

The University of Sydney

Copyright in relation to this thesis*

Under the Copyright Act 1968 (several provision of which are referred to below), this thesis must be used only under the normal conditions of scholarly fair dealing for the purposes of research, criticism or review. In particular no results or conclusions should be extracted from it, nor should it be copied or closely paraphrased in whole or in part without the written consent of the author. Proper written acknowledgement should be made for any assistance obtained from this thesis.

Under Section 35(2) of the Copyright Act 1968 'the author of a literary, dramatic, musical or artistic work is the owner of any copyright subsisting in the work'. By virtue of Section 32(1) copyright 'subsists in an original literary, dramatic, musical or artistic work that is unpublished' and of which the author was an Australian citizen, an Australian protected person or a person resident in Australia.

The Act, by Section 36(1) provides: 'Subject to this Act, the copyright in a literary, dramatic, musical or artistic work is infringed by a person who, not being the owner of the copyright and without the licence of the owner of the copyright, does in Australia, or authorises the doing in Australia of, any act comprised in the copyright'.

Section 31(1)(a)(i) provides that copyright includes the exclusive right to 'reproduce the work in a material form'. Thus, copyright is infringed by a person who, not being the owner of the copyright, reproduces or authorises the reproduction of a work, or of more than a reasonable part of the work, in a material form, unless the reproduction is a 'fair dealing' with the work 'for the purpose of research or study' as further defined in Sections 40 and 41 of the Act.

Section 51(2) provides that "Where a manuscript, or a copy, of a thesis or other similar literary work that has not been published is kept in a library of a university or other similar institution or in an archives, the copyright in the thesis or other work is not infringed by the making of a copy of the thesis or other work by or on behalf of the officer in charge of the library or archives if the copy is supplied to a person who satisfies an authorized officer of the library or archives that he requires the copy for the purpose of research or study'.

*'Thesis' includes 'treatise', dissertation' and other similar productions.

THE ARCHITECTURE OF CIRCULARITY
DESIGN, HEIDEGGER AND THE EARTH

GLEN HILL

**A Thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy**

**Department of Architecture
University of Sydney**

March, 1997

For My Parents

ABSTRACT

This Dissertation locates itself at the nexus of three themes: *design theory*, *ecologically responsible design* and the thought of *Martin Heidegger*. In Division I of the Dissertation it is argued that much of the contemporary discourse on environmentally thoughtful design assumes a theoretical framework for the design process which is grounded in *Rationalism*. With the advent of the many streams of post-foundational thinking, both Rationalism and Rationalist formulations of design theory have come under mounting criticism. In the light of this criticism, Division II of the Dissertation attempts to lay out a *non-foundational account of the design process* which builds upon the work of the early Heidegger together with that stream of contemporary philosophical hermeneutics influenced by Heidegger. The implications that this alternative way of understanding the design process may hold for ecologically thoughtful design is then examined. Rather than supporting the assumption that design offers the potential to participate in overcoming the ecological crisis, Division III of the Dissertation employs the work of the later Heidegger to argue that, as the instrument of the self-concealing circularity of our technologised way of being, design may instead be at the heart of the ecological crisis.

ACKNOWLEDGEMENTS

Reflecting on the journey that I have taken in the writing of this thesis brings mixed emotions. This work has filled a central place in my life for such a long time that there is almost a sense of regret in leaving the daily rituals of its writing behind. While not without its tedium and frustration, the journey has, for the most part, been pleasurable and rewarding. This is largely because the journey was not taken alone. Many people have given support and encouragement along the way.

I would like to thank the academic and administrative staff at the Department of Architecture who all contributed to creating a friendly and welcoming research environment. I would especially like to thank Professor Peter Webber for the care and support he has shown me over many years.

To the friends and fellow students in the Departments of Architecture, Urban and Regional Planning, and Architecture and Design Science — Alec McGillivray (whose presence in the faculty is greatly missed), Peter Corcoran, Gabrielle Philips, Sue Stewart, Bronwyn Hanna, Rodger Rajaratnam, and Steven Loo — thankyou for the erudite advice when it was sought, but most importantly, thankyou for the humour that made the difficult patches bearable.

I can find no adequate way of expressing my thanks to my wife Kabita, who worked tirelessly and without complaint to make sure the world kept turning.

And to my parents, not only for the support they gave during the journey with this thesis, but for the care and love they have offered during my whole life's journey, any thanks seem insufficient.

I would like to give my final and very special thanks to my supervisor, Adrian Snodgrass, who introduced me to hermeneutics and post-structural thought, and whose patient and nurturing supervision gave me direction. It is his extraordinary scholarship that has opened the space of possibility for this thesis.

CONTENTS

CHAPTER 1	INTRODUCTION	1
DIVISION I:	DESIGN AND THE TRADITION	
CHAPTER 2	The Rationalist Tradition	35
CHAPTER 3	Rationalism, Design and the Ecological Crisis	60
DIVISION II	DESIGN AND HERMENEUTICS	
CHAPTER 4	Heidegger's Absent Presence in Design	103
CHAPTER 5	Design as Deliberation	130
CHAPTER 6	Design as Thematized Projection	174
CHAPTER 7	Finitude and Design	213
DIVISION III	DESIGN AND THE EARTH	
CHAPTER 8	Struggle Between World and the Earth	281
CHAPTER 9	Conclusion: Letting Be	329
BIBLIOGRAPHY		352
APPENDIX		372

CHAPTER 1

INTRODUCTION

Design and Ecology

When I commenced reading for this doctoral thesis my interest was focussed on the intersection of two discourses: that which addressed *design as process*, and that which addressed the perceived *ecological crisis*. While my understanding of the involvements that might be at work at this nexus has transformed immeasurably during the course of my doctoral research, the focus of this dissertation has remained unchanged.

•

It is a commonplace that our perceived ecological crisis is in some substantive way related to the technological interventions that have been brought into being as products of human designing. Our technologically mediated ways of being are seen as causally linked to ecological degradation, loss of bio-diversity and depletion of finite resources; and these technologically mediated ways of being are themselves seen to be the outcome of human designing.¹ Design could therefore be said to be at the heart of the ecological crisis. 'Design' and 'ecological crisis' entwine.

Within the current design literature, there is a burgeoning number of works which address the relationship between design and the perceived ecological crisis. Commonly there is a pattern to the argument presented in these texts. The structure of the argument often has three key steps: an emotive description of the ecological *crisis*; a discussion of the crucial role of design in *contributing* to the ecological crisis; and a substantive section of the work which details how design

¹This makes a claim for a very broad characterisation of design and the role design plays in our human ways of being. This claim will be supported at length in later sections of this dissertation.

might be re-oriented toward *overcoming* the ecological crisis.

Following this pattern, the first chapter of Brenda and Robert Vale's *Green Architecture* provides an overview of critical aspects of the ecological *crisis* in terms of the ancient elements of Air (atmospheric pollution), Water (fresh water pollution and depletion), Fire (pollution by, and depletion of, fuel sources), and Earth (resource depletion and associated pollution).²

Design of the built environment is then shown to *contribute* substantially to this ecological crisis, for example:

The greenhouse effect and the ozone hole are two of the most threatening effects of pollution, but what is their relevance to architects, and those who commission and use buildings? The relevance arises from the fact that roughly 50 percent of CFCs produced throughout the world are used in buildings...³

The body of the text then describes how design might be re-oriented in order to participate in the *overcoming* of the ecological crisis. In the case of this text it is argued that such an overcoming requires that designers somehow transform both themselves and their design outcomes in such a way that their designing incorporates six 'green principles': (i) conserving energy, (ii) working with the local climate, (iii) minimising the use of new resources, (iv) respecting the needs of users, (v) respecting the site, and (vi) holistically incorporating all of the above.⁴

A similar pattern of argumentation is evident in Mackenzie's *Design for the*

²Vale, B. and R. *Green Architecture: Design for a Sustainable Future*, London: Thames and Hudson, 1991, pp. 15-35.

³*Ibid.*, p. 23.

⁴*Ibid.*, pp. 69-169.

Environment. The summary statements that introduce three of the key chapters follow the three steps of the argumentation structure. The first sets out the scope of the ecological *crisis*, introducing 'the many important problems we confront' which are then detailed under the categories of global warming, ozone depletion, deforestation, waste generation, water pollution and resource consumption.⁵

The second summary statement demonstrates the extent to which the design of the built environment *contributes* to this crisis:

'Buildings are responsible for more external pollution than any other product. About half the greenhouse gases produced each year by industrialised countries are related to buildings, through the use of energy. Buildings also contribute directly to other global environmental problems, such as acid rain and the reduction in the ozone layer.'⁶

The summary statement that introduces the concluding chapter declares that design will have to be re-oriented if the environmental crisis is to be *overcome*:

If we are to minimise the extent of environment problems design will have to change, because users and consumers of design — individuals and industry — will have to change.⁷

The nature of the re-orientation that is required is, it is claimed, uncomplicated yet profound:

...the inclusion of environment criteria as an integral part of the design

⁵Mackenzie, D. *Design for the Environment*. New York: Rizzoli, 1991, pp. 24-37.

