

Ecological Design: A New Critique

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Ecological design has come of age. It is now about a decade since the first wave of green design emerged as a significant new factor in product and graphic design. Though it is, by no means, fully developed and accepted, and only just beginning to be implemented in design education, for example, there is a broad consensus that environmental issues can no longer be ignored by designers and critics. There has been a significant change in recent years, from the days when it was just a matter of getting the environment onto the agenda, and establishing the broad parameters of a green design practice—the inevitable process of reappraisal and differentiation as a movement begins to acquire a history and a polemics. Already, a second or third wave of ecodesign practice and criticism has emerged which is concerned with a more subtle analysis of meaning and methodology.

As it has developed over the last decade, ecodesign has constantly borrowed ideas and terminology from ecology and environmentalism, though rarely is this explicitly acknowledged. It seems important, therefore, to evaluate the changing course of ecodesign since the mid-1980s within the framework of the broader development of ecological ideas. One notable feature is a change in terminology: the original term “green design” is rarely used today and, although it was the buzzword the late 1980s, it is already passé. Instead, ecologically or environmentally-sensitive or affirmative design, or more generally ecodesign, has become the most widely accepted term. In the last year or so, this has, in turn, given way to “sustainable design.” These terms are fairly interchangeable, and perhaps the importance of such substitution of words should not be exaggerated, but they are one indication of shifting attitudes.

The transition from “green” to “eco-” to “sustainable” in the design field represents a steady broadening of scope in theory and practice, and to a certain extent, an increasingly critical perspective on ecology and design. Here, use of terms seems to indicate an attempt to wrestle with the complexities and implications of an ecological approach to design—going beyond the rather simplistic notions of design and the environment in the previous decade.

In this essay, which is part history and part analysis of ecodesign criticism, I use these three terms as keywords to explore different facets of ecological design, and to contextualize them within particular phases of the environmental movement in the last decade. I have emphasized the more radical theories to emerge within both design and environmental thinking in order to demon-

strate what this might imply for a new ecological design criticism. What will emerge is that this is not necessarily a cohesive or unified phenomenon—there are many shades of green and different ecological perspectives, reflecting political distinctions within the environmentalism and differences within ecological theory and practice. Although ecodesign in the last decade has been dominated by a concern for the mechanisms of putting policy into practice, a fundamental recognition has emerged that what is at stake is a new view of the world and a choice of possible futures, and it is this which has the most interesting implications for design criticism.

Green Design

“Green” became the buzzword of the 1980s. As public awareness of environmental problems spread and green parties became more prominent throughout Europe, there was a sudden profusion of greenery within the media and in advertising in the mid-to late-’80s. Because “green” encapsulated green politics, current environmental concerns, and identified them with a specific color, in an unprecedented way, green design arrived with a ready-made symbolism: green products, green packaging, and numerous books on “how to be green” in green book jackets. The “lead” nations, within Europe, in environmental terms, such as Germany and the Netherlands, began research into design and the environment in the early 1980s. Evelyn Möller coined the phrase “ecological functionalism” in 1982, and devised an ecological checklist for product designers and manufacturers which formed the basis of a working group on ecology and design in the *Verband Deutscher Industrie-Designer*.¹

In the UK, the Design Council took the lead with an exhibition called “The Green Designer” in 1986, organized by Paul Burall, Design Council publicity officer, and John Elkington, environmental consultant. Despite the fact that the term “green” was borrowed from politics, the approach in this exhibition was largely apolitical, taking place as it did in the design culture of the mid-’80s, when the idea of “winning by design” or “profit by design,” as the Design Council called it, was paramount. In fact, the exhibition was the Design Council’s contribution to Industry Year in 1986, and it was mainly concerned with demonstrating that green design was not “anti-industry,” and that the “the greening of industry had gone further than most people imagined.” John Elkington argued that the problems had now been largely overcome because green markets and the emergence of the environmental industry meant that there was no longer a conflict between a green approach to design and business success.² The exhibition focused on examples of specific products, and devised “10 Questions for the Green Designer” related to energy use, durability, recyclability, and acceptability in the marketplace. Five years later, a similar exhibition was held at the Design Centre called “More From Less” which also included “Cradle to Grave Guidelines for Design.” A number of books on

1 Evelyn Möller, “Design-Philosophie der 80er Jahre(2). Kommt mit dem Ende der Wegwerf-Ideologie ein Ökologischer Funktionalismus? *Form* 98 (1982) and *Unternehmen Pro Umwelt. Ansätze ganzheitlichen Denkens in Politik and Wirtschaft Architektur Produktionentwicklung and Design* (Munich: Lexika, 1989). In the Netherlands at this time, 1984-5, the Advisory Council for Research on Nature and the Environment was promoting research into product design: J. C. Van Weenen, C. A. Bakker, and I. V. de Keijser, *Eco-design: An Exploration of the Environment* (Milieukunde: Universiteit van Amsterdam, 1991).

