ECOLOGICALLY SUSTAINABLE DESIGN THROUGH REFLECTIVE PRACTICE

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Abstract

This research paper is an investigation into the notion of sustainability as it is currently understood by the architecture profession. Its underlying contention is that there is a gap between the root cause of unsustainability and the profession's efforts at addressing it. This gap which fundamentally undermines the effectiveness of all such efforts to date is located at the interface between inner human needs and their manifestation as human behaviour.

This paper introduces the latest thinking about inner human needs emerging through a matrix of sciences dedicated to the study of the brain, mind and consciousness.   This study is considered Western science's last great frontier (Varela 2002) and is built upon contributions from disciplines as diverse as bio-medicine, physics, neuroscience, cognitive science, psychology, philosophy and artificial intelligence (Psyche 2004). Cross-cultural collaboration between leading members of this scientific community and high-ranking Tibetan Buddhists engaged in their own study of the mind serves to emphasize the extensiveness of this effort (Mind & Life Institute 2004).

Of critical importance to the notion of sustainability is research into the effects of science generally and of Information Technology, Biotechnology and Nanotechnology in particular, upon humanity into the 21st Century. Predictions are that human nature as it is currently understood will be more profoundly affected by these technologies than by anything that has happened to the human species in the past 100 000 years (Greenfield 2004).

This research paper takes up the challenge to place such predictions into the sustainability debate within the architecture profession. Now under consideration is the impact of humanity upon supporting ecosystems, the potential for behaviour modification based on consciousness research and the impact of technology upon the fundamental dynamics of human consciousness itself.

In 1987 the Brundlandt Report posited that 'a sustainable society meets the needs of the present without compromising the ability of future generations to meet their own needs' (Architectural Institute of British Columbia 2004). The core premise here is that sustainability is recognised as a measurement of that which is required to meet human needs. Furthermore, describing those needs is left open to debate in recognition of the innate relativity of the term (Hinrichsen 1987). How human needs are perceived and transformed through conscious effort is central to such collaborative efforts as those between consciousness researchers, behavioural scientists and Buddhism (Mind & Life Institute 2004). How they might otherwise be radically transformed is at the core of futurist predictions concerning the impact of technology upon human consciousness.

It is incumbent upon the architectural profession, promoting as it does its leadership role in the sustainability debate, to review its own understanding of the link between human nature, behaviour modification and sustainability in the light of such important new considerations.

Introduction

Amongst those engaged in thinking through the extent of the current ecological crisis there is overwhelming consensus that reclamation of human nature's spiritual / biological nexus is a fundamental prerequisite for rehabilitation (see for example Naess 1986, 1989, 2002; Siu 1957; Capra 1983, 2002; Laszlo 1989, 1995; Varela et al 1991; Suzuki 1997; Ricard & Trinh 2001). Characteristically such critiques start with a review of the cultural triggers that have given rise to contemporary Western culture. Therein they trace the cumulative effect upon the human psyche of the separation of mind and body in scientific, philosophical and religious thought. Such dialectical dualism is presented as significantly loosening the spiritual / biological nexus within human nature and to eventually giving rise to a homo-centric and ego-centric mind-set which, now armed with ever more powerful technologies, drives societal and environmental abuse.

Further consensus emerges with the recognition that Western civilization is on the cusp of quantum change. Fundamental challenges to conventional scientific thinking such as Gaia Theory within the Biological Sciences; Chaos Theory and Quantum Theory within the Physical Sciences; and the theory of Autopoiesis within Neurocognitive Science have instigated significant change in understanding the nature of existence and the role humans play in it. The push is to reconceptualize a narrowly mechanistic, hierarchical modelling of the universe within a more indeterminate, synthetic model 'credited with the discovery of universal laws of evolution and self-organization of complex systems' (Knyazeva 2003). Within this synthetic model the universe operates as a dynamic emanation of cascading complexity founded upon a quantum flux of potentiality (Ricard & Trinh 2001). In the words of Prigogine: 'This presents a new dialogue of man with nature.'(Prigogine & Stengers 1984)

'Eco-science (ecology) is not enough; Eco-wisdom (ecosophy) is needed' (Naess).

