Value-change and self-reflective practice in ecologically sustainable design

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ABSTRACT: Ecologically sustainable design is a transformative design paradigm based on the theory of interdependence. This theory requires that the transformative agenda of design is holistic in practice. In effect, the requirement is for value-change on the part of the designer along with transformation of the built environment.

This paper, based on recently completed research into design practice, argues that value-change rests on certainties that are drawn on intuitively while designing, and that this intuitive process is characteristic of design as praxis. It is further argued that design, as praxis, requires a phenomenological approach for inculcating value-change. A phenomenological approach relies on self-reflective practices exemplified by meditation and yoga that can focus on the designer’s ethical know-how. A model for this approach to value-change, the biopsychosocial approach, already exists within clinical medicine.

This paper presents findings from interviews with key architects practising self-reflection and/or ecologically sustainable design. These highlight the premium placed by these architects on both certainty and empathy, and how these values influence design as praxis. Formalising techniques for closer scrutiny of these values will highlight design as praxis. Doing so will critically strengthen ecologically sustainable design as holistic, transformative practice.

Keywords: self-reflective practice, ecologically sustainable design, value-change

INTRODUCTION

This paper argues that an oversight in the formulation of ecologically sustainable design as outlined in the UIA/AIA Declaration of Interdependence for a Sustainable Future (1993:wp) undermines it as a self-transformative practice. The UIA/AIA declare that:

We are ecologically interdependent with the whole natural environment; we are socially, culturally, and economically interdependent with all of humanity; sustainability, in the context of this interdependence, requires partnership, equity, and balance among all parties.

What has been overlooked here is that the nature of interdependence is both physical and mental and is expressed as such at the basic level of the individual. To raise this is to pursue the Heideggerian phenomenological tradition of raising the obvious, on the grounds that it is through interrogating the obvious that fresh insights into the human condition are made. To consider oneself as an interdependent being runs counter to normative notions of the ‘self’ and of the ‘other’; notions that, in our everyday interactions with the world, we characterise as independently existing entities (H. V. Guenther 1994; Heidegger 2006; Parkes 1987; Wallace 2008). Consequently, it is at the level of the individual that the argument for value-change through self-reflective practice arises, while the value-change under consideration is to normalise interdependency.

To discuss this further, this paper draws on recently completed research into design practice by one of the authors of this paper. An outline of the research and its pertinent findings are first presented before the discussion is developed through five issues of concern drawn from the research. These issues highlight the impact of the theory of interdependence upon practice and its flow-on effect in establishing grounds for certainty in practice. The first issue highlights value-change in terms of its effect upon the designer as a proper consideration of ecologically sustainable design. The second issue raises current and emerging understandings of the interdependent nature of consciousness and creativity through the paradigm of quantum physics. The concern here is that these understandings cannot be properly considered within ecologically sustainable design without recognition of design as a self-transformative practice. The third issue highlights the extent of certainty under the logic of intersubjectivity. Intersubjectivity is a less absolute but more realistic interpretation of certainty attuned to the quantum physics paradigm that can account for design as praxis. This raises the fourth issue, which argues that design, as praxis, plays a critical role in practice, which is best developed through phenomenological methods for inculcating value-change. This fourth issue will be discussed through two streams of phenomenology unfamiliar within architectural discourse: Husserlean phenomenology and yogic science. The Husserlean stream is a scientific approach to introspection developed at the beginning of the 20th Century. The value of this method is seen in its similarity to yogic...
practices. While yogic science has developed over thousands of years, and thus offers a highly refined phenomenological method for introspection, Husserl’s approach is from within a Western scientific tradition and therefore enables a rigorous appraisal of yogic methods that can bridge between yogic 1st-person and Western 3rd-person perspectives. The fifth issue raises the biopsychosocial model within clinical medical practice as a formal method for value-change to outline its relevance to design as praxis.