2 *The Green Designer* (London: Design Council, 1986), 4.

green design appeared around this date to answer the need for basic information on environmental issues for designers, adopting the same basic approach as the Design Council.³

In political terms, all of these exhibitions and publications can be classified as "light green," as opposed to "dark green," terms that were being used by the mid-'80s to designate different tendencies within the green movement. To distinguish itself from the red/blue, left/right of traditional politics, the green movement referred to a spectrum from gray to green, with the deeper the shades of green being the more radical. In the late-'80s, the terms were somewhat trivialized to refer to light and dark green consumers, but they reflected a deep division within the environmental movement between those who advocated a radical rejection of the status quo, a critique of the paradigm of modern industrial society (whether capitalist or socialist), and the lighter green idea of modifying existing institutions and practices. This ideological division goes back to the historic roots of the environmental movement in the late 1960s and early '70s (and beyond), but it acquired a new urgency in the 1980s as the green movement came into the mainstream.

One very influential way of designating these different strands within the environmental movement which still seems relevant to the green or ecodesign movement today, is Timothy O'Riordan's classification of "technocentric" and "ecocentric." He used these terms to represent two fundamentally different outlooks on the world. The ecocentric attitude is based on bioethics and a deep reverence for nature. It is in favor of low-impact technology, and is concerned with the environmental impact of rampant economic growth and large-scale industrial development; emphasizing, instead, morally and ecologically sound alternatives. Conversely, the technocentric mode is characterized by an unswerving belief in the ability of human science and high technology to manage the environment for the benefit of present and future generations and is based on an ideology of progress, efficiency, rationality, and control, viewing discussions about the wider political, social or ethical dimensions of the environment with suspicion.⁴ In the 1970s and 1980s, these different attitudes also came to be described in terms of "shallow" and "deep" ecology, the latter, like ecocentrism, emphasizing harmony with nature and the intrinsic worth of all forms of life, as well as simplifying material needs so as to reduce human impact on planetary ecology.⁵

In the mid-to-late '80s, the predominate form of green design represented a light green, technocentric, or shallow ecological approach, but it is possible to identify darker green or deeper ecological design, too. For example, the range of products and services listed in John Button's *Green Pages*, with its emphasis on consuming less;⁶ or the German *Baubiologie* movement which believes that "living with less is better than saving energy," and that it is possible

3 For example, Paul Burall, *Green Design* (London: Green Council, 1990) and Dorothy Mackenzie, *Green Design, Design for the Environment* (London: Lawrence King, 1991).

4 T. O'Riordan, *Environmentalism* (London: Pion Ltd., 1976).

5 Deep ecology was first developed by the Norwegian philosopher Arne Naess in the early 1970s. See Arne Naess, "The Shallow and the Deep. Long-range Ecology Movement. A Summary," *Inquiry* 16 (1973) and special issue of *The Ecologist* on Deep Ecology: "Rethinking Man and Nature: Towards an Ecological World View" 188, no. 415 (1988).

6 John Button, *Green Pages: A Directory of Natural Products, Services, Resources and Ideas* (London: Optima, 1988).

to do without many existing products through the improved design of buildings and changes in lifestyles.⁷ This raises the whole question of alternative or green lifestyles, which have long been part of the green movement but which came to the fore in the debate over green consumerism in the late-'80s.

Green consumerism arrived in 1988 with the publication of the best-selling *Green Consumer Guide*, by John Elkington and Julia Hailes. It was timed to coincide with "Green Consumer Week," organized by Friends of the Earth in September 1988. In the next year or so, there was frenzied activity on the green marketing front with some major claims being made for the new green products. This led to certain misgivings on the part of environmental groups and, while supporting green consumerism in principle, Friends of Earth, for example, warned of a "green con," and argued for the need to go *Beyond Green Consumerism*.⁸ An essential conflict appeared to exist between what could be called a dark green approach to design and consumption, and the values of advertising and marketing:

Notions such as durability, reduced or shared consumption, or substituting nonmaterial pleasures for the use of objects, conflict with requirements of mass marketing. Advertising is tied to an expanding economy, the one thing that we living on a finite planet, must avoid.⁹

Here was a danger that:

efforts to promote a demand for consumer goods that are environmentally benign will simply result in strengthening the growth of consumerism.¹⁰

As a response to this two new consumer magazines emerged in 1989. *Ethical Consumer* and *New Consumer* attempted to promote the use of "consumer power for positive economic, social, and environmental change."¹¹ There was an essential contrast between this approach and the more mainstream studies such as *Green, Greener, Greenest* by Michael Peters, an investigation into whether green consumerism was a significant marketing trend in Europe.¹²

Although these issues were not explicitly discussed within green design circles at the time, and there was never any question that a dark green approach would be on the agenda, there were occasional nods toward darker shades of green. For example, the title of a conference at the Design Museum in 1990, "Green Design: Beyond the Bandwagon," reflected a similar concern over green con to that expressed by Friends of the Earth, and concentrated on *genuine* green products and graphics. Alongside speakers from design and industry, Richard Adams of *New Consumer* broadened the debate.

In the next few years, the practicalities of greening products and industry came to the fore. The Design Research Society, for

7 Keystone Architects, statement at the EDA exhibition, London Ecology Centre, 1990. Hartwin Busch "Building Biology: Towards a new era of healthy building," *Caduceus* 7 (1989).

8 Sandy Irvine, *Beyond Green Consumerism* (London: Friends of the Earth, 1989).

9 Sandy Irvine and Alec Ponton, *A Green Manifesto: Politics for a Green Future* (London: Optima, 1989).

10 James Robertson, *Future Wealth: A New Economics for the 21st Century* (London: Cassell, 1989), 9.

11 *New Consumer Review* (Newcastle, England: New Consumer, 1991).

12 Michael Peters Brand Development Division and Diagnostic Market Research Ltd., *Green, Greener, Greenest: The Green Consumer in the UK, Netherlands and Germany* (September 1989).

example, organized a conference called "The Greening of Design" in Manchester in 1992 which concentrated on environmental factors in new product development and business from a design management point of view. There was considerable overlap between this and attempts to introduce business ethics and green management into industry on the part of the New Economics Foundation and the New Consumer. But the latter adopted a more radical, watchdog role:

The vital issues of the coming decades will revolve around the nature of global consumption and distribution. Fundamental choices will have to be made about lifestyles, patterns of production and consumer priorities. Planet-sustaining decisions must be based on extensive and wide ranging information about the nature of our consumer society and those who service it.¹³

In the next few years, such ideas were to be taken on board by green designers who, as a kind of recognition of a wider frame of reference, began increasingly to refer to their work as "ecological design."

Ecological Design

The adoption of the term "ecological" to refer to anything vaguely to do with the environment dates back to the beginning of the environmental movement in the late 1960s and '70s. In 1988, John Button referred to about ninety sightings of the prefix "eco" including ecocity, ecomanagement, ecotechnics, and eco(logical archi)ecture; but not at that time, ecodesign.¹⁴ The term came into prominence a few years later, but one early use was by the Ecological Design Association, formed by 1989, whose journal was called *Ecodesign*. The EDA chose "ecological" rather than "green" because it was thought, quite rightly, that "green" would soon be an outdated term. This also reflected a broad understanding of ecological design, including radical notions of deep ecology:

The design of materials and products, projects and systems environments communities which are friendly to living species and planetary ecology.¹⁵

Although, by 1990, ecodesign was most advanced in European countries, there were some new initiatives in the early 90s in Australia. In 1990, the EcoDesign Foundation in Sydney was set up, "dedicated to the promotion of ecological sustainability through industrial re-creation."¹⁶ There, Tony Fry and Ann-Marie Willis focused on both the immediate task of greening products and the longer-term goals of redefining design and industrial practice—what Chris Ryan of the Centre for Design at the Royal Melbourne Institute of Technology has recently referred to as "EcoRedesign" and "Ecodesign," respectively.¹⁷ An international EcoDesign conference was held at RMIT in October 1991 which, according to Anne-Marie Willis, reflected "the unchoate nature of ecodesign":

13 Richard Adams, Jane Carruthers, and Sean Hamil, *Changing Corporate Values: A Guide to Social and Environmental Policy and Practice in Britain's Top Companies* (Newcastle: Kogan Page, 1990), x.

