop out rate for participants undertaking normal gym activity as compared to those involved in *Green Gym* projects, data showed significantly improved mental health and enhanced well-being in *Green Gym* settings. *Green Gym* participants stated that "being in the countryside" and "contact with nature" are key motivating factors for being active (Ibid). This research seems to support the findings the green exercise studies from *Essex University* (Pretty et al., 2005; 2007).

Civic environmentalism

The *Green Gym* projects described in the previous section are based on outdoor nature-conservation type activities. In other research studies, this kind of social psychiatric project has been termed. "civic environmentalism" (Townsend, 2006). Civic environmentalism has been linked with various mental health benefits for participants (Ibid, Furnass, 1996[1])

In an attempt to identify components necessary for a curriculum of nature-based therapy/ecotherapy training, public health researcher, Ambra Burls, has identified a wide range of positive and reciprocal health impacts stemming from community projects of "stewardship of natural capital" for marginalized populations (Burls, 2007). Based on a multi-method approach which included semi-structured interviews of both users and practitioners involved in a community civic environmentalism project and participant researcher field notes (stemming from an ethnographic case study of another "green space maintenance" programme for mental health users), several noteworthy beneficial outcomes became evident to Burls, including enhanced positive mood states (i.e. contentment, fun or amusement), acts of creativity and even peak experiences (Burls, 2007).

Lewis has observed how urban community garden schemes can positively strengthen social cohesion within neighbourhoods, reduce violence and elicit more positive appraisals of self and others (Lewis, 1996[2]). Maller and colleagues report that conservational projects such as *Friends of Parks* (Furnass, 1996[3]) lead to a range of positive outcomes correlating with dimensions of well-being, including that of general satisfaction and enhanced social relationships. Additional components of well-being identified by Furnass (via semi-structured interviews) were: opportunities for creative expression, a sense of participating in meaningful occupational activity and notably, opportunities for contact with nature (Townsend, 2006; Maller et al., 2002).

[1] Cited in maller et al., 2002
[2] Cited in Maller et al., 2002
[3] Cited in Maller et al., 2002 and Townsend, 2006

"*Just working with nature in general has to be good for your health. I always feel good about it*." (Participant in civil environmentalism project – Townsend, 2006)

Mardie Townsend has described a series of research studies carried out at Deakin University in Australia, drawing on both qualitative and quantitative data collection methodology to demonstrate significant physical, social and psychological health benefits of participation in such nature-based activity (Ibid). Three completed studies have provided evidence supporting a correlation between active involvement in hands-on environmental groups and positive health, enhanced well-being and social connectedness outcomes (Ibid). Mental health benefits of these projects are described in terms of social factors, relaxation and multi-sensory stimulation. Initial findings from the latest study (still in progress) of a woodland-based civic environmentalism project, focusing specifically on a self-selected population of individuals suffering from depression, anxiety and social isolation, indicate that the project "is likely to have" important mental health benefits for those involved (Ibid). However, such a claim remains within the sphere of conjecture until concrete results from this project become available. It should also be noted that there are several challenging aspects connected to the design of this study: for example, the presence of seriously confounding treatment variables such as medication use or other psychological/psychiatric interventions. Although Townsend reports that such baseline information is being collected and "will be taken into account in the analysis of project outcomes" (Ibid), I find it rather surprising, that the research design of this study does not include a control or comparison group (similar population, similar baseline data, yet different community-based, group activity) - a feature which would have considerably strengthened the feasibility of this study.

Community based conservation projects like these must be embraced as "macro-level" approaches to health promotion (Burls, 2007), which explicitly harness multi-level strategies of individual mental health promotion (i.e. drawing on the benefits of direct contact with nature, social effects related to group membership and *and* participation in personally meaningful and socially-valued occupation- Ibid). Of course, the identification of specific causal effect of natural content and contingencies is challenging in terms of such approaches, but if we choose to put the issue of confounding variables to side and consciously embrace the perspective that mental health benefits are best perceived as " relating to a combination of exposure to natural environments, increased levels of incidental exercise, and increased social capital" (Townsend, 2006), then this approach represents a distinctly promising avenue for mental health promotion and treatment of mental disorder – one which is certainly of relevance to clinical psychology.

The literature on civic environmentalism contains the interesting element of altruism - a factor, which may have significant implications in terms of explaining the mental health promoting properties of nature-based community activity. Community-based projects of natural stewardship are often of a voluntary nature and benefits have been described in terms of contributing something meaningful to the community, serving a greater purpose, opportunities for making a positive contribution to society, etc. (Burls, 2007; Maller et al., 2002; Furnass, 1996[1]). Research shows that people who participate in voluntary activities experience greater levels of positive emotion, less negative emotion, increased self-worth and greater satisfaction with life (Zachariae, 2006). Voluntary helping activities are also connected to better physical health and greater longevity (Oman et al., 1999[2]).

In this context, I would briefly like to mention recent rather findings that indicate that environmentally-friendly behaviour and attitude may be associated with distinct benefit for mental health (Mellen, 2006).

[1] cited in Townsend, 2006
[2] cited in Zachariae, 2006

In a demographic survey-based study[1] (n=643), Mellen found a significant correlation between reported subjective well-being (scales of life satisfaction, personal development and social well-being) and higher levels of environmental knowledge, environmentally friendly behaviour and attitudes (Ibid).

Wilderness and adventure therapy[2]

Of course, as in the case of civic environmentalism, any attempt to draw conclusions as to the specific therapeutic influence of nature contact *per se* is notoriously difficult in the field of wilderness and adventure therapy, due to the inevitable presence of the previously acknowledged confounding factors (e.g. Frumkin, 2001).

For example, in a cross-cultural international study, which sought to quantify the effects of wilderness landscapes on health and well-being, using questionnaires applied pre and post wilderness experience (based on simplicity, walking, and observing wildlife), Jo Peacock found that levels of self-esteem were significantly enhanced after wilderness experiences (Peacock, 2007). It should be noted however, that many participants reported the sharing of experiences together as a major reason for their positive feelings. Similarly, in the Kaplan's long-standing research based on wilderness programmes in the US, one of the main findings (using both pre- and post questionnaires and journal writing during and after the quest) was a positive increase in self-reported levels of self-esteem (Kaplan & Kaplan, 1989). However, these results are also susceptible to interpretative errors due to the presence of many different "uncontrollable variables" (e.g , these wilderness programmes were group-based), which might well be more directly correlated with these outcomes than the fact that participants spent an intense period exposed to relatively pristeen natural environments (Ibid). Another major component of the programmes was the learning of particular survival skills and physically demanding challenges such as long distance hiking. Obviously, the experience of enhanced competence and skills development might well be the most significant causal factor underlying any increase in self-esteem. Although the Kaplans acknowledge the weaknesses in their own research methodology (i.e. results based on self-reports and lack of use of standardised measures) and express caution in how results are interpreted, they insist that the general pattern of results should be viewed as indicating the particular suitability of wilderness environments for providing suitably challenging and novel experiences to enable positive developments in self-concept (Ibid).

Greenway has reported marked increases in positive emotions and general sense of well-being[3] as a direct consequence of exposure to 2-week long wilderness experience programmes (Greenway, 1995). As in the Russel and Mehrahbian study cited earlier, this research also alludes to significant increases in health-enhancing behaviour (reported in terms of decreases in smoking and use of alcohol) as a consequence of exposure to nature. These findings are based on qualitative field research, which spanned over 2 decades and 1400 subjects and was based on 700 interviews, 700 questionnaires and 52 longitudinal studies tracking participants several years after the wilderness experience (Ibid). However, although the sheer volume of data collected by Greenway is impressive, as these trips were undertaken in groups, we must acknowledge the possibility of social factors and as a confounding

[1] Survey designed specifically for this study (Mellen, 2006)

[2] The terms wilderness and adventure therapy are often used synonymously in the literature. However, they can be distinguished from each other on the basis of their origins and theoretical positioning. Adventure therapy as an approach is sourced in experimental learning theory and concepts of supporting development and change by bringing people out of their "comfort zone" through challenging experiences and thereafter processing new learning via group processes of reflection (Gass, 1993). Nature is seen as optimal environment for providing such developmental challenges (Berman & Davis-Berman, 1995). Wilderness therapy has developed is characterised by a more eco-psychological and meta-physical stance and is less focused on intentional activity and more on the meeting of the individual with the vastness of wild places – abandoning "civilisation" for a while in the quest to find a more authentic level of self (Harper, 1995).

[3] 90% of respondents on return described "an increased sense of aliveness, well-being and energy" (Greenway, 1995)

variable, not to mention elements relating to task achievement (Frumkin, 2001). Unfortunately, Greenway's has not published his findings in any relevant academic journal and it has not been possible for me to ascertain the details of his research methodology or the statistical significance of his results

Yet, whatever cocktail of causal factors might be implied (group bonding, common goal, meaningful activity, social interaction, restorative factors, experiential metaphor, positive reframing, existential reflection, transcendence or any combination of such factors), wilderness and adventure-based approaches are undeniably connected to a plethora of beneficial mental health effects and have been therapeutically applied in treatment of a wide spectrum of clinical populations from youth with eating disorders (Berman & Davis-Berman, 1995; Fisker & Carstensen, 2006), behavioural problems and low self-esteem/issues of identity (Berman & Davis-Berman, 1995) to depression (Ibid; Steensgaard, 2008). It should be noted that there are many studies within the field of wilderness and adventure therapy that indicate benefits in terms of self-esteem. For example, a meta-analysis of more than 300 studies of participants in wilderness experience programs found that the most significant pattern emerging from these studies was increased self-esteem and sense of personal control for participants (Hendee 1993[1]).

Transcendence in wilderness settings

"*Thoreau wrote of nature as a source of spiritual renewal and inspiration. A surprising outcome of the wilderness research has been the remarkable depth of such spiritual impacts*" (Kaplan & Kaplan, 1989)

One particularly interesting finding arising from research on wilderness therapy is that of experiences of transcendence in natural settings. Of course, scholars such as Abraham Maslow and Margharita Laski have long since observed the association between nature and transcendent experience (Maslow, 1964; Laski, 1961)[2]. Burns has described nature's capacity to take us "beyond the self" (Burns, 2005), speculating that spiritual experiences may arise as a direct consequence of states of awe and wonder arising in natural settings. In fact, Burns considers experiences of spiritual transcendence to be one of the major categories of benefits available in human-nature interaction (Burns, 2005; 2007). Transcendence has been referred to as a virtue or strength that "forges connections to the larger universe and provide meaning" (e.g. Petersen & Seligman, 2004[3]) and a significant correlate of general well-being (Myers, 2000).

Several researchers have noted the transpersonal effects of exposure to wild natural environments (Priest, 2007; Williams & Harvey, 2001; Frederikson & Anderson, 1999; Kaplan & Kaplan, 1989). In their earlier wilderness-based research, Kaplan and Kaplan noted that the simplicity of immersion in wilderness experiences had the impact of causing many participants to describe experiences of a sense of "wholeness or oneness" (Kaplan & Kaplan, 1989) [4].

Williams and Harvey describe how transcendent experiences have been associated with a range of positive psychological states such as flow (Csikszentmihalyi, 1992), peak experience (Maslow, 1968) and ecstacy (Laski, 1964)[5] and are generally triggered more readily in natural settings than other

[1] Cited in Berman & Davis-Berman, 1995.
[2] Cited in Williams & Harvey, 2001.
[3] Cited in Seligman et al., 2005
[4] It is perhaps worth noting here that the Kaplans have later identified *spirituality* as a further dimension to processes of restoration in a study of restorative effects of retreat at a Benedictine monastery (Ouellette et al., 2005). Factor analysis of reasons for attending the retreat gave support for all components of Kaplan's *Attention Restoration Theory* (ART) but also indicated spirituality as another possible component of restoration (Ibid).
[5] Maslow and Laski cited in William & Harvey, 2001.

contexts (Williams & Harvey, 2001). Drawing on both quantitative and qualitative methods (both content analysis of written descriptions and a questionnaire survey), these authors have studied qualitative experiences of spiritual transcendence and associated positive effects in forest settings (n=131), as well as the environmental characteristics, which might shape these experiences (Ibid). According to Williams and Harvey, the phenomena of transcendent experience shares certain psychologically beneficial features, listed as strong positive emotion, renewed perspective on everyday life with a greater sense of own ability to cope, "a sense of union with the universe or some other power or entity", experiences of flow and greater absorption in the present moment and a sense of timelessness (Ibid).

The authors conclude that emotional responses and transcendental experiences vary according to environmental feature. Experiences termed as "deep flow experiences" (feelings of relaxation and tranquillity), were associated with settings characterised as having high compatibility and familiarity (Kaplan & Kaplan, 1989), whereas highly novel and fascinating environments tended to be connected with what they term "diminutive experience" (Williams & Harvey, 2001). Diminutive experiences were less relaxing and attributed to strong focus and presence in the moment. It should be noted that Williams and Harvey assume spiritual experience as an experiential consequence of human-nature interaction. Their focus is rather how *type* of transcendent experience is related to the particular features of a natural environment (Ibid).

Frederikson and Anderson have also charted the qualitative aspects of person-place relationship in terms of effects of different environmental features on reports of spiritual experience (1999). Using a combination of on-site observations, personal field journals and in-depth interviews, the affective responses and reports of "spiritual inspiration" were recorded in a group of 12 women undertaking a wilderness trip in one of two locations. Follow-up interviews were carried out within three weeks of the trip. Although most women assigned experiences of spiritual inspiration or "religious experience" to the combined influences of natural features, the sharing of the experience with others and the effects of physical challenge, the importance placed on contact with nature itself is worth noting in this study (Ibid). Features of the landscape or "biophysical aspects of the environment" and the experience of being away from civilization were granted particular meaning and significance in terms the subjective importance of the trip. Participants "frequently mentioned how exhilarating it was to hear or see various signs of wildlife, or to feel the weather gradually shifting before a storm". Periods of solitude in nature also emerged a significant influential factor, with many participants revealing this as important in terms of self-reflection and the pondering of existential themes. Several described how processes of self-reflection were qualitatively different from when at home, attributing this to subjective feelings of greater freedom to explore undisturbed and heightened sensual acuity. In fact, many connected this heightened sensory awareness with that of spiritual experiences in nature. Another element to emerge from this qualitative study was that of a sense of attachment to and identification with those places in which the individual had been immersed. On the basis of follow-up interviews, these authors hypothesize that meaningful experiences of transcendence in nature may have long-term beneficial effects on the mental health (i.e. lead to a more "psychologically-balanced state of being") of the individual (Ibid). However, they do not provide any empirical support for such a claim.

States of flow in nature

"*Even individuals not intending activities often find themselves aligning their purposes in that direction in the presence of nature*" (Kaplan & Kaplan, 1989).

In a study of the psychology of mountain-climbing, Mitchell has described experiences of transcendence, distinguishing between active and passive "experiences of the sublime" (Mitchell, 1983[1]). I would like to highlight that his description of the active form of sublime experience as an "active merging with mountains through the dynamics of climbing" (Ibid), bears a strong resemblance to Csikszentmihalyi's concept of flow (1990). In the above study, Williams & Harvey also identified experiences of flow as an integral element of positive states of transcendence in natural settings (Williams & Harvey, 2001). Interestingly, the concept of flow or "vital engagment" (Csikszentmihalyi, 1990) has been frequently associated with the beneficial psychological effects of meaningful activity in natural settings although, yet in these more general applications, it is not associated with transcendental experience (e.g. Grahn, 2007a; Grahn, 2006; Welen-Anderson, 2006; Norling, 2001).

Drawing on Csikszentmihalyi's work, Ingemar Norling of *Sahlgrenska Hospital* in Gothenburg, theorised that nature-based activity leads readily to states of flow, because activity in such settings is generally meaningful and enjoyable for most people, and thus inherently self-rewarding (Norling, 2001). That activity leading to states of vital engagement might be inherently meaningful for people has been described by Nakurama & Csikszentmihalyi (2003) and Kaplan and Kaplan have long ago noted that activity in nature is meaning-generating (1989).

It should therefore come as no surprise that researchers at Alnarp have been attracted to the theory of flow/vital engagment in their search for psychological explanations, and have explicitly assigned it a causal role in therapeutic outcome of the rehabilitation programme for burnout clients (Stigsdotter, 2007; Grahn, 2007a). Grahn has described how healing garden activities are inherently self-rewarding flow experiences in which positive perceptions of self and one's purpose is enhanced (Grahn, 2007a).

Seligman and colleagues have claimed that one of the major routes to happiness is provided by full engagement in gratifying activities, i.e. activities in which we experience a state of flow or complete absorption (Seligman et al., 2004). A person in flow is sufficiently challenged, yet not so much that he or she is overtaxed by a task. Thus, in flow experiences, a balance is achieved between personal resources, inclinations and demands. Csikszentmihalyi and LeFevere found that people who experience high levels of flow at work and in their leisure time are significantly more motivated and creative than those not experiencing states of flow (1989[2]).

Vital engagement or flow has been described as an essential component of optimal development and thriving (Nakamura and Csikszentmihalyi, 2003). In this context, it seems of relevance to note that erosion of engagement is one of the alleged components of burnout syndrome (Maslach et al., 2001). Thus we might hypothesise, that if states of flow and vital engagement are a potential outcome of exposure to natural settings, then this might justify their use in terms of prevention and treatment of burnout syndrome.

The hypothesis that state of flow or vital engagement might be a central element leading to beneficial outcome of activity in nature is a potent and plausible one, which I would posit offers itself as an obvious candidate for future research. In fact, to avoid the reification of this theory, which I would propose is evident to some extent within the Swedish literature[3], it is essential that researchers develop methods to examine its evidence-base more thoroughly.

[1] Cited in Williams & Harvey, 2001
[2] Cited in Seligman et al., 2004
[3] e.g. Norling, 2001; e.g. Grahn, 2005; 2006; Bergenzaun Abel, 2004

2.5 SUMMARY OF BENEFITS

"*A balanced appraisal of the overall state of relevant knowledge suggests that cautious optimism is justified.*" (Ulrich, 1999)

Mental health benefits across a continuum

The above overview may be perceived as an attempt to 'weave' research findings, clinical application and a range of theoretical perspectives together into a meaningful and descriptive 'tapestry' depicting the alleged and demonstrated beneficial psychological processes and effects attainable within the sphere of human-nature interaction. This weaving process has revealed cognitive, affective and physiological stress-restorative properties of natural environments, how nature might help us in regulation/management of our psychological resources and the potential of direct interaction with natural environments and participation in nature-based activity to elicit positive emotions and mood states, not to mention achievement of greater levels of meaning and coherence, the enhancement of self-esteem and well-being, increased engagement and sociability etc. Admittedly, this process has resulted in a complex product, made up of threads of evidence from a multitude of sources – also those beyond psychology as an academic discipline and clinical practice.

A summary (including sources) of these alleged beneficial psychological outcomes attainable in natural settings, stretching across a spectrum/continuum of health promoting process/effect: from recovery and restitution in cases of psychopathology to achievement of optimal states of flourishing mental health in normal populations (*as described in Figure 2, page 21*) are herewith presented in Table 1 (*see page 58-59)*. This evidence has been extracted from a range of empirical (ranging from true experimental to quasi-experimental and correlational studies[1]), anecdotal and theoretical sources, which I have made clear in my presentation.

[1] Thus in terms of an evidence hierarchy, some sources are obviously more reliable and valid than others (Zachariae, 2007).