⁶*Ibid.*, p. 38.

⁷*Ibid.*, p. 154.

process will be one of the most important and far-reaching developments in the history of design.⁸

Following a similar pattern of argumentation, chapter 1 of Papanek's *The Green Imperative* describes various dire aspects of the ecological crisis. Papanek is unequivocal about the depth of the crisis, opening the chapter with the claim that '[t]here can be little doubt that the environment and the ecological balance of the planet are no longer sustainable.'⁹

Papanek then continues the pattern by demonstrating that design is deeply implicated in *contributing* to this parlous ecological state:

Ecology and the environmental equilibrium are the basic underpinnings of all human life on earth; there can be neither life nor human culture without it. Design is concerned with the development of products, tools, machines, artefacts and other devices, and this activity has a profound and direct influence on ecology...This can be clearly demonstrated. The creation and manufacture of *any* product — both during its period of active use and its existence afterwards — fall into at least six separate cycles, each of which has the potential for ecological harm.¹⁰

Finally Papanek describes how design might be re-oriented toward *overcoming* the ecological crisis. As Papanek holds design to be an activity which is not simply the domain of professional designers, his proposals for the way in which design might participate in the overcoming of the ecological crisis are broad. He proposes an

⁸*Ibid.*, p. 154.

⁹Papanek, V. *The Green Imperative: Ecology and Ethics in Design and Architecture*. Singapore: Thames and Hudson, 1995, p. 17.

¹⁰*Ibid.*, p. 29.

educational process in which design is transformed by the adoption of 'an ecological world-view'.¹¹ For Papanek, design practised through such a world-view would be constituted by a diverse (perhaps jumbled?) inventory of new directions. These include the now standard fare of pragmatic ecological functionalism, such as minimising waste¹² and recycling,¹³ but also include more diverse ingredients such as democratic notions of 'people participation'¹⁴ and new age spiritualist dimensions which draw upon 'the collective unconscious'¹⁵ and 'nature's magic numbers'.¹⁶

However, it is not only texts directed toward a popular audience which utilise this three step pattern of argumentation. Articles addressing this subject area in scholarly journals can also be seen to embody this argumentation structure. For example, a cluster of articles written by Allan Rodger and Roger Fay on the relation between ecologically sustainable development and design reveal this pattern.¹⁷ In *Sustainable Suburbia* Rodger and Fay open their paper by establishing the extent of the ecological crisis. They state that '[t]he Biosphere is under threat. Along with threats to the Biosphere come threats to all living systems and in particular the sustainability and quality of human life.'¹⁸

Rodger and Fay then demonstrate the role of design in *contributing* to the ecological crisis. In this case the focus is on the design of technology — the 'tool-kit' with which humans 'interact with the biosphere'.¹⁹ Rodger and Fay emphasise the crucial role of the design of the built environment as part of this tool kit. They claim

¹¹*Ibid.*, p. 48.

¹²*Ibid.*, p. 59.

¹³*Ibid.*, p. 58.

¹⁴*Ibid.*, p. 59.

¹⁵*Ibid.*, p. 98.

¹⁶*Ibid.*, p. 110.

¹⁷Fay, "Ecologically Sustainable Development and the Built Environment." *Architectural Science Review* 37 (2 June 1994):8-9; Rodger, A and R. Fay. "Sustainable Suburbia." *Exedra* 3 (1 1991): 4-15; Rodger, A. "An Integrated Approach to an Energy Efficient House." *Architectural Science Review* 37 (2 June 1994): 59-66; Rodger, A. "Architecture for Sustainable Development." *Exedra* 1 (2 Summer 1989): 4-11.

¹⁸Rodger and Fay. "Sustainable Suburbia," *op. cit.*, p. 4.

¹⁹*Idem.*

that in Australia 75% of the accumulated capital stock that constitutes 'our existing tool kit' is to be found in the built environment.²⁰

The body of Rodger and Fay's paper then details how the incremental redesign of the built environment of the suburbs might contribute to *overcoming* the ecological crisis. They suggest that the design of suburbs should be re-oriented in two complementary ways. Firstly the physical fabric should be redesigned to reduce its environmental impact, reduce its consumption of resources, and reduce the need for polluting and energy consuming movements of people and goods. Secondly this redesign should at the same time contribute to 'cultural sustainability' by providing 'a pattern of living' which culminates 'in a sense of personal involvement, of purpose, of belonging, of security, of responsibility, of challenge, of comradeship and of love.'²¹ The implication being that change will be motivated by making design outcomes 'desirable.' The importance of 'desire' in bringing about change will be revisited in Division II of this dissertation.

The three step structure of argumentation is also evident in the environmental policy statements of numerous professional bodies concerned with design of the built environment. The Royal Australian Institute of Architects *Environment Policy* begins with a succinct statement of the ecological *crisis*: '[t]here is undeniable evidence that population growth and associated development are radically affecting the ecological balance of the planet.'²²

The policy then points out the significant *contribution* of the designed environment to this crisis:

²⁰*Idem.*

²¹*Ibid.*, p. 5.

²²Royal Australian Institute of Architects. "RAIA Environment Policy." *Architecture Australia* (September/October 1994), p. 86.

Buildings contribute substantially to the depletion of our planet's finite resources and the reduction of environmental quality. For example, about one third of the total greenhouse gas emissions arising from fossil fuel combustion in Australia are attributable to energy use in the residential, commercial construction and building materials sectors.²³

The body of the policy then describes how architectural design might be transformed in order to contribute to the *overcoming* of the ecological crisis. This transformation requires that architectural designers adopt five design principles: (i) maintain and restore biodiversity, (ii) minimise consumption of resources, (iii) minimise pollution of air, soil and water, (iv) maximise health, safety and comfort of building users, and (v) raise awareness of environmental issues.²⁴

Numerous other environmental policies from professional design bodies around the world disclose a similar argumentation structure. These include, for example, the *New Zealand Institute of Architects Environmental Policy*²⁵ together with its associated *Position Papers* by Graeme Robertson,²⁶ Richard Lambourne,²⁷ Tony Watkins,²⁸ the *Environmental Principles for Engineers* issued by the Institution of Engineers, Australia,²⁹ and the *Declaration of Interdependence for a Sustainable Future* prepared by the American Institute of Architects and the International Union of Architects

²³*Idem.*

²⁴*Ibid.*, pp. 87-8.

²⁵New Zealand Institute of Architects. *NZIA - Duroid environmental Policy Papers (EPP'S)*. Second Issue, 1992.

²⁶Robertson, G. *Sustainable Built Environments: Position Paper 2: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992; Robertson, G. *Projected Climate Change: Position Paper 3: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992; Robertson, G. *Atmospheric Ozone Depletion: Position Paper 4: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992; Robertson, G. *UNCED - Introduction for Architects: Position Paper 11: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

²⁷Lambourne, R. *Environmental Health Hazards: Position Paper 7: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992; Lambourne, R. *Sustainable Timber Usage: Position Paper 8: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

²⁸Watkins, T. *Section 1 Chapter 7 Agenda 21: Position Paper 10: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

²⁹National Committee on Environmental Engineering. *Environmental Principles for Engineers*. Institution of Engineers Australia, 1992.

which has over 90 member countries.³⁰

A text which at one level appears to fall neatly into the three step argumentation structure described here is Tony Fry's *Remakings: Ecology / Design / Philosophy*.³¹ At other levels, however, this work differs substantively from the works cited thus far. Along with a group of other key texts that might be described as 'post-foundationalist,' this text occupies a pivotal position in this dissertation. The significance of this and other key texts will unfold in subsequent chapters. For the moment though, rather than look at what is unique about Fry's text, it is appropriate to see how it too embodies the three step paradigm.