14 John Button, *A Dictionary of Green Ideas: Vocabulary for a Sane and Sustainable Future* (London: Routledge, 1988), 139-142.

15 EDA leaflet (London 1990).

16 Ecodesign Foundation *NewsLines* 1 (Sept. 1991): 4.

17 Chris Ryan, "From EcoREdesign to Ecodesign," *Ecodesign* IV, no. 1 (1996).

...for many this simply meant the "adding in" of environmental criteria to the design process. Yet ecodesign has the potential to be more than the reform of existing design, for if taken seriously, it can establish a new foundation for design that could bring economic and ecological needs into a new union....¹⁸

In the Netherlands an international gathering of designers met in March 1991 to discuss ecodesign, focusing on principles and methods as well as prevention by design.¹⁹ This was a working group of the European Union's Eureka program, set up to provide the forum for the concept of environmentally sound product design. It was organized under the auspices of the Dutch Ministry of Economic Affairs. This was one example of many government-sponsored initiatives in the early '90s. UNEP (the United Nations Environment Program) had identified fifty of these by 1994²⁰—a sign that ecodesign was beginning to be incorporated into national policies. Joint research was undertaken by academic institutions and industry, too, in the Netherlands²¹ and the UK.²²

Much of this research in the UK and elsewhere focused on the minutiae of ecodesign practice, adopting a systems approach either to the individual product or product system, or to industry as a whole. This included life cycle models which charted energy and material flow through a product system from "cradle to grave" or "womb to tomb," and there was a proliferation of flowcharts and circular diagrams. This was related to the new interdisciplinary subject of industrial ecology, "a framework for conceptualizing environmental and technical issues" which could help to inform the implementation of ecodesign or DFE (Design for the Environment).²³ Industrial ecology, like LCA, is closely modeled on ecological systems:

Industrial ecology is meant as a conceptual tool emulating models derived from natural ecosystems, aimed at developing fundamentally new approaches to the industrial system reorganization.²⁴

This attempt to draw upon ecological models to analyze product or industrial systems has proven very useful, since it is a way of containing the complexities of an environmental approach to design within limits by defining the boundaries of a system. But it does present some problems. It tends to be technocentric in that it embodies a belief in objective, value-free, scientific evidence; whereas, like EIA (Environmental Impact Assessment) or COBA (Cost Benefit Analysis), it clearly involves value judgments. Only by "scoping," that is concentrating on key areas of environmental impact, can LCA, for example, be at all manageable. Otherwise, the detailed analysis would include a huge amount of data and take years to complete. Selectivity inevitably introduces an element of

- 18 Anne-Marie Willis, "Echoes of EcoDesign 1," *EcoDesign Foundation Newsletter* (Sydney, Dec. 1991): 2.
- 19 J. C. Van Weenen, C. A. Bakker, and I. V. de Keijser, *Eco-Design: An Exploration of the Environment*. (Milieukunde, The Netherlands: Universiteit van Amsterdam, 1991). Delegates included Dorothy Mackenzie, Ezio Manzini, and Chris Ryan.
- 20 "Eco-design Initiatives Gather Momentum," *ENDS Report* 231 (April 1994): 29.
- 21 In the Netherlands, there was discussion of a formal system to put products through a green filter and a team of designers and environmental experts at the TNO Product Centre. Delft Technical University studied eight product systems in terms of material and energy use, and suggested ways in which manufacturers could improve them. Harry te Riele and Albert Zweers, *Eco-design: Acht voorbeelden van milieugerichte produktontwikkeling* (Delft: Delft Technical University, 1994).
- 22 In the UK, a Eureka eco-design seminar was organized by the Royal Society of Arts in March in 1994 on the telecommunications industry. This provided a forum for all those researching into eco-design, LCA, innovation, and the strategy of firms, notably at the Institute for Advanced Studies, Manchester Metropolitan University and the Design Innovation Group at the Open University.
- 23 Brad Allenby (AT&T), "Sustainable Development, Industrial Ecology, and Design for the Environment" White paper no. 10 (June 1993).
- 24 Silvia Pizzacaro, "Theoretical Approaches to Industrial Ecology: Status and Perspectives," international seminar "The Scenario of Sustainability: The Systemic Context" (Milan, April 1994): 1.