Table 1
A summary of evidence indicating the alleged positive psychological effects of exposure to natural environments (as inspired by Maller et al., 2005; 2002)

Claimed positive psychological effect	Key references and type of evidence		
	Empirical	Anecdotal	Theoretical
Perception/belief that nature offers restorative and stress-reducing benefits	Hartig & Staats, 2006; Nielsen & Hansen, 2005; Frerichs, 2004; Grahn & Stigsdotter, 2003; Korpela et al., 2001; Korpela & Hartig, 1996		Ulrich, 1983
Perception/belief that access to nature improves life quality	Bjørk et al., 2007[1]	Zeisel & Tyson, 1999	Grahn, 2003
Enhanced attentional functioning, cognitive restoration	Ottosson & Grahn, 2006; Herzog et al., 2002; Taylor et al., 2001; Van der Berg et al., 2003; Kaplan, 2001; Wells, 2000; Hartig et al., 1991; Hartig et al., 2003; Tennesen & Cimprich, 1995; Berto, 1995; Cimprich, 1993;	Hansen-Møller & Oustrup, 2004	Kaplan & Kaplan, 1989
Stress regulating: decreased arousal, lower pulse and heart rate, lowered cortisol levels, general parasympathetic response	De Kort et al., 2006; Pretty et al., 2005; Hartig et al., 2003; Parsons et al. 1998; Ulrich et al., 1991; Hartig et al., 1991; Heerwagen, 1990[2]		Ulrich, 1983
Stress management, use of nature as coping strategy/resource	Guwaldi, 2006; Whitehouse et al., 2001; Nielsen & Hansen, 2006; Stigsdotter & Grahn, 2004	Burns, 1998; Kaplan & Kaplan, 1989; Grahn, 2005	Ulrich, 1983; Ulrich et al., 1991; Grahn, 2005; Kaplan, 2001; Francis 1987[3]
Stress buffering/ stress prevention	Grahn & Stigsdotter, 2003; Nielsen & Hansen, 2006; Hansen & Nielsen, 2007; Wells & Evans, 2003; De Vries et al., 2003; Stigsdotter & Grahn, 2004; Parsons et al., 1998; Hartig et al, 1991; Leather et al., 1998		Burns, 1998
Enhancement of affective state and improved mood	Whitehouse et al., 2001; Pretty et al., 2005; Pretty et al., 2007; Gigliotti & Jarrot, 2005; Hartig et al., 1991; Hartig et al., 2003; Van der Berg et al., 2003[4]; Hartig et al., 1996; Cooper Marcus & Barnes, 1995; Larsen et al., 1998; Ulrich et al., 1991; Russel & Mehrahbian, 1976[5]	Burls, 2007; Clinebell,1996; Burns, 1998; Greenway, 1995	Ulrich, 1983
Positive distraction			Ulrich, 1999
Reduction in aggression and anger	Hartig et al., 2003; Berger, 2006; Hartig et al., 1991; Whall et al., 1997[6]; Kuo & Sullivan, 2001a; 2001b; Kuo, 2001	Lewis, 1996[7]	Hartig et al., 1991
Enhanced self-esteem	Peacock, 2007; Pretty et al., 2007; 2005; Priest, 2007; Berger 2006;	Lewis, 1996	

[1] Cited in Ottosson & Grahn, 2008
[2] Cited in Morris, 2003
[3] Cited in Kaplan & Kaplan, 1989
[4] Cited in Van der Berg et al, 2007
[5] Cited in Burns, 1998
[6] Cited in Ulrich, 1999
[7] Cited in Maller et al., 2002

	Reynolds, 2002; Berman & Davis-Berman, 1995; Hendee, 1993[1]; Kaplan & Kaplan, 1989		
Increased fascination permitting opportunities for reflection			Kaplan & Kaplan, 1989: Herzog et al., 1997; 2002
Attainment of new perspectives and deeper levels of meaning and coherence/regulation of self-concept	Whitehouse et al., 2001; Frederikson & Anderson, 1999	Burns, 1998; Grahn et al., 2006	Korpela et al.2001; Korpela & Hartig, 1996; Kaplan & Kaplan, 1989; Searles, 1960
Increased social engagement and enhancement of social relations	Burls, 2007; Coley et al, 1997; Taylor et al., 1998; Berger, 2006; Browne, 1992[2]	Townsend, 2006¸Burns, 1998; Clinebell, 1996; Lewis, 1996	
Generally enhanced psychological well-being	Pretty et al., 2007; Gigliotti & Jarrot, 2005; Reynolds, 2002;1999; Kaplan, 2001; Leather et al., 1998; Furnass, 1996[3]	Burns, 1998; 2005; Greenway, 1995	
Increased positive appraisal of and satisfaction with life circumstances (including job satisfaction)	Kuo, 2001; Kaplan, 2001; Whitehouse et al., 2001; Kaplan et al., 1988; Leather et al., 1998; Larsen et al., 1998; Furnass, 1996; Finnegan & Solomon, 1981[4]		
Increased levels of engagement and motivation	Gigliotti & Jarrot, 2005; Reynolds; 1999; 2002		Burls, 2007
Experience of states of vital engagement/flow	Williams & Harvey, 2001; Frederikson & Anderson, 1999		Grahn, 2006; Norling, 2001
Production of narratives drawing on symbols available in the metaphorical environment		Linden & Grut, 2002; Berger & McLeod, 2006; Burns, 1998; Worsham & Goodvin, 2007; Welen Anderson, 2006	
Increased focus, awareness and presence in the here and now	Williams & Harvey, 2001	Burns, 1998;2005	Markersen, 2007a
States of transcendence	Williams & Harvey, 2001; Frederikson & Anderson, 1999	Burls, 2007; Priest, 2007; Kaplan & Kaplan, 1989	Burns, 2005; Maslow, 1964; Laski, 1961[5]
Macro-level health benefits – i.e. benefits for community and environment	Mellen, 2006	Burls, 2007; Townsend, 2007; Pretty et al., 2005; Maller et al., 2002	

Individual variables

Obviously, in drawing conclusions about psychological benefits of nature contact, the different personal needs, biographies and characteristics of a client will influence to what extent a particular environment is experienced as beneficial to mental health or not. Indeed, it has been postulated that individual experience of nature depends on current life situation and on how much a person is able to absorb from the environment (Ottosson & Grahn, 1998). For example, perceived restoration potential of environments appears to be correlated with individual *need* for restoration, with findings that suggest that there is a greater tendency to perceive natural environments as restorative when one is suffering from states of psychological depletion, such as stress and fatigue (Grahn, 2007a; Hartig & Staats, 2006; Guwaldi, 2006; Stigsdotter & Grahn, 2003; Hartig, 1993[6]). Guwaldi has observed that teachers with "high-frequency vocational stress" appear to use nature for restorative purposes, emphasising a need to "get away and stay away", whilst those classified as low-frequency vocational stress, described their needs for nature contact in terms of "sensory enjoyment" (Guwaldi, 2006). This finding

[1] Cited in Berman & Davis-Berman, 1995
[2] Cited in Maller et al., 2002
[3] Cited in Townsend, 2006
[4] Cited in Kaplan, 2001
[5] Cited in Williams & Harvey, 2001
[6] Cited in Ulrich, 1999

harmonises with clinical observations from Alnarp Rehabilitation Garden, where the restorative needs of clients have been linked by researchers as closely dependent on "mental powers" available to the client (Grahn et al., 2007; Grahn, 2005). These clinical observations have formed the basis of a visual model which aims to convey how level of patient engagement is a factor of available psychological resource – and how such engagement typically changes during the course of the treatment programme at Alnarp, from "*inwardly directed engagment"* at the start of the programme through "*emotional participation"*, "*active participation"* and finally to a level described as "*outwardly expressed engagment*[1] "(Grahn, 2005). Thus, we see how individual needs are indeed phase-specific, demanding different interventional strategies at different temporal points in the recovery process. Here we see how a further nuance of nature-assisted interventional strategies (or any therapeutic strategy for that matter) – i.e. that the needs of an individual will change over time.

"*Overvejelserne over valg af metode relateret til klientens problematik er desuden gjort mere nuancerede ved også at inddrage spørgsmålet om fasespecifikke opgaver i forskellige dele af terapien*" (Hougaard, 2004)[2]

Whitehouse and colleagues also emphasise how the patterns of usage of a healing hospital garden are closely associated with the particular needs of the individual, with healthy children needing activities and ill children preferring stillness and peace (Whitehouse et al., 2001). That individual experience of nature can vary greatly is exemplified by a qualitative interview-based study, in which three female patients, undergoing treatment at *Alnarp Rehabilitation Garden*, reported widely differing needs in terms of nature contact/gardening and other activities (Nevstrup Anderson, 2007).

Current need for social interaction may be one of the parameters that play a role in determining the degree to which nature is experienced as personally health-promoting. A study of a group of elderly people recently admitted to a nursing home, showed an initial preference for views with people, followed by a later predominance of natural view preferences (O'Coonor et al., 1991[3]). In another study, which indicates the necessity for other basic safety needs to be satisfied before nature can be experienced or considered beneficial, natural environments encountered in solitude were rated as more restorative, but only as long as clients' feelings of safety are first controlled (Staats & Hartig, 2004).

These findings lead me to speculate as to the possible influence of a hierarchy of needs á la Maslow (Maslow, 1968). Although Maslow's theory of human motivation is largely speculative and has been criticised for its lack of empirical support (e.g. Wahba & Bridgewell, 1976[4]), it has had immeasurable influence in the history of psychological thought and practice. I would therefore like to draw on Maslow's theory to hypothesise that contact with nature for purposes of enhancing health and well-being (as opposed to physical survival) might fall into the category of what Maslow termed '*growth'* or '*being needs'* (*B-needs*), whereas the above two categories of safety and social belonging are more fundamental '*deficiency needs'*. Interestingly, Maslow's B-needs, as motivators towards self-actualisation and transcendence, actually directly referred to the role of nature's beauty in meeting what he described as aesthetic needs (Maslow, 1968). In other words, he claimed that we are consciously and unconsciously motivated to seek aesthetic experiences in our striving towards personal growth and self-actualisation, and that nature may play a role in meeting such needs (Ibid). Thus, on the basis of such theorising, we might conclude that this is a further individual variable

[1] Translated from the Swedish "utåtriktat engagemang" (Grahn, 2005).
[2] Translation: " Considerations about choice of method in terms of the client problem are made more nuanced by including the question of whether phase-specific tasks may be relevant in different phases of the therapeutic process" (Hougaard, 2004)
[3] Cited in Ulrich, 1999
[4] Cited in Huitt, 2004

parameter influencing the extent to which exposure to natural environments might be experienced as psychologically beneficial.

Parameters connected to life-span also affect how nature is individually experienced. Kaplan & Kaplan (1989) noted age differences in their early studies: for example, they observed how the reflective opportunities of solo experiences in nature were generally more highly valued the older a person was. For adolescents, time alone in nature seemed to be an unpleasant challenge but for older adults, such time was more often reported in positive tones and connected with psychological processes, which might be described as existential or transpersonal (Ibid). The Kaplans have later been drawn to examine in more detail what they observed as a seeming lack of interest in nature during the teenage years. Based on an extensive review of existing literature, they conclude that adolescents' experience of nature does not follow the "universal preferences" model of other research. In fact, it appears that there is a "time out" in preference for natural settings during these years (Kaplan & Kaplan, 2002), a finding, which obviously has implications in terms differential use of nature-based therapeutic practices.

Ulrich and colleagues have noted the influence of learning-based and cultural influences on individual preferences for nature, suggesting that "western cultures tend to condition their inhabitants to revere nature and dislike cities" (Ulrich et al, 1991). This paper also points out the influence of past positive (or negative) conditioning on attitudes to nature: memories of good or less appealing times in natural settings will of course influence to what extent an individual might seek nature for psychological purposes. We must not overlook the fact that in some cases, natural settings normally associated with positive appraisals, might be experienced as far from benign. This may be due to general anxieties about "snakes, spiders or other creepy-crawlies" (Burns, 2005), phobic disorders (for example, agoraphobia as an obvious candidate) or traumatic experiences connected to particular natural settings. For example, a forest might well be perceived as highly dangerous and evocative of traumatic memories[1], eliciting responses of fear rather than fascination (Van der Berg & Ter Heijne, 2005). The possibility that natural environments might, for some clients, be associated with *negative* affect and *increased* stress, must of course be acknowledged and assessed before beginning any treatment rationale involving contact with nature.

Burns too, has asked whether nature is beneficial for everyone's well being, speculating as to the appropriateness of nature-assisted therapeutic strategies for "non-nature lovers" (Burns, 2005). He posits that there will be those who are afraid of nature and appreciates that for many post-modern, urban individuals, an experience of detachment from nature might make nature as therapeutic paradigm meaningless to them. Do Orr's "environmentally illiterate" actually experience a connection to nature or a desire to spend time in nature (Orr, 1993)? Would such individuals benefit therapeutically from contact with natural environments? Obviously, such speculations remain to be investigated in future research projects. Yet, the fact remains, that people do express a universal preference for nature over urban environments (Van der Berg et al., 2007; Herzog et al., 2000; Newall, 1997; Purcell et al., 1994)) and many people (even incarnate city-dwellers) will choose to go on holiday in natural settings (Burns, 2005). We must also acknowledge that various studies exist which substantiate a general preference for natural settings in times of stress/psychological distress (Olds, 1985; Francis & Cooper Marcus 1992[2]; Barnes, 1994; Korpela & Hartig, 1996; Herzog et al., 2002; 2003; Grahn & Stigsdotter,

[1] Anecdotal case story: Peter Engholm Jensen, leader of Red Cross refugee centre in Copenhagen, describes the case of a Bosnian woman who responded to a view of a pine forest from her window with a classic post-traumatic reactions involving anxiety and flashbacks. The view evoked memories of a severely traumatic experience in which this woman had seen her family executed in such a setting. The woman was relocated to a new room with an urban view: Personal correspondence.

[2] Cited in Cooper Marcus & Barnes, 1999 (Barnes, 1994 is also cited in this book)

2003; Frerichs, 2004[1]; Regan & Horn, 2005). Furthermore, throughout his entire 20 years of clinical practice, utilising strategies for well-being arising from self-assessments of pleasurable sensory experiences (based on an estimated 2000 administrations of the *Sensory Awareness Inventory*, which is a method used to facilitate positive, therapeutic sensory experiences for clients), Burns notes that most sensory experiences reported have been nature-based – from the smelling of a rose to watching waves crash on a shore (Burns, 2005). Thus, for Burns, the question is not whether people do or do not relate to natural environments, but rather to find "what aspects of the environment they relate to in a most pleasurable way, and how that interaction can be effectively utilized for enhancing well-being" (Ibid).

Needless to say, it is imperative that we acknowledge and be sensitive to parameters of individual differences, not only when drawing conclusions about the effects of nature on human mental health, but also in relation to clinical practice. As Burns puts it, "*Different people respond to different therapeutic interventions – a factor one needs to be cognizant of when using nature-guided processes either for the enhancement of well-being or as therapeutic intervention*" (Burns, 2005). For example, does the client want to work with nature? Are they perhaps afraid of nature? Can nature-assisted strategies be justified in terms of a client's specific therapeutic needs? What other forms of therapy would perhaps suit the client better? And how might use of nature-based applications and therapeutic focus change over time in relation to a particular client's needs/resource level (Grahn, 2005), based on the principle of "fasespecifikke opgaver"[2] Hougaard, 2004?

"*Før man beslutter sig for at anbefale en behandling, vil det imidlertid være vigtigt også at undersøge behandlingens praktiske relevans, herunder hvad der er vigtigt for klienten, og hvordan klienten oplever behandlingen*" (Zachariae, 2007)[3]

[1] Cited in Van de Berg et al., 2007
[2] Translation from the Danish: "phase-specific tasks".
[3] Translation from the Danish, "Before one decides to recommend a treatment, it will be important to examine the practical relevance of this treatment, including what is important for the client, and how the client experiences the treatment" (Zachariae, 2007).

2.6. IMPLICATIONS FOR CLINICAL INTERVENTION

Taking individual differences into account, I would now like to focus on how the benefits described in this chapter (both in terms of nature as direct relationship and setting) might manifest as concrete clinical or salutogenetic strategy? How might psychologists draw upon the above findings in terms of practice? Are there good grounds for "cautious optimism", as claimed by Ulrich (Ulrich, 1999)?

Established areas of application

Firstly, let me list some of the clinical applications currently available within the literature. Table 2. (*see page 64)* provides a range of known nature-assisted mental health applications within psychological interventional practice.

Of course, the examples listed in this table represent clinical applications the entire spectrum of nature-assisted modality from adventure/wilderness therapy to civic conservation to passive use of healing garden environments[1]. Therefore, many of these clinical applications represent multi-level therapeutic approaches, which obviously rely on psychological process/effect from sources other than nature-human contact, such as those linked to increased social inclusion, participation in meaningful occupation, not to mention a range of non-specific and factors which might be attributed to the therapeutic relationship. This is a theme I have highlighted at several points during this discussion and summarised in *Figure 1* on *page 20*. Evidence that might indicate nature's specific unmediated or direct therapeutic and salutogenetic benefits coming from the realm of authentic clinical practice (as opposed to experimental studies) is largely based on qualitative report methodology and subjective evaluation of participating clinicians (e.g. Linden & Grut, 2002; Burns, 1998).

However, I would argue that the incorporation of nature-assisted strategies within integrated programmes of prevention, management and rehabilitation of stress and stress-related disorders does seem to be well-founded, both in terms of supportive empirical data and clinical experience. Such a claim is made on the basis of many sources outlined in the above literature review, which indicate appropriate response in terms of stress reduction and relaxation, not to mention the inferring of stress-restorative properties in cases of pathological states of depletion. Stress intervention is applicable across the whole range of the mental health-promoting continuum – for example, processes of cognitive and affective restoration are equally applicable in terms of "micro-restorative" stress-buffering opportunities (Kaplan, 2001) as they are as integrated element in treatment of chronic stress-related disorders such as burnout/stress-related depression (Ottosson & Grahn, 2008; Grahn, 2005). Indeed, Ulrich's *Theory of Supportive Gardens* (as applied to both medical and psychological treatment settings), is founded on the basic premise that exposure to garden environments improve health outcomes mainly because of their effectiveness as stress-regulating/restorative *and* stress-buffering resources (Ulrich, 1999).The concept of nature as supporting us in both in the management and restoration of psychological capital and resources is a central one to this thesis and I have outlined a great deal of literature, which indicates such a relationship (see section 2.2). Thus, as I have noted in the introduction, it is not surprising that this is the area of application, which currently receives most attention.

[1] And yet this table is no where near exhaustive. I have not included all the applications demonstrated within fields of horticultural therapy and wilderness/adventure therapy, but merely given a brief overview.

Table 2
A selection of clinical applications of nature-assisted psychological interventions available within the literature

CLINICAL APPLICATION	SOURCE OF EMPIRICAL AND/OR ANECTODAL EVIDENCE
General public health strategies of mental health promotion	Maller et al., 2002; 2003; Nielsen & Hansen, 2006[1]
Stress management/regulation	Guwaldi, 2006; Stigsdotter & Grahn, 2004
Stress prevention/buffering	Wells & Evans, 2003; Parsons et al., 1998; Nielsen & Hansen, 2006
Stress rehabilitation or restoration including treatment of burnout syndrome/'udmætningsdepression	Grahn et al., 2006; 2008; Kaplan & Kaplan, 1989; Ulrich et al., 1991; Stigsdotter & Grahn, 2003; Clinebell, 1996
PTSD, crisis rehabilitation	Ottoson & Grahn, 2008; Linden & Grut, 2002; Ottoson, 2001; Gerlach-Spriggs et al., 1998
Grieving processes	Rust, 2004; Linden & Grut, 2002; Whitehouse et al., 2001
Depression and depressive symptomology	Mind, 2007; Reynolds; 2002; 1999; Townsend, 2006; Burns, 1998; Berger & McLeod, 2006; Clinebell, 2006
Recovery, e.g.schizophrenia/psychotic states	Grahn, 2005; O'Reilley & Handforth, 1955[2]
Addicitive disorders	Grahn, 2005; Greenway, 1995; Russel & Mehrahbian, 1976; Priest, 2007; Berman & Davis-Berman, 1995
Emotional and attachment disorders in children	Worsham & Goodvin, 2007
Attentional disorders and learning difficulties in children	Taylor et al., 2001; Berger, 2006; Berger & McLeod, 2006
Dementia disorders	Hartig & Cooper Marcus, 2006; Gigliotti & Jarrot, 2005; Dahlenborg, 2005; Schmidtbauer et al, 2005; Zeisel & Tyson, 1999; Whall et al., 1997[3]
Eating disorders	Berman & Davis- Berman, 1995; 1989; Fisker & Carsten, 2006; Fisker, 2008[4]
Antisocial behaviour and aggression	Berger, 2006; Kuo & Sullivan, 2001a; 2001b; Kuo, 2001; Lewis, 1996[5]; Whall et al., 1997[6];
Increased self-esteem, identity issues	Berman & Davis- Berman, 1995; Pretty et al., 2005; Reynolds, 2002
Social skills development and enhanced relationships	Worsham & Goodvin, 2007; Berger, 2006; Burns, 1998; Coley et al., 1997; Clinebell, 1996
Existential crisis	Burns, 1998; Kaplan & Kaplan, 1989

[1] Accordingly, Nielsen and Hansen have called for changes in public policy to improve both the level of attractiveness and ease of access to green areas to promote greater health for the inhabitants of Copenhagen (Nielsen & Hansen, 2006).
[2] This reference comes from a Sempik and colleagues who cite a report from a 1955 edition of the *American Journal of Psychiatry,* which describes the efficacy of a horticultural therapy programme for 14 female psychiatric patients (11 of whom had been diagnosed as schizophrenic) considered untreatable by other interventions. Case study reports of these patients showed a "striking improvement" and significantly improved levels of adaptation in 13 of these patients (O'Reilly & Handforth, 1955 - cited in Sempik et al., 2003b).
[3] Cited in Ulrich, 1999
[4] PhD thesis due for publication May, 2008
[5] Cited in Maller et al., 2002
[6] Cited in Ulrich, 1999

It is worth highlighting in this context how burnout syndrome as a pathological manifestation of prolonged stress has been defined in terms of emotional resource depletion and the draining of psychological capital (Maslach et al., 2001; McMicheal et al., 2001). Opportunities for both regulation and restoration of emotional resources in natural settings would therefore be of relevance to burnout rehabilitation. At the heart of burnout syndrome lie the components of emotional exhaustion, a loss of ability to participate in emotionally-engaged interaction (depersonalisation or cynicism) and a negative view of own competence (Maslach et al., 2001). If, as the literature indicates, exposure to nature elicits elevations in emotional and mood state, it seems reasonable to hypothesise as to the therapeutic implications of natural settings in terms of burnout recovery[1]. This is of course not a novel idea by any means – indeed, the entire programme of burnout rehabilitation at Alnarp, is built on the conceptual fundament assumption that direct contact with nature is a significant aspect of positive therapeutic outcome for clients suffering from burnout syndrome (e.g. Grahn, 2007a; Stigsdotter & Grahn, 2003).