The conclusion reached amongst these various critiques is that for the human project to survive its life-threatening environmental crisis a natural solution would lie in a re-integration of humanity's spiritual / biological nexus that expands human nature beyond its homo-centric and ego-centric focus. The challenge is to naturalize such a quest through application to everyday activity. Significantly the solution is not technological, it is attitudinal. It is not only a problem of the mind but also of the heart. Nobody is exempt from the project. There is no allowance for separation between the private and the public, between the personal and the professional – it is simply all embracing. In contemplating the intrinsic worth of all things Naess asks humanity to 'uncover the moral experiences through which (to) recognize the attempts of all forms of life to attain Self-realization' (Angus 1997). Nothing in the universe is valueless but valuable in ever expanding networks of interrelationship. This differs sharply from the deeply undervalued view of nature which underpins the disintegrating environmental relationship that characterises contemporary Western culture. Yet such revelations have not been unanticipated throughout the history of human thinking. Humanity's great mystical traditions grew out of a need to 'be at one' with nature as an expression of the highest spiritual attainment. Whereas in the East this thinking remains deeply embedded within Taoist, Yogic and Buddhist thinking, in the West it became lost (Benoist 1988). It is in denial of this fundamental truth concerning humanity's spiritual / biological nexus that many thinkers blame the progressive alienation within Western culture of all higher behaviour.

Overview

The expectation has been raised that the designer's own relationship with nature is to go beyond a homo-centric and ego-centric focus in order to develop into eco-wisdom. This paper pursues the implications of this through a popular model for discussing human behaviour known as the 'Social / Personality Model'. This model categorises behaviour according to various levels of self-awareness.

Public self-awareness is a central characteristic of the architecture profession, being as it is a mode of reflective practice integral to good design. It is a necessary mechanism for responding to the changing needs and impacts of the building design process. However, private self-awareness within reflective practice is not necessarily part of this process. Private self-awareness will be presented as an effective means for self-transformation towards eco-wisdom which is yet to be fully embraced by the architectural profession in its pursuit of professional effectiveness. That this situation is symptomatic of an ethos of dialectical dualism recognised as the deeper problem within the profession constitutes the first section of this paper.

The second section presents a review of research into consciousness that illuminates the value of private self-awareness within reflective practice. As both a research topic and a professional development technique, the heightening of private self-awareness within reflective practice has an extensive track record of over a quarter of a century within the health and teaching professions in particular. The contention is

raised that developing private self-awareness can offer insights into the psychological dimension of sustainability through the person of the designer. Exposing the designer's own inner needs and aspirations to closer scrutiny could clarify how a designer might more effectively engage in the process of designing for ecological sustainability.

The third section contextualises the discussion through a selective review of the new quantum/technological era dawning upon humanity, and its possible impact upon the individual's spiritual / biological nexus. There is concern that such fast emerging technologies could hamper thinking skills such as self-awareness and reflection – the very skills integral to design thinking and necessary for the development of eco-wisdom. Information technology, nano-technology and biotechnology are increasingly finding application within the built form. Therefore a fuller understanding of their transforming potential that goes beyond the built form to encompass the effect upon the designer personally needs to be part of the architectural debate.

1:1 Understanding the architecture profession as a culture

The 1993 International Union of Architects (I.U.A.) 'Declaration of Interdependence for a Sustainable Future' supports the ethical imperative to develop the built environment according to principles of sustainability as laid out in the United Nations 1987 Bruntland Report into Environment and Development.

As a signatory to the I.U.A. Declaration of Interdependence, the Royal Australian Institute of Architects (R.A.I.A.) through its Environment Policy commits the profession to promoting a shift in values towards ecological sustainability. To that end it asks its members to place sustainability at the core of their practice structures, and to formalize sustainable practices and procedures to the degree that it becomes normalized within daily practice. Members are urged to undertake their own research into sustainability as well as to engage in ongoing professional development (R.A.I.A. 1995). In assisting practitioners to become more aware of developments within the field of Ecologically Sustainable Design, the B.D.P. Environment Design Guide has emerged as the building industry's premier research-based forum. Within this forum Systems Thinking is promoted as the most effective model through which to effect engagement in ecologically sustainable design (Rodger, 2000). It is seen to empower participatory self-organization, facilitate co-operative inter-professional relationships and to allow the architectural design ethos to re-orient around sustainable relationships between people and environment.