- 25 "Critical Review of LCA Practice," *ENDS Report* 219 (April 1994).
- 26 Anna Bramewell, *Ecology in the Twentieth Century: A History* (New Haven: Yale University Press, 1989). A good example of the word "ecology" being used in a general philosophical or political sense.
- 27 Daniel B. Botkin, *Discordant Harmonies: A New Ecology of the 21st Century* (New York: OUP, 1990).
- 28 See Donald Worster, *Nature's Economy: A History of Ecological Ideas*, 2nd edition (Cambridge: Cambridge University Press, 1994) and Richard Huggett, "Nature's Design: The Ecologist's View," a paper originally intended to be given at the "Eco Design" conference held in the Department of Philosophy, University of Manchester in October 1995. I would like to acknowledge how much this interesting, interdisciplinary conference has influenced my recent thinking on ecology and ecodesign, especially papers by John Wood, James Cullen, and Richard Huggett (whose paper was circulated to delegates afterward).
- 29 See, for example, John Harte, "Ecosystem Stability and Diversity" in Stephen H. Schneider and Penelope J. Boston, eds., *Scientists on Gaia* (Cambridge: MIT Press, 1991).
- 30 I. G. Simmons, *Interpreting Nature: Cultural Constructions of the Environment* (London: Routledge, 1993).
- 31 A point made by John Wood at the Eco-Design conference in Manchester October 1995. The Santa Fe Institute in the USA, home of complexity theory, began to look at global sustainability in the early '90s, and suggested that the study of complex adaptive systems implied a new model. Sustainable human society is an interconnected system in which economic, social, and political forces are deeply intertwined and mutually dependent on each other. Thus, a sustainable human society cannot be achieved by rational methods and technical fixes, but only by the transformation of traditional attitudes and appetites. M. Mitchell Waldrop, *Complexity: The Emerging Science at the Edge of Order & Chaos* (New York: Viking, 1992).

bias, and what is excluded from the debate may be as important as what is included. A recent study of 132 LCA schemes found that they did not share a common methodology, and that they tended to support the views of the company which sponsored them.²⁵ A more fundamental issue is that certain kinds of ecological models are being borrowed from ecological science as if they were absolutes, whereas, in fact, a closer look at the history and development of ecology reveals a range of methods, approaches, and philosophies.

There is no real consensus on whether ecology is a science or a philosophy, even though the term "ecology" was coined in the mid-19th century by Ernst Haeckel to refer to a new sub-branch of biology concerned with the relationship between living organisms and their surroundings. For him, it had social and political implications, too.²⁶ In the 20th century, ecological science can be roughly divided into two main phases. In the period up to about 1960, it was based on the idea of homeostasis and ecological balance. The concept of the ecosystem was developed by Tansley, Odum, and others. This has been described as the "ecology of the machine age," and is still based largely on the mechanistic beliefs of 19th century science.²⁷ By contrast, the new ecology which developed from the 1970s onwards rejected the idea of nature as a balanced system, and emphasized instead the disequilibrium of natural systems. Linked as it was with chaos and complexity theory, it revolutionized the concept of nature which was now seen to consist of unpredictable, dynamic, evolving, self-adaptive systems.²⁸

In many respects, the ecodesign studies referred to above are based more on the first kind of ecology than on the second, and reflect a mechanistic view of the world. The new ecology of chaos and complexity throws the whole basis of the inquiry into dispute. In a pragmatic sense, designing systems or products based on a mechanistic mode would be doomed to failure if the real world does not, in fact, work like that. The old dogma that the modeling of ecosystems is an exact science appears to have been shattered.²⁹ This raises the problem of the nature of the evidence culled from ecological science. Not only does the long-term nature of ecological research make it difficult to produce the hard and fast evidence called for by environmentalists, policymakers—and now designers—but recent ecology presents a dynamic picture of unpredictable chaos-like successions which contradict the classical models of stability and homeostasis.³⁰ The implication of chaos and complexity theory for ecodesign are not yet clear, but it does seem to suggest that an incremental approach is difficult because small changes can trigger gigantic impacts. The study of complex adaptive systems also implies a new model of design, one that is more modest and relational.³¹

There is a further implication of recent ecological thinking for design. Edward Goldsmith contrasts an ecological world-view with the modernist world-view of industrial society, which is:

...methodically substituting the technosphere or the surrogate world of human artifacts for the biosphere—or the *real* world of living things—from which the former derives its resources and to which it consigns its waste products....