Reflecting further on the last component of burnout, which is defined in terms of a tendency to negatively view or appraise one's own performance (Maslach et al., 2001), it might be hypothesised that studies which refer to nature's role in generally supporting more positive appraisals/outlook on life situation (e.g. Kuo, 2001; Whitehouse et al., 2001; Larsen et al., 1998; Leather et al., 1998; Kaplan et al., 1988; Frey, 1984[2]) and increases in self-esteem (Priest, 2007; Pretty et al., 2005; Reynolds, 2002; Hendee, 1993[3] etc.) might likewise be relevant in terms of treatment of burnout. In other words, these findings demonstrate that time spent in nature may be able to bring about more *positive appraisals of current life circumstance.* Whether, these tendencies can be applied to appraisal of one's own competency and performance, is of course another thing, but we might hypothesise contact with nature as perhaps supporting more universal shifts towards more positive cognitive/emotional appraisals of self and life. Such speculations obviously require much refinement before they might be presented as a testable hypothesis.

If contact with natural environments does lead to enhanced positive appraisals and encourage more positive outlook on life situation and self, then a plausible hypothesis might be that increased optimism could well be an outcome of spending time in preferred natural settings. Various researchers have identified the positive link between optimism and both psychological and physical health (Seligman, 1991[4]; Taylor et al., 2000[5]). A range of studies have shown that optimistic individuals live longer, are more healthy and are more capable of dealing with stressful situations (Danner et al., 2001; Maruta et al., 2000[6]). They also exhibit greater self-esteem and thus greater self-efficacy, which makes it easier for them to build and utilise their social network. This leads to optimistic people exhibiting greater resilience in the face of stress (Zachariae, 2006). We also know from clinical research, that interventions that work to build optimism help to prevent depression (Seligman et al., 1999[7]). Thus, it would be valuable to determine whether this hypothesis has any empirical fundament to rest upon. Until, that time, this claim is, of course, also purely speculative.

[1] Note that I will laterl be describing how contact with nature has been linked to enhanced positive appraisals of self and life situation, which is obviously relevant in relation to the last of these components (i.e that of negative appraisals of ones own level of competence).
[2] Cited in Kaplan & Kaplan, 1989
[3] Cited in Berman & Davis Berman, 1995
[4] Cited in Foster & Lloyd, 2007
[5] Cited in Gable and Haidt, 2005
[6] both cited in cited in Zachariae, 2006
[7] Cited in Seligman & Csikszentmihalyi, 2000

However, the fact cannot be overlooked that many of the alleged processes/effects in natural settings seem to align themselves strongly with theoretical perspectives from the psychological literature on stress. Accordingly, in the above overview (see section 2.2), I have touched on a number of stress theoretical aspects which present themselves as relevant in terms of the explaining the stress interventional potential of nature-human relationship - hypotheses which clearly lend support to the justification for use of natural environments in programmes of stress recovery, management and buffering. These can be summarised:

- The possibility that reflective states in natural settings might enhance *Sense of Coherence* and generally enhance positive appraisals of life situation
- That benefits of natural environments might be due to increased person-environment fit or balance between individual resources and environmental demands
- The possibility that positive emotions and mood states elicited in contact with natural environments might undo the negative effects of stress, increase resilience and contribute in terms of conferring stress-buffering properties
- That use of natural settings for stress reduction, relaxation, emotional and self-regulation might be perceived in terms of coping strategy or coping resource

Another interesting example of theoretical correspondence is provided by the similarities to be drawn between the phases of restoration in nature as described by Rachel and Stephen Kaplan (1989)[1] and the phases of Cullberg's crisis theory (Cullberg, 1979). Although phase-type crisis theory has been academically discredited on the basis of lack of empirical evidence (Elklit, 1994), it still is a theory, which enjoys a relatively prominent level of clinical currency. Thus, it does seem worth reflecting as to whether this correspondence might have clinically supportive value in terms of the phase-specific integration of nature in treatment of PTSD.

Of course, stress intervention is an area that is equally applicable to occupational (Stigsdotter & Grahn, 2004; Leather et al., 1998; Kaplan et al., 1988[2]) and educational (Guwaldi, 2006; Wells & Evans, 2003) settings, as it is clinical and health psychology. I would propose that the evidence implies nature as context and strategy as applicable at the levels of primary, secondary and tertiary stress interventions. Occupational psychology, for example, might benefit from intentional use of nature-assisted strategies as integrated element of stress management programmes/positive psychological HRM tool etc. Several researchers have previously noted the relative absence references to the potential role of the natural environment in stress management programmes for the workplace (Kaplan & Kaplan, 1989; Tyll, 1988[1]). Applications in educational psychology also might include stress management programmes for both teachers (Gulwaldi, 2006) and children.[3] Stress preventative applications at the level of public health have also been described in the above review (e.g. Neilsen & Hansen, 2006). On the basis of the evidence, clinical trends and theoretical development in this area, I can only conclude that it would be in the interest of practicing psychologists to take note of the potential inherent in these findings.

A further promising interventional area, which simply must be emphasised, is that demonstrating the superiority of 'green exercise' in terms of enhanced mental health benefits, as compared to exercise in traditional settings (Pretty et al., 2005; 2007; Priest, 2007; Reynolds; 2002; 1999). Results from these

[1] These phases are the "clearing of the head", recovery of directed attention capacity, the facing of matters on one's mind and the final stage is that of reflecting on future priorities and plans (Kaplan & Kaplan, 1989)
[2] Cited in Kaplan & Kaplan, 1989
[3] Not to mention interventional strategies for behavioural difficulties and attentional disorders (Taylor et al., 2001), social skills training and enhancement of emotional intelligence (Berger, 2006) etc.

studies provide us with evidence of particular significance – not only because this evidence stems from competent experimental research methodology including the use of comparison groups (excepting Priest, 2007), but also because of its mental health relevance in terms of an already existing body of research indicating the substantial effects of exercise on psychological health and well-being (e.g. Biddle & Ekkekakis, 2005; Scully et al., 1999[1]; Faulkner & Sparkes, 1999). Thus, if exercise in natural environments shows significantly enhanced beneficial effects as directly compared to traditional settings, we can conclude that nature does indeed make a particular difference. The implications for psychological treatment interventions and preventative mental health strategies are particularly promising in relation to these findings. Indeed, Pretty and colleagues claim that their research on green exercise is of particular relevance in terms of public mental health strategies to both treat and prevent conditions of mental suffering (Pretty et al., 2007). They also note that positive effects on self-esteem as being of particular relevance to those vulnerable individuals experiencing low self-esteem (Pretty et al., 2005). The implications of such an evidence-based observation should not go unheeded by clinical psychologists. On the whole, I would propose that the therapeutic and salutogenetic implications of the research on 'green exercise' may be of great value to future strategies of clinical and clinical health psychological intervention, and I will be returning to discuss its relevance for intervention in case of depression in the next section.

Research results provided by Taylor and colleagues on children suffering from ADD [2] lend support to use of natural environments in the treatment of attentional disorders in children (Taylor et al., 2001). The implications here for educational psychological practices are obviously worth exploring. The potential for drawing on nature-assisted strategies for purposes of recovery of depleted cognitive resources is of course applicable across a wide range of clinical settings, from recovery from conditions such as burnout syndrome and stress-related fatigue to the need for "micro-restorative" (Kaplan, 2001) opportunities in situations of cognitive taxation (e.g. in the form of stress management techniques in jobs requiring high levels of executive functioning capacity). Improvements in cognitive functioning implied from the above review may of course also applicable in terms of the improvement of life quality for individuals suffering from Alzheimer's disease.

Future areas of psychological intervention

I would propose that the potential for further development of 'green interventions' ranges across a wide variety of populations and modalities of applied clinical psychological practice. For example, there are grounds to hypothesise that an integrative nature-assisted approach might be applicable in psychological treatment of anxiety disorders (Hartig et al., 2003; Ulrich et al., 1991), substance abuse (Grahn, 2005; Burns, 1998; Russel & Mehrahbian, 1976), neurological recovery (Ottosson & Grahn, 2008; Grahn, 2007b; Holmström 2007)[3] and as an integrated element in anger management programmes (Kuo & Sullivan, 2001a; 2001b; Hartig et al., 2003; Hartig et al., 1991; Whall et al., 1997[4]). For example, that research has shown responses in terms of general parasympathetic activation and reduction in levels of physiological arousal (De Kort et al., 2006; Hartig et al., 2003; Ulrich et al., 1991;

[1] Cited in Pretty et al., 2005

[2] See page 26.

[3] Another interesting perspective on the therapeutic possibilities of natural environments, is provided by research on enriched environments. Studies by Komitova and colleagues on recovery from brain lesions indicate a rich area of potential utility (Komitova et al., 2005). It has been shown that neuronal plasticity is enhanced in situations where rats are placed in environments resembling their natural contexts, and where possibilities to interact with and master environmental conditions are present (Ibid). Both Grahn (2007b) and Holmström (2007) have referred to the significant implications of this research to therapeutic use of nature for humans. However, this is a field of application, which awaits further development.

[4] Cited in Ulrich, 1999

Hartig et al., 1991), seems to imply an appropriate intervention for anxiety disorders and general strategies of anxiety management[1].

Unfortunately, it is beyond the scope of this thesis to provide a detailed assessment of these suggestions. However, I would like to reflect briefly on the potential role of nature in prevention and alleviation of depression or mood disorder[2]. What are the grounds for assuming a potential role for 'green prescriptions' for depression as integrated element within a wider treatment rationale?

UK mental health organisation, Mind, has called for a "green agenda" in mental health care, with specific emphasis on treatment and prevention of depression (Mind, 2007). This call is based on the above-outlined research on 'green exercise' by Pretty and his collegues at Essex Universtity (Pretty et al., 2007; 2005). Note here that *Mind*, the researchers from Essex University (Pretty et al., 2007; 2005) *and* Reynolds in his evaluation of Green Gym projects in the UK (Reynolds, 2002), all highlight the specific potential of nature in terms of treatment of affective disorders. Of course, there is already a strong evidence base indicating that exercise is beneficial in both prevention and treatment of depression (Biddle & Ekkakakis, 2005; Biddle et al., 2000[3]). If exercise in natural settings does enhance the beneficial psychological effects of exercise, as claimed (Priest, 2007; Pretty et al., 2005), it seems quite reasonable to hypothesise that outdoor, green exercise could be beneficially 'prescribed' for clients suffering depression. Indeed, Ulrich has claimed that nature offers rich potential for the alleviation of depressive symptoms, especially if applied in combination with exercise (Ulrich 1999). Obviously, findings of the green exercise studies, which relate to enhanced self-esteem lend further support to a hypothesis of relevance in terms of treatment of depression.

What other empirical, clinical or theoretical data might indicate nature-assisted therapeutic strategies in the treatment of those suffering from symptoms such as depressed mood, anhedonia, irritability, sadness, hopelessness, poor self-esteem, sleep disturbances, appetite disturbances, rumination and fatigue, etc.? And how might exposure to natural environments buffer against depression in vulnerable populations or prevent the recurrence of depressive episodes?

Interestingly, the very existence of *Seasonal Affective Disorder* (defined in the DSM-IV as a sub-type of major depression with seasonal pattern) provides a potent example of how depressive states and their alleviation (this disorder is readily responsive to exposure to sunlight or light therapy) can be connected with natural, environmental conditions. But what of forests and farmland, gardens and greenery – can they also help to alleviate depression?

Various clinicians, such as George Burns and Ronan Berger, have reported successful outcome of therapy with depressed clients utilising nature-assisted approaches (Burns, 1998; Berger & McLeod, 2006). Burns reports being inspired by the work of Newman (1980), who has focused on modifications of attributional style in depressed clients undergoing a wilderness programmes (Burns, 1998). Newman claims that such programmes are effective in ameliorating learned helplessness/ depressive attributional styles, leading to new coping skills and a sense of control and competency, with obvious benefits for client's self-concept and levels of self-esteem (Burns, 1998). Burns has based his treatment of depressed individuals on similar principles, i.e. "enhancing realistic attributions, skills

[1] However, it is of course important to be aware of the existence of *Relaxation Induced Anxiety* in some highly anxious clinical patients. In such cases approaches, which lead to relaxation might not be indicated but instead, clients will have need of supervised medical treatment (Murphy, 2003).
[2] I will not make the distinction here between unipolar and bipolar forms of depression, nor differential diagnoses for unipolar depression, such as major depression, dysthymic disorder or stress-related depression ("udmætningsdepression" – Netterstrøm, 2007) and their subtypes. Nor will I discuss different theories of aetiology.
[3] Cited in Biddle & Ekkekakis, 2005

development, competence, control and self-esteem" (Ibid). A case-study is provided by Burns from his own clinical practice of a 50 year old woman with major depression. Using various nature-based activities, including sensate focusing and nature-based assignments, Burns claims that this client became more empowered and learned more successful coping strategies, through the discovery of "a vast reserve of natural stimuli that can readily assist her in creating greater feelings of happiness and pleasure" (Ibid).

"*Interacting with the magnitude and quality of natural stimuli makes it difficult to be depressed at the same time. In fact it is proposed that natural environments can act as a reciprocal inhibitor of depression*" (Burns, 1998).

Such speculations are supported by literature describing how clients suffering from affective disorders have participated in various of the group and activity-based, nature-assisted therapeutic treatments, with substantial positive psychological outcome as measured in terms of qualitative results based on interview and self-report methodology (Priest, 2007; Townsend, 2006; Reynolds, 2002 etc). Self-report methodology has also used by Steensgaard in a 2-day adventure therapy pilot project to explore the effects of adventure therapy on depressed individuals (Steensgaard, 2008). Steensgaard reports that levels of depression and anxiety were significantly reduced following participation in nature-based, group activities. However, it should be noted that this source is a journalistic article, with no reference to details of methodology – and therefore, this evidence must be classed as strictly anecdotal.

Adventure and wilderness therapies are often based on principles of social and practical skills development and compatible goal-based tasks, with outcome often described in terms of enhanced self-esteem; which I would propose make them potential candidates in terms of an integrated element of cognitive-behavioural therapies for depression – on the basis of the potential offered for constructive changes in patterns of self-appraisal, attributional style and development of alternative problem-solving/copings skills. However, positive outcomes stemming from group-based, nature-assisted therapies, must obviously ascribe their therapeutic value to other factors than contact with nature, e.g. increased social inclusion and enhanced self-esteem via group process and skills development. This is a theme I have referred to at many points throughout the above discussion. Nature here is interpreted as appropriate context or setting for more potent therapeutic mechanisms. Yet, I would propose that there are indications to be found in the literature, which might be interpreted as implying direct beneficial effects of nature for clients suffering depressive disorders. For example, indications of increased positive appraisals (increased life satisfaction and self esteem), increased positive affect/mood, elicitation of pleasurable sensory experience, shifts in cognitive state from directed attention to fascination, physiological responses leading to relaxation and lowered anxiety, as arising in unmediated human-nature interaction might usefully serve such clinical intervention.

"*Positive psychotherapy contrasts with standard interventions for depression by increasing positive emotion, engagement, and meaning rather than directly targeting depressive symptoms*" (Seligman et al., 2006)

There is now a reasonably good evidence-base indicating that the cultivation of positive psychological states and emotions may support the alleviation of depressive symptoms (Seligman et al., 2006). Thus if nature can be directly and indirectly instrumental in evoking positive emotion, engagement and meaning, as the literature implies, then nature-assisted approaches offer themselves as suitable strategies within the context of an overall positive psychological approach to clinical intervention.

Ulrich has highlighted the concept of “natural distraction” (i.e. a form of positive distraction) as one possible mechanism by which nature may lead to improvements in mental health (Ulrich, 1999; 1991[1]). He presumes that via pleasurable activity and opportunities for reflection in nature might shift attentional focus, with consequent mental health benefits:

"*A positive distraction is an environmental feature or site that promotes an improved emotional state in the perceiver, may block or reduce worrisome thoughts, and fosters benefical changes in physiological systems such as lowered blood pressure and stress hormones*” (Ulrich, 1999).

Ulrich has talked of the restorative properties of positive distractions provided by sensory features or experiences within natural settings (Ibid). Drawing on the literature of positive distraction in healthcare (i.e. beneficial health outcomes achieved via use of comedy and laughter, art, music, companion animals etc), he propose the same principles are applicable in terms of natural features or situations, which may improve affective state, “block or reduce worrisome thoughts” and lead to reductions in states of physiological arousal (Ibid). The implications in terms of treatment in depression are to be noted, especially in relation to symptoms of rumination.

The possibility of drawing on nature as positive distraction is absolutely worth noting. For example, nature assisted-strategies could well be integrated within any therapeutic programme aimed at enhancing the client’s level of intentional attentional control, for example Attention Training Therapy (ATT), as developed by psychologist Adrian Wells (Wells, 2000). ATT was developed to modify the ”*perservative self-relevant processing*”, generally characterising emotional dysfuntion (Ibid) and involves intentional strategies of “voluntary distraction”, which according to Wells, can be seen as a method of emotion-focused coping. Drawing on nature as positive distraction would appear to be harmonious with such a therapeutic methodology.

This is but the tip of the iceberg: there are many more hypotheses which might emerge within this domain, from the effects of therapeutic contact with natural environments on symptoms of insomnia or disturbances of appetite to the role of social, nature-based strategies (such as civic environmentalism) in preventing major depression in individuals who may be defined as currently suffering states of “languishing” (Keyes, 2002). However, these suggestions must remain in the sphere of speculation until further research and clinical experience might possibly arise to validate and substantiate them.

[1] Cited in Ulrich, 1999

Nature as element within an integrative approach

From an assessment of the literature, and especially noting how nature is typically employed in terms of clinical practice, it seems to be an inescapable fact, that any claims to the potential of nature as psychological intervention must be first and foremost approached from the perspective of *integration*. The data points clearly to nature as incorporated element within a multi-methodological framework, readily encompassing the validity and utility of other therapeutic modalities (such as cognitive, narrative and solution-focused approaches), and drawing on other psychologically potent elements such as exercise, group process, meaningful activity and non-specific factors such as the myth and ritual of therapy (Frank, 1982). In terms of therapy, it does not make sense to talk of a 'green cure' replacing a 'talking cure' but as these approaches being able to supplement or mutually enhance each other.

In other words, therapeutic use of nature may be most appropriately applied within a framework of methodological and theoretical integration, rather than 'pure intervention'. Although an advocate for the use of nature-assisted strategies as potent tools of therapy, Burns states that they do not provide "a total and immediate modification of a lifetime of personal problems" but are rather "a part of the therapeutic tool kit that can be used independently or in conjunction with other therapeutic processes" (Burns, 1998). Burns has actually described his own "nature-guided" psychotherapeutic approach as an integrative approach (Ibid). Such a multi-methodological/theoretical approach is also characteristic of other clinicians who explicitly draw upon the therapeutic value of nature (Berger, 2006; Berger & McLeod, 2006; Burns, 1998; Haley, 1984).

Within the field of psychotherapy, a trend towards more and more integrative forms of practice is strongly evident (Hougaard, 2004).