It is useful to reflect upon the level of systems thinking already integrated into architectural practice. Architects traditionally operate across many inter-related networks as part of everyday practice (Cuff 1991). Participants in the design and construction process are increasingly expecting to establish long-term relationships across flexible, integrated alliances, and to operate collaboratively and co-operatively within those alliances as self-motivated 'learning organizations' (Dawson 2004:3; Webb 2005). Design processes are being transformed in order to address a broadening base of constituencies that include social, economic and environmental needs (Webb 2005; Battle and McCarthy 2001; McDonough and Braungart 2002). Predictive modelling of building performance has significantly enlarged building-systems-integration thinking to incorporate qualitative social and environmental feedback (Dawson 2004:2). As systems thinking expands, team members are increasingly being sourced from outside traditional building disciplines early in the design process to become part of more horizontally integrated team structures (Battle and McCarthy, 2001; McDonough and Braungart 2002). Within the building industry and in line with management practices across Government and business generally, governance systems at all scales are moving away from top-down, one-way information flows to facilitate largely horizontal, integrated Systems Thinking networks in recognition of the superior outcomes obtained (Doppelt 2003). However this is not yet mainstream thinking.

'Dialectical dualities' (Cuff 1991:11) is a recognized characteristic of the architecture profession. In this mode practitioners differ consistently between what they say or believe and what they do – a condition which is known to reduce professional effectiveness. Critiques of contemporary architectural practice continue to expose just how ingrained this thinking is (Kelbaugh 2004). While Systems Thinking can provide the structural settings through which to empower participants in the design process, it does not necessarily address the deeper problem of dialectical dualities. Addressing this issue is known to require a close scrutiny of personal motivation (Argris & Schon 1978). If the designer's own relationship with nature is to go beyond a homo-centric and ego-centric focus in order to develop into eco-wisdom, personal motivation becomes a critical dynamic that needs to be clearly recognised within the profession and properly activated through professional development. Observations by Cuff confirm however that 'architectural researchers (tend to) focus their attention on the professional product – buildings and places' (Cuff 1991:15) as opposed to designer profiles and practice methods. This pre-occupation with product encourages a similar pre-occupation by the practitioner. While such a research orientation is crucial it is not necessarily sufficient, especially if the desire of the profession is to help more practitioners become engaged in designing for

ecological sustainability. The focus on design intervention over designer transformation has meant little research exists into the psycho-dynamics of sustainability within the architectural profession.

2:1   Inner human needs and the reflective practitioner – a psychological framework

A framework popular in experimental social psychology known as the 'social/personality' model (Morin 2004) provides the theoretical basis for a discussion of the psycho-dynamics of sustainability in this next part of the paper. This particular model distinguishes between 'focusing attention outward toward the environment (consciousness) and inward, toward the self (self-awareness)' (Morin 2004:1). These two basic modes of attention are then broken up into four levels of consciousness each representing higher levels of awareness. The two highest levels are known as Self-awareness and Meta-self-awareness. Within Self-awareness two further states are described; private self-information and public self-information. It is considered that regular examination of more private self-information represents the possession of a higher level of self-awareness than public self-awareness. Within the highest state of Meta-self-awareness, one is aware that one is self-aware.

Reflective practice is well recognized as a mechanism for improving self-awareness and channelling meta-self-awareness (Epstein 1995). Designers process their work through reflective practice (Schon 1983), but no studies have yet been conducted within architectural practice that reveal the mix of self-awareness in operation. While examination of public self-information is clearly the dominant mode (Schon 1983), research into the processing of private self-information would open up to scrutiny deeper personal issues that further impact upon the design process. In considering that sense-making within a dynamic situation constitutes the real world processing of architectural design throughout the life of a project (Cuff 1991), it would appear a useful and natural step for the designer to engage in private as well as public-self–awareness as part of professional development through daily practice. In so doing there is potential for alignment between inner need, personal motivation, and professional conduct. Such an alignment is integral to developing the eco-wisdom necessary to validate and thus enhance the processing of ecologically sustainable design.