This suggests a different version of ecological design because to reverse this process means rethinking priorities and changing fundamental attitudes including phasing out unnecessary products, reversing the process whereby luxuries are turned into needs, living with less, and working with the natural system.³² Under the impact of such thinking, and that of the Gaia Hypothesis³³ and the Permaculture Movement,³⁴ a new model of a radical, dark green, sustainable lifestyle has begun to emerge but this has, so far, been only partially reflected in ecodesign—in the EDA, for instance. There are some signs that such ideas are beginning to have an impact on more mainstream ecodesign. In 1993, the O2 Group, for example, held a conference call “Striking Visions” to create visions of sustainable lifestyles, taking a long-term view of the changes in attitudes needed to bring this about, and how design can make a new consumerless world palatable and even enjoyable.³⁵ This was reflected in a shift in the discussion about ecological design and a move toward the idea of “sustainable” or “global” design.

Sustainable Design

Sustainability is not a new concept. It is an ecological term that has been used since the early 1970s to mean: “the capacity of a system to maintain a continuous flow of whatever each part of that system needs for a healthy existence,”³⁶ and when applied to ecosystems containing human beings refers to the limitations imposed by the ability of the biosphere to absorb the effects of human activities. The term sustainable development was first used in the early ‘80s, but was popularized by the Brundtland Report of 1987.³⁷ “Sustainable” has become the buzzword of the ‘90s in the same way “green” was in the ‘80s, and is equally open to different interpretations and misuse. The Brundtland Report adopted a global perspective on the consumption of energy and resources, and emphasized the imbalance between rich and poor parts of the world, arguing that: “Sustainable development requires that those who are more affluent adopt lifestyles within the planet’s ecological means.”³⁸ However, because the report also argued that economic growth or development is still possible as long as it is *green* growth, this has been interpreted by many to endorse a “business as usual” approach, with just a nod in the direction of environmental protection. This ignores the real meaning of sustainable development, which is enshrined in the widely quoted concept of “futures”: “...meeting the needs of the present without compromising the ability of future generations to meet their own needs.”³⁹

- 32 Edward Goldsmith *The Ecologist* 188, no. 415 (1988): 118, and *The Way: An Ecological World View*, 2nd edition (London: Green Books, 1996); *De-Industrializing Society* (London: *The Ecologist*, 1988).
- 33 Gaia, the earth-goddess, is the name given by scientist James Lovelock to his hypothesis that the earth is like a super-self-regulating organism. Gaia has become a potent symbol in the last few years because it provides a planetary perspective on the current ecological crisis. See James Lovelock, *Gaia: A New Look at Life on Earth* (Oxford & New York: OUP 1987) and *The Ages of Gaia: A Biography of Our Living Earth*, 2nd Edition, (Oxford & New York: OUP, 1995).
- 34 Permaculture (*permanent agriculture or permanent culture*) is a total design system based on the functional zoning of a site in a series of concentric circles according to frequency of use, and brings together the design of dwellings, animal husbandry and edible landscaping, and community building. There is little reference to the contents of the innermost zone, the dwelling, but permaculture implies a radical rethinking of products and services, too. Permaculture has been one of the fastest growing organizations within the green movement in the 1980s and ‘90s—it is the equivalent of the alternative technology movement of the 70s. See Mollison, *Permaculture: A Designer’s Manual* (Tagari: Tyalgum, Australia: 1988).
- 35 “Striking Visions,” O2 Event (Netherlands Nov. 1993) organized by the Dutch O2 group. O2 was founded by the Danish designer Niels Peter Flint as an international organization of environmentally aware industrial designers.
- 36 John Button, *Dictionary of Green Ideas*, 446.
- 37 World Commission on Environment and Development, *Our Common Future* (Oxford: OUP, 1987).
- 38 *Ibid.*, 9.
- 39 *Ibid.*, 8.

When applied to design, this not only introduces—or reintroduces—the ideas of ethical and social responsibility, but also the notion of time and timescale. Thinking about the life cycle of products through time, and considerations about design for recycling, have led to the concept of DfD—Design for Disassembly—followed by the idea of going *Beyond Recycling*⁴⁰ towards the design of long-life, durable products. These two concepts are not as contradictory as they sound, as Victor Papanek has recently remarked: “To design durable goods for eventual disassembly may sound like an oxymoron, yet it is profoundly important in a sustainable world.”⁴¹