"*Psykoterapiens aktuelle tilstand er beskrevet som eklekticismens eller integrationismens æra, i og med at psykoterapeuter vælger at gøre brug af flere forskellige metoder, og der stræbes mod at nå til en almen, integrativ teori om psykoterapi.*" (Hougaard, 2004)[1]

We may draw on integration of nature in terms of a purely technical/pragmatic adaptation, i.e. one more tool for the toolbox based on a the psychotherapeutic principle of "technical eclectism" (which bases its therapeutic rationale on evidence-based practice, selecting from what works and applying techniques differentially on the basis of specific client needs) or a more comprehensive attempt at "theoretical integration" (Hougaard, 2004; Hougaard & Rosenberg, 1998). Integration of nature-assisted practices may of course also represent a fundamental shift in worldview (see chapter 4 for a description of such a paradigm shift).

As outlined in section 2.1, there appear to be very few references to the therapeutic role of nature within the literature of clinical and counselling psychology. It should come as no surprise, that the few existing cases I have found, take a multi-methodological approach where nature is included within an integrated approach. For example, a study published in the *Journal of Clinical Child Psychology and Psychiatry*, describes a nature-assisted approach to treatment of children referred by US Child Protective Services (Worsham & Goodvin, 2007). In this qualitative interview-based study, a garden environment as therapeutic setting is reported as being "especially conducive" to exploration and development of new adaptive skills and representational models in maltreated children (Ibid). Worsham and Goodvin evaluated providers' beliefs about aspects of therapeutic value in a multiple modality

[1] Translation: The current state of psychotherapy has been described as the era of eclectism or integration, based on the fact that psychotherapists are choosing to draw upon a range of different methods, and there is an attempt to reach a general, integrative theory of psychotherapy (Hougaard, 2004).

programme, including garden-based nature-assisted interventions, along with play therapy and one-to-one contact with a therapist. Using semi-structured interviews to extract themes relevant for providers, it was revealed that the integrative "attachment-based" approach of this programme was perceived as having therapeutic value by providing a suitable combination of modalities, which led to the positive "challenging of representational models" (Ibid). The combination of safe and stimulating garden environment, its activities and learning opportunities, interaction with animals and of course, the caring, supportive interpersonal atmosphere of this programme, were seen as providing a "secure base" for children to explore their environments, form positive relationships and attachments and acquire a broader adaptive repertoire.

Here we see an example as to how nature might be integrated as an element within a multi-level treatment context. This brings me to an earlier defined research aim i.e. to explore the hypothesis that psychotherapy, as applied clinical psychological modality, might well benefit from an expansion of its conceptual and clinical repertoire to integrate nature as potential therapeutic means and medium. I would claim that it is precisely such an *integrative* or *eclectic* approach provides the most suitable 'bearing pillar' from the perspective of psychotherapy theory for the possible integration of nature-assisted therapeutic and salutogenic approaches (Hougaard & Rosenberg, 1998; Hougaard, 2004; Norcross & Goldfried, 2005).

Many of the alleged beneficial outcomes outlined in the above overview seem to indicate the potential value of inclusion of nature as therapeutic context and strategy, as based on integrative psychotherapeutic principles of *technical eclectism* e.g. drawing on strategies which may be categorised as evidence-based, e.g. use of play in green areas in treatment of attentional disorders (ADD) in children (Taylor et al., 2001) or drawing on evidence as to specifically stress-restorative effects etc. Furthermore, the literature also justifies an integrative platform for nature-assisted practice from the perspective of *theoretical integration* (Hougaard & Rosenberg, 1998). Instead of sampling from *what* works, the approach here is to choose techniques on the basis of *how* they work. In other words, what is important is that "*all such borrowed techniques should make sense in the context of the theory into which they are borrowed*" (Roth & Fonagy, 2006). In the case of nature-based therapy, an example of theoretical integration might be based on the proposed enhancement of positive emotions and affect in terms of a general *Broaden and Build* model as described earlier (Frederiksen, 2005). Thus, nature contact is included as intervention on the basis of alleged effects on emotions and mood state. Such an approach is in accordance with recent integrative literature which points in the direction of selecting therapeutic strategies on the basis of their effect on particular psychological systems (e.g. cognitive, affective, interpersonal etc) (Hougaard & Rosenberg, 1998).

Another candidate for *theoretical integration* as premise for inclusion of nature-assisted strategies and contexts is provided by Burns, who takes an explicitly positive psychological perspective to the integration of nature within his therapeutic repertoire, talking of the theoretical compatibility of nature-based approaches with solution- and wellness-focused strategies (Burns, 1998; 2005).

Indeed, the potential to be found in an inherently *positive psychological* perspective of the therapeutic endeavour is deemed of particular interest in this context (Seligman et al., 2006). Nature-assisted interventions seem to harmonise well with a well-being and resource-strengthening approach, as is evident from the above overview. Could nature-assisted approaches be usefully aligned, for example, within approaches such as Seligman's *Positive Psychotherapy* (Seligman et al., 2006) or Fava and colleagues' *Well-Being Therapy* (Fava & Ruini, 2003) on the basis of the above- described beneficial outcomes, in terms of increased well-being, positive emotion and mood states etc.? There is certainly

basis for further argument, which might attempt to claim a fundamental compatibility between process/effect arising via human-nature interaction and the positive psychological dimensions of happiness, i.e. "the pleasant life", "the engaged life" and "the meaningful life" (Seligman et al., 2004). I will not go into detail here, but will merely briefly list some of the alleged processes/effects arising in contact with nature that might be applied within such a theoretical framework: i.e. enhanced positive emotions, enhanced mood states, pleasurable experiences, enhanced life satisfaction, meaningful activities leading to states of vital engagement/flow and sense of purpose, enhanced social engagement, caring and altruism, appropriate challenge, use of skills, learning of new skills, enhanced-person environment fit etc.

Another, more pragmatic, perspective from which we might legitimise the integration of natural environments within psychological intervention is to situate nature in terms of 'adjunct' or complement to standard, traditional psychological interventions. Hyer and colleagues (1996) have taken such a perspective in a study of the efficiacy of a 5-day outward-bound programme as adjunct treatment modality with a group (n= 219) of adult psychiatric patients (war veterans suffering chronic combat related PTSD) as published in the *Journal of Clinical Psychology*. Although this study showed no significant difference in treatment outcome between those patients participating in the adventure therapy group and a control group (Ibid), it did include subjective reports from participants alluding directly to the personal positive value and meaning of such interventions (for example, reports of enhanced self-esteem).

Clearly, the concept of nature-based strategies as *compliment* to existing treatments is an approach worthy of serious consideration. Burns has talked of nature-guided strategies in such a way, stating that, "interactions with nature may well enhance the efficacy and expediency of therapy" (Burns, 2005) and Markersen has referred to nature-assisted strategies in terms of their providing suitable positive psychological homework assignments, as a part of his integrative cognitive-oriented psychological practice (Markersen, 2007b).

However, it is not my intention to reflect in greater depth on the potential of nature-based strategies as integrated aspect of relevant psychological or psychotherapeutic modalities. This would require the space of an entire thesis again! However, this is clearly an exciting and comprehensive field that waits further empirical and theoretical development[1].

I will leave this discussion resting on the suggestion that nature-assisted approaches may be optimistically perceived as having psychological interventional value in terms of either an element within a comprehensive and intentionally formulated integrative model or, at the very least, in the pragmatic form of adjunct to existing treatment.

[1] Integration on the level of non-specific factors is also a possibility.

2.7 CONCLUDING REMARKS

Despite some obvious flaws in the literature[1], I would conclude that there are good grounds for a greater level of optimism than stated by Ulrich (Ulrich, 1999). In fact, I would take Ulrich's "cautious optimism" to a more confident level and state that there is a reasonably promising fundament on which to build upon, both in terms of future research and development of integrative models of clinical practice across a range of potential applications and further theoretical development.

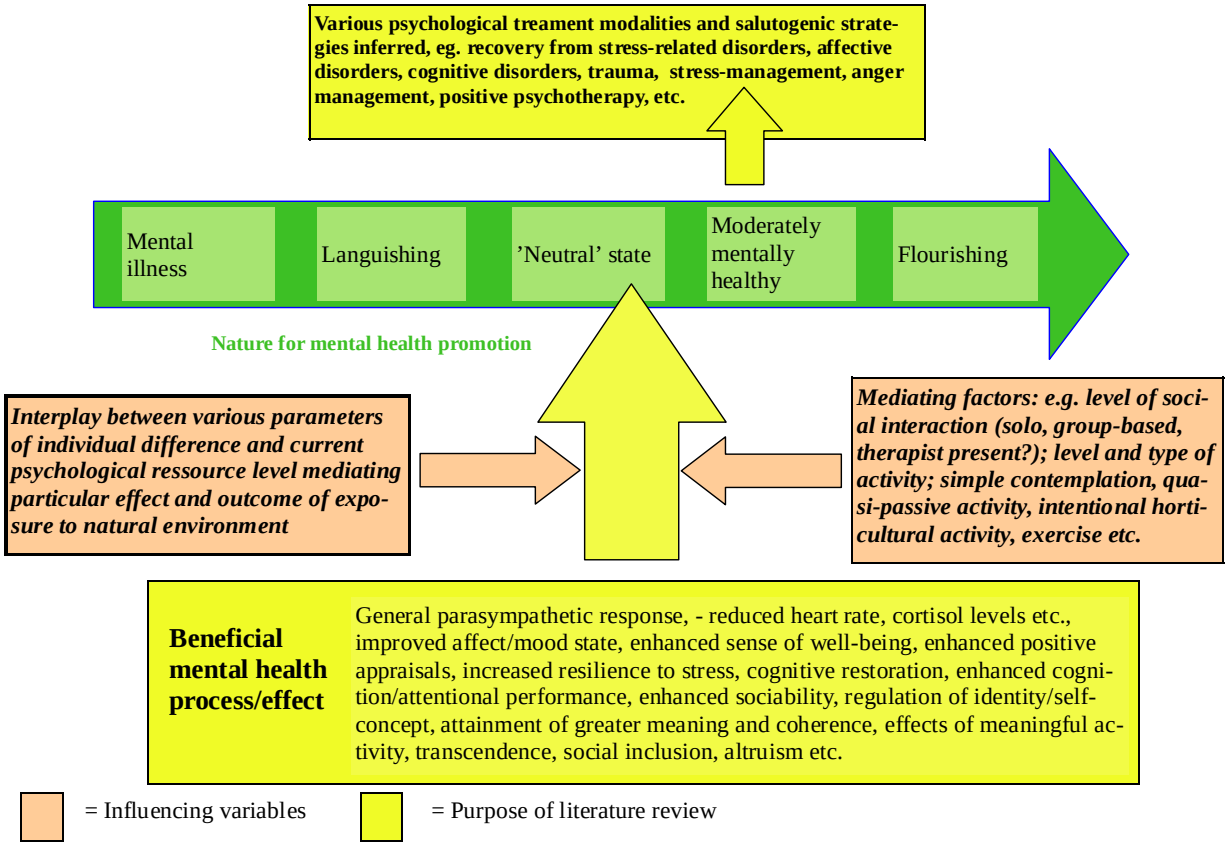
I have listed a range of benefits attainable in terms of mediated and unmediated contact with natural environments, stemming from strongly evidence-based empirical sources to quasi-experimental field research to clinical anecdotes and pure theoretical speculation. Furthermore, I have made a theoretical attempt to situate potential forms of practice within an integrative model (as inspired by psychotherapy theory). I have done my best to clearly communicate where the realms of theory, hypothesis and anecdote stop and where solid evidential data begins. At times this has been difficult, because of my chosen approach, which I have earlier described by drawing on the metaphor of 'weaving a tapestry' incorporating different 'threads' of theory, research and practice - rather than the provision of clear cut categories separating these areas. For me, these threads have been impossible to disentangle without destroying the integrity of this endeavour. I hope though, that the resulting 'image' conveyed is a coherent one.

Figure 3. is an attempt to summarise the results of this review in a visual form (and an attempt to make the resulting 'image' more coherent), drawing once more on the mental health continuum of Keyes (2002) – in this case, to describe the range of mental health-promoting benefits potentially available in nature-human interactions. Note that this figure represents the development of an earlier model (*Figure 2. page 21*).

It cannot be denied, however, that this is a field in need of further development of qualified evidence-based practice. It appears to me that the current situation is not remarkably changed from that of 1989, when Kaplan and Kaplan emphasised that many of the theories and themes within the field of nature-human relationship had not yet been studied empirically and called for "cumulative insights" to be gained from multiple research endeavours addressing the nature-human psyche relationship from different perspectives, varied settings and with a range of clinical populations (Kaplan & Kaplan, 1989). According to Grahn and colleagues, research on nature-based approaches to therapy is "young, still small, and relies heavily on research coming from the US." (Grahn et al., 2007) and Ulrich has long since appealed for the generation of a body of research linking outcome to nature-based therapeutic conditions (Ulrich, 1999). Although the overview in Chapter 2 reveals an available body of empirical data, it comes largely from the field of environmental psychology. In terms of clinical psychology/psychotherapy, there can be no doubt that this is a research domain crying out for development of its empirical fundament. I will be addressing this need for research in greater detail in Chapter 3.

[1] I will be providing a more comprehensive critique of the research in chapter 3.

Figure 3
Nature's influence on mental health: a summary



Developing an earlier metaphor, this figure may be seen as representing the resulting 'tapestry', which has been produced from the weaving of relevant threads. Of course, I am not claiming that this is a finished product in any way – there are surely threads I have overlooked, and my weaving technique is far from accomplished. But, I hope that this image does in same way present a coherent description, which might inspire debate and reflection on the role of nature in clinical psychological practice.

CHAPTER 3

SOME REFLECTIONS ON RESEARCH

"*We exist in a climate where people want to see proof about how healthcare treatments work. If ecotherapy is to be taken seriously, we must be able to agree on some core competencies and on standards of quality and effectiveness*". (Doherty, 2007)

3.1 CRITIQUE OF THE RESEARCH

Although the potential for nature based strategies and contexts as integrated element in healing and health-promoting psychological settings is clearly promising, it must be noted that the research sources on which this appraisal is based do contain some inherent weaknesses, which must be taken into account before drawing any hard and fast conclusions as to nature's role in mental healthcare. It is necessary to temper the above summary with a sober commentary on the validity and reliability of the research on which it is based. Existing overviews of the literature, such as those provided by Maller and colleagues (2002; 2005) provide a rather uncritical appraisal of the relevant studies, overlooking the fact that the research in the field of nature-based approaches to mental healthcare has frequently been criticised for methodological design flaws (e.g. Burton, 1981[1]; Hartig et al., 1991; Parsons, 1991; Priest, 2007; Morris, 2003). For example in a review of 73 research references into the psychological effects of wilderness programmes, Burton found that much of the research was seriously flawed in terms of methodological criteria, suffering deficiencies in terms of sample size, reliance on subjective reports and non-standardised measures, lack of appropriate control group and follow up studies and insufficient use of statistical testing (Kaplan & Kaplan, 1989). As a result of these deficiencies, Burton found that only 19 out of the 73 studies could be regarded as valid (Ibid). Likewise, Morris has criticised a number of wilderness therapy programmes for adolescents using psychiatric outpatient services as being "fraught with methodological and interpretive problems" due to lack of comparison groups, small sample sizes and an absence of follow-up data (Morris, 2003). Many of the studies covered in the preceding overview are subject to similar criticisms – for example, Priest, 2007 (no comparison group, small sample size, no follow up); Townsend, 2006 (no comparison group; self-selection of participants; seriously confounding treatment variables etc.).

In any assessment of results coming from clinical field research, such as that currently being carried out at *Alnarp Rehabilitation Garden*, we must also exercise caution. Research into treatment of clients with chronic stress-related disorders at Alnarp is subject to the potential influence of an almost inexhaustible range of potentially confounding therapeutic parameters (e.g. the presence of therapeutic personnel with a range of professional backgrounds, different levels of human contact, different garden settings, an eclectic mix of therapeutic modality - including contact with animals, horticultural activity, art therapy and indoor psychotherapy sessions - Welen-Andersson, 2006) which make drawing conclusions as to causal relationships between therapeutic process and mental health outcome most challenging. Not surprisingly, Nevstrup-Andersen has found a wide range of individual variables with regards perspectives on what is meaningful and significant with regards own therapeutic process within

[1] Cited in Kaplan & Kaplan, 1989

the programme (Nevstrup-Andersen, 2006). It is therefore understandable that the research team at Alnarp have decided to wait with publishing results, until they can "bring more power" to the data, admitting that there is still a need to improve research design and methodology at Alnarp (Grahn, 2007b)[1].

Thus, as I have repeatedly emphasised in the preceding overview, we need to be acutely aware the influence of confounding variables if our aim is to make a qualified attempt to identify processes and effects, which might be interpreted as arising from the *direct* and *unmediated* meeting between the human psyche and the natural, biological, non-human environment. Of course, I have been aware of this factor from the outset (*see section 2.1*) and the distinction drawn between studies pertaining to nature as directly influencing human mental health (nature as relationship) and those alluding to positive effects arising from multi-level process/effect, which include nature as an integral element (nature as setting), can be seen as an attempt to clarify this sphere of ambiguity (*see figure 1, page 20*).

However, in pursuing a research aim that desires *to ascertain the extent to which nature makes a difference to psychological outcome*, we cannot escape the fact that a critical examination of - especially the field studies in this overview - reveals the abundant presence of confounding variables - a factor that obviously threatens validity and reliability. Frumkin has stated that the proposed mental health benefits of nature-based therapeutic approaches carried out in group settings and and/or centre on activities may often be due to factors, such as goal achievement or group bonding and not nature contact itself (Frumkin, 2001). Indeed, the presence of a wide range of confounding variables might be described as one of the major pitfalls of naturalistic research in this field and certainly one to be aware of in design of future research. One such example (of the many I have noted), is that the recorded positive psychological outcomes of walking in natural environments (Priest, 2007) might be due to the direct beneficial effects of the exercise (Scully et al., 1999[2]) or the effects arising from interactional aspects of group membership (Priest, 2007). If we add the contribution of a wide variety of participant variables to the pot, such as different diagnoses, then it becomes a most challenging endeavour to identify the specific effects of nature as 'ingredient.' Significantly, this study neither included a comparison group – which for example, walked in an urban setting - or a normative control.

However, I have also included many studies based on true experimental designs where the influence of such confounding variables has been limited and controlled, which thus may be described as providing stronger evidence of 'unmediated' effects of nature contact. However, these studies often employ virtual images of nature as independent variable, rather than nature itself (such as Pretty et al., 2005; Hartig et al., 1991; Ulrich; Van der Berg et al., 2003). Many of the covered studies on restorative effects have assumed such "experiential isomorphism" (De Kort et al., 2006). Therefore, these true experimental studies also have their drawbacks: for what they might gain in internal validity, they lose in ecological validity. Several writers have directly queried the value of experimental research in this field, pondering as to what is actually being studied when one uses visual representations of nature, rather than real natural settings. For example, regarding emotions, Holmström (2006) has questioned whether one is able to evoke natural emotional responses using virtual images, or whether, what one is actually measuring is rather "anticipatory or virtual emotions" as described by Frijda & Mesquita

[1] However, it should be emphasised, that this current action research project has generated much of value in the way of theory and clinical experience and provided a forum for empirical experimentation, which is presently in the process of bearing fruit. For example, one particularly interesting empirical study currently in progress, is that of PhD student Anna Jepsson, who is investigating the connection between oxytocin release and nature contact (Stigsdotter, 2007). As to theoretical development, Master's student Tomas Holmström has provided an eloquent and insightful description of how sensory and emotional processes might lead positive health outcomes in natural settings by drawing on the multiple code theory of Wilma Bucci, sensory integration theory of Jean Ayres, Antonio Damasio's theories of emotion, along with Daniel Stern's concept of vitality affects (Holmström, 2006).
[2] Cited in Pretty et al., 2005

(2000[1]). He points out that the experience of natural environments is multi-sensory and that there is a distinct absence of studies, which attempt to investigate the complex influence of true exposure to nature (Holmström, 2006). Van der Berg and collegues have also pointed out that experimental studies, relying on visual representations of nature, often lack the rich and nuanced sensual array of real settings (Van der Berg et al., 2003). Furthermore, Kaplan has emphasised intrinsic motivation as an important component of restorative experiences (Kaplan, 2001). In the case of experimental settings, motivation is often extrinsic. In this way too, ecological validity may be depreciated through use of experimental settings for research.

Perhaps, we are obliged to accept, as Morris has done, that "health within an environmental context must be considered as a multifaceted and holistic phenomenon" (Morris, 2003) which does not lend itself well to traditional experimental methods of research. If we were to view the field from this more benevolent perspective, and design our research accordingly, we might avoid throwing the baby (psychological outcomes of exposure to authentic natural settings) out with the bathwater (difficulties in designing watertight research methodology).