2:2   Inner human needs and the reflective practitioner in practice

A considerable amount of literature exists within the health and teaching professions through which to guide further discussion on the known effects of integrating private self-information into reflective practice (see Epstein1999; Borrell-Carrio et.al. 2004; Mamede & Schmidt 2004 for example). The development of any form of expertise arises through being able to distinguish between competence and capability (Guest et.al 2001). Capability is a measurement of adaptation to change through continual investment in improvements that challenge beliefs, abilities and one's knowledge base. Cultivating knowledge, awareness and emotional balance are all considered instrumental to fostering capability (Epstein 2003 citing Ciompi 1991; Polanyi 1974). Within the health professions unexamined emotions, biases and premature categorization are known to lead to inaccuracy and error (Epstein 2003 citing Dimsdale 1984; Mangel 1987).

The observation by Epstein that reflective practitioners 'examine the schisms between what they think they do and what they actually do' (Epstein 2003:3) has real significance for the architectural profession. According to Epstein, reflective practice develops a mindfulness that is understood as a 'purposeful, non-anxious, reflective presence' (2003:1) applicable to all aspects of practice. In the process it draws attention to ones own mental and physical processes during everyday tasks. Undivided attention and measured calmness are considered the hallmarks of compassionate care and within the health professions the special attractiveness of mindfulness practice lies in its ability to re-orient practitioners back to this core value in daily situations of complexity and distraction. The programme has evolved as a blend of Buddhist psychology and contemporary philosophical understanding of professional knowledge, learning, development and intelligence (see Epstein 1999). It is practiced in order to develop four specific habits of mind: attentive observation, critical curiosity, open mindedness and presence. The fact that these habits have also been observed within activities as divergent as meditation and the development of musical excellence exemplifies their universal applicability (Epstein 2003 citing Engel 1982). Anecdotally this state of mind exists within the practice of architecture as evidenced in the published writings of Greg Burgess, one of Australia's most highly acclaimed architects, whose work enhances social and environmental well-being (Burgess 2004). However, such a state of mind is yet to be formally recognised or widely pursued outside of a minority of such exemplars. My own research programme is currently underway to place the development of this state of mind into the wider debate surrounding ecologically sustainable design.

Specific techniques for the development of Meta-self-awareness are the domain of meditation practice and within the health professions a programme of healing has been developed around it known as Mindfulness Based Stress Reduction (MBSD) Within the rigors of this type of engagement, the results of its practice

include a richness of the healing experience that significantly contributes to the success of patient treatment and also a deepened empathy between doctor and patient (Krasner 2004). Enriching experiences, deepened empathy and the strengthening of compassion attested to through these various reflective practices are widely acknowledged as fundamental universal needs, which when met, affect lasting transformation (Ball 1999). Such qualities are fundamental to the development of eco-wisdom. Formally engaging designers in reflective practices that encourage practitioner transformation towards eco-wisdom opens up the potential for greatly enhancing ecologically sustainable design.

2:3 Inner human needs and the Science of Consciousness

With the rise of cognitive science and new developments in brain and behavioural research 'the phenomena of attention and cognitive control' (Mind & Life X1 2003) have become central areas of research. 2003 saw the staging of the first public forum between the bio-behavioural sciences and Buddhism in a deliberate attempt to open up new insights into how the mind works and place them into a larger philosophical and ethical context. This ground-breaking dialogue has established an agenda for a programme of collaborative research effort centred on 'neural and behavioural changes produced by mental training and contemplative practice.'(Mind & Life X11 2004). Buddhism is very clear that training attention expands capacity to exert cognitive control over one's thoughts and bodily processes; therefore the research effort is on scrutinizing attention, imagining and emotion to that end. The findings from studies conducted so far indicate 'that a short training program on mindfulness meditation has demonstrable effects on brain and immune function' (Davidson et.al; 2003). The opportunity is for greater understanding of self-regulation of biological pathways that 'extend the reach of both mind and body (over) rehabilitation, healing and (enhancement of) health and well-being' (Mind & Life X111 2005). Other collaborative research programmes are also underway into the cultivation of emotional balance. These particular research programmes focus on the development of such positive mental attributes as compassion in a deliberate attempt to integrate scientific endeavour directly into everyday life (Mind & Life 2005).

As contemporary Western culture is largely contained within a scientific mind-set this type of research provides a significant new opportunity for re-integrating human nature's spiritual / biological nexus. Such a development is an important one for the design professions and especially for the designer engaged in ecologically sustainable design as it can also help to substantiate the field-based research into reflective practice and practitioner transformation already undertaken within the health and teaching professions. This should provide the necessary impetus for enhancing reflective practice as already engaged in as part of everyday architectural practice.

3:1 Inner human needs and the advent of the technological era

'…the question is how the advances in science might change our thoughts, feelings and personalities.' (Greenfield 2003:xi). The extent to which, what is technically possible, can change human values comes through their capacity to influence with unprecedented intimacy, the highly plastic workings of the human mind. Greenfield muses that with our lives rapidly filling with interactive, increasingly personalized information technology, intrusive but invisible nanotechnology, and highly sensitized and augmentative biotechnology, this will present a major challenge to how we think, what kind of individuals we are and even whether we remain individuals at all. With the infiltration into daily life of the Internet and the concomitant rise of a virtual cyber world, the momentum towards becoming networked into a global collective represents a significant expansion of the collective sense of self. Its effects on physical interrelationships are just now beginning to be felt. The physical world is set to become the interfaced backdrop for the virtual world as research being undertaken at M.I.T. leads the race to integrate automated pro-active technology within all states of matter – solid, liquid, gaseous – throughout all the architectural spaces of daily life. This raises the likelihood of the natural world being further screened out from one's psyche; undermining fledgling attempts at ecological interconnectedness at the very moment in history when life as we know it requires humanity's fullest attention.

As a neuroscientist Greenfield presents the implications of repeated sensory inputs upon the brain's architecture. She considers that the transformations that look set to be played out upon our psyche will emerge through the favouring of the brain's 'fluidity' mechanisms over its 'crystalline' mechanisms. In a world in which technology is increasingly being geared to take on contingency planning within our daily lives, whether it be 'smart' information generation and retrieval systems, 'smart' medicine', smart' bombs or 'smart' refrigerators, that part of our minds designed to assess and interpret daily activity and within which the crystalline intelligence of memory arises is being actively bypassed. The emphasis will be on the experience of interaction rather than on the internalization of learning. The directions in which the new technologies are heading have the potential to put human beings into a 'passive sensory-laden state where our minds

become less relevant' (Greenfield 2003:xi). The concern is that the new technologies are so powerful that humans will have no choice but to become dependant upon them (Greenfield 2003).

A case in point is the Asia-link program "Euro-China Exchange", a design research initiative based on new generative design software known as Argenia. Generative Design is a 'scientific Art process that identifies a genetic code as the idea of artificial worlds' (Soddu 2003). This software mimics the genetic code to reproduce endless unique and non-repeatable design variations to design unpredictable 3D models of towns and architectures. Such an approach to design describes the fast changing nature of the design paradigm in which architects are increasingly forced to work. What type of role does the designer play in these circumstances? Will the soliciting of creative building designs via the human imagination be phased out of the design process? Pursuing Greenfield's thinking, how compromised will the designer's creative capacity be in the first place as the wider technologically-infused, social forces reinforce a cycle of disempowerment and disengagement from problem solving generally? What happens with humanity's fledgling re-engagement with nature? How can Eco-wisdom emerge in such a climate? Considering the speed with which the new technologies are infiltrating daily life, these questions require urgent wide-ranging public and professional debate.

Summary

Under discussion is the state of mind of the designer engaged in designing for ecological sustainability. It is argued that dialectical dualism operates deep within the Western psyche and manifests at varying scales of cultural activity. In affecting the disintegration of humanity's spiritual / biological nexus it is presented as the genesis of the ecological crisis. Within the architectural profession it operates to separate belief systems from everyday practice; a condition known to reduce professional effectiveness.

Reflective practice that processes both public and private self-information is presented as effective in exposing dialectical dualism. While reflective practice is integral to architectural design, the emphasis is on processing public self-information with little professional attention given to integrating private self-information into the design process. Yet within health and education, its integration into daily professional practice has been found to enrich experiences, deepen empathy and strengthen compassion – all qualities integral to cultivating eco-wisdom.

Rapid technological developments look set to transform the human psyche. Considered most vulnerable are those parts of the mind used to reflect upon daily activity. This has profound implications for the development of eco-wisdom. How it is to be cultivated within such a context needs urgent wide-ranging public and professional debate.

Conclusion

A field study is currently being developed by this author to discover how ecosophy is being pursued with the Australian architecture profession. Interviews are being conducted with a range of exemplars to ascertain whether or not they are consciously or not utilizing Systems Thinking to provide the structure and reflective practice the methodology for developing ecosophy.

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