The term “sustainable design” has begun to be used in the last year or so to refer to a broader, longer-term vision of ecodesign. At the Centre for Sustainable Design, established at the Surrey Institute of Art and Design in July 1995, sustainable design means “analyzing and changing the ‘systems’ in which we make, use, and dispose of products,” as opposed to more limited, short-term DFE.⁴² The ECO2 group makes a similar distinction between “green design, project-based, single issue and relatively short-term; and ‘sustainable’ design, which is system-based, long-term” ethical design.⁴³ Emma Dewberry and Phillip Goggin have also explored the distinctions between ecodesign and sustainable design; arguing that, whereas ecodesign can be applied to all products and used as a suitable guide for designing at product level: “The concept of sustainable design, however, is much more complex and moves the interface of design outwards toward societal conditions, development, and ethics....⁴⁴ This suggests changes in design and the role of design, including an inevitable move from a product to a systems-based approach, from hardware to software, from ownership to service, and will involve concepts such as dematerialization and “a general shift from physiological to psychological needs.” Finally, they emphasize the extent to which consumption patterns must change, and refer to the inequality between developed and developing nations, the fact that 20 percent of the world’s population consumes 80 percent of the world’s resources and conclude that ecodesign does fit into a global move toward sustainability, but has many limitations in this context.⁴⁵ This is the point made by Gui Bonsiepe, who has expressed the fear that ecological design will remain the luxury of the affluent countries while “the cost of environmental standards would be shifted onto the shoulders of the Third World.”⁴⁶

This raises the other dimensions of sustainable development: “Equity,” meeting the needs of all, and “Participation,” effective citizen involvement in decision-making, without which global sustainable growth would be impossible—except by an unacceptable form of “ecofascism.” These issues are only just being raised in design circles, but were explored in detail recently by the WorldWatch Institute in reports on global resources and consumption patterns. In *How Much is Enough? The Consumer Society and the Future of the*

40 Tim Cooper, *Beyond Recycling: The Longer Life Option* (London: New Economics Foundation, 1994).

41 Victor Papanek, “Eco-logic” *Ecodesign* III, no. 1 (1994): 10. Discussed in his recent book, *The Green Imperative: Ecology and Ethic in Design and Architecture* (London: Thames & Hudson, 1995).

42 Anne Chick, “MA in Sustainable Design,” Centre for Sustainable Design leaflet, 1995.

43 ECO2 group, “Hierarchy of EcoProducts in Strategies,” workshop on defining ecodesign, Nov. 1994.

44 Emma Dewberry and Phillip Goggin, “Ecodesign & Beyond: Steps towards ‘Sustainability’” (Open University and Nottingham Trent University, Nov. 1994): 7-8; and Emma Dewberry, “Ecodesign Strategies,” *EcoDesign* IV, no. 1 (1996), in which she distinguishes between green design, ecodesign, and global design approaches and company initiatives.

45 Dewberry and Goggin, “Ecodesign & Beyond.”

46 Gui Bonsiepe, “North/South: Environment/Design,” *Inca* 14 Gui Bonsiepe, formerly of the *Hochschule für Gestaltung*, Ulm, until recently has been living and working in Latin America since the 1970s, and so he is in a good position to view the situation from a “south” perspective.

Earth, Alan Durning divides the world population into three consumption classes and analyses their consumption of food, transport, and goods, concluding that environmental destruction results from the overconsumption of the top one-fifth of the world's population and from the poverty of the bottom one-fifth. He asks if there is a level of sufficiency for all the world's population, a level above poverty and subsistence but below the affluent consumer lifestyle that is sustainable? The answer is a shift from the "cultivation of needs" to "a culture of permanence": "substituting local foods for grain-fed meat and packaged fare, switching from cars to bikes and buses, and replacing throwaways with durable goods."⁴⁷ This obviously implies a new agenda for design, and this is beginning to be discussed in the UNEP Working Group on Sustainable Product Development which was started in January 1994 as a follow-up initiative to the Rio Conference of 1992. It is a network of 360 people in 40 countries all over the world, including 18 from developing and transitional countries. The Research Programme is based on the principles of sustainable development:

The very concept of 'sustainability' underlies our fear for the next generation's future, and forces the question; is a harmonious balance between their product demands and the earth's ecology possible and how can it be sustained?⁴⁸

Products are redefined in terms of categories such as "service" (transport "pool," rented products); "dematerialization" (virtual libraries, teleworking systems), as well as life cycle design and longevity. But perhaps even more interesting is the focus on "Products, Services and Systems that Meet Human Needs," and which can lead to an improvement in living and working conditions. Areas of "need" to be explored include transportation, communication, heating, cooling, clothing and textiles, and the use of water by the end-consumer.⁴⁹ This shift of emphasis from the products to the needs reintroduces an important theme from the 1970s, that of "Design for Need,"⁵⁰ and, in many ways, sustainable design has come back full circle to some of the radical design theories of the 1970s.