I would suggest that the key to working with both the drawbacks of field studies and of experimental settings is to strive towards convergence of results via multi-method and interdisciplinary approaches. Indeed, Hartig and colleagues have long ago pointed out that although there are many ways in which research can be criticised in this field, there is a "remarkable degree of convergence" between studies and that the way forward for this field involves the embracing of a multi-method, convergent approach to replace the "*monomethod approach that has been predominant in this area of inquiry*" (Hartig et al., 1991).

Of course, multi-method approaches (i.e. utilisation of a pluralistic methodology), based on a principle of convergent validity and reliability are a well-accepted approach of clinical and counselling psychology researchers (Barker et al., 1994). For example, psychotherapy researchers, Hill and Lambert have also stated that the best approach to assessing psychotherapy outcome is by "measuring change from multiple perspectives, with several types of ratings scales and methods" (Hill & Lambert, 2004).

Taking into account that attention to the mental health benefits of natural environments is currently being shown from several different academic disciplinary fields (including landscape architects, occupational therapists, doctors and public health researchers), Grahn, Taggert and Stigsdotter have proposed that research within this field might be best approached by adopting an interdisciplinary triangulation approach, incorporating research based on a psychotherapeutic/clinical psychological model with research from the domains of medicine, landscape architecture and horticultural/occupational therapy (Grahn et al., 2007). Maller and colleagues have also called for interdisciplinary approaches to facilitate future research (Maller et al., 2002).

Of course, I grant that the specific methods of research should always *"flow naturally from the questions that are asked*." (Barker et al., 1994). Yet, I would like to suggest action research as a particularly suitable approach for application of the above noted methodological triangulation, for I believe that it allows the flexibility and attention to diversity presented by a clinical arena so unavoidably rich in variables. Although research might be limited to a specific geographical, clinically delineated setting (i.e. a healing garden such as *Alnarp Rehabilitation Garden in Malmø* or the proposed healing garden at Hørsholm) an appreciation of multiple 'sub-settings' (i.e. different

[1] Cited in Holmström, 2006

landscapes or garden "rooms"[1], degrees of passivity/activity, level of interpersonal or cognitive demand, presence or absence of therapist etc.) is required (Grahn et al., 2007). Indeed, Grahn and colleagues have described the research setting of the therapeutic or healing garden, as containing multiple "single settings" in which "the physical environment and behaviour are indissolubly connected" and whose structure is defined by a variety of different parameters including distinct natural characteristics, events, processes, and health outcomes (Ibid). Action research can bear such a pluralistic methodological approach by providing a vehicle by which multiple perspectives can be fed into a dynamic cycle or spiral of ongoing field research (Taylor, 1994), thus providing a relevant framework for generating the needed evidence- base within this field.

As Zachariae puts it, "*Evidence-based practice can and should be a dynamic, not a static process, where experiences from clinical practice raise new questions and cause the development of new methods, which thereafter become the object for systematic investigation, which again promotes clinical practice*[2] " (Zachariae, 2007). At the heart of action research, lies the opportunity for continued professional development of clinical practice, furthering the relevance of this approach in relation to my hypothesis, that nature-based strategies might well extend the clinical repertoire of psychologists.

Needless to say, the need for a more substantial evidence-base within this field is clear (Ulrich, 1999). Indeed, this will be necessary if proponents for nature-facilitated approaches within mental healthcare are to be heeded (Docherty, 2007). Various researchers have appealed for the generation of a body of research linking outcome to nature-based therapeutic conditions (Grahn et al., 2007; Ulrich, 1999). Although the preceding chapters have revealed a promising body of empirical data and clinical experience it is clear that the literature in this field is still substantially weighted towards the theoretical. Indeed, I have found myself contributing with more theory rather than empirical data (see chapter 4)! There can be no doubt that this is a psychological research domain crying out for development of its empirical fundament especially with focus on fields of applied clinical psychology.

3.2 TENTATIVE SUGGESTIONS AS TO FUTURE AREAS OF RESEARCH

"*There are still objections raised in response to the demand for evidence that psychological treatments work. In the long run, however, there is no reason to believe that psychological treatments will be able to avoid being subjected to such evaluations of quality*[3]" (Zachariae, 2007)

As to future research proposals that might support the development of such an evidence base, one might say that the sky is the limit. Throughout the discussion I have noted a veritable plethora of possible pathways down which research might travel. With respect to the development of nature-assisted strategies in clinical psychological intervention, let me say that firstly, we need further evidence that supports the claim that processes arising in the meetings of the human psyche and natural environments are directly therapeutically beneficial and can be measured as distinct mental health outcomes. Yet, we also need to differentiate between psychological processes/health outcomes related to both therapeutic settings and specific clinical therapeutic activities.

[1] Stigsdotter & Grahn, 2002
[2] Translated from the Danish: "EBP kan og bør være en *dynamisk*, ikke en statisk process, hvor erfaringerne fra den kliniske praksis stiller nye spørgsmål, og foranlediger udviklingen af nye metoder, som derefter gøres til genstand for systematisk forskning, som igen fremmer ny klinisk praksis." (Zachariae, 2007)
[3] Translation from the Danish:"Der fremføres til stadighed indvendinger mod kravet om evidens i psykologisk behandling. På længere sigt er der dog ingen grund til at tro, at psykologiske behandlinger vil undgå krave om at blive underkastet en kvalitetsvurdering" (Zachariae, 2007)

Secondly, evidence is required that supports the hypothesis that integration of nature-facilitated approaches can enhance or compliment other psychological modalities. Utilising a technical eclectic model of integrative therapy, which seeks to draw directly on evidence-based practice[1], i.e. what processes/techniques work and for whom, this goal of research becomes synonymous with the first.

To achieve such goals, I would suggest there is a need for process outcome research[2] across a wide range of dimensions, covering both analysis of the more universal beneficial mental health effects and underlying processes arising from therapeutic contact with nature, as well as the influence of parameters related to particular individual differences (e.g. specific symptomology, degree of pathology/health, preferences/compatibility, psychological resources, past experience with nature, cultural influences etc.). The type of natural setting and the form of nature contact (e.g. healing garden or wilderness, passive/active exposure, use of specific practices or techniques, involvement of therapist) are further relevant parameters for research. For example, how can we develop a greater knowledge base as to person-environment fit within green therapeutic contexts: i.e. the matching of individual needs to particular natural settings? From the theory of healing gardens, we find an assumption that "experiences of nature affect people differently, largely depending on their life situation" (Stigsdotter & Grahn, 2002) and that the level of therapeutic involvement or immersion in a natural setting appears to be closely related an individual's current psychological resources and ability to meet the "demands" of that setting (Grahn, 1991[3]). A potential approach for further research would be to examine which particular client groups benefit from nature-based therapeutic interventions. This is an approach based on the desire to elucidate "what works for whom?" (Roth & Fonagy, 2006). In this way, we might evaluate which types of natural setting have the greatest efficiacy and cost-effectiveness for particular populations (Frumkin, 2001).

"*As we learn more about the health benefits of particular environments, we need to act on these findings. On the clinical level, this may have implications for patient care. Perhaps we will advise patients to take a few days in the country, to spend time gardening, or to adopt a pet, if clinical evidence offers support for such measures*" (Frumkin, 2001)

In the previous chapter, I have highlighted several areas, which might lend themselves as appropriate themes for future research projects. For example, potential areas of 'green intervention', which might be studied, include the efficiacy of nature-assisted approaches in psychological treatment of affective disorders (Ulrich, 1999; Pretty et al., 2005; Maller et al., 2002, etc), anxiety disorders (Hartig et al., 2003; Ulrich et al., 1991), substance abuse (Grahn, 2005; Burns, 1998; Russel & Mehrahbian, 1976), neurological recovery (Ottosson & Grahn, 2008; Grahn, 2007b; Holmström 2007) and as an integrated element in anger management programmes (Kuo & Sullivan, 2001a; 2001b; Hartig et al., 2003; Hartig et al., 1991; Whall et al., 1997[4]) .

Maller and colleagues have listed a range of areas of research needed, including empirical evidence of the causal role of nature in specific nature-based therapies such as wilderness and adventure therapy or the impact of regular contact with nature on general mental health and life quality (Maller et al., 2002). Ulrich too has called for research in a number of areas, including that of nature's role in

[1] Evidence-based practice is defined here as combining both best research evidence, with the psychologist's own clinical experiences and the client's own values and wishes (Zachariae, 2007)

[2] Typically, the goal of psychotherapy research will be to link process to outcome: this is process outcome research. However pure process or pure outcome research can also be executed. Process research will study what happens in the therapeutic setting and outcome research refers to immediate or long-term changes as a result of therapy. Sometimes however, it is difficult to identify what is process and what is outcome with changes in process sometimes serving as indicators of outcome (Hill & Lambert, 2004)

[3] Cited in Stigsdotter & Grahn, 2002

[4] Cited in Ulrich, 1999

enhanced life quality (Ulrich, 1999). Frumkin and Swedish researchers, Grahn, Tenngart and Stigsdotter have appealed for a research agenda, which focuses on a perspective of salutogenesis or enhanced health (Frumkin, 2001; Grahn et al., 2007). Furthermore, there is a call for research, which might evidence nature's beneficial effects on specific target groups such as individuals with depression and youth suffering from substance abuse or at risk from substance abuse (Maller et al., 2002). Assessing how nature-based strategies might be optimally integrated with other psychotherapeutic approaches (e.g. cognitive, narrative, experiential) to develop suitable models of best practice is another avenue we might well pursue.

In any research design endeavour, we must be aware of the importance of grounding the formulation of suitable research questions or hypotheses in an explicit theoretical framework. Which areas, therefore, might be suitable on the basis of their reasonably well-formulated conceptual fundament? Based on the outlined indications that natural settings seem to be optimal environments for eliciting positive affect, enhanced mood and other positive psychological states, research focusing on positive psychological parameters as dependent variables seems to be a suitable candidate. For example, referring to reflections in Chapter 2, an analyis of the contribution of nature –assisted strategies to therapeutically potent positive psychological states and emotions could be suitably approached within the theoretical context of Frederikson's *Broaden and Build Model* (Frederikson, 2005).

Positive psychological investigations might be achieved by the measuring of a range of operational dependent variables such as subjective well-being (Marks & Shah, 2005), Sense of Coherence (Antonovsky, 1987), happiness (Seligman, 2002[1]; Seligman, 2002), optimism (Seligman, 1991[2]; Danner et al., 2001[3]), flow (Csikszentmihalyi, 1990; Csikszentmihalyi & LeFevre, 1989) etc. Many relevant instruments have been developed within this field, which might be applied for purposes of measuring positive psychological effects of contact with nature in experimental designs - including *Experience Sampling Method* (Ibid) and questionnaires such as Deiner and colleagues *Satisfaction with Life Scale*,(Deiner et al., 1985[4]) and Ryff´s *Psychological Well-Being Scales* (Ryff & Singer, 1998[5]). Another related potential research theme is that of engagement, which has been conceptualised as a positive psychological dimension of the chronic work-related stress disorder, burnout[6] (Maslach et al., 2001). Engagement has been operationalised successfully using the opposite pattern of scores on the Maslach Burnout Inventory (MBI) dimensions (Maslach & Lieter, 1997[7]).

I have also earlier noted the implications of nature as source of metaphor – in terms of narrative material to be drawn on in the domain of therapy and/or as used in nature-based homework assignments – as an exciting area, calling out for further theoretical and empirical development. The integration of nature-assisted strategies within a narrative approach presents itself here as a likely candidate on the basis of both theoretical and technical compatibility.

An area I find myself particularly drawn to investigate more fully in the future, is that of the therapeutic potential that might lie in the intentional combination of mindfulness practice and nature-based interventions. Burns has drawn a parallel between techniques of heightening sensory awareness in nature and the cultivation of mindful presence (Burns, 2007b). If mindfulness is attending or directing

[1] Cited in Seligman & Steen, 2005
[2] Cited in Foster & Lloyd, 2007
[3] Cited in Zachariae, 2006
[4] Cited in Duckworth et al., 2005
[5] Cited in Huppert et al., 2005
[6] Alternative burnout terminology: work-related neurasthenia (ICD-10); adjustment disorder (DSM-IV), udmattelsessyndrom (Åsberg et al., 2006), belastningsdepression (Netterstrøm, 2007).
[7] cited in Maslach et al., 2001

attention to the present moment without judgement (Kabat-Zin, 2000), then we might say that sensory awareness in nature is attending to the embodied experience of the moment in terms of sensory input. Both "techniques" refer to a form of focused attention *to what is* in the moment, whether this be awareness of own thought processes, affective experience or sensory input. Both techniques take us out of "doing-mode" and into "being-mode" (Segal et al., 2002).

"*Da jeg kigger på mit æbletræ, der har jeg mine stunder.*"[1]
(Participant on a course in Mindfulness, Odense, *Danish Psychological Society*, 2008)

Interestingly, in a lecture held for the Danish mental health organisation, *Psykiatrifonden, c*ognitive psychologist, Tomas Markersen, talked of the psychological value of therapeutic use of natural environments as residing in opportunities offered for accessing the present moment more readily (Markersen, 2007a). According to Markersen, positive states of mental health may arise in the simple meeting with features of a natural, non-demanding environment, because they invite us more readily into the present moment (Ibid). In an above-cited study, Williams and Harvey have linked the state of *fascination*, inspired by novel and aesthetic environmental features, to "greater absorption in the present moment" (Willams & Harvey, 2001). Buddhist teacher and counsellor, Mark Coleman, has written poetically of the power of mindfulness in nature as both psychological intervention and spiritual path, pointing out the long history of spiritual practices of focused awareness in natural surroundings (Coleman, 2006). Of course, the Buddha himself attained enlightenment outdoors meditating under the Bodhi tree!

Interestingly, Kaplan has linked features of *Attention Restoration Theory* with techniques of directed attention drawn on "Eastern meditation traditions" (Kaplan, 2001). Kaplan claims that both restoration in nature and meditation practice can support individuals in managing attentional resources to prevent and alleviate stress and mental fatigue (Ibid). His central thesis is that both mindfulness/meditation and intentional use of restorative environments help us *avoid* the use of precious directed attention capacity. Both support us to achieve states of focused attention in the moment[2], thereby releasing "tired cognitive patterns" (Ibid).

Inspired by Kaplan, a fairly straightforward hypothesis, in terms of clinical practice, is that mindfulness in nature might be intentionally employed to *enhance* restoration (for example, through stimulating the state of 'fascination' and accentuating experiences of 'being away' via access to the moment)[3]. Additionally, inspired by Burns (2007), we might propose that mindfulness in nature will facilitate processes of heightened sensory awareness, leading to alleged associated mental health-promoting positive states and emotions. A suitable research project might investigate whether mindfulness does increase the potency of nature-based strategies in terms of measures of restoration and well-being. Indeed, Kaplan has stated that this seems to be "a promising area for research" (Kaplan, 2001) [4].

"*Something in the environment that is not taken in by the mind is unlikely to influence it*" (Kaplan, 2001).

Inspired by the above speculations, I cannot help but hypothesise that integration of, for example, MBCT (Segal et al., 2002) and nature-based approaches might be a fruitful meeting in terms of

[1] Translation from Danish: When I look at my apple tree – it's there I have my moments.
[2] Which is terms of ART is represented by the cognitive state of *fascination* (Kaplan, 2001).
[3] Note that Kaplan has also proposed that the degree of to which mindfulness training/meditation confer positive mental health outcome might be dependent on the environment these practices are carried out in. Thus an alternative hypothesis is that restorative environments, such as nature, might enhance the benefits of meditation (Kaplan, 2001).
[4] Measures available include the *Mindful Attention Awareness Scale* of Brown and Ryan (2003) or the *Sense of Presence Questionnaire* (De Kort et al., 2006).

treatment of stress-related and affective disorders. I would propose that this integration might be based on principles of both technical eclectism and theoretical integration (Hougaard and Rosenberg, 1998).

To conclude, I believe that the scope of investigative possibility within this field is practically inexhaustible, and I have only touched on a few brief suggestions as to areas, which might possibly be mined for relevant and testable research questions/hypotheses. Of course, I have alluded to many more potential avenues in the preceding overview, such as:

- further investigation of nature's effects on socialbility and pro-social behaviour and (Browne, 1992[1]; Coley et al, 1997; Taylor et al., 1998; Kuo & Sullivan, 2001a; 2001b)
- further empirical focus on how states of flow might be linked to the positive mental health effects of nature-based activity
- an analysis of methodologies resting on a hypothesis of the psychological benefits of multi-sensory stimulation, as instrumentalised in Burns' *Sensory Awareness Inventory* (Burns, 1998)
- the link between alleged possibilities for positive distraction/ fascination in natural settings and levels of rumination
- an investigation of whether regular exposure to nature might significantly enhance positive appraisals of self and life circumstances and general levels of optimism
- an exploration of nature as source of metaphor in psychotherapy

However, as it is beyond the remit of this paper to attempt a more comprehensive listing and neither will I go into more depth and detail with regards specific research formulation and design, Needless to say, whichever hypothesis or research question we decide to pursue, then "d*esign is paramount*" (Ulrich, 1999), and in a field with so many potential ambiguous and confounding factors, design is especially paramount.

Judging by the academic and public interest currently being shown in nature-based mental healthcare strategies (see Section 1.1), I would predict that this is an area of research, which will witness rapid growth in the coming years. I wait with anticipation to see in which ways this development will manifest. Let me conclude this section by echoing Zachariae's call for continuous and formalised, cross-disciplinary co-operation between different research-generating bodies (clinical psychologists, scientific institutions, professional organisations, and health departments/authorities) (Zachariae, 2007). I believe that this is the most logical and potentially fruitful route to follow in the development of evidence-based psychological practice, which might legitimise the integration of nature as relevant player in the realm of clinical and other applied psychological disciplines.

[1] Cited in Maller et al., 2002 and Morris, 2003

CHAPTER 4
HUMAN-NATURE RELATIONSHIP

"*There is now a mismatch between the human mind and the world people inhabit*" (Ornstein & Ulrich, 1989[1])

From the pragmatic challenges of research and the necessity of building a valid and qualified fundament, which might justify clinical practice, I would now like to draw this investigative journey to a close by exploring a final 'territory' whose landscape is characterised by more theoretical and philosophical features.

Returning to the conclusions of chapter 2, I have proposed that we, as practicing psychologists, might justify therapeutic use of natural environments in terms of their providing an optimal *context* and relevant element of clinical integration. This is a conclusion, which situates nature at a rather pragmatic level. I would like now to balance this rather "utilitarian" (Kellert & Derr, 1998[2]) or what might even be perceived as a distinctly "anthropocentric" perspective on the value of nature for human mental health promotion (Mellen, 2006). Although, I have earlier made use of the term "nature as relationship" to categorise evidence of supposed direct or unmediated influences of nature on human mental health (*see section 2.1*), I have been employing the term rather pragmatically (i.e. what it is about human-nature interaction that can be employed strategically for purposes of human mental health promotion) and without adequate qualification of what the term 'relationship' might signify in this particular context. Therefore, it is high time I took this discussion of nature-human relationship to a level of greater sophistication and profundity.

Thus, in the following chapter, I would like to reflect in greater depth on the concept of psychological human *relationship* with nature and to explore the situating of the human psyche within an expanded relational/systemic field. My hope is that such a theoretical endeavour, which draws on concepts from diverse schools of thinking (such as evolutionary psychology, phenemonology, ecological psychology and systems thinking), might provide a more to *why* nature does appear to be an optimal context/setting for the promotion of human mental health, bringing a further degree of illumination to the alleged beneficial mental health outcomes described in Chapter 2.

Is relationship with nature "a human *need*, fired in the crucible of evolutionary development" as some have proposed (Kellert & Wilson, 1993)? Do we form attachments to natural places? Does it make sense to say we 'relate' to and 'communicate' with nature? Can the concept of 'therapeutic relationship' be applied to therapeutic use of human-nature interaction? Thus, by reflecting on such wider and more philosophical perspectives of human-nature interaction, I will attempt to theoretically situate the human psyche within a wider relational sphere than the exclusively human and thus take this discussion beyond the level of pragmatic use of nature in the service of human health.

