## Design (and ecodesign)

Definition

Design is the process of planning, initiating and / or laying out a new product, service, piece of equipment, landscape, building, plan, policy or the like, typically in an artistic, technically proficient, or skilful fashion. It is a future-oriented act of envisioning and creative problem-solving. Typically design involves sketching, drafting, computer-assisted manipulation of three dimensional spaces, and artistically and / or accurately representing and arranging forms and materials for new functions and purposes. Design by its very nature embraces ideas about utility, aesthetics, convenience, efficiency and practicality. In architecture, for example, design ideals can be traced to Vitruvius who espoused durability, convenience and beauty as the tenets of design (Paden, 2001).

Design involves the manipulation of technologies, from simple instruments such as drafting pens and paper to sophisticated technologies such as Computer Assisted Design (CAD) and Geographic Information Systems (GIS). Design practitioners include: architects, planners, landscape architects, instrument-makers, interior designers, artists, engineers, environmental scientists, computer scientists, and chemists - among others. Much design literature is underpinned by environmental determinism (the notion that the environment directly affects human behaviours and actions) and encompasses a set of values whereby humans are seen to legitimately manipulate the environment to produce outcomes that benefit our species over others (Grant, 2000).

Throughout history, various civilisations have practiced elements of design.

Stonehenge in England, for example, is a Neolithic design innovation, presumably allowing for the accurate forecasting of crop sowing and harvest times. Some commentators have argued that the ability to design is a unique property of our species being, enabling humans to produce environmental modifications and transformations from stone tools to metropolises like Chicago (Cronon, 1991).

Feminist historian of science Donna Haraway (1997) has even asserted that in many ways humans have become cyborgs - biomechanical entities that are dependent upon, and have merged with, our technologies.

Western society in particular has inherited a fractured system of thinking centred upon the instrumental value (use value) of nature. Since the industrial revolution, modern design practices have resulted in the large-scale metabolisation of nature into canals, bridges, buildings, automobiles and the like (Gandy, 2003; Hough, 1994; Spirn, 1984). The perception that humans are outside of nature (Haraway, 1997; Plumwood, 1993) has led to environmental impacts seldom being factored into design processes (e.g. the production of harmful and / or toxic substances such as dioxins or radioactive waste). More recent design applications including the use of nanotechnology in the design and assembly of tools at a molecular level, and genetic engineering (the manipulation of an organism's DNA to produce new features within that organism or even new organisms), perpetuate dualistic thinking about nature-society relations and the concomitant risk of adverse environmental impacts.

## Ecodesign

Ecodesign entails 'designing with nature', for the benefit of the wider environment. Contemporary applications of ecodesign include the development of new technologies as a transition to ecological sustainability – what Slessor (2001) characterises as a movement from 'high tech' to 'eco tech'. Water sensitive urban design, nature's services approaches, ecological restoration, permaculture, green buildings, biotechnology, wind farms, hybrid cars are all examples of ecodesign. Ecodesign combines environmentally benign philosophies, technologies, materials and legal standards (e.g. ISO 14,000) to meet current needs in ways that create lower levels of environmental impact while preserving biodiversity (natural capital). Ecodesign advocates strategies that will result in a net environmental gain – both social and ecological (e.g. Hough, 1994). The underlying premise is to emulate biophysical and ecological processes - recognising interdependencies, and in so doing, improve the ecological sustainability of products and services. Ecodesign seeks to overcome the 'utopian ideals' inherent in traditional design practices - such as order and beauty, which inevitably produce 'sterile environments', replacing them with sensibilities grounded in the chaotic 'messiness' of biological systems (op. cit,). Industrial ecology for example seeks to mimic ecosystem processes by metabolising waste. The waste outputs of industries are used as the raw material inputs for other industries – thus closing material and energy loops (Frosch, 1995).

From an environmental planning perspective, perhaps the most influential work on ecodesign was McHarg's (1967)classic *Design with Nature*. In this book McHarg sketched out a new way of designing human settlements working with, rather than against, natural processes and recognising natural limits. Other important ecodesign contributions include Anne Whiston Spirn's (1984) *The Granite Garden*, Platt et al.'s

(1994) *The Ecological City*, Peter Calthorpe's (1993) *The Next American Metropolis* and Sim Van der Ryn and Stuart Cowan's (1995) *Ecological Design*. Possibly the ultimate expression of ecodesign can be found in Wolch's (1998) 'Zoöpolis' – a new kind of socially and ecologically inclusive city built around environmental processes and acknowledging plants and animals as legitimate urban residents.

## References

Calthorpe, P. (1993). The Next American Metropolis: Ecology, Community and the American Dream. New York: Princeton Architectural Press.

Cronon, W. (1991). *Nature's Metropolis: Chicago and the Great West*. New York: W.W. Norton and Company.

Frosch, R. A. (1995). Industrial ecology: Adapting technology for a sustainable world. *Environment*, 37, 16-37.

Gandy, M. (2003). Concrete and Clay: Reworking Nature in New York City.

Cambridge, Ma.: The MIT Press.

Grant, D. P. (2000). The nature of design and planning. In P. Knox & P. Ozolins (Eds.), *Design Professionals and the Built Environment*. Chichester: John Wiley and Sons.

Haraway, D. (1997). Modest\_Witness@Second\_Millennium.

FemaleMan©\_Meets\_Oncomouse<sup>TM</sup>. New York: Routledge.

Hough, M. (1994). Design with city nature. In R. H. Platt, R. A. Rowntree & P.

C. Muick (Eds.), The Ecological City: Preserving and Restoring Urban

Biodiversity. Amherst: The University of Massachusetts Press.

McHarg, I. (1967). Design With Nature. New York: John Wiley and Sons.

Paden, R. (2001). Values and Planning: The Argument from Renaissance Utopianism. *Ethics*, *Place and Environment*, 4(1), 5-30.

Platt, R. H., Rowntree, R. A., & Muick, P. C. (Eds.). (1994). *The Ecological City:*Preserving and Restoring Urban Biodiversity. Amherst: The University of

Massachusetts Press.

Plumwood, V. (1993). Feminism, and the Mastery of Nature. London: Routledge.

Slessor, C. (2001). Sustainable Architecture and High Technology: Eco-Tech.

London: Thames and Hudson.

Spirn, A. W. (1984). *The Granite Garden: Urban Nature and Human Design*. New York: Basic Books.

van der Ryn, S., & Cowan, S. (1995). Ecological Design. New York: Island Press.

Wolch, J. (1998). Zoöpolis. In J. Wolch & J. Emel (Eds.), Animal Geographies:

Place, Politics and Identity in the Nature-Culture Borderlands (pp. 119-138).

London: Verso.