1. THE RESEARCH PROJECT: SELF-REFLECTIVE PRACTICE IN SUSTAINABLE DESIGN

The research supporting this paper was conducted through in-depth interviews with nine architects over a period of eighteen months between 2006 and 2007 (Mellersh-Lucas 2010). The objective of the interviews was to elicit ‘thick descriptions’ of normative thinking about sustainable design and self-reflective practice. The interviewees were identified as key practitioners for their expertise in either self-reflective practice and/or ecologically sustainable design. Five are internationally and nationally acclaimed, and all are well respected within the local profession. The sample was specifically drawn from architects practising within a Melbourne-centric milieu; the rationale being to determine how deeply ecologically sustainable design and/or self-reflective practice had infiltrated professional development at the local level. While the purpose of the research was to uncover effective strategies for practising ecologically sustainable design, also under investigation were the concepts of self, design and intuition. The interview material was analysed according to grounded theory and deconstructivist theory. Grounded theory provided for the building of a substantive theory that emphasised localised dealings with particular, real-world situations. In this case it emphasised self-reflective practice within ecologically sustainable design. Deconstructivist theory was used to look for self-limiting/expanding concepts of self, design and intuition on the basis that ideology imposes limits on what can and cannot be said. This was in recognition that ecologically sustainable design is a response to a general need in society for credible evidence of sustainability through scientific rigour; yet, it is practised within an architectural sub-culture dominated by the avant-garde. The ideological dimensions of this situation are complex, for ecologically sustainable design has been fashioned to conform to a cultural paradigm dominated by a techno-rational mentality widely criticised as hubristic (Hård and Jamison 2005), while within the architecture profession, an avant-garde that valorises a romanticist fascination with genius derides such conformity as scientific (Pérez Gómez 2006).

The major research findings pertinent to this paper are that, first, the status quo is critiqued through certainties which rest on normative values (Mellersh-Lucas 2010). Furthermore, such certainties underlie design thinking, and this process is characteristic of design as praxis. Finally, the design process is an eminently appropriate vehicle for value-change, but one in need of reformation through self-reflective practice of sustainable values, however, are considered to be grounded in a tacit dimension largely unamenable to logic (Polanyi 1967; Tiberius 2008). Moreover, praxis is recognised as our spontaneous coping skills that we intuitively draw on as ethical know-how (Varela 1999a). As such, praxis prefigures and thus guides design as a reflective, decision-making process (Cuff 1991; Schön 1983; Snodgrass and Coyne 2006). The proposition raised by these considerations, therefore, is that intuitive processes pre-empt rational processes as the critical pathway to effecting value-change. This proposition challenges the pre-eminent status given to rational thinking in Western culture. It is not, however, to deny the value of rational thinking, but to reposition it according to the latest insights into human dynamics.

Therefore, the larger proposition to be taken up in this paper, is that a targeting of intuitive design processes is the critical path to realigning normative values within the paradigm of interdependency. This proposition is grounded in design practice through three of the most insightful of the research participants, identified as PN, PM and BG. That only three participants are to be quoted reflects both the limitations of the interview process and an inability, more generally, to discuss the intuitive dimension of design. This does not demonstrate a lack of concern for design as an intuitive process, however, for the majority of the interviewees acknowledged their indebtedness to such a dynamic. What was found to be of more concern, and hence better articulated, was for the grounding of ecologically sustainable design in a rigorous logic. The uneasy relationship between intuition and logic as the basis of design presents, from the research, as the fundamental conundrum for the architect. Quixotically, it is precisely through a rigorous interrogation of intuitive processes that this paper foregrounds intuition as the key to the transformative agenda of ecologically sustainable design.

2. INTERDEPENDENCE IN THEORY AND PRACTICE

The theory of interdependence requires that any transformative agenda be holistic in practice (UIA/AIA 1993). Design is, by nature, a transformative dynamic that is not only an outward- and task-oriented dynamic, but also an inward- and self-oriented one, for, it is well recognised that the designer embodies the transformative process, which re-emerges intuitively as his/her ethical know-how or praxis (Pallasmaa 2009; Snodgrass and Coyne 2006). Therefore, the hyper-transformative agenda of ecologically sustainable design, as set out in the UIA/AIA Declaration, should necessarily target value-change on the part of the designer along with transformation of the built environment and both orientations of practice should be raised for appraisal within the literature devoted to ecologically sustainable design. However, little attention is given to value-change on the part of the designer. Overwhelmingly, the attention is on transformation of the built environment.

Further investigation of this oversight through various critiques from within architecture (Sharr 2007; Vesely 2004; Williamson et al. 2003) and across the sciences and humanities (Berry 1999; Plumwood 2002; Wallace 2000), link it with an outmoded view, based on classical physics, of the relationship between human consciousness and the
physical world. This view is often sourced back to the Cartesian split between mind and matter (Atmanspacher 1997); a split that characterised the rise of Western science during the Enlightenment era and reached its zenith by the late nineteenth century as the modern science of psychology came into being (Wallace 2008). Over the past century, however, quantum physics, at both the micro-scale and at the scale of the cosmos, has come to explain reality more fully than classical physics (Barrow et al. 2004; Wheeler 1990). The new physics can be usefully considered in the pursuit of ecologically sustainable design as a self-transformative practice. How this may be done is through a re-evaluation of consciousness and creativity.