In the opening paragraphs of Fry's book each of the three steps are taken. Fry commences with a description of the critical dimensions of the ecological *crisis*:

As the number of people on Earth ever increases so does post-industrial culture's appetite for resources and energy. Correspondingly, the negative environmental impact of its products, waste and lifestyles ever becomes a growing problem. It follows that this economy and culture, as it has developed as a functioning assemblage of its entire history, accumulatively threatens the continued well-being of all biological and social life.³²

Fry then describes the critical significance of the *contribution* of design³³ to the

³⁰This document asserts in part that '[t]oday's society is seriously degrading the environment and is not sustainable,' that '[b]uildings and the built environment play a major role in the human impact on the natural environment,' and that members of the design professions should commit to a change of direction in which 'environmental and social sustainability' are placed 'at the core of [their] practices and professional responsibilities.' UIA/AIA World Congress of Architects. *Declaration of Interdependence for a Sustainable Future*. International Union of Architects and American Institute of Architects, 1993.

³¹Fry, T. *Remakings: Ecology Design Philosophy*. Sydney: Envirobook, 1994.

³²*Ibid.*, p. 9.

³³In an earlier text, Fry is even more explicit about the role of design in contributing to the ecological crisis: '[i]t does not take a great deal of analytical effort to realise that design (in all its guises), has been in the service of what is now being designated as the problem.' Fry, T. "Material

unfolding ecological crisis (and indeed to its potential overcoming):

The realisation of the omnipresent power of design, and its past, present and future importance, is still under-recognised in the design professions themselves as well as within intellectual and political culture at large. A vast gulf can be seen, for example, between the modest volume of critical literature on the area and the enormous impact of design as, an embodiment of thought, an economic practice, the designation of material form and the prefiguration of direction — all of which converges to have a cumulated and profound impact on human life and the life of all else on planet Earth.³⁴

Completing the pattern, Fry then describes how design might participate in the *overcoming* of the ecological crisis, indeed, how the ecological crisis can *only* be overcome by design. Like the authors of the previous texts, Fry advocates that design must be somehow re-oriented in order to overcome the crisis.

Humanity, on so many levels, lives a paradox — it depends upon that which it threatens. So faced with a fundamental danger to life the transformation of industrial culture is the only available means of salvation. The question, a question of power, before the peoples of industrialised nations, on the basis of this transformatory proposition, is 'how can industrial culture be re-made?...expressed by way of the briefest answers, that it is 'by design, so long as design itself is re-designed'.³⁵

For Fry, re-orienting design to overcome the ecological crisis requires that design

re-creation: eco-designing a new mainstream." *Artlink* 11 (4 Summer 1991/92), pp. 18-19.

³⁴Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, p. 9.

³⁵*Idem.*

participate in shifting the very grounds of our industrial culture:

It is vital to recognise the context in which change has to occur, if positive change is to become possible. This means acknowledging that the global environmental crisis has been induced by human beings, especially through industrial culture, as lived as values in action. It can be said, and quite simply, that in order to survive I, and all other human beings, pragmatically need to change the basis upon which systems of value and action are constructed. This change can only occur by design.³⁶

Re-orienting Design

What each of these texts which address the nexus of design and ecological crisis hold in common is the presumption that if the ecological crisis is to be overcome, design itself must be re-directed from its current trajectory toward some new trajectory. Just what that new trajectory might be, varies depending upon the text. It may involve the inclusion of new design criteria, such as minimising pollution, minimising the consumption of resources, and maintaining or restoring biodiversity. It may involve re-orienting design to generate outcomes which not only satisfy ecologically grounded functional criteria, but also have perceived positive cultural or spiritual dimensions which make the adoption of such design outcomes desirable. Or it may involve transforming the manner in which design outcomes are generated and procured, through, for example, more democratic or participatory concept development and design implementation phases.³⁷

³⁶*Ibid.*, p. 9-10.

³⁷For discussion of the relative value of considering ecological issues at various phases during the process of design project procurement, see Hill, G. "Environmental Constraints upon the Process of Project Procurement." Major Report, University of Technology Sydney, 1992.

From the outset, one question interested me greatly, and that question remains central to this dissertation: *What is the process by which such a re-orientation of design might take place?* In Kuhn's terms,³⁸ what is the structure of the paradigm shift which occurs when a new design trajectory, in this case toward more ecologically thoughtful designing, arises? By what process are we able to first think the possibility of such a transformed design paradigm? Once thought, what motivates the desire to change toward such a paradigm? And what motivates consumers of design to desire to adopt the ecologically thoughtful outcomes of such a re-oriented design paradigm? Conversely, what inhibits the change in paradigm? And what inhibits the adoption of the ecologically thoughtful outcomes of such a re-oriented design paradigm?

To summarise then, this dissertation sets out to explore the *process* by which, and within which, paradigm shift in design occurs. The paradigm shift that is at the heart of the thesis is the re-orientation toward a trajectory of ecologically thoughtful design. The dissertation is not however a detailed *technical study* of any particular ecologically thoughtful design trajectory. Particular ecologically thoughtful design trajectories are instead the vehicles for the exploration of the process of paradigm shift in design.

Theorising the Design Process

From the outset of researching for this dissertation, it was evident that if the paradigm shift toward ecologically thoughtful design was to be studied through the lens of the design process, then what would first be required was an appropriate description of the design process which could provide the theoretical framework for the study. It was also hoped that the focus allowed by this lens would ensure that what might potentially be a dangerously unbounded research project could be kept both directed and manageable.

³⁸Kuhn, T. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1970.

Because I had already studied formulations of the design process which were grounded in structuralist, cognitivist and methodological approaches³⁹ as part of my Masters degree,⁴⁰ there was a presumption that these would again form the theoretical framework for this study. It gradually became evident, however, that simply adopting such rationalist⁴¹ models of the design process might not only be inappropriate to the questions I was now asking, it might in fact prefigure the answers to these questions. In other words, rather than the theorising of the design process acting as a transparent window that allows an undistorted view of the paradigm shift toward ecologically thoughtful design, the understanding of the design process might itself influence or *constitute* that description of the paradigm shift.

Each of the texts which address the possibility of a paradigm shift toward ecologically thoughtful design assumes a position on how such a shift might come about. Two quite different scenarios are evident, though these scenarios often

³⁹For an introductory discussion of structuralism, cognitivism and the methods movement in design, see Gelernter, M. *Sources of Architectural Form: A Critical History of Western Design Theory*. Manchester: Manchester University Press, 1995, pp. 256-277.

Design theoreticians cited in my Masters thesis that might be fitted within these categories include: Alexander, C. *Notes on the Synthesis of Form*. Cambridge, Massachusetts: Harvard University Press, 1964; Broadbent, G. "A Plain Man's Guide to Systematic Design Methods." *Royal Institute of British Architects Journal* 5 (May 1968); Coyne, R., M. Rosenman, A. Radford, M. Balachandran, and J. Gero. *Knowledge-Based Design Systems*. Massachusetts: Addison-Wesley, 1990; Cross, N. *Design Process and Products: A Review of Design*. Milton Keynes: The Open University Press, 1983; Gero, J. *Expert Systems in Computer-Aided Design*. Amsterdam: North-Holland, 1987; Gero, J. *Artificial Intelligence in Design*. Southampton: Computational Mechanics Publications, 1989; Hall, A. D. Jr. *A Methodology for Systems Engineering*. New York: Van Nostrand, 1962; Jones, C. *Design Methods: Seeds of Human Futures*. New York: Wiley, 1970; Lawson, B. *How Designers Think*. London: Architectural Press, 1980; Logan, B. *The Structure of Design Problems*. Glasgow: University of Strathclyde, 1987; Maher, M. L. "Heuristically Generating Multiple Optional Beam Designs." In *Expert Systems in Engineering, Architecture and Construction in Sydney*, edited by J. Gero and F. Sudweeks, University of Sydney, 1989; Moore, G. *Emerging Method in Environmental Design and Planning*. Massachusetts: MIT Press, 1970; Newell, A. and H. Simon. *Human Problem Solving*. Englewood Cliffs: Prentice-Hall, 1972; Newell, A. "Artificial Intelligence and the Concepts of Mind." In *Computer Models of Thought and Language*, ed. R. Schank and K. Colby. San Francisco: W. H. Freeman, 1973; Schank, R. *Explanation Patterns: Understanding Mechanically and Creatively*. Hillsdale: Lawrence Erlbaum, 1986; and Simon, H. *The Science of the Artificial*. Cambridge: MIT Press, 1969.