Conclusion

Thus, ecological design, as it has developed over the last decade, has reinvented some old ideas and produced some new ones. It has gone through a process of maturity, moving toward a deepening of understanding of environmental issues and a darker shade of green. It has become increasingly evident that the radical nature of an ecological approach to design implies a new design critique. In the 1980s, this was not necessarily apparent when green was the flavor, or rather the color, of the month and it seemed that green design would comfortably settle down into the mainstream of design industrial practice. In the 1990s, the oppositional nature of ecologi-

47 Alan Thein Durning, *How Much is Enough? The Consumer Society and the Future of the Earth* (London: Earthscan, 1992), 109. See also John E. Young and Aaron Sachs, *The Next Efficiency Revolution: Creating a Sustainable Materials Economy* (Worldwatch Paper 121, 1994). Peter Harper of the Center for Alternative Technology, Wales, has been working along the same lines, and has made an interesting analysis of the acceptability of putative "eco-technology" and lifestyle changes. He has classified possible response from light to dark green in "The L-Word: A.T. and Lifestyles," *Proceedings of AT2000: A Conference on Alternative Technology for the 21st Century* (Milton Keynes: Open University, 1994).

48 United Nations Working Group on Sustainable Product Design News Fax (August 11, 1995); 1.

49 Ibid., 2,3. See also Yorick Benjamin, senior researcher, "Sustainable Product Development," *EcoDesign* IV, no. 196.

50 "Design for Need" was the name of an ICSID (International Council for Societies of Industrial Design) conference held at the Royal College of Art in 1976. See J. Bicknell and L. McQuiston, eds., *Design for Need: The Social Contribution of Design* (Oxford: Pergamon Press, 1977).

cal design is more apparent, since even fairly pragmatic attempts to apply ecological principles to design seem to inevitably challenge existing practices and ideologies.

Designers and design critics are increasingly emphasizing the actual or, potentially, radical nature of an ecological approach to design which implies a new critique—a recognition of the fact that to adopt an ecological approach to design is, by definition, to question and oppose the status quo. Ezio Manzini, for example, has described this as a shift from the “normalized ecological design” of the 1980s and the “new radicalism” of the ‘90s, which increasingly recognizes that ecological design necessitates changes in lifestyles that challenge the current global model of development.⁵¹ In a similar way, Tony Fry argues that ecodesign is the means by which industrial culture can be remade, and that the need to change basic values can only be achieved “by design so long as design itself is redesigned.” He is critical of existing ecodesign theory and practice, but postulates a potentially radically ecodesign which could create a new direction for design.⁵² From a different perspective, Gui Bonsiepe has also recently critically evaluated ecodesign. Although a new environmental ethic implies a new design ethic, he says, ecodesign, in theory and practice, has not yet developed enough to have created a new paradigm for industrial design. However:

The unquestionable merit of ecodesign consists in having articulated concerns which put into question paradigms of design and industrial production and consumption that we took for granted.⁵³

These issues may be new to design in the 1990s but, within the environmental literature, there has been a constant discussion since the 1960s of the extent to which an ecological world-view represents a new paradigm requiring a fundamental challenge to industrial society, or merely a minor modification of existing values and practices, and a debate over the degree of change required to overcome the current ecological crisis. That such issues are now being taken seriously within the design field—more so than the 1970s—suggests a shift in attitudes which will have far-reaching consequences for design criticism. During the last few decades, design criticism has followed design practice and has been dominated by a nonecological approach, tending to view consumerism as having positive economic and social value, and thereby endorsing the kind of industrial culture under attack by Greens. Only now, in the wake of discussions of ecological design theory and practice, is an ecological design criticism beginning to emerge.

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- 51 Ezio Manzini, “Prometheus of the Everyday: The Ecology of the Artificial and the Designer’s Responsibility,” *Design Issues* IX, no. 11 (Fall 1992): 5 and “Design, Environment, and Social Quality: From ‘existenzminimum’ to quality maximum,” *Design Issues*, 10, no. 1 (Spring 1994).
- 52 Tony Fry, *Remarkings. Ecology. Design. Philosophy*. (Sydney: Envirobook, 1994), 9, 11-12.
- 53 Gui Bonsiepe, “North/South Environment/Design,” *Inca*, a publication of the San Francisco Chapter of the Industrial Designer’s Society of America (August 1992).