3. CONSCIOUSNESS, CREATIVITY, CERTAINTY AND QUANTUM PHYSICS

The new physics exposes the integral role of “conscious subjects as active participants in the emergence of the known universe” (Wallace 2008:75). This is an expression of interdependence yet to be explained scientifically, but one thoroughly critiqued within humanist accounts of consciousness and creativity (Cooper 2002; Jung and Pauli 1955; Pérez Gómez 2006; Tucker 2006; Vesely 2004). The informed view is that this remains a scientific mystery while the nature of consciousness remains unresolved (Atmanspacher 2008; Barrow et al. 2004; Wallace 2008; Wheeler 1990). As a consequence, pressure is mounting to re-evaluate two fundamental premises that define science: a worldview based on classical physics and the notion of certainty through objectivity. The pressure is for quantum theory, as the more fundamental theory of matter, to become the foreground theory concerning nature. The science of objectivity, with its roots in the Cartesian split, could then be properly developed into a science of intersubjectivity to take account of consciousness (Varela 1999b; Zajonc 2004). At stake is an unprecedented unification of psychology and physics (Wallace 2008) through which to accommodate current knowledge within a more appropriate conceptual framework (Barrow 1988, c1986). Such a debate signifies radical value-change concerning mind and matter, and “self” and “other” not only within the sciences, but also in society more broadly, by virtue of the pre-eminence of the scientific view in influencing normative values in Western culture.

Under the quantum physics paradigm, the designer as a creative individual can now be radically reconsidered as an interdependent process. Two examples drawn from the research underlying this paper demonstrate how this can strengthen ecologically sustainable design. First, for PM, an architect internationally recognised for his scientific approach to ecologically sustainable design, his design inspiration comes from the symbiosis between humanity and nature witnessed in his African homeland. It allows him to design for holistic built environments that more closely mimic natural systems. The key to his architecture is his holistic appreciation of the environment as meaningfully interdependent. Its meaningfulness, experienced through empathy and made logical to PM as an extension of the ‘organism’, helps him to dissolve the separation between ‘habitat’ and ‘organism’ into an interdependent reality (Mellersh-Lucas 2010 Vol 2:37). PM realises the Gaia principle through his own empathic extension: that nature is the consequence, not the precursor, of participation in its formation. He identifies and exemplifies a concrete example of a participatory universe in formation at the local level.

For BG, an architect internationally recognised for his humanistic approach to community-responsive and -sustaining architecture, he too identifies, as a real danger to ecologically sustainable design, the conceptual separation between mind and matter implicit in a literal reading of environment and space. From his own experience, he argues that an architect must learn a very different reading of environment and space as arenas pregnant with potentialities awaiting activation. His reflections give concrete expression to the notion, within quantum physics, that ‘the total information of a system is a primary concept [out of which] … a property emerges as a secondary concept’ (Wallace 2008:75). This notion is a complete reversal of systems thinking and information theory via classical physics. GB recognises that he draws particular design solutions from out of a primordial information field filled with ‘consciousness, memory and imagination’ that is larger than his own contribution and includes that of the other participants in the design process (Mellersh-Lucas 2010 Vol 2:35). He exemplifies a humanist concern, within architectural discourse, for design solutions to emerge from within the ‘space of real possibilities’ (Vesely 2004:21). This is an intersubjective, milieu contrasted against the ‘space of possible realities’ that has become the trademark concern of the avant-garde and techno-rationalists alike (Vesely 2004:21). This type of space is a profoundly hubristic and alienating concept of spatial reality in that it takes no account of the psychological dimension as understood by PM and BG. This emptying of space is characteristic of the scientific view under the influence of classical physics. It typifies the larger view of the universe and its dynamics through which Western culture operates with such unsustainable and destructive power. Within architecture, it is a view criticised for precipitating the loss of ‘continuity of meaning’ that traditionally grounded design thinking within its intersubjective milieu (Vesely 2004:21).