⁴⁰Hill, "Environmental Constraints upon the Process of Project Procurement," *op. cit.*

⁴¹The characteristics of these texts which allow them to be categorised as 'rationalist' are discussed in subsequent chapters.

indiscriminately intermingle within the same text. One scenario suggests that a shift in 'attitude' or 'perception' — change from within — must be the first step in the change from the current ecologically destructive paradigm. Brenda and Robert Vale thus assert that:

...A realization of the problem and the resources in common may form the beginnings of some more *fundamental change in attitude* which is the necessary precursor to change.⁴² [my italics]

A similar sentiment is contained in Crowther's prescription for change toward an 'ecologic' way of designing:

A *shift in perception* toward these expanded views of concept, design and realisation [of wider ecological concerns] *is the first step* toward a professional ecologic design practice.⁴³ [my italics and my gloss in brackets]

This assumption about the way in which a shift in paradigm occurs is also contained in less domain-specific texts addressing the issue of change to a more ecologically responsible way of being. The Commonwealth of Australia's Draft National Strategy for Ecologically Sustainable Development states that:

This issue [community awareness and involvement in Ecologically Sustainable Development (ESD)] was a pervasive theme throughout the ESD Reports, reflecting the *vital need for changes to community attitudes* if we are to ensure widespread adoption of sustainable patterns of development.⁴⁴ [my italics and my gloss in brackets]

⁴²Vale, *Green Architecture*, op. cit., p. 44.

⁴³Crowther, R. *Ecologic Architecture*. Boston: Butterworth Architecture, 1992: p. 268-69.

⁴⁴Commonwealth of Australia. *Draft National Strategy for ecologically Sustainable Development*.

The second scenario for the way in which a shift in paradigm might come about is grounded in an assumption that 'the fabric of society' must itself first change. This 'change from without' scenario is evident in texts in which the focus is on a transformed commercial, legislative, and financial framework that might induce change, together with the *objects* of design that might constitute such a new, ecologically responsible pattern of existence. Texts such as Mackenzies' *Design for the Environment* focus on case studies of ecologically responsible design products, which are made possible by changed 'legislative frameworks,' 'commercial imperatives,' 'employee pressures' and 'market demands.'⁴⁵ The designer is thus drawn into change by changes in the fabric of society in which they operate:

Until now, many designers may have felt that, if they wished to use their skills, they have had no alternative but to participate in the misuse of design. Now, however, as individual values and business priorities are beginning to change, they have the opportunity to demonstrate that environmental considerations, along with social and ethical concerns, occupy a central position within mainstream design thinking.⁴⁶

I myself unnoticingly adopted the 'change from without' scenario when, in 1992, I prepared the response on behalf of the Royal Australian Institute of Architects to the Draft National Strategy for Ecologically Sustainable Development. The response stated, in part, that:

We believe that the Draft Strategies substantially weaken the impetus of the recommendations which arose out of last year's Working

Canberra: AGPS, 1992, p. 5.

⁴⁵Mackenzie, *Design for the Environment. op. cit.*, pp. 12-16.

⁴⁶*Ibid.*, pp. 11-12.

Groups. Unfortunately, the documents now appear much more directed toward *communicating platitudes* than to establishing a firm set of actions and a firm framework for the achievement of ... a sustainable society.

From the perspective of those of us involved in the design of the built environment ... it is apparent that the dominant *economic and regulatory framework in which we operate reinforces actions which are not necessarily environmentally responsible*. Even for Architects and Planners who know and understand the environmental implications of their design decisions and know how to design outcomes which are environmentally responsible, it is often impossible to do so because of the difficulty of countering the economic and regulatory structures which militate against environmentally sustainable outcomes. Design professionals cannot force their clients to take decisions which are detrimental to their economic or market interests - no matter how ecologically sound those decisions may be.⁴⁷ [my italics]

Mind versus World

In a work which takes an historical excursion through the highlights of Western design theory, Gelernter begins the task (without, I would argue, taking it to a satisfying conclusion) of showing how the rationalist dichotomy between 'mind' and 'world' is embedded in Western theories of design.⁴⁸ It could be argued that this rationalist mind-world dichotomy is evident in the two scenarios, identified above, which describe the ways in which a paradigm shift in design might occur. In the scenario which argues that there must first be a shift in 'perception' or 'attitude' the

⁴⁷Hill, G. "Response to Draft Strategy for Ecologically Sustainable Development, and Draft National Greenhouse Response Strategy for and on behalf of the Royal Australian Institute of Architects Natural Environment and Energy Group." 1992.

⁴⁸Gelernter, *Sources of Architectural Form*, op. cit.

source of change is located in 'the mind'. In the scenario which claims that there must first be a shift in the fabric of society, the source of change is located in 'the world'.⁴⁹

The conundrum concealed in the tension between the two different theorisations of the way in which the paradigm shift toward ecologically thoughtful design might be brought about, is captured in Harvey and Hallett's *Environment and Society*:

Individual behaviour might be regarded as supplying the fundamental building blocks of social processes. In that environmental problems are the outcomes of social processes, it can be understood why some writers, when suggesting solutions, emphasise the role of the individual. 'The only solution to the environmental crisis', Ivan Illich believes, 'is the shared insight of people that they would be happier if they could work together and care for each other.' 'In the end', Dennis Pirages and Paul Ehrlich say, 'each person must be made to feel responsible for the present and future welfare of all mankind.' This last remark seems to suggest that the changes in individual attitudes will be engineered at the level of society as a whole. It is this sort of cultural change which is described by Lynton K. Caldwell: a new ethic is needed, a theology of the Earth; a powerful political ideology could emerge from a view of man in nature arising from a convergence of

⁴⁹The dichotomy between world and mind might also be claimed to be evident in the different emphases of two of the three main trajectories of environmental philosophy. Social Ecologists like Bookchin emphasise the need to remake the structures of social relations within society, arguing that the domination of nature by humans is an extension of the domination of humans by other humans. Deep Ecologists on the other hand want to re-make human attitudes, proposing a form of biospherical egalitarianism in which the understanding of self is broadened to include all of nature. (The third main trajectory, Ecofeminism, draws from and contrasts itself with both of the other trajectories, stressing the significance of the dominance of man over woman as underlying the dominance of man over nature.) Social ecology's emphasis on human social relations is evidenced for example in Bookchin, M. *Remaking Society*. Montreal: Black Rose Books, 1989. The mentalistic turn of Deep Ecology is evidenced for example in Fox, W. *Towards a Transpersonal Ecology*. Boston: Shambhala, 1990. For a discussion of Ecofeminism, including its placement in relation to social ecology and deep ecology, see for example Plumwood, V. *Feminism and the Mastery of Nature*. London: Routledge, 1993.

science and religion.

But which comes first: a change in the individual, or change in the social system which surrounds him [/her]?⁵⁰ [my gloss in brackets]

Rodger's article *Architecture for Sustainable Development* demonstrates clearly the tension between 'mind' and 'world' inherent in theorising the adoption of ecologically thoughtful design. Ecologically thoughtful design is characterised as an 'idea' (belonging to the mind) whose implementation is impeded by social, technological and economic structures (conditions of the world):

If it is such a good idea, why is it not widely adopted? Unfortunately it is in conflict with the very short financial horizons that are associated with rapid rates of social and technological change and thus with high interest rates and inflation.⁵¹

In *Global Warming and the Built Environment*, Norgard and Christensen offer what appears to be an elegant resolution to the question of whether change in the design of the environment is initiated by a change in attitudes (the mind) or a change in the fabric of society (the world), by arguing that the relation between the two scenarios for change is in fact circular:

Values and attitudes are not changed overnight. They are shaped during the entire process of socialization (Figure). Upbringing in preschool age often creates the emotional value pattern which constitutes the base for the rest of one's life. More concrete values and attitudes are imposed during the formal education period in schools

⁵⁰Harvey, B. and J. Hallett. *Environment and Society: An Introductory Analysis*. London: The Macmillan Press Ltd, 1977: 82-83.

⁵¹Rodger, "Architecture for Sustainable Development," *op. cit.*, p. 7.

and other institutions, as well as through TV and other media.⁵²

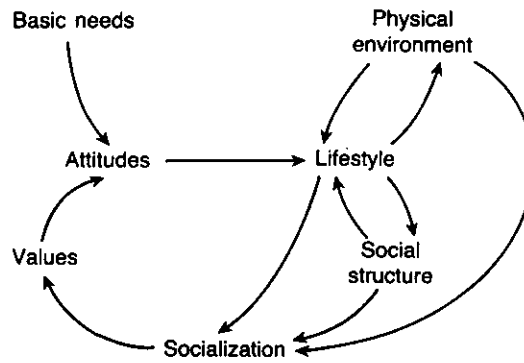


Figure:

‘Values and attitudes are shaped by the social structure as well as the other way round.’ (Norgard and Christensen, p. 212)

I would argue, however, that this position, which is in fact not unlike the resolution which Gelernter arrives at in respect of design theory when he discusses favourably Piaget’s influence on contemporary design theory,⁵³ does not entirely dissolve the problem of the rationalist mind-world dichotomy. Mind and world still maintain their integrity within the proposed circular structure. Because the circular relation between mind and world has no starting point, the serious question which arises from this structure is how change itself is made possible? If it is simply the case that values and attitudes (products of mind) are shaped by existing social structures (the world), and, reciprocally, social structures are put in place by particular values and attitudes, then there is no point at which change can *first* occur, and the circle

⁵²Norgard, J. and B. Christensen. “Technological Options and Sustainable Energy Welfare.” In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994: 189-220, p. 212.