[1] Cited in Burns, 2005
[2] Cited in Burls, 2007

4.1 EVOLUTIONARY PERSPECTIVES

Ulrich took the concept of innate adaptive biological compatibility to particular natural environments and made it the fundament of his famous psycho-evolutionary model of stress restoration in natural settings (Ulrich, 1983). Clinical psychologist, George Burns, has theorised along the same lines, outlining what he calls a "historic ecobiological connection" to describe the rapid and innate positive psycho-physiological responses of humans to certain natural stimuli (Burns, 1998). Furthermore, Aldridge and Sempik have theorised as to evolutionary determined "innate factors" to explain the beneficial effects of both passive and active dimensions of social and therapeutic horticulture (Sempik & Aldridge, 2003a). Although acknowledging the speculative nature of such theorising, Parsons has stated that evidence from studies of preference for nature, lend support to such an evolutionary-based explanation of the alleged beneficial effects of natural settings on human psychology (Parsons, 1991). According to the "*biophilia hypothesis*", psychological phenomena that stemmed from a long history of interaction with the natural environment are presently resident in our genes (Kellert & Wilson, 1993). According to Kellert and Wilson, we thus cannot understand human psychology without setting it within the context of our natural environment (Ibid). Indeed, Oliver and Ostrofsky have outlined an ecological paradigm of the mind which stresses the importance of acknowledging that "despite its unprecedented malleability, the human brain-mind has a complex, characteristically human architecture" which has evolved over millennium in dynamic relationship with the natural environment (Oliver & Ostrofsky, 2007). They point out that most of the current research in fields of neurophysiology and neuropsychology, is based on a premise that the principles behind the brain's functioning are evolutionary and ecological in nature (Ibid). Neuropsychologist, James Ashbrook, has stated that psychology can only fully understand the mind if it realises that "mind comes out of nature and does not function apart from nature" (Ashbrook, 1989[1]).

An evolutionary perspective is supported by evidence which suggests that human beings generally, and not just in times of stress or distress, express preferences for natural settings rather than urban ones, regardless of nationality or culture (Herzog et al., 2000; Newall, 1997; Purcell et al., 1994; 2001). Studies show that places described as "favourite places" are more often represented by natural settings than any other type of setting (Korpela et al., 2001; Korpela & Hartig, 1996). Preferences are particularly for natural environments with water features, old trees, intact vegetation and minimal human intervention (Parsons, 1991). In fact, research data exists that indicates an "aesthetic liking for specific vegetation and tree canopy structures that are found in particular types of savannah environments" (Orians, 1986[2]). We have earlier mentioned a fascinating theory as to why we are aesthetically attracted to natural landscapes (*see page 31)*, i.e. one that links humans and nature via "shared evolution in a fractal world" drawing on studies[3] that show that human psychology is based on fractal structures and fractal processes, and that there exists a fundamental "resonance " between the human perceptual system and the perceived fractal object in nature (Joye, 2006; Purcell et al., 2001). According such theorising, we are thus aesthetically drawn to natural settings containing high levels of fractal dimension and our "resonance" with such dimensions manifests as positive psycho-physiological reactions such as lowered physiological measures of stress (Wise & Taylor, 2003[4]).

Accordingly, elderly residents in an old people's home have been found to consistently prefer views of natural landscapes with "long vistas framed by plants, in an informal setting with water, grass and

[1] Cited in Clinebell, 1996
[2] Ulrich et al., 1991
[3] Joye cites studies by Goldberger, 1996 and Short, 1991.
[4] Cited in Joye, 2006

trees" (Browne, 1992[1]). It even appears that when access to greenery or even views of green landscapes are not possible, then we even 'compensate' by using nature-like décor, pot plants and pictures depicting natural scenes (Heerwagen & Orian, 1986[2]). Furthermore, data on widespread cross-cultural recreational use of nature (e.g birdwatching) and the immense popularity of gardening as nature-based activity provides indirect support for the idea of natural environments as preferred environment (Maller et al., 2002).

The hypothesis that certain natural environments are biologically and psychologically compatible with human well-being has been extended by several researchers to posit a fundamental psycho-biological *mismatch* between humans and their postmodern, largely non-natural, technological environments/lifestyles (Byrnit, 2006; Burns, 2005; Maller et al., 2005; Gullone, 2000; Suzuki, 1997[3]; Kellert, 1997; Nesse & Williams, 1996[4]; Parsons, 1991; Kaplan & Kaplan, 1989). The claim is that such environments/lifestyles have "outstripped our biological evolution, resulting in a negative effect on our personal well-being" (Burns, 2005). Exposure to mainly modern urban environments, and sparse contact with natural environments, is claimed be one possible cause of psychological dysfunctionality (Byrnit, 2006; Maller et al., 2005). For example, Byrnit has utilised such an evolutionary psychological perspective to explain the widespread occurrence of chronic stress-related illness in our society, arguing that post modern social and working practices demand that we adapt to conditions far-removed from those our developmental history has prepared us to deal with (Byrnit, 2006). She argues that, although we can *survive* in our rapidly evolving cultural environment, we perhaps cannot *thrive* there, because biological evolution is a much slower process than cultural evolution (Ibid).

Byrnit's hypothesis is interesting: that stress should not just be perceived as a matter of individual appraisal or as a mismatch between personal psychological resources and environmental demands. Neither is stress merely a question of personal coping strategies that might be strengthened or via structural changes within an organisation. Her theory points us in a direction that urges us to take into account that the largely urban, artificial and non-natural conditions we have created for ourselves may, from an evolutionary perspective, be non-conducive to our psychological flourishing in the long-term (Maller et al., 2005; McMicheal, 2001; Burns, 1998). Such an alternative perspective on the aetiology of chronic stress might constructively guide us to think more along the lines of exposing ourselves to environments, which are more readily compatible with our level of biological adaptation.

In this way, we indirectly bring an evolutionary-based argument into the claim for therapeutic use of natural settings; one that allows us to duly speculate that nature might provide psychologically *optimal* settings for human health and healing on the basis of our innate psycho-biological affinity for such settings.

4.2 RELATIONAL PERSPECTIVES

"*The relationship of people and the natural environment spans a wide range of concerns, from the pragmatic to the spiritual*" (Kaplan & Kaplan, 1989)

Of course, the existence of a profound relationship between nature and human health/healing is a perennial theme. Throughout history, traditional healers have viewed health as a holistic concept with

[1] Cited in Morris, 2003
[2] Cited in Kaplan, 2001
[3] Cited in Maller et al., 2002
[4] Cited in Burns, 2005

no clear distinctions between person, ecology and cosmology (Suzuki, 1997[1]). From such a perspective, "*disrupting the balance of the relationship between these factors is the cause of ill health….restoring the oneness, righting the balance, or re-establishing open communication with the forces of the universe is what restores health and well-being*" (Burns, 2005). Therapeutic powers have been and still are often associated with particular 'sacred' physical sites such as the River Ganges for the Indian Hindus or Mount Fuji for the Japanese Shino and Buddhists. Human interaction with these sites - through prayers, ritual and offerings – is thought to be necessary to procure the healing powers of these sites. Such a worldview sees an ongoing healthy dialogue with the natural world as vital for the health of the person, and the health of the vast interconnected system, of which the person is but one small part.

Tibetan medicine, for example, is described as being a vast and complicated system of psycho-cosmo-physical healing (Clifford, 1984[2]) and many traditional cultures still perceive the breaking of the link with the earth is the cause of illness and disease (Burns, 2005). A potent example is given by a study on health promotion and illness prevention in an elderly Chinese population, which revealed a strong belief that conforming with the laws of nature and retaining a balance with the natural world were the keys to good health and well-being (Yeou-Lan, 1996[3]). One of the central elements of Chinese perennial philosophy is the spiritual dictate of "harmonising with the environment"[4], which means intentionally allowing oneself to be regular immersed in natural settings, interacting with nature and being mindful of the natural world around one (Ibid). Yeou-Lan's study revealed a belief amongst these elderly Chinese people that contact with nature led to peace of mind, good health and well-being. According to Maller and colleagues, these findings correspond remarkably well with the literature on restoration (Maller et al., 2002).

Some have gone further than a thesis of evolutionary-based biological compatibility to hypothesise that relationship with the natural world is a fundamental psychological *need* for human beings. Kellert and Wilson's *biophilia hypothesis* states that humans have a tendency to emotionally affiliate with life and that this tendency is an inherent part of our evolutionary heritage (Kellert & Wilson, 1993), manifesting as a human *need* and playing an integral part of our physical and mental development (Kellert & Derr, 1998[5]). I have earlier broached the concept that meaningful connection to nature might well be a human *need* in terms of Maslow's '*growth'* or '*being needs'* (*B-needs*), which are those needs which motivate towards self-actualisation and transcendence (Maslow, 1968). Interestingly, Maslow actually directly referred to the role of nature's beauty in being able to satisfy what he described as aesthetic *B –needs* (Ibid).

Harold Searles was one of the first psychologists to refer to human relationship with nature as psychologically significant, theorising as to nature's role with regards normal development and the development of schizophrenia (Searles, 1960). He drew upon the theory of ego-development through object relations to describe how the infant moves from a state of all-encompassing subjective oneness to a "mature sense of relationship to the non-human word" (Ibid). Searles believed that in adolescence, a sense of inner conflict arises between a yearning to return to this oneness and, at the same time, to resolve the anxiety that one might lose ones sense of self, ones own "unique humanness" (Ibid). According to Searles, negotiating this conflict was important developmentally, as it presented an avenue by which the human being achieves a mature sense of self and his or her relationship to the

[1] Cited in Maller et al., 2002
[2] Cited in Burns, 2005
[3] Cited in Maller et al., 2002
[4] Along with "following bliss" and "listening to heaven" (Yeou-Lan, 1996 –cited in Maller et al., 2002)
[5] Cited in Burls, 2007

world. He conjectured that the healthy development of relationship with the non-human world, free of projection and transference, would lead to emotional satisfaction and a sense of living, meaningful "kinship" to the natural world (Holmes, 2003).

That we relate to a wider system than that encompassed by the sphere of human relations is supported by research into processes and functions of attachment to natural places (e.g. Low & Altman, 1992[1], Frey 1981[2]). Place attachment is a significant area of research within environmental psychology and alludes to observations of how humans appear to form connections or bonds with particular environmental aspects of places, which serve to shape individuals' definitions of who they are (Clayton & Opotow, 2003). Place attachment is conceived as being made up of affective, cognitive and behavioural components, which manifest in emotionally salient bonds and cognitive appraisals of oneself as connected to a particular environment, which has been described in terms of place identity (Kyle et al., 2004). Korpela and colleagues, have theorised that we form emotional attachments ("favourite places") to places that allow us the opportunity to restore emotional balance and self-regulate (Korpela et al., 2001; Korpela & Hartig, 1996). These authors go as far as inferring that place attachment might be just as significant for self-regulation as social attachment (Ibid). In other words, our attachments to natural places – i.e. our active and relational approach to natural places – might be of fundamental significance to our regulation of identity or concept of self:

"*Place identity is conceived of a substructure of a person's self-identity that is comprised of cognitions about the physical environment that also serve to define who the person is*". (Proshansky & Fabian, 1987)[3]

Charlene Spretnak (1997) has proposed an interesting thesis, based on constructivist and social constructionist concepts of self as held in a relational sphere, which seems relevant to mention in connection with the above ideas. She has hypothesised as to processes of 'ecological constructionism', where, through relational interactions with nature, we might come to know ourselves in much the same way as we come to know ourselves in our meeting with other humans. Spretnak has appealed for a general shift to such an "*ecological postmodernist*" worldview as relevant response what she sees as a dysfunctional relationship with the natural world (Spretnak, 1997). Might this theory of ecological construction of self be of relevance to the realm of therapy? This is a fascinating, yet radical, speculation, which obviously requires much refinement and development if it is to gain currency within psychological thinking.

Nevertheless, inspired by Evernden, Clayton and Opotow have talked of individuals as not being "discrete objects in a neutral environment" but as "fields of care" which also encompass relations with the non-human world (Clayton & Opotow, 2003). Burls has also described relationship with the natural world in terms of caring (Burls, 2007). In a study of existing practices of eco therapy, with a view to developing training programmes for ecotherapists, Burls found (using semi-structured interviews) that service users "*seemed to greatly value their new-found or existing relationship with nature, the mutual nurturing, and their wish to further the relationship into stewardship, encouraging community involvement in respect for nature and the care of it"* (Burls, 2007).

Some environmental psychologists have even developed measures of perceived relationship with natural settings. For example, the *Connection to Nature Scale,* a reliable, multi-item measure "designed

[1] Cited in Kyle et al., 2004
[2] Cited in Kaplan & Kaplan, 1989
[3] Cited in Clayton & Opotow, 2003

to tap an individual's affective, experiential connection to nature" has uncovered a direct positive association between levels of feeling emotionally connected to the world and measures of subjective well-being, which was based on a questionnaire relating to current levels of life satisfaction (Mayer & McPherson Frantz, 2004).

But to what extent is the concept of human-nature relationship a clinically feasible one? According to Burns, nature-facilitated therapy is founded on "interactional and integrated elements of the nature-human relationship" (Burns, 1998). Berger and McLeod have talked of nature as "partner in the process of healing", postulating that when using nature as therapeutic resource, we are in the domain of a 3-way relationship, involving client, therapist and nature as actors (Berger and McLeod, 2006). But does the encompassing of a wider realm of relationship within the clinical domain imply a form of therapeutic relationship? Does it make sense to use such a concept in this context? If yes, then it is surely a very different form of therapeutic relationship than that expounded in the psychotherapeutic literature. Of course, one could argue that some of the Rogerian necessary conditions appear to be present in relationship with nature. Searles, for example, has talked of the non-demanding nature of our relationship with the natural world (Searles, 1960). It goes without saying, that in our 'meetings' with nature, we are unconditionally accepted and non-judged, though of course, when it comes to empathy and positive regard, employment of the concept begins to theoretically crumble? And obviously, when we apply the w*orking alliance* as a more specifically active and collaborative aspect of the therapeutic relationship, then the analogy completely falls to the ground.

Although I find it appropriate at this point, to abandon the theoretical pursual of the concept of therapeutic relationship, I would however conclude that *relationship* with nature is, nevertheless, a profoundly viable concept and one that signifies a level of 'interaction' that may facilitate beneficial mental health outcomes. In Chapter 2, I have outlined a range of evidence, which alludes to this sphere of directly, health-promoting interaction between humans and their natural environment. Concepts and ideas of nature-human relationship may be classed as purely speculative (e.g. Markersen, 2007b) and granted, there are other relevant hypotheses, such as that of cultural learning, which may be involved in patterns of human-nature interaction and general attitudes to nature. However, the above data does appear to indicate a tendency to prefer nature universally, draw upon nature for regulation of mental health and development, bond affectively with places in nature and find nature essentially meaningful (Bragg, 1996). I propose that such a perspective might well imply the situating of the human psyche within a relational field, rather than merely seeing nature as a pragmatic medium/context from which certain psychological 'products' might be obtained.

4.3 NATURE'S ROLE IN PSYCHOLOGY

If we acknowledge the above findings and theories as providing reasonably good grounds to suggest that humans might have an innate and adaptive tendency and need to *relate* to their natural environments, and that this relationship is an important component of healthy development, maintenance of mental health and recovery in situations of mental distress and illness, one might be forgiven for wondering why nature does not enjoy a more prominent place in psychological thinking.

Of course, there are a number of influential theorists such as Edmund Husserl, Maurice Merleau-Ponty, William James, James Gibson, Roger Barker, Urie Brofenbrenner, Ernesto Spinelli, Kurt Lewin, and Gregory Bateson who would have us attend to our psychological embeddedness within the wider

world[1], yet - to borrow the terminology of Ludwig Binswanger - it appears that the worldview of psychology has generally not embraced the *Umwelt*, our natural, biological, physical reality, with its multitude of non-human ecological variables (Binswanger, 1968[2]). Phenomonological psychologist, Ernesto Spinelli has called for the embracing of the level of *Umwelt* within psychological theory and practice (Spinelli, 1989). And in the same vein, humanistic psychologist, James Kuhn, has claimed that psychology in general has limited itself to "too narrow a definition of the human experience", and calls for the integration of an "ecological-humanistic worldview" into psychological thinking and practice: a worldview which includes humans as part of the environment and not separate from it (Kuhn, 2001).

The reasons for the absence of a wider ecological dimension in general psychological theory and practice can be debated. According to Heft, this is due to the fact that the Cartesian worldview and its separation of the natural environment and person, mind and matter, still remains an integral feature of contemporary psychology (Heft, 2001). Within psychology the basic assumption remains that "*the individual knower never experiences the world as such, but only a mental copy of it; and all human knowing…is based on mental representations* " and therefore an unbridgeable gap exists between the physical world 'out there' and the knower's experience of it (Ibid). Heft states that the challenge psychology faces is to reconcile such theorising with "the fundamental evolutionary tenet that psychological processes are adaptive with respect to environmental conditions possessing functional significance" and to develop a "truly ecological approach" in psychology, which might embrace a conceptual foundation compatible with the life sciences, rather than one based on the mechanistic, dualistic foundations of physical science (Heft, 2001) [3].

In the following section, I would like to make a tentative attempt to theoretically develop such a "truly ecological approach", via a focusing on the domain of psychotherapy. This will be an attempt to resituate the individual in terms of (potentially therapeutically potent) relationship with the non-human natural world viewed through the lens of psychotherapy theory. Yet hopefully, the concept suggested will be of relevance to other areas of applied psychological intervention. This theoretical endeavour will draw not only on ecological psychology, but also phenemonology and systems thinking.

4.4 A "TRULY ECOLOGICAL APPROACH"[4] TO PSYCHOTHERAPY

"*I felt a sense of sadness…that psychotherapy has been so tardy in acknowledging that the psyche is not a separate entity but an integral aspect of an ecological whole. Well-being depends not only on the balance of our intra-psychic systems but also on our interactions with both the micro and macro ecology of which we are just one interdependent element*" George Burns, clinical psychologist (Burns, 1998, p. xv)

Where is nature?

Several theorists and clinicians have proposed, that the thinking about and practicing of psychotherapy continues to occur largely within a human-centred paradigm (Rust, 2004; Burns 1998; Clinebell, 1996; Hillman, 1995; Roszak, 1995; Cohen, 1997; 1995). This is reflected in the observation that the

[1] I am referring here to the phenomonological approaches of philosophers Husserl and Merleu-Ponty, William James' radical empericism, James Gibson's ecological psychology, Roger Barker's ecobehavioural approach, Kurt Lewin's Field Theory, Spinelli's claim that psychology/psychotherapy should embrace the *Umwelt*, Urie Brofenbrenner's ecosystemic approach and the systems thinking of Gregory Bateson.
[2] cited in Spinelli, 1989 – for a more concise description of Binswanger's concept of the *Ulmwelt*, *Mitwelt*, *Eigenwelt* and the *Überwelt*, see footnote page 91.
[3] Interested readers are referred to Heft's eloquent meta-theoretical book "Ecological Psychology in Context: James Gibson, Roger Barker and the Legacy of William James' Radical Empericism" (Heft, 2001).
[4] Heft, 2001

psychological literature is largely devoid of references to the interactional dynamics of human psyche and nature[1]. For example, in the 700-sided, 2004 edition of *Psykoterapi: teori and forskning*[2] by respected Danish psychotherapy theorist, Esben Hougaard, the role of nature-based strategies in psychotherapy is not mentioned at all (Hougaard, 2004). Neither does the 5th edition of *Bergin and Garfield's Handbook of Psychotherapy and Behavior Change* refer to the therapeutic potential of nature (Lambert, 2004). Likewise, in the latest edition of the *Sage Handbook of Counselling and Psychotherapy*, not one reference to nature-facilitated approaches is to be found within its covers - even on the section on stress management (Feltham & Horton, 2006). A focused search of a wide selection of specifically clinical, counselling and psychotherapy journals resulted in very few articles related to this theme. Most of the articles and studies found using this procedure referred to the use of animal-assisted therapy[3].

Of course, this absence of nature-based perspectives might be explained by the fact that psychotherapy is traditionally conceived as a psychological service provided by a qualified person or persons, working through the interpersonal medium of a professional relationship and employing specific psychological techniques (often involving dialogue or the 'talking cure') with a client or client group to effect behaviour or personality change, symptom relief and improvement in social, emotional and cognitive functionality (Roth & Fonagy, 2006; Hougaard, 2004). In other words, at the heart of the psychotherapeutic endeavour, there is a therapist present in relationship with a client, no matter what the therapist's positioning or theoretical orientation.

Therapeutic change might stem from the influence of non-specific factors (such as eliciting positive expectations/hope or providing a socially-sanctioned framework for treatment – Frank, 1982) dimensions of the therapeutic alliance, client contributions and/or a specific methodological technique (e.g. cognitive schema focused intervention, emotional catharsis, solution-focused systemic dialogue etc.), but little attention is given to the influence of interaction with the non-human world in the psychotherapeutic project. Treatment setting, content and model of psychopathology are almost inevitably psychosocial (Roth & Fonagy, 2006), whilst the therapeutic role of a wider ecological dimension passes relatively unheeded[4].