These two examples provide concrete expressions of a deep level of interdependency accessed via design thinking that challenges current conceptual frameworks concerning human consciousness and the physical world. Space and environment are understood in terms of their psychological as well as physical dimensions. This understanding BG the concept of habitat as the extension of the psyche. Habitat is recognised by both PM and BG as a mode of presence cultivated by its inhabitants and not to be distinguished from them as an independent phenomenon. It indicates a domain of interdependency that is both experiential as well as empirically ascertained. This approach to design signifies the type of profound value-change to be practiced under the auspices of ecologically sustainable design. How this may be addressed is the next issue to be discussed in this paper.
4. CERTAINTY, INTUITION AND DESIGN AS PRAXIS

Again, BG provides vital insights into the experiential nature of design as praxis. Through formal self-reflective practices, he has deliberately drawn upon both the psychic and physical energies it is composed of to bring its information-rich qualities to the fore. The crucial insight of BG, of all the interviewees, is in describing design as a process that, “under the guardianship of intuition”, lifts design beyond discursive thought to become the creative act of bringing forth resolutions from out of what he experiences as a primordial information field (Mellersh-Lucas 2010 Vol 2:44). Few of the other interviewees had the language skills to adequately articulate their intuitive design processes, though a common observation was that design resolution was “hollow” when the process was simply functional and rational (Mellersh-Lucas 2010 Vol 2:46). The typical approach to bringing forth a more profound response was to actually take time out from the specific task, sleep on it, do something else in order to let subconscious, intuitive processes make their necessary and enriching contribution. BG’s more self-reflective approach reveals deep insights into this intuitive domain brought to consciousness through practices that he describes as meditation or making himself “open to grace” (Mellersh-Lucas 2010 Vol 2:44). He considers that these practices provide for a level of certainty he can rely on when in the throes of designing. This experiential and intuitive domain characterises design as praxis (Snodgrass and Coyne 2006; Vesely 2004). That it can be brought more fully to consciousness through formal techniques such as meditation will be discussed in the next section. To prepare for that discussion, this section first clarifies design as praxis through distinguishing the role of intuition from the role of deliberation in the design process.

Within experimental psychology, the consensus view is that intuition is “a complex set of inter-related cognitive, affective and somatic processes, in which there is no apparent intrusion of deliberate, rational thought” (Hodgkinson et al. 2006:4). This idea is further supported by the enactive view of cognition as developed within the cognitive sciences (Thompson 2007; Varela et al. 1991). This view identifies cognition as an enactive process that arises in conjunction with sensorimotor structures to allow us to interact with the world as a living organism. It is these “experiential, sensorimotor structures that then ‘motivate’ rational and abstract thought” as a secondary process (Varela 1999a:16). In other words, there is always a spontaneous awareness we experience as immediate coping that exists prior to deliberation. It is within this immediate coping or non-reflective phase of cognition that intuition operates. Further to this, post-Kantian philosophical accounts of ethical behaviour identify immediate coping as a “moral situatedness and expertise” that arise because “our lived world is so ready-at-hand that we have no deliberateness about what it is and how we inhabit it” (Varela 1999a:5-9). Hermeneutical accounts also emphasise a minimal pre-knowledge necessary for understanding, and thus, our ethical situatedness prior to deliberation (Snodgrass and Coyne 2006).

Praxis, according to its original classical Greek definition, involves a particular form of judgement based on choice. This form of judgement is identified as “tacit understandings gained from experience and within a context of ethical behaviour” while “the exercise of choice [is] between various things or courses of actions, [which] is at one and the same time a preferring and a choosing” (Snodgrass and Coyne 2006:112). In other words no room exists for deliberation; it is an intuitive process. Design as praxis is, therefore, a concomitant preferring and choosing-making, identifiable as ethical know-how, to guide the flow of designing as a practical decision-making activity. With decision-making identified as a secondary process, this raises the need to target value-change mechanisms that acknowledge the primary dynamic of praxis.

5. PHENOMENOLOGICAL METHODS FOR INCULCATING VALUE-CHANGE

The nature of consciousness as a primordial information field has been thoroughly investigated over the millennia by investigators outside Western philosophical and scientific traditions (Evans-Wentz 1975, c1958; Herbert V Guenther 1984, 1989; Taimiri 1967, c1961; Wallace 1996). This paper groups these investigations under the generic term of ‘yogic science’ to emphasise both their heritage and their practical methodology. Two outstanding characteristics of yogic science are that, first, it is a psychology of well-being through introspection (Begley 2007; Wallace and Shapiro 2006) and second, as a methodology, it inculcates value-change into an intuitive expression of certainty through a process that “is critical, rational, systematic and analytic” (Goleman and Thurman 1999:62). In other words, yogic science is a formalised method for the transformation of ethical know-how through the methodical exploration of consciousness (H.H Dalai Lama 2001; Kelsang 1990; Ngawang 1974). In this respect, it describes both a descriptive and a prescriptive enterprise wherein science, philosophy, psychology and religion co-exist. The purpose of this holistic dynamic is specifically to generate wisdom as an ongoing meta-cognitive state of awareness along with compassion as a heightened state of empathetic engagement, for a central tenet of all yogic science is that these are the essential ingredients for self-transformation (H.H Dalai Lama 1995; 2001; Wallace 2006). The other essential feature of yogic science, which cannot be overemphasised, is its insight into the interdependent nature of consciousness and energy (Evans-Wentz 1975, c1958). Hence, much focus is placed on mind/body processes to strengthen this interdependent dynamic.

Within the cognitive sciences, investigations into the nature of consciousness have identified the need for a review of the research paradigm, which is currently based on classical physics and its associated methodology. A return to empiricism via phenomenology as an introspective method of investigation is also advocated (Thompson 2007; Varela 1996; Varela and Shear 1999). While phenomenology has developed within architectural theory as a philosophical critique of the experiential and existential dimension of place-making based on the writings of Heidegger, within the cognitive sciences, it is the Husserlian approach to scientific enquiry, which foregrounds the 1st
person perspective, that is pursued. With this has come an appreciation of non-Western, empirically-based, phenomenological approaches to the study of consciousness developed within yogic science (Varela 2002). New methodologies based on this appreciation, such as neurophenomenology, are currently under development (Thompson 2007). Neurophenomenology combines both Husserlean and yogic first-person methodologies with third-person methodologies, and in so doing, highlights the need for rigour in first-person introspection.

The Husserlean approach is best described as paralleling, to a degree, the first two steps of the yogic approach, which is best described as a four-step approach. In the first step common to both approaches, the focus is on distancing one’s attention from the content of one’s normal mental processes. The second step of the Husserlean approach then focuses exclusively on a disinterested investigation of mental processes that structure the emergence of thought. The yogic approach, however, utilizes a rigorous examination of mind to take on the task of value-change, and as such, moves from a descriptive to a prescriptive endeavour.

The most generic description of yogic methodology is that, as a four-step process, it revolves around the key third step of meditation (H.H Dalai Lama 2001; Kelsang 1990). The first step, as mentioned before, is to encourage an objective distancing from one’s normal mental processes. However, it does this through exercises to strengthen the mind/body in recognition of the interdependent nature of consciousness, and energy. The second step is to then engage in an analytical form of contemplation requiring concentration and critical analysis in order to cultivate a sense of closeness or empathy with a chosen subject matter. Once this emotive state of mind has arisen, the third step is to train it. This third step is the meditation state proper in which the empathy developed through scrutiny in the preceding step is embedded through single-pointed concentration. With systematic repetition, intuitive insight arises (Ngawang 1974). This development signifies a naturalised state of mind beyond an intellectual understanding that corresponds to ethical know-how or praxis (H.H Dalai Lama 2001). In effect, it develops certainty through emotional training. The final step is an act of dedication to finish the formal meditation session. This step is to balance certainty with humility. Between the sessions, the practitioner is counseled to practice mindfulness as a meta-cognitive state for monitoring their normative values (Kelsang 1990). A number of critical features of this process need to be highlighted at this point. First, the emotive state generated in Step Two and maintained in Step Three is information rich. Second, the training of the emotions through single-pointed concentration effects a speed-up of intuitive insight. Third, the certainty that comes with normative values is consciously grounded in rigorous practices thus making praxis more transparent and reliable.

From this description, some broad parallels with design thinking emerge, while the research also revealed further characteristics of the larger design process that parallel the ongoing discipline of yogic practice. For instance, the second step in yogic practice corresponds to the task-oriented aspect of design thinking, for design, too, utilises an analytical form of contemplation requiring concentration and critical analysis in order to cultivate a sense of closeness or empathy with a chosen subject matter. The emotive state generated then powers a type of single-pointed concentration characterised in the design discourse as creative flow (Pallasmaa 2009). At this point, design as praxis comes to the fore to guide creative flow (Snodgrass and Coyne 2006). While the focus during this phase of design remains task-oriented, in the meditation session, the focus becomes purposefully self-oriented. It can be seen from this comparison, that meditation diverges from design at this point to maintain conscious awareness of the information-rich, emotive state itself, and to give over the necessary time and presence for its naturalisation into intuitive insight.

6. AN INFORMAL APPROACH TO INCULCATING VALUE-CHANGE

Crucially, the research also found that informal reflections upon one’s situatedness guide value-change. This approach also utilises the generation of heightened emotion to power an engagement in the subject matter, and this engagement can also be so absorbing that the knowledge becomes ingrained as intuitive insight. In this respect therefore, yogic practices can be seen to ask no more of the practitioner than what the practitioner can already give to their professional practice. A range of reflective practices beyond design was also found to best reinforce the heightened level of engagement generated informally. PN’s engagement with ecologically sustainable design exemplifies this approach. For PN, she conscientiously pursues the transformative agenda of ecologically sustainable design through reflecting upon her heightened state of discomfort at what she sees as her privileged position as a member of the powerful and affluent West. She then transforms this discomfort into empathetic engagement through active learning about sustainability, reinforcing that learning through a range of avenues both personal and professional. PN practices design as an iterative process reinforced through a commitment to mindful lifestyle practices, active engagement in the Wilderness Society and her advocacy role within the Australian Institute of Architects. Her approach exemplifies a deeply emotional and energising commitment to ecological sustainability that activates value-change and incultates normative values without recourse to formalised self-reflective practices. This approach typified what are critically acclaimed levels of engagement in ecologically sustainable design for most of the interviewees. Fundamental to this approach to ecologically sustainable design as a self-transformative practice was an awareness by the interviewees that their design thinking rested on intuition and normative values. This, for many, reflected their childhood upbringing mixed with a personal propensity that was difficult for them to explain. Of the nine interviewees, only three were found to be able to discuss their value-change mechanisms as a self-reflective practice through which they could monitor themselves.

The one critical practice found to be missing from this informal approach was meditation. Meditation, as described above, is a unique methodology for expanding conscious awareness of one’s empathetic state to embed an
information-rich dynamic as intuitive insight. Intuitive insight acts upon normative values and re-emerges as praxis. Praxis guides the design process as creative flow by providing the intuitive certainty necessary for that flow. Crucially, meditation is known to allow the practitioner to engage in the transformation of more intractable normative values deliberatively and BG, of all the interviewees, illustrates the sort of normative values to be critiqued under the auspices of interdependency as set out in the UIA/AIA Declaration and raised for critique in this paper. The point remains that the nature of consciousness needs proper investigation through proper means and the only well-developed means available at present have been developed within yogic science. While a model for this approach to value-change within daily professional practice does not formally exist within architecture, within clinical medicine, one does. It is known as the biopsychosocial approach.

7. THE BIOPSYCHOSOCIAL APPROACH

The biopsychosocial approach exemplifies the rise of a more holistic, systems-based model of health-care practice. In this respect, it shares the same concerns as ecologically sustainable design for a more participatory approach to design in architecture. In pioneering the biopsychosocial approach into clinical practice, major advances in the study of professionalism and mindfulness were brought together (Epstein et al. 2003). A number of core attributes required of an holistic approach to clinical practice are identified including:

- self-awareness; active cultivation of trust; an emotional style characterized by empathic curiosity; self-calibration as a way to reduce bias; educating the emotions to assist with diagnosis and forming therapeutic relationships; using informed intuition; and communicating clinical evidence to foster dialogue, not just the mechanical application of protocol (Borrell-Carrió et al. 2004).

Essentially practitioners are encouraged to make explicit what are normally tacit forms of awareness regarding knowledge and feelings, identify personal biases and to remain mindful of them in the normal course of daily activity. The research literature evaluates the efficacy of the biopsychosocial approach in terms of "reduced stress, increased coping, and improved empathy among healthcare professionals" while highlighting meditation as critical to such outcomes (Praisman 2008:216). The lessons to be drawn from the biopsychosocial approach are first, that praxis is formally recognised, second, it is accommodated via self-reflective practices drawn from yogic science and third, value-change in terms of improved empathy is a recognised outcome of such an approach.

CONCLUSION

Recent research has identified, on the one hand, the importance of self-identification with ecologically sustainable design for the practising architect, and, on the other, a lack of self-reflection as a formal part of their design processes (Mellersh-Lucas 2010). This paper concludes that, for ecologically sustainable design to be practiced as a holistic transformative practice, practitioners need to be fully integrated into the transformative process as self-reflective practitioners. This conclusion is based on an updated understanding of the nature of consciousness and of formalised methods for its exploration as a self-reflective practice. It represents an update that has been overlooked in the development of ecologically sustainable design as a transformative paradigm. Formalising techniques for the transformation of ethical know-how through self-reflective practice will highlight design as praxis and redress this oversight.

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