⁵³Gelernter, *Sources of Architectural Form*, *op. cit.*, pp. 266-68 and 270-72. The influence of structuralists such as Piaget on contemporary design theory is discussed in subsequent chapters of this dissertation.

becomes a vicious one.

Theory-laden Observation

Speaking about the domain of science, Kuhn argues persuasively that we do not simply encounter 'bare facts'. The normalised framework of understanding through which we see the world, what Kuhn calls a paradigm, determines what it is that we see:

But is sensory experience fixed and neutral? Are theories simply man-made interpretations of given data? The epistemological viewpoint that has most often guided Western philosophy for three centuries dictates an immediate and unequivocal, Yes! In the absence of a developed alternative, I find it impossible to relinquish entirely that viewpoint. Yet it no longer functions effectively, and the attempts to make it do so through the introduction of a neutral language of observations now seems to me hopeless.⁵⁴

In the same way, it is difficult to accept that theoretical descriptions of the design process, together with the facts that are brought to the support of these theories, are simply self-evident truths discovered through the neutral language of observation. The appearance of the rationalist 'mind-world' dichotomy in theorisations of the way in which a shift toward ecologically thoughtful designing might occur is evidence of Kuhn's claim that theories are inevitably grounded in particular normalised ways of seeing, and that facts are never neutral but are always theory-laden.

It would therefore appear that, in order to begin to address inadequacies inherent in the current discourse which is attempting to explain the way in which a paradigm

⁵⁴Kuhn, *The Structure of Scientific Revolutions*, op. cit., p. 126.

shift toward ecologically thoughtful designing might come about, it is important to look critically at the normalised rationalist way of seeing within which this discourse is embedded. Further, if a different understanding of the way in which such a shift might occur is to be found, it would appear necessary to seek an alternative to the hegemonic rationalist epistemology in which that different understanding could be situated.

Three Literatures

It was perhaps fortuitous that, because the thesis weaves together three strands — ecology, design and philosophy — reading for this dissertation extended over three substantively different domains of literature. The particular character of the literature encountered in each domain effectively allowed texts from one domain to inform, challenge and critique texts from the other. As a result, the reading of texts which presented various formulations of the design process occurred alongside the reading of texts which pry at and expose the normalised ways of seeing embedded in these same formulations. The diversity of reading therefore allowed an encounter with material which could both critique rationalist models of the design process, and prepare the ground for developing an alternative description of the design process which was not embedded in a rationalist way of seeing.

i. Ecological Design

Of the three different corpuses of literature, the first could be loosely placed under the rubric of 'ecological' texts. The most significant works within this group are those of the form discussed earlier in this chapter which address the question of how design might be transformed to overcome the perceived ecological crisis. In addition to this central group of design related texts, there is a broader group of texts which address the ecological crisis from the perspective of other disciplines. Considered from the viewpoint of this dissertation, these might be categorised as 'background' texts. They provide a vantage point which allows the domain-specific

texts on ecologically thoughtful design to be located within the larger discourse which is responding to the ecological crisis. Included here are works on environmental law;⁵⁵ works on environmental economics which adopt various politico-economic positions that include environmentally oriented re-workings of market economics, environmental critiques of neoclassical economics and socialist and Marxist versions of environmental economics;⁵⁶ works on environmental history which present various revisionist readings of human cultural history and its relation to natural history;⁵⁷ and works on environmental philosophy which include the three dominant strands of radical environmental philosophy — Social Ecology, Deep Ecology and Ecofeminism.⁵⁸

⁵⁵See, for example, Boer, B. "Implementing Sustainability." In *Environmental Responsibility Across International Boundaries*, Second International Conference on Environmental Law: National Environmental Law Association and LawAsia, Bangkok, 1991.

⁵⁶See, for example, texts on environmental market economics, such as Daly, H., ed. *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy*. San Francisco: W. H. Freeman, 1980; Daly, H. "The Economic Growth Debate: What Some Economists Have Learned But Many Have Not." *Journal of Environmental Economics and Management* 14 (December 1987); Georgescu-Roegen, N. "Energy, Matter and Economic Valuation: Where Do We Stand?" In *Energy Economics and the Environment: Conflicting Views of an Essential Interrelationship*, ed. H. Daly and A. Umana. Boulder: Westview Press, 1981; Pearce, D., E. Barbier, and A. Markandya. *Blueprint for a Green Economy*. London: Earthscan Publications, 1989; Cumberland, J. "Intergenerational Transfers and Ecological Sustainability." In *Ecological Economics: The Science and Management of Sustainability*, ed. R. Costanza. New York: Columbia University Press, 1992; van der Ploeg, S., L. Braat, and W. Lierop. "Integration of Resource Economics and Ecology." *Ecological Modelling* 38 (1987); environmental critiques of neoclassical economics such as Norgaard, R. "Environmental Economics: An Evolutionary Critique and a Plea for Pluralism." *Journal of Environmental Economics and Management* 12 (4 December 1985); Norgaard, R. "Economics as Mechanics and the Demise of Biological Diversity." *Ecological Modelling* 38 (1987); Hamilton, C. *The Mystic Economist*. Fyshwick: Willow Park Press, 1994; and Marxist/Socialist environmental economic analyses such as Wheelright, E. "The Socio-economic Roots of the Environmental Problem." In *Radical Political Economy: Collected Essays*, ed. E. Wheelright. Sydney: A.N.Z. Book Co., 1974; Zarsky, L. "The Green Market." *Australian Left Review* (124 December 1990); and Grundmann, R. "The Ecological Challenge to Marxism." *New Left Review* (187 May/June 1991).

⁵⁷See, for example, Ponting, C. *A Green History of the World*. London: Penguin, 1991; Boyden, S. *Biohistory: The Interplay Between Human Society and the Biosphere*. Vol. 8. Paris: UNESCO, 1992; Southwick, C. *Global Ecology in Human Perspective*. New York: Oxford University Press, 1996, pp. 127ff.; and Flannery, T. *The Future Eaters*. Port Melbourne: Reed Books, 1994.

⁵⁸For a discussion of Social Ecology, see for example Bookchin, *Remaking Society*, *op. cit.*; Bookchin, M. "Towards an Ecological Society: The Concept of Ecotechnologies and Ecocommunities." In *Toward an Ecological Society*, ed. M. Bookchin. Montreal: Black Rose Books, 1980. For a discussion of Deep Ecology see for example Naess, A. *Ecology, Community and Lifestyle*. Translated by D. Rothernberg. London: Cambridge University Press, 1990; Naess, A. "Sustainable Development and Deep Ecology." In *Ethics of Environment and Development: Global Challenge, International Response*, ed. J. R. Engel and Joan Gibb Engel. London: Belhaven Press, 1990; Naess, A. "Self-Realisation: An Ecological Approach to Being in the World." In *Thinking Like a Mountain*, ed. John Seed et al. 1988; Fox, *Towards a Transpersonal Ecology*, *op. cit.* For a discussion of Ecofeminism see for example Plant, J., ed. *Healing the Wounds: The Promise of Ecofeminism*. Philadelphia: New Society Publishers, 1989; and Plumwood, *Feminism and the Mastery of Nature*, *op. cit.*

ii. Design Theory

The second group of texts could be categorised under the rubric of 'design theory' literature. These texts do not refer directly to the ecologically implications of design, but instead constitute an investigation of rationalist and non-rationalist descriptions of the *design process* which might potentially provide a theoretical framework within which to situate an understanding of the paradigm shift toward ecologically thoughtful design.

This group includes texts by design theorists such as Alexander,⁵⁹ Jones,⁶⁰ Broadbent,⁶¹ Cross,⁶² and Archer,⁶³ who present methodological descriptions of the design process. Also included in this group are works, influenced by both the design methodologists and Newell and Simon's cognitive formulations of 'problem-solving',⁶⁴ which present cognitive and knowledge-based models of the design process and prepare the ground for Computer Aided Design and design by Expert Systems and Artificial Intelligence.⁶⁵ For reasons that will be discussed extensively in the course of the dissertation, these texts are described here as 'rationalist' interpretations of the design process.

Juxtaposed against these rationalist interpretations of the design process are a group

⁵⁹Alexander, *Notes on the Synthesis of Form*, *op. cit.*

⁶⁰Jones, J. *Design Methods*. New York: Wiley, 1970; and Jones, J. "A Method of Systematic Design." In *Developments in Design Methodology*, ed. N. Cross. New York: Wiley, 1984.