Let us return again to the concept of the *Umwelt* (Binswanger, 1968[5]) as described above and its seeming general absence within disciplines of psychology. The same might also be said with regards the worldview of psychotherapy. Yet, according to existential psychotherapist, Ernesto Spinelli, the *Umwelt* impacts upon us and has meaning for us, and should therefore also be granted significance in the therapeutic space, alongside the *Mitwelt*, *Eigenwelt* and the *Überwelt*[6] (Spinelli, 1989). Encouraged by Spinelli and other psychologists, who have called for inclusion of a wider ecological system within psychological theory and practice (e.g. Kuhn, 2001; Burns, 1998; 2005; Hillman, 1995), I now propose that it may be a valuable endeavour for mental healthcare professionals, from fields of clinical and counselling psychology, to explore how natural and semi-natural environments or the *Umwelt*[7] might be included in their meta-theoretical fundament and manifest concrete psychotherapeutic practice.

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[1] There are however a few exceptions: e.g. Worsham & Goodvin, 2007; Berger & McLeod, 2006; Besthorn, 2002; Cohen, 1993; Hyer et al. (1996).
[2] Translation of book title: "Psychotherapy: theory and research".
[3] My search methodology is covered in greater detail in section 2.1.
[4] Several have placed the responsibility for this lack of recognition of the potential that lies in integrating nature into mental health practices squarely at the feet of Sigmund Freud (Roszak, 1995; Burns, 1998). Burns has described how Freud's focus on the intrapsychic journey "reversed the orientation of therapy from the outward focus of traditional healers to one of inner analysis" and set the tone for the development of a psychotherapy which located the psyche 'within' and the real world 'outside' (Burns, 1998; 2005).
[5] cited in Spinelli, 1989
[6] Mitwelt: public world-self interactions, including culture, race, work, class, gender etc; Eigenwelt: private and intimate world-self interactions plus the intra-personal; Uberwelt: interaction of self with abstract and absolute dimensions of existence such as ideology, death, meaning etc. (Spinelli, 1989)
[7] Binswanger, 1968 – cited in Spinelli, 1989.

Bringing the ***Umwelt*** into psychotherapy

"*If a fish were able to develop a theory of fish existence, it probably would not focus attention on how being continually immersed in water influenced everything about fishness.*" (Clinebell, 1996)

Of course, psychotherapy has long been influenced by contextual thinking, which situates the individual within a wider, interconnected system of relational processes, i.e. family, group, community, society or cultural milieu. These approaches, which include a wide range of systemic family therapies (Carr, 2000), ecological counselling (Conyne & Cook, 2004) and a variety of therapies built on a community or multi-cultural psychological fundament (e.g. Nagayama Hall, 2005; Kristensen, 2004), employ an ecological or systemic understanding of humans and their behaviour, in which the individual can be best understood and helped within the context of his or her interpersonal field. This paradigm shift, from person-centred to ecological approaches within psychotherapy, has been influenced by thinking from a wide range of theoretical sources, including general systems theory and cybernetics (Bateson, 1972;1979; Weiner, 1950[1]; Capra, 1996) constructivism (Maturana and Varela, 1980[2]); the ecological systems approach of Broffenbrenner (1979) and Kurt Lewin's field theory, which links person and environment as interdependent regions of "life space"[3] (Lewin, 1951). Ideas of the construction of self as a dynamic process held in the relational field have likewise informed a great number of post-modern, so-called, social constructionist therapeutic approaches from collaborative language-systems therapy to narrative and solution-focused therapies (e.g. Anderson, 1997; Freedman & Coombs, 1996; White & Epston, 1990; De Shazer & Berg, 1992[4]).

However, the terms *ecological* and *environmental*, as utilised in such systemic or person-in-environment therapeutic approaches, refer to a sphere of exclusively human relational, socio-lingual and cultural influences. None of these therapies extend beyond "the city limits" (Roszak, 1995). None of these therapies have expanded the level of system to encompass that, which connects the human and the non-human, living world. According to Clayton and Opotow, psychological concepts of identity here "miss the larger non-human context within which all human relations occur" (Clayton & Opotow, 2003).

So, might it be possible then, to extend our definitions of psychologically significant level of system in order to conceptually situate practices of nature-assisted psychotherapy? For example, could Brofenbrenner's (1979) ecological systems theory, which extends from the *microsystem* (immediate social network), through the *exosystem* (community level of network) to the *macrosystem* (wider social network of culture, politics etc), be usefully expanded to include the natural environment or physical ecosystem within which all relations are ultimately embedded (Clayton & Opotow, 2003; Capra, 1996; Roszak, 1995)? Interestingly enough, some theorists have attempted to extend Brofenbrenner's model to include an extra level of system - termed the "world" (Maton, 2000[5]) or "global system" (Kasambira and Edwards, 2000[6]) - yet this expansion does not refer to relationships with the non-human world, but rather psychologically significant global human activities, such as the bombing of the World Trade Centre in 2001 (Conyne & Cook, 2004). However, I would to like to draw attention to a recently revised version of the World Health Organisation (WHO) health map, which actually does include the level of

[1] Cited in Capra, 1996
[2] Cited in Carr, 2000
[3] By "life space", Lewin was referring to the total psychological field at any given time.
[4] De Shazer & Berg - cited in Carr, 2000
[5] Cited in Conyne & Cook, 2004
[6] Cited in Conyne & Cook, 2004

natural environment and global ecosystem in its conceptual understanding of what determines health and well-being (Barton & Grant, 2006).

I would like to speculate that this model might in some way serve as inspiration for the development of an expanded, eco-systemic model for psychotherapy and other schools of applied psychology – a model in which the "natural environment" and "global ecosystem" are also represented as psychologically relevant levels of system.

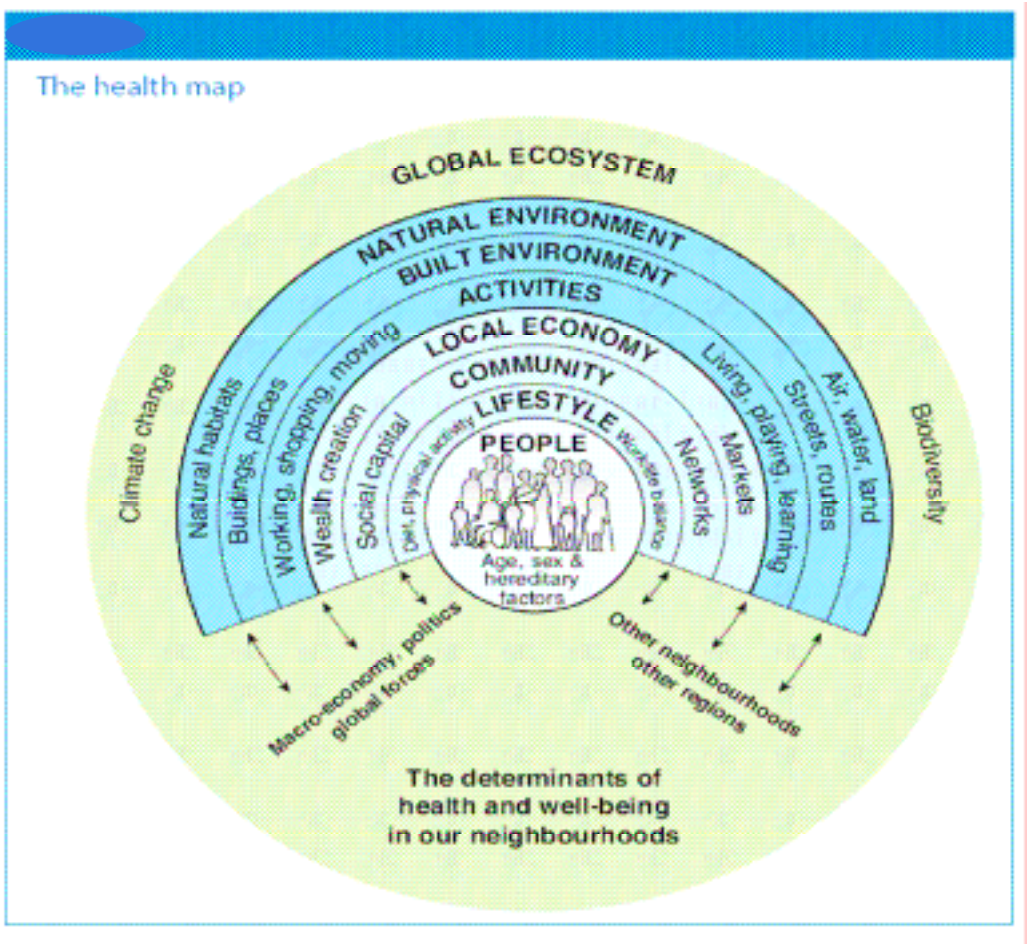
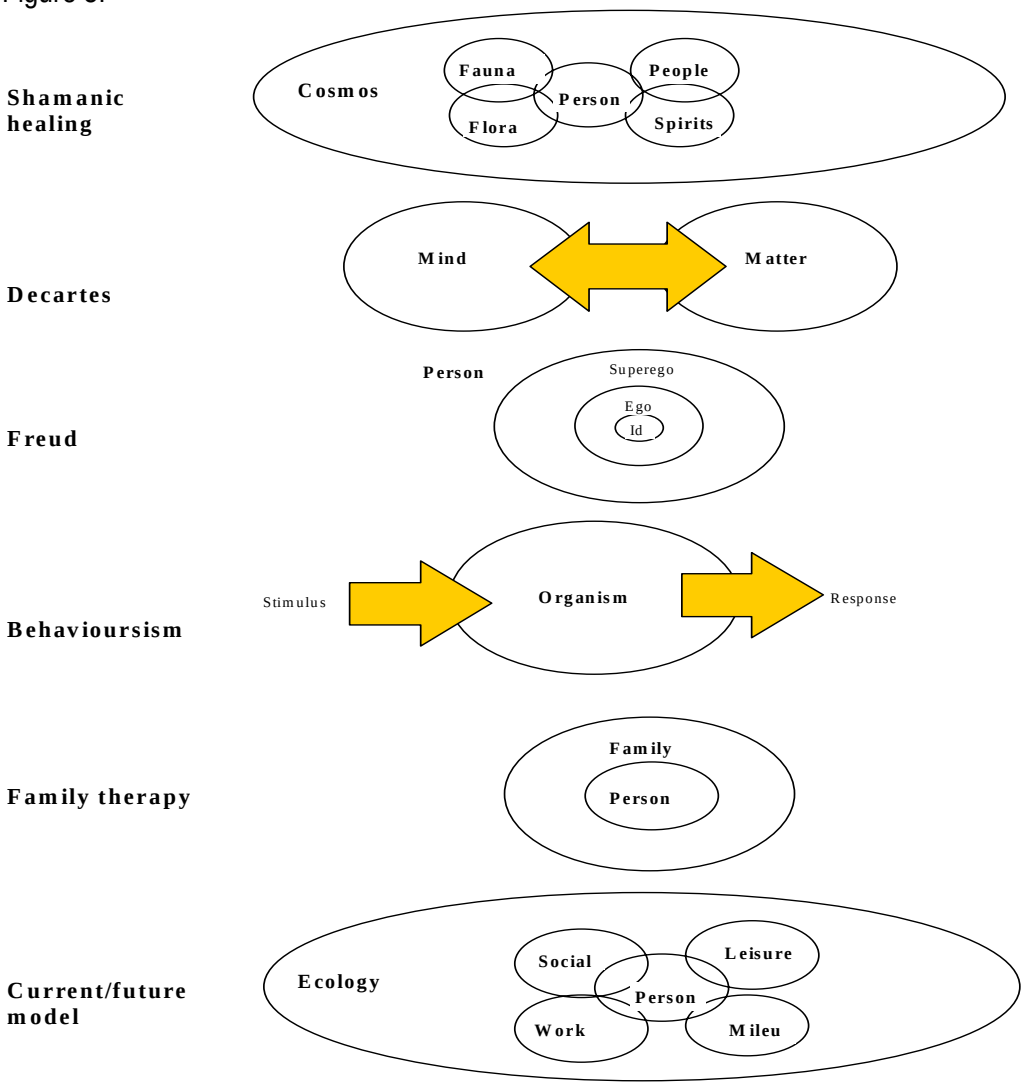


Figure 4.
The Health Map
Barton & Grant, (2006)
With permission from Sage Publications.

To my knowledge, only Burns has attempted such a systemic model in his "Timeline of concepts of well-being" (Burns, 2005), which represents an historical overview of the major paradigms in the development of psychological treatment modalities. In this overview, he suggests a "current/future model" for mental healthcare, which is situated within a wider non-human ecology.

Figure 5.



A timeline about concepts of well-being
(Burns, 2005)

Yet, Burns stands as a rather lone figure in the landscape as he attempts to integrate (both theoretically and clinically) a broader non-human, ecological level of system into an understanding of what might have significance for the health of the human psyche[1].

But, can we talk about self in wider 'ecological relationship'? Are we embedded in a psychologically potent relational field at the level of non-human, ecological system, as earlier proposed? Can we argue for the validity of Burn's current/future model of treatment epistemology? In the above section, I have already examined the concept of relationship with natural, non-human environment drawing on various perspectives such as psycho-evolutionary theory (e.g. Ulrich, 1983), the *Biophilia Hypothesis (Kellert & Wilson, 1993)*, place attachment (Altman & Low, 1992), and ideas of "mismatch" between the human

[1] I will not critically analyse this model as my intention here is merely illustrative, i.e. to provide an example of an attempt to expand the conceptual boundaries of psychotherapy by a clinical psychologist.

psyche and postmodern, urban environments (e.g. Byrnit, 2006; Burns, 2005; Gullone, 2000; Kaplan & Kaplan, 1989).

Expanding the level of system

Let us now turn to the level of meta-theory to further articulate a framework in which the human psyche might be situated within an expanded level of system/relational context. I propose that such sources are to be found principally in the fields of phenonomonological, ecological and systems-inspired psychology. The phenomonological thinker, Edmund Husserl talked of the psychological embodiment of the self in the directly experienced world of material Lebenswelt or life-world (Husserl, 1960[1]), which he saw as a fundamentally inter-subjective or relational world, organised as multiple levels of system.

Heft has described how the conceptual foundations of a truly ecological psychology were provided by William James' phenemonological radical empiricist approach at the start of the 20th century (Heft, 2001) – a stance which grew "directly out of a functionalist evolutionary account of psychological processes and fully embraces the reciprocity between animal and environment that such a view entails" (Ibid). According to Heft, James insisted that what is meaningful for individuals, exists in a relational and yet independent, shared environment, and that we directly experience this meaningfulness in our immediate, dynamic, reciprocal engagement with that environment (James, 1912/1976[2]). Radical empiricism proposes that "the potentially known is latent in the world and knowing is manifested as differentiation of structure in 'pure experience' through the continuing transaction of knower and known" (Heft, 2001). Interestingly, radical empiricism profoundly influenced the ecological thinking of both Gibson and Barker (Ibid). James Gibson's theory of ecological perception, which describes the environment as replete with *affordances* for learning, also implies a profound dynamic relationship between individual and his or her world.

I would like to point out the resemblance between William James' radical empiricism and systems thinker Gregory Bateson's theory of embodied mind, in which information – "the difference that makes a difference" – supposedly moves in circles through subject and object and back again through many points of contact, linking mind and matter (Bateson, 1979). According to Bateson, *mind itself is as a radically interconnected systems phenomenon,* an ongoing interaction between human and its environment, whose 'language' is the language of pattern and relationship (this is what Bateson meant by the term "the pattern that connects"). Mind and nature are thus seen as inseparable, because the knower and the known are actually part of the same system.

"*Mind became, for me, a reflection of large parts and many parts of the natural world outside the thinker.*" (Bateson, 1979)

This brings us to a place where systems thinking presents itself a suitable conceptual paradigm in which to situate the claim that psychology would do well as a discipline to embrace the non-human, natural world in its striving to understand human behaviour and development. According to systems theory, human beings exist as embedded holons within relational, dynamic physical and psychosocial eco-systems, characterised by processes of feedback, self-regulation and self-organisation (Capra, 1996). Thus, if we accept the definition of ecosystem as including "the sum total of influences operating in a persons life, including such diverse influences as biological makeup, interpersonal relationships, physical environment, and the broader socio-cultural context" (Conyne & Cook, 2004), then it seems

[1] Cited in Abram, 1996.
[2] Cited in Heft, 2001

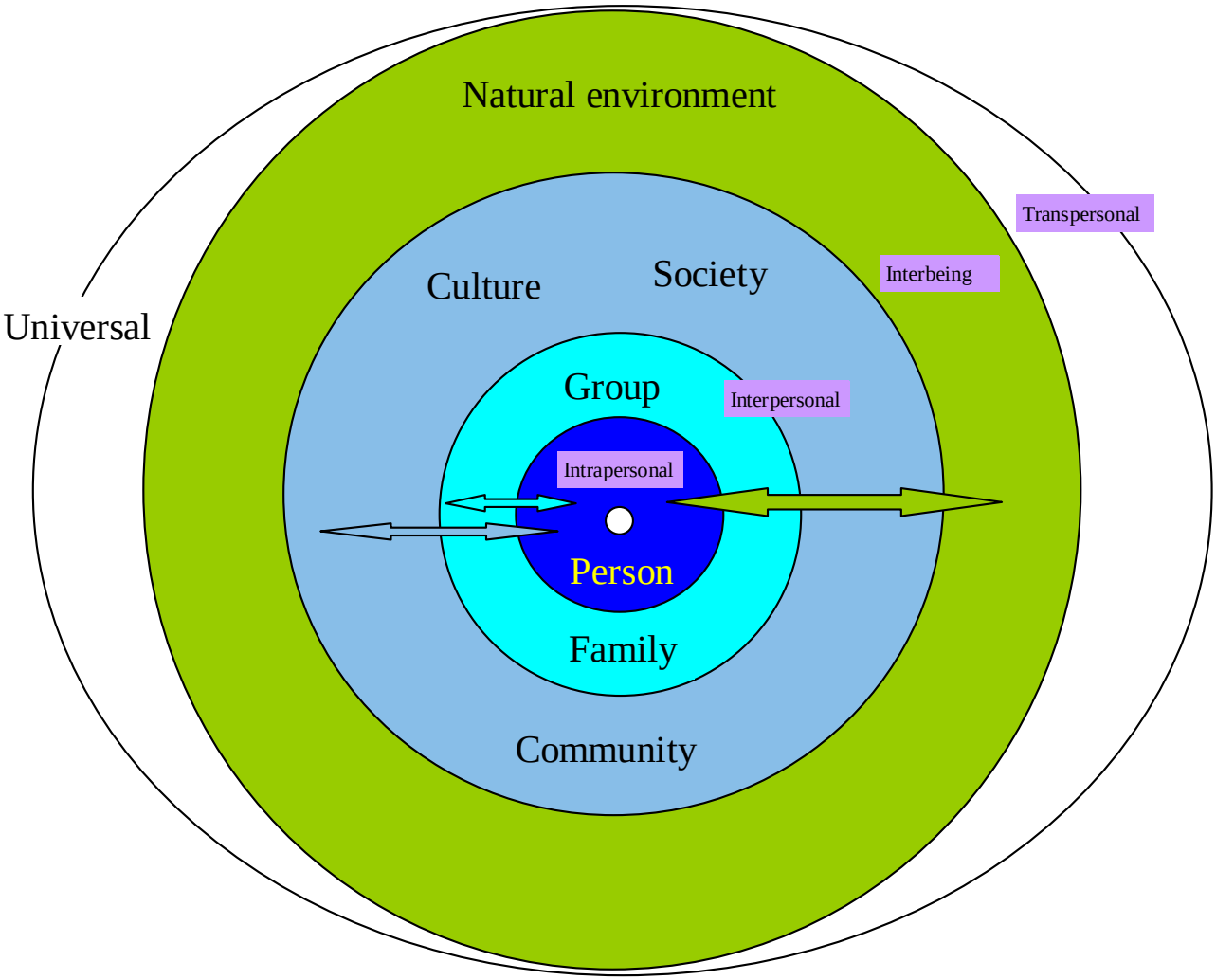
reasonable to suggest that the natural environment must be of relevance to the discipline of psychology. On the basis of such reasoning, I would posit that a truly eco-systemic psychology can embrace multiple levels of organisational system – including non-human systems.