⁶¹Broadbent, G. *Design in Architecture: Architecture and the Human Sciences*. Chichester: John Wiley, 1973.

⁶²Cross, N. *Developments in Design Methodology*. New York: Wiley, 1984; and Cross, *Design Process and Products*, *op. cit.*

⁶³Archer, B. "An Overview of the Structure of the Design Process." In *Design Methods in Architecture*, ed. G. Broadbent and A. Ward. 76-102. London: Lund Humphries, 1969.

⁶⁴Newell and Simon, *Human Problem Solving*, *op. cit.*

⁶⁵See for example Mitchell, W. *The Logic of Architecture: Design, Computation, and Cognition*. Cambridge Massachusetts: MIT Press, 1990; Schank, R. "What is AI Anyway?" In *The Foundations of Artificial Intelligence: A Source Book*, ed. D. Partridge and Y. Wilks. 3-13. Cambridge: Cambridge University Press, 1990; and Schank, *Explanation Patterns*, *op. cit.*; Boden, M. *The Philosophy of Artificial Intelligence*. Oxford: Oxford University Press, 1990; Johnson-Laird, P. *The Computer and the Mind: An Introduction to Cognitive Science*. London: Fontana, 1988; Gero, *Artificial Intelligence in Design*, *op. cit.*; Gero, *Expert Systems in Computer-Aided Design*, *op. cit.*; Radford, A. and J. Gero. *Design By Optimization in Architecture, Building and Construction*. New York: Van Nostrand Reinhold, 1988; Stiny, G. "Introduction to Shape and Shape Grammars." *Environment and Planning B* 7 (1980): 342-351; and Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*

of texts, significant to this thesis, which interrogate and critique the normalised ways of seeing embedded in these rationalist descriptions of the design process. Included here are works such as Gelernter's *Sources of Architectural Form*⁶⁶ and Schön's *The Reflective Practitioner*.⁶⁷ Gelernter's text, referred to above, demonstrates how our common theories of design are constituted by the rationalist dualism of 'mind' and 'world'. Schön's text, which deals more specifically with design as a process, persuasively argues that the rationalist model of 'instrumental problem solving made rigorous by the application of scientific theory and technique'⁶⁸ is an inappropriate model for design, and that much design thinking does not proceed by way of the conscious manipulation of knowledge as it is traditionally conceived.

Also included in this group are an important cluster of texts whose critiques of rationalist models of design coincide in many ways with those of Schön, but which have been influenced to varying degrees by the thinking of the continental philosopher Martin Heidegger and the work of contemporary hermeneutic philosophers. These texts adopt, to various degrees, a post-foundationalist stance toward the theorising of the design process. Within this group, works by Fry,⁶⁹ Winnograd and Flores,⁷⁰ McLaughlin,⁷¹ Coyne⁷² and Snodgrass⁷³ all provide

⁶⁶Gelernter, *Sources of Architectural Form*, op. cit.

⁶⁷Schön, *The Reflective Practitioner*, op. cit.

⁶⁸*Ibid.*, p. 21.

⁶⁹Fry, *Remakings: Ecology Design Philosophy*, op. cit.; Fry, T. *Design History Australia: A Source Text in Methods and Resources*. Sydney: Hale and Iremonger and the Power Institute of Fine Arts, 1988; Fry, T. *Vital Design*. Unpublished Paper, Eco-Design Foundation, Sydney; Fry, "Material re-creation: eco-designing a new mainstream," op. cit.

⁷⁰Winnograd, T. and F. Flores. *Understanding Computers and Cognition: A New Foundation for Design*. New Jersey: Ablex Publishing Corporation, 1986.

⁷¹McLaughlin, S. "Practices and Primordial Understanding: Major Implications of Heidegger's Philosophy for Computer-aided Architectural Research." Unpublished Ph. D. thesis, University of Sydney, 1993.

⁷²Coyne, R. *The Impact of Computer Use on Design Practice*. Working Paper, University of Sydney, 1990; Coyne, R. "Inconspicuous Architecture." In *Gadamer Action and Reason*. Conference Proceedings, University of Sydney, 62-70, 1991; Coyne, R. and A. Snodgrass. "Is Designing Mysterious? Challenging the Dual Knowledge Thesis." *Design Studies* 12 (3 1991): 124-131; Coyne, R., A. Snodgrass, and D. Martin. *Metaphors in the Design Studio*. Working Paper, University of Sydney, 1992; Coyne, R., and A. Snodgrass. *Problem Setting within Prevalent Metaphors of Design*. Working Paper, University of Sydney, 1992; Coyne, R., and A. Snodgrass, *Computers and Praxis: How the Theoretical is Giving Way to the Pragmatic in Computer Systems Design*. Working Paper, Department of Architectural and Design Science, University of Sydney, 1993; Coyne, R. *Where in the World is Cyberspace? The Phenomenology of Computer-Mediated Communications*. Working Paper,

sharp critiques of the rationalist models of the design process. While these works reveal positive possibilities for an alternative theorising of design, it could by no means be said that Fry's desire for the design community to build and communicate 'a meta-understanding of design' has yet been realised.⁷⁴

iii. Philosophy

The third group of texts are predominantly philosophical. After commencing reading for this dissertation it quickly became clear that the critique of rationalist theories of design, discussed in the preceding group of texts, is part of a larger critique of rationalism that permeates all disciplines. It therefore became important to attempt to gain an understanding of the wider philosophical framework within which both rationalist design theory and its critics were situated. In addition, it became evident that not only the discourse of design theory, but the other key discourse with which I was engaged — that relating to the ecological crisis — also belonged within a wider philosophical framework. Three of the main streams of radical ecology for example — Deep Ecology, Social Ecology and Ecofeminism — each manifest various normalised philosophical positions which have a long tradition going back at least to Plato.⁷⁵

Encouraged by my supervisor, my reading extended to the works of late nineteenth and twentieth century continental philosophers. This included limited reading of the works of Nietzsche,⁷⁶ Husserl,⁷⁷ the later Wittgenstein,⁷⁸ Barthes,⁷⁹ Foucault,⁸⁰

University of Sydney, 1994; and Coyne, R. *Designing Information Technology in the Postmodern Age: From Method to Metaphor*. Cambridge, Massachusetts: The MIT Press, 1995.

⁷³Snodgrass, A., and R. Coyne. *Hermeneutics, Objectivity and Design Evaluation*. Working Paper, University of Sydney, Undated; Snodgrass, A. "Hermeneutics and the Application of Design Rules." In *Gadamer Action and Reason*. Conference Proceedings, University of Sydney, 1-11, 1991; Snodgrass, A. and R. Coyne. "Models, Metaphors and the Hermeneutics of Designing." *Design Issues* 9 (1 Fall 1992): 56-74; Snodgrass, A. and R. Coyne. "Is Designing Hermeneutical?" *Architectural Theory Review* 2 (1 1997): 1-29.

⁷⁴Fry, *Vital Design*, *op. cit.*

⁷⁵For a discussion of the relationship between Platonic and Cartesian dualisms and deep ecology, social ecology and ecofeminism, see for example Plumwood, *Feminism and the Mastery of Nature*, *op. cit.*

⁷⁶Nietzsche, F. *On The Genealogy Of Morals*. New York: Vintage Books, 1969.

⁷⁷Husserl, E. *The Crisis of the European Sciences and Transcendental Phenomenology*. Translated by D.

Derrida,⁸¹ together with the work of hermeneutic philosophers such as Ricoeur⁸² and Gadamer.⁸³ Also of interest were the parallels to continental philosophy found in the works of the American pragmatist philosophers James⁸⁴ and Dewey.⁸⁵ Important too were the works of contemporary philosophers influenced by, or commenting on, this group of prominent continental and pragmatist philosophers. Included here are philosophers such as Carr,⁸⁶ Fish,⁸⁷ Bernstein⁸⁸ and Rorty.⁸⁹

Gradually however, the work of one thinker, Martin Heidegger, began to situate itself prominently in the arguments being woven into the thesis. Heidegger's work appeared to lay itself neatly over every major theme in the thesis. Even 'the turn' in his thinking after the writing of his major work, *Being and Time*,⁹⁰ and the incorrigibility of his politics, bring forward issues of value to the themes explored in the dissertation.⁹¹

Carr. Evanston: Northwestern University Press, 1970.

⁷⁸Wittgenstein, L. *Philosophical Investigations*. Oxford: Basil Blackwell, 1958.

⁷⁹Barthes, R. *The Rustle of Language*. Oxford: Basil Blackwell, 1986.

⁸⁰Foucault, M. *Archaeology of Knowledge*. London: Tavistock Publications, 1972; and Rabinow, P., ed. *The Foucault Reader: An Introduction to Foucault's Thought*. London: Penguin, 1984.

⁸¹Derrida, J. *Of Grammatology*. Translated by G. Spivak. Baltimore: Johns Hopkins University Press, 1976; Derrida, J. "Bernard Tschumi: La Case Vide — La Vilette 1985, Point de Folie." *AA Files* 12 (1986): 65-75; Derrida, J. "A Letter to Peter Eisenman." *Assemblage* 12 (1990): pp. 7-13.

⁸²Ricoeur, P. *The Rule of Metaphor*. Translated by R. Czerny. Toronto: University of Toronto Press, 1977.

⁸³Gadamer, Hans-Georg. *Truth and Method*. London: Sheed and Ward, 1979; Gadamer, Hans-Georg. *Reason in the Age of Science*. Translated by F. Lawrence. Cambridge Mass: The MIT Press, 1981; Gadamer, Hans-Georg. *Heidegger's Ways*. Translated by John W. Stanley. Albany: State University of New York, 1994; Gadamer, Hans-Georg. *Philosophical Hermeneutics*. Translated by D. Linge. Berkeley: University of California Press, 1976.

⁸⁴James, W. *Pragmatism, A New Name for Some Old Ways of Thinking*. Cambridge Mass: Harvard University Press, 1978.

⁸⁵Dewey, J. *The Public and Its Problems*. Athens: Ohio University Press, 1991.

⁸⁶Carr, D. *Interpreting Husserl*. Dordrecht: Martinus Nijhoff Publishers, 1987.

⁸⁷Fish, S. *Doing What Comes Naturally: Change, Rhetoric and the Practice of Theory in Literary and Legal Studies*. Durham: Duke University Press, 1989.

⁸⁸Bernstein, R. *Beyond Objectivism and Relativism*. Oxford: Basil Blackwell, 1983.

⁸⁹Rorty, R. *Philosophy and the Mirror of Nature*. Oxford: Basil Blackwell, 1980; Rorty, R. *Objectivity, Relativism, and Truth: Philosophical Papers*. Vol. I. Cambridge: Cambridge University Press, 1991.

⁹⁰Heidegger, M. *Being and Time*. Translated by J. Macquarrie and E. Robinson. Oxford: Blackwell, 1962.

⁹¹For a discussion of 'the turn' (*Kehre*) in Heidegger's thinking, which is first evidenced in the 1930 essay *On the Essence of Truth*, see Guignon, C., ed. *The Cambridge Companion to Heidegger*. Cambridge: Cambridge University Press, 1993, pp. 15ff.

Heidegger's project undermines the grounds of rationalism. Charles Taylor asserts that 'Heidegger's importance lies partly in the fact that he is perhaps the leading figure among that small list of twentieth-century philosophers who have helped us emerge, painfully and with difficulty, from the grip of modern rationalism... But one might claim some pre-eminence for Heidegger in that he got there first.'⁹² His thinking has had a major influence on numerous philosophers who, in different ways, also take up the task of dismantling the grounds of the truth of rationalism. Prominent among these are Merleau-Ponty, Gadamer, Foucault and Derrida. As previously discussed, Heidegger's thinking has also influenced a number of design theorists who employ his insights in their critique of rationalist models of the design process.

However, Heidegger's role in this dissertation is not merely as an instrument of criticism. The early Heidegger's laying out of human understanding, human interpretation, and what it means 'to be in the world,'⁹³ offers the possibility of piecing together an alternative interpretation of designing. This alternative interpretation has significant implications for both understanding, and acting in the presence of, the crisis of the ecological.

Heidegger's significance in relation to the dissertation is reinforced by the fact that his thought not only impacts upon the discourse of rationalism and design, it has also had a direct influence on the other key discourse that constitutes this thesis — ecological crisis. The later Heidegger constructs a difficult thesis within which rationalism itself could be interpreted as being at the heart of the ecological crisis. For Heidegger, modern technology's tendency to treat the Earth primarily as a

⁹²Taylor, C. "Engaged Agency and Background in Heidegger." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. Cambridge: Cambridge University Press, 1993: p. 317.

⁹³This laying out is contained predominantly in his major work, *Being and Time*. See Heidegger, *Being and Time*, *op. cit.*

resource is an outcome of rationalist metaphysics. Here Heidegger's critique of technology and the role of anthropocentric rationalism can be seen to overlap the theoretical ground of environmental philosophies, especially Radical Ecology.⁹⁴ But again Heidegger offers more than criticism. His formulation of the notion of 'Earth' not only offers the possibility of an alternative 'ground' to that assumed by rationalism, it also has radical implications for the possibility of rethinking the ecological crisis and rethinking the role that design might play in the overcoming of the crisis.

There is a regiment of theorists and commentators who have interpreted Heidegger's work. Aspects of the work of numerous of these interpreters are employed, to various degrees, in constructing the arguments presented in this thesis. A handful of these theorists are drawn upon extensively, and their interpretations colour the various threads of the argument woven into the thesis. Of the interpreters of Heidegger's early work, especially *Being and Time*, Dreyfus' commentary *Being-in-the-World* has been indispensable.⁹⁵ Of the interpreters of his later work, especially those who engage with his notion of Earth, Haar's *The Song of the Earth* has been influential.⁹⁶ Of the theorists who have drawn out the implications of Heidegger's critique of modern technology, both Zimmerman and Ihde have been important.⁹⁷ Zimmerman's exploration of Heidegger's connection to contemporary thinking on the ecological crisis has also been vital,⁹⁸ as has Fry's

⁹⁴For a discussion of the complex relationship between Heidegger and radical ecology see Zimmerman, M. *Contesting Earth's Future: Radical Ecology and Postmodernity*. Berkeley: University of California Press, 1994, and for a discussion of the relationship between Heidegger and Deep Ecology see Zimmerman, M. *Heidegger's Confrontation with Modernity: Technology, Politics and Art*. Bloomington: Indiana University Press, 1990, pp. 241-44.

⁹⁵Dreyfus, H. *Being-in-the-World*. Cambridge, Massachusetts: MIT Press, 1991.

⁹⁶Haar, M. *The Song of the Earth: Heidegger and the Grounds of the History of Being*. Translated by R. Lilly. Bloomington: Indiana University Press, 1993.

⁹⁷Zimmerman, *Heidegger's Confrontation with Modernity*, *op. cit.*; Ihde, D. *Technics and Praxis: A Philosophy of Technology*. Dordrecht: Reidel Publishers, 1979; Ihde, D. *Existential Technics*. Albany: State University of New York Press, 1983; Ihde, D. *Technology and the Lifeworld: From Garden to Earth*. The Indiana Series in the Philosophy of Technology, Bloomington: Indiana University Press, 1990; Ihde, D. *Instrumental Realism*. Bloomington: Indiana University Press, 1991; Ihde, D. *Philosophy of Technology: An Introduction*. New York: Paragon House, 1993.

⁹⁸Zimmerman, *Contesting Earth's Future*, *op. cit.*; Zimmerman, M. "Heidegger, Buddhism and Deep Ecology." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. Cambridge: Cambridge

employment of Heidegger's thought in his own engagement with the crisis of the ecological.⁹⁹ Fry's work has additional significance in that it not only links Heidegger to the ecological issue but also to the critical role of design in relation to the crisis of the ecological.

The Dissertation

To accept Heidegger's position is to admit that this dissertation is not a search for facts or truths as they are commonly understood. It is, rather, an exploration of understandings and interpretations. It is an exploration of understandings and interpretations of the *ecological crisis*; an exploration of understandings and interpretations of the *design process*; an exploration of understandings and interpretations of the *role of design in the ecological crisis*; and an exploration of understandings and interpretations of how *design might participate in a shift* toward a way of being which could overcome that crisis.

Dissertation Structure

The story of this dissertation is told in three Divisions. But it is not a story that could be said to 'progress' in any modern sense. It is, like my experience in researching for this dissertation, an excursion, and a return. A circular journey. Yet while the story of the dissertation returns often to the questions with which it began, like the excursion and return of the hermeneutic circle, it does not return with the same understanding of these questions.

Division I: Design and the Tradition

The first part of the story examines the Western rationalist tradition and the way in which it has participated in constituting (i) a particular hegemonic understanding of

University Press, 1993; Zimmerman, M. "The Role of Spiritual Discipline in Learning to Dwell on Earth." In *Dwelling, Place and Environment: Towards A Phenomenology of Person and World*, ed. D. Seamon and R. Mugerauer. Dordrecht: Martinus Nijhoff Publishers, 1985.

⁹⁹Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*

the ecological crisis, (ii) a particular hegemonic understanding the process of design, and (iii) a particular hegemonic understanding of the role of design in overcoming the ecological crisis.

Rationalism is a word that signifies a vast field of possibilities. This dissertation does not attempt to offer anything like a comprehensive overview of rationalism. It offers instead a selective view. It would also be naive to claim that the examination of rationalism presented here is 'open' and 'objective,' and that it leads 'logically' to the rejection of rationalism in favour of a post-foundationalist position. Again, as with any endeavour of this kind, the hermeneutic circle of understanding is at work in the writing of this dissertation. The writing of these words comes *after* encounters with Heideggerian and other post-foundationalist critiques of rationalism. Thus those aspects of rationalism that are presented, and the criticisms that are offered, cannot help but be framed by the understanding put in place by these prior encounters. However, as the arguments presented later contend, the 'prejudices' that are brought to any interpretation, including this interpretation of rationalism, are not only *not* a deficiency, they are a *necessary* pre-requisite to there being any interpretation at all.

The brief history of rationalism that is presented in this Division focuses on the consistent privileging of 'presence' in the various historical manifestations of rationalism. 'Presence' is shown to underlie the 'mind-world' dichotomy recognisable in the various historical understandings of design, and is a theme which links all three parts of the thesis. The relationship between rationalism and science is also briefly explored. This is considered significant in part because science has participated so actively in defining the ecological crisis and proffering solutions for the crisis, and in part because the discourse of rationalism is so often entangled with that of science. The highly visible and continuing skirmish between rationalist and post-foundationalist philosophers in the field of the philosophy of science is

illuminating in that it lays bare the key points of contention of the opposing factions.¹⁰⁰ Any attempt to offer an alternative to the rationalist formulations of objectivity, truth and reality would, I feel, need to engage with this debate.

The normalised ways of seeing which this exploration reveals as constitutive of Western rationalism are then shown to be embedded in common understandings of the design process. The understanding that there is an objective reality which is accessible by conscious application of a rational methodology allows design to be interpreted as an activity which involves an intentional relation between the rational mind of the designer and the objectively existing world. In this view, if the analysis that is the first step in the design process is able to gain a full and correct picture of the design context (which includes an objective view of the ecological context) then the intentions of the designer should be achievable. Although this sort of intentionality in design has been shown to be problematic (even within the discourse of rationalist design theory) because the difficulties with this understanding of design appear to lie in the prejudices of rationalism itself, attempts to find a solution within the rationalist framework seem unlikely to succeed.

As rationalism advocates the possibility that the rational mind can have *control* over the objectively existing world, this leads to a particular way of formulating design's involvement in the shift toward an ecologically responsible way of being. As Dreyfus asserts, 'Western thinkers from Socrates to Kant to Jürgen Habermas have assumed that we know and act by applying principles and have concluded that we should get clear about these presuppositions so that we can gain enlightened control of our lives.'¹⁰¹ As evidenced earlier in this chapter, texts addressing the role that design might have in overcoming the ecological crisis invariably suggest that designers need to adopt a new *attitude* and design needs to incorporate a new set of

¹⁰⁰The war of words, which reached a crescendo with the 1996 'Sokal Hoax', is discussed in Chapter 2 of this dissertation.

¹⁰¹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 4.

ecological *principles*. By working in accordance with these principles it is expected that this will *control* the design outcome, which will, as a result, be more ecologically responsible.

From the texts cited earlier, there appears to be a substantial degree of agreement on what design principles need to be followed to achieve the desired ecological outcome. This leads to the question that if change can be achieved by simply applying these principles, why does the shift toward this new design paradigm appear to be such a slow and arduous struggle?

Division II: Design and Hermeneutics

Heidegger's early work, especially his seminal text *Being and Time*, demonstrates that human understanding is hermeneutical — that is, it is interpretive. Heidegger shows that our traditional Western rationalist formulations of the way humans understand and find meaning in the world are misdirected in their attempt to *ground* understanding in something that can be brought to *presence* — whether that ground be the Platonic notion of something objectively inhering in the world, or whether it be the Cartesian notion of the conscious human mind. Heidegger points out that the 'ground' for human understanding is none other than the 'back-ground' of shared projects and practices which constitute the experiences of a particular human's existence. This background is *absent* in any act of interpretation, and can *never* be fully brought to presence.

In this, the largest of the three sections of the dissertation, Heidegger's thinking on human understanding and interpretation is used as the basis of a critique of rationalism and rationalist interpretations of the design process. More significantly however, Heidegger's detailed laying out of the structure of human understanding and interpretation is drawn upon to develop an alternative, detailed description of the design process. This description builds upon the work of theorists influenced by

Heidegger — notably Snodgrass, Coyne, McLaughlin, Winnograd and Flores — who have already initiated the task of developing an account of the design as a hermeneutic process.

The account of the design process laid out in this Division demonstrates that design is a deliberative process initiated by 'breakdown' and structured by 'the temporality of care.' In this account, the moves which are spun out in the design process, and which determine the distribution of care in the design outcome, are not held to be controlled by the individual designer's will or intentions as they are traditionally conceived. The moves that show up in the design context as sensible are instead circumscribed by the designer's background understanding, which is itself seen to be the outcome of prior designing. In the same way, values, attitudes and beliefs, which are assumed in the rationalist tradition to act as meta-level controllers of the choices humans make, including choices made in the design context, are held instead to be reifications of background understanding.

As discussed earlier in this chapter, much of the discourse on environmentally thoughtful design argues that for design to participate in the overcoming of the ecological crisis, the values and attitudes of designers need to be transformed, and design moves, such as goal setting and establishing criteria, need to be re-oriented. The laying out of the design process in this Division problematises the role of values, attitudes, goals and criteria, and challenges rationalist assumptions about the extent to which the will of the individual designer controls the design process. As an outcome, the possibility that we are free to choose new ecologically thoughtful attitudes or values and thereby re-orient design process, is also brought into question.

Division III: Design and the Earth

By implying that meaning is grounded in a human world of projects and practices,

the early Heidegger's interpretation of the meaning of being might be claimed to be both instrumental and anthropocentric. If it were the case that meaning were grounded solely in human culture, then what 'is' becomes no more than a cultural construction. This position is in fact not too distant from that held by some post-modern theorists, and is the position which rationalist philosophers most enjoy critiquing. The later Heidegger recognized that the instrumentalism and anthropocentrism of his early work reflected the condition of our epoch — a condition in which understanding is enframed by a technological way of being. In his later work, Heidegger moves from a position in which meaning is held to be grounded solely in the human world to one in which meaning arises from the struggle between the human world and what he refers to as 'Earth' — a difficult and multivalent concept which might initially be described as that from which all possibilities arise, but which cannot be fully brought to presence and therefore controlled.

With the account of the design process laid out in the previous Division as background, this Division employs the work of the later Heidegger to explore the role of the design process in the ecological crisis and address the question of how, or indeed whether, the design process might participate in the overcoming of that crisis. Heidegger's notion of a world being brought into being by the 'struggle' between world and Earth is related to the discussion in the previous Division of the way in which a world is brought into being by the process of design. In the process in which a world is brought into being, Earth is said to be disclosed as part of a caring world in which 'dwelling' is made possible. Heidegger argues, however, that our modern technologised way of being is 'enframed' in such a way that all things, including Earth, are revealed merely as a resource for our care. In this way, design itself is shown to be enframed and set upon a cycle of striving to install caring worlds which leads to a situation where care and dwelling are themselves jeopardised.

The cycle of striving in which design is instrumental is shown to devalue any attempt to step outside the cycle and establish alternative ways of being, including alternative ecologically responsible ways of being. Division III concludes by pondering whether it might be possible to escape the enframing in which design's participation in the unrelenting striving to bring into being caring worlds threatens the very possibility of care.

DIVISION I
DESIGN AND THE TRADITION

CHAPTER 2

THE RATIONALIST TRADITION

Introduction

This Division examines the Western *rationalist tradition* and the way in which that tradition has shaped (i) the contemporary understanding of *design theory*, (ii) the perceived *ecological crisis*, and, as an outcome, (iii) the way in which design might *respond* to the ecological crisis.

This chapter discusses a number of significant historical manifestations of rationalism which are embedded in our normalised Western understanding of notions of *reality*, *objectivity* and *truth*. These normalised understandings are then shown to underlie contemporary debates between representationalist and non-representationalist, and realist and anti-realist, philosophical positions — debates which are particularly impassioned when drawn into the domain of science.

The Metaphysics of Presence