It is not within the scope of this thesis to expound and develop such a conceptual framework in greater detail. I would, however, on the basis of the above reasoning, like to follow up on my earlier hypothesis that a model of self-in-system could be extended for the purposes of and justification for integration of nature-assisted approaches within clinical psychological intervention. Such a model would embrace a wider concept of eco-system than previously present in the psychological literature, including that which lies beyond the usual human-centred, or "anthropocentric" parameters of the therapeutic domain (Mellen, 2006). The following model (*see Figure 6*.), inspired by both Broffenbrenner's (1979) ecological systems model and Barton & Grant's Health Map (2006), is a tentative attempt to visually portray such an expanded level of psychologically relevant system. This model represents an attempt to provide an *ecosystemic* meta-theoretical framework[1] within which a nature-based approach to psychotherapy and other disciplines of applied psychology might possibly be situated. The use of the term *ecosystemic* here is not to be confused with Broffenbrenner's (1979) or Coyne and Cook's (2004) definition of eco-systemic approach, which do *not* explicitly refer to the natural environment as psychologically relevant level of system.

This model is intended merely as a tentative first step on a journey towards a meta-theoretical/theoretical fundament for the development of nature-assisted psychological intervention, particularly in terms of psychotherapy. I would thus ask the reader to perceive of this attempt in terms of theoretical brainstorming. Note also that the inclusion of a transpersonal level is justified on the basis of findings in chapter 2 alluding to this as a potential dimension of nature-based psychological experience (e.g. Williams & Harvey, 2001; Frederikson & Anderson, 1999; Burns, 2005 Maslow, 1964; Laski, 1961[2]). The 'universal' level is formed as an eclipse, touching the level of 'natural environment, in order to reflect this research and symbolise greater possible capacity for transcendence in natural settings. The small white circle at the centre of the 'person' is included in order to symbolise that the universal runs through/behind all levels and exists as the ultimate 'medium' from which all life/interaction manifests.

[1] Indeed, to situate any psychological treament modality within a wider ecosystemic framework.
[2] Both Maslow and Laski cited in Williams & Harvey, 2001

Figure 6
Proposal as to an eco-systemic model depicting expanded levels of psychologically relevant system with focus on the embeddedness of individual-in-relationship (*as inspired by Brofenbrenners Ecological Systems Model, 1979*)



Some qualifying remarks

Focusing on the field of psychotherapy, I have thus made a tentative attempt to resituate psychological practice within an expanded systemic framework. My proposed model takes Brofenbrenner's ecological systems model and expands it to include a wider conceptualisation of level of psychologically relevant system. Obviously, this is a bold presumption and such a concept requires much work and refinement. I make no assumptions as to the validity of this concept – my intention has been merely to explore the possibilities through the exercising of theoretical creativity.

I propose that it is within such an eco-systemic framework that any potential integrative model of nature-assisted psychotherapy might be suitably situated. Here, nature is perceived as relevant level of

relational influence as based on the theoretical and empirical fundament depicted in this chapter and the evidence as to beneficial outcome outlined in chapter 2.

In other words, I have made nature a relevant psychological player, and argued for the possibility that nature is not just a tool, but is characterised by aspects which might be referred to as a relational field of personal meaning. Hopefully this section and resulting model is not only explanatory (providing hypotheses as to why nature affects us as it does), but also might be used to theoretically/meta-theoretically situate and legitimise nature as integral element within various models of psychological intervention.

CHAPTER 5
CONCLUDING DISCUSSION

"*Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their freshness into you, and the storms their energy, while cares will drop off you like falling leaves*." (Muir, 1917)

My intention with this study has been to explore the realm of nature-human interaction in terms of its potential value for mental healthcare in general, and applied clinical psychological endeavours in particular. On this 'journey' I have passed through several different landscapes - from an analysis of the available empirical, theoretical and clinical literature, to conjecture as to potential areas of interventional application and research, to more speculative proposals as to the situating of the human psyche within its natural environment in terms of psychologically potent sphere of relationship.

However, the reader may be forgiven for perceiving this journey as having covered a rather large a distance in a very short a time. Admittedly, I have at times felt it would have been appropriate to stop and take time to reflect more deeply in my meeting of various different themes emerging from my investigation. Yet, I have felt impelled to travel onwards and maintain my tempo in order to stay true to my original, rather expansive, research aim.

I am acutely aware of the fact that this work has perhaps asked far more questions than it has answered. I would justify this by emphasising that my fundamental intention has been to contribute in some way to laying the *groundwork* for future research, practice and theorising within clinical psychology. This has been a mapping of the wider territory with a view to more specific local investigations in the future.

Yet, on the basis of the above overview and accompanying theoretical reasoning, I would postulate that there are good grounds to suppose that integration of nature-based perspectives within domains of clinical psychological intervention might provide opportunities to profitably enhance and expand the clinical repertoire - qualified however, with an acknowledgement that nature's particular therapeutic/salutogenetic potential is dependent on a range of factors related to individual needs and specific therapeutic indications. Generally though, I would be so bold as to make the presumption that, via the convergence of empirical evidence, clinical experience and theoretical reasoning from a wide range of disciplines and perspectives, there is ample data to warrant the clinical and theoretical attention of psychologists/psychotherapists.

Nature as psychologically optimal environment

The concept of nature for psychological regulation of what Csikszentmihalyi has termed, "psychological capital" (Csikszentmihalyi, 1990) stands out as a central theme in the literature. Drawing upon the Keyes-inspired mental health continuum once more (*see Figure 2, page 21*), we can see that individuals will present with different requirements for regulation of resources depending on their starting point, i.e. in the case of healthy individuals, nature might be called upon in terms of strengthening, imbuing or optimising resources (putting more in of what is already there), and in the case of individuals suffering states of pathology or depletion, nature might be useful in terms of

resource replenishment or restoration (i.e. putting something back that has been lost). Indeed this corresponds well with Gulwaldi's findings that people draw upon nature differently depending on their current psychological needs (Guwaldi, 2007).

Much of the literature on the relationship between nature and human mental health subscribes to the more traditional, pathogenic perspective, hypothesising that individuals suffering conditions of low 'psychological capital' or problematic mental health states, may be drawn to use nature therapeutically in order to recover mental resources and to reflect on and work out their problems (e.g. Guwaldi, 2006; Herzog et al., 2002; 2003; Van de Berg et al., 2007; Kaplan & Kaplan, 1989). This is the literature on restoration contained in section 2.2. However, a perspective that sees the clinical potential of nature from a more positive psychological perspective (i.e. enhancement of strengths, well-being and optimal functioning is also evident in the literature (e.g. Gable & Haidt, 2005; Stigsdotter, 2005; Burns, 1998; 2005; Clinebell, 1996).

Generally then, we might conclude that natural settings appear to be places where "people take their problems" (Francis & Cooper Marcus, 1991), for healing, restoration and symptom relief, but also where people go to achieve states of relaxation, gratification, pleasure, happiness, inspiration, self-esteem, improved self-concept and sense of meaning – and even transcendence! In other words, pleasant, non-threatening, natural environments appear to be *optimal* environments for human psychological health in the broadest sense of the word: from healing of pathology to supporting flourishing and self-actualisation. The concept of 'optimal environment' is particularly useful here, as it seems to harmonise well with both a situating of nature in terms of setting *or* as relationship: a distinction I have made use of throughout this study (*see Figure 1, page 20*). The optimality of nature as psychological environment has also been discussed from the perspective of an evolutionary-based, biological compatibility or 'match' (*see section 4.1*) in addition to the concept of psychologically significant relational interaction with the non-human world (*see section 4.2*).

Theoretical integration within a positive psychological framework

I would suggest that it might be appropriate to situate the *practice* of nature-assisted approaches within a general psychology of well-being (Seligman et al., 2006; Gable & Haidt, 2005). Positive psychology provides a vision of a psychology "that concerns itself with repairing weakness as well as nurturing strengths, a psychology that concerns itself with remedying deficits as well as promoting excellence, and a psychology that concerns itself with reducing that which diminishes life as well as building that which makes life worth living" (Seligman et al., 2004) - the tapestry of process and effect woven in Chapter 2 is surely woven with positive psychological threads (e.g. enhanced positive emotions, enhanced mood states, pleasurable experiences, enhanced life satisfaction, increased self-esteem, enhanced coping, meaningful activities leading to states of vital engagement/flow and sense of purpose, enhanced social engagement, caring and altruism, appropriate challenge, use of skills, learning of new skills, enhanced-person environment fit, states of trancendence, etc.) that support such a vision.

"*Contact with nature enhances happiness and facilitates healing.*"" (Burns, 2005)

In other words, nature as intervention harmonises well with a positive psychological agenda for mental health promotion. Of course, as much is suggested with my use of a health-promoting continuum as inspired by Keyes (2002), which acknowledged the natural environments not only in terms of healing and restoration, but also as facilitating factor in terms of flourishing and optimal well-being (*see figure 2,*

page 21 and figure 3 page 75). I have earlier raised the possibility that nature-assisted approaches might be usefully aligned within positive psychological approaches such as Seligman's Positive Psychotherapy (Seligman et al., 2006) or Fava and colleagues' Well-Being Therapy (Fava & Ruini, 2003.

Furthermore, the search for 'optimal environments' for mental health is a clearly formulated goal of positive psychology (Gable & Haidt, 2005) – and thus, to describe safe and generally-preferred natural environments as offering optimal settings for human psychological thriving and healing, seems a most plausible basis on which to justify integration of nature in clinical psychological practices. Of course, we should be wary about potraying a picture of natural environments as in some way superior, in terms of their mental-health promoting properties. Markersen has questioned whether other non-natural environments might be equally beneficial or optimal (Markersen, 2007b). He describes practices of encouraging clients to find their own personal "healing garden" in other contexts, by which he means, to find places that elicit positive states such as relaxation, enjoyment and meaning, natural or not (Ibid). Of course, there are other 'optimal environments' conducive to psychological health and healing. For example, the literature contains several examples, which show that restoration as psycho-physiological process, is not only reserved to natural settings (e.g. Oulette et al., 2005; Guwaldi, 2006; Herzog et al., 2002). In a study teachers' choice of place for restoration from stress, Guwaldi found that, although natural settings are often described as favourite places for restoration, other situations and places such as home and places that provide opportunities for social interaction, are also perceived as restorative (Guwaldi, 2006). Museums have been identified as environments offering restorative potential (Kaplan et al., 1993), and the restorative effects of retreat at a Benedictine monastery have likewise been the focus of research (Ouellette et al., 2005). In another ART-based study, participants generally rated entertainment and exercise as more highly preferred in terms of potential recuperative value than natural settings (Herzog et al., 2002). Furthermore, restorative effects have also been linked to the practice of mindfulness techniques independent of particular setting (Kaplan, 2001). These studies do, of course, indicate that non-natural, pleasant settings or experiences might be equally restorative for some individuals, preventing any generalised conclusions as to the superiority of natural settings as restorative environments from being drawn. Yet, it does appear from the literature that natural settings are generally preferred (e.g. Herzog et al., 2000; Newall, 1997; Purcell et al., 1994; 2001) and especially effective in promoting positive psychological change (e.g. Pretty et al., 2005; Berto, 2005; Herzog et al., 2002; Kaplan, 1995; Ulrich et al., 1991). And according to Burns, when asked to list sensory experiences that elicit positive emotions and pleasure for clients, a vast majority invariably refer to nature-based experiences and sensations (Burns, 2008).

Wide ranging potential for application

As to clinical applications, the overview provided in Chapter 2 indicates that we might beneficially apply nature-assisted strategies across a wide range clinical settings and goals, as part of an integrative approach to treatment and prevention. However, it must be said that the past and current literature does seem to indicate a particularly relevant application in the case of supportive therapy[1], i.e. enhancing coping, alleviating symptoms, representing new strategies for mental health management for clients, enhancing mood and experience of positive emotions, reducing stress and encouraging generally normative adaptation to life circumstances etc. For example, there is a substantial evidence-base indicating the stress restoration/regulation utility of natural settings – an application, which I believe is currently undervalued as psychological intervention in current practices of stress

[1] Jeg-støttende terapi

management and alleviation. I would posit that prevention and treatment of stress-related disorders presents us with one of the most obvious areas of application for nature-assisted approaches.

But there are also indications in the anecdotal and theoretical literature, which allude to nature's role in supporting processes which might be described as eliciting deeper and more "life-transforming" therapeutic change – through existential reflection, regulation of self-concept, the facilitation of enhanced levels of meaning and coherence, experiences of transcendence and healing of trauma through use of nature as metaphorical environment and restorative context. However, the empirical validation of such claims and hypotheses is at present lacking.

Let me stress once more, that it is *not* my intention to suggest that the use of natural environments is to be perceived as a universal cure-all. Nature is not meant to be a substitute for therapy, but it can be an important, supplemental resource that supports the process. Thus, as described in section 2.6, the therapeutic and salutogenetic relevance of nature to practicing psychologists is probably best perceived from a standpoint of methodological and theroretical clinical integration[1].

"*Nature-based assignments can readily be incorporated into most therapeutic models, especially those directed toward brief, effective, strategic and solution-focused approaches*." (Burns, 1998)

We might also justify the intentional use of nature on the basis of its ability to strengthen and enhance other endeavours. For example, we know that exercise confers positive benefits for mental health, but exercise in natural settings seems to confer even higher levels of mental health. Could the potentising effects of nature, demonstrated in this example, be relevant in other domains? Might exposure to natural environments enhance other therapeutic processes for some clients? Could some clients even benefit from consultation carried out under open skies? Burns relates the story of a young woman who refused to receive therapy in his consulting room but insisted on talking with him outside (Burns, 2007b). These are interesting speculations as to the possibilities for enhancement of the clinical repertoire, which might easily be tested in terms of comparison with other more traditional therapeutic settings.

Of course, nature as psychological intervention has its limits. I have touched on many of these in section 2.5 where I have outlined the theme of individual differences. Indeed, many factors will play a role in how efficiaous a nature-assisted intervention might be – for example, the specific presenting problem (in cases of nature-related or open-space related phobias, traumas strongly associated with particular natural environments, etc. nature-assisted approaches will obviously be counter-indicated), outcome desired, culturally-defined differences in attitude to nature and so on.

Yet, in general, I would conclude, that judging by the range of current application and the evidence-base provided, the seeds of possibilities for future application are cast on fertile ground. I have provided a number of ideas as to what 'seeds' could be sown in section 2.6 and 3.2.

[1] Of course nature-assisted approaches can be practiced from the worldview presented in Chapter 4 – that humans are relationally situated within nature and need nature for mental health and development. I will return to discuss practice from a deeper perspective on page 104.

Methodological manifestation

"*Perhaps we will advise patients to take a few days in the country, to spend time gardening, or to adopt a pet, if clinical evidence offers support for such measures*" (Frumkin, 2001)

As to how nature-assisted mental health interventions might concretely manifest in practice, this of course will depend on the particular form of methodological and theoretical integration chosen (e.g. narrative, Gestalt, cognitive, solution-focused, experiential or generally positive psychological or even pharmaceutical approach to intervention). I have attempted to give a brief overview of several different established nature-assisted approaches such as horticultural therapy, wilderness therapy, civic environmentalism, walking for health and use of healing gardens. Nature as therapeutic/salutogenetic context (or independent variable) may range from quests in the wilderness to passive contemplation in a garden to a natural view from the consulting room. Indeed, I have made it clear from the outset of this study, that there are a multitude of different parameters, which might influence the particular manifestation of clinical practice. In addition to those earlier stated (i.e.e whether a practice is group-based or solo, active or passive (*see section 2.1*), we also need to take into account factors such as the degree of therapist intervention, therapist positioning, goals of therapy, client compliance etc.

Specific methodologies have ranged from Burns's outcome-directed use of the *Sensory Awareness Inventory* (Burns, 1998), the elicitation of metaphor from either nature-based assignments or shared activity with a therapist (Burns, 1998; Linden & Grut, 2002), use of ritual (Berger, 2006) to group involvement in a conservation project (Reynolds, 2002; Townsend, 2006). I have also made suggestions as to suitable methodologies, which show particular promise in terms of amalgamation within a nature-assisted integrative approach, such as mindfulness/meditation in nature (see section 3.2).

In terms of the practice of nature-assisted psychotherapy, nature may be drawn on as focus of client-elicited homework assignments (Burns, 1998), experiences in nature may be the source of therapeutic material taken up in therapy (for example, experiential metaphors may be drawn on – Ibid), or natural settings may be the very context of therapy itself – i.e. the consulting room could be under open skies or in a greenhouse.

The field of nature-assisted clinical psychological intervention is obviously still in its fledgling days and the need for development of models of best practice is most obvious. At a recent seminar on nature-guided therapy in Copenhagen[1], the need for ideas and guidelines as to how psychologists might actually practice integrative nature-based approaches was clearly evident. Burls has highlighted the pressing need for training programmes for ecotherapists and has recommended that future practitioners need extensive psychotherapeutic knowledge and multi-therapeutic skills including those which may draw from nature as therapeutic resource (giving the example of use of metaphors from nature as an example) (Burls, 2007).

[1] Nature-guided psychotherapy: expanding the boundaries of healing with clinical psychologist George Burns, 24 Feb 2008, Danish Centre for Ecotherapy/Dansk Center for Naturterapi

Deep and shallow approaches to nature-assisted mental healthcare

Alternative possibilities exist as regards positioning of nature as psychological intervention: in Chapter 2, I have primarily argued for a positioning which might be described as pragmatic, based on a concepts of nature-assisted approaches as evidence-based technical strategies, nature as theoretically integrated element within a multi-modal approach or nature-assisted interventions as adjunct treatment modalites or 'appendages' to established approach. The evidence, which makes up the primary content of Chapter 2, seems to provide support for such a positioning. Taking inspiration from the philospher Arne Næss and his distinction between 'deep' and 'shallow' approaches to ecology (Næss, 1973), we might label this as a 'shallow' approach to use of nature in mental healthcare.

Yet, we, as psychologists, might also justify integration of nature within clinical psychological practice from a 'deeper' position – i.e. one which represents a radical paradigm shift and the embracing of a worldview, which sees nature-human relationship as a psychologically relevant level of relational system, incorporates concepts of human psyche as essentially embedded in non-human, biological systems, sees interaction with natural environments as a fundamental human *need* and safe and aesthetic natural settings as *optimal* environments for human healing and thriving on the basis of principles of evolutionary-based compatibility and interconnectedness. This is a plausible positioning as based on evidence and theorising presented in Chapter 4. It is from such a paradigm that I have argued for an ecosystemic model of nature-assisted psychotherapy – where the concept of ecosystem has been extended beyond that proposed by Broffenbrenner in 1979 to incorporate the natural world (*see Figure. 6, page 97*). Implicit in such a profoundly systemic model of mental health care is the reality of "*the human psyche as an integral part of the web of nature*"(Brown, 1995) and the fact that the psychological well being of humans (parts of the system/holons) is intricately dependent on the health of the wider ecological system (and vice versa). The concept of "eco-health" (Burls, 2007) harmonises well with this 'deeper' paradigm. Eco-health is a term coined to describe interventions, which target multi-level dimensions of health outcome, including the health of the individual, community and biosphere (Ibid). It is apparent from the literature within this field, that many therapists working with nature-based strategies are doing so because they feel it is imperative to address the mental health of humans within the wider context of the health of the biosphere, i.e they are working from a 'deeper' positioning which acknowledges the validity and importance of conceiving mental health as a holistic phenomena (e.g. Burls, 2007; Berger, 2006; Rust, 2004; Burns, 1998; Clinebell, 1996; Hillman, 1995; Hillman & Ventura, 1993 etc).

Practicing from such a holistic paradigm clearly holds some profound implications: it infers more than just the extention of what is conceived as having therapeutic utility and validity in a clinical framework, taking us further or deeper than the mere employment of human-nature relationship in human healing and mental health promotion. Indeed, some have proposed that the practice of nature-based therapy from such a positioning might be viewed as a relevant response to the current state of environmental degradation and ecologically (self) destructive behaviour witnessed in western cultures, for its practice ultimately demands a redefinition of mental health to include the quality of our relationship with the rest of life (Conn, 1995; Roszak, 1995). According to Roszak, therapists practicing from such a paradigm may consciously bring the psychological influence and ethical implications of the "human-to-planet relationship" into the domain of treatment (Roszak, 1995).

These are interesting and timely speculations which are clearly worthy of our attention as psychologists. Yet, no matter what ones chosen positioning as therapist - shallow or deep, micro- or macro- level (Burls, 2007) - I would conclude from this study, that there is substantial theoretical,

empirical and clinical basis to warrant the intentional integration of nature in general mental health settings and the acceptance of nature as representing a legitimate health-promoting context or strategy in terms of integrative interventional approaches.

Thus, it appears that the claim for a “green agenda for mental health” (Mind, 2007) is justified and that there are grounds to suppose that an extention of the therapeutic/salutogenetic paradigm might be valuable for disciplines of clinical psychological intervention. With this work, I hope that I may have provided some relevant material, which might support the further constructive development of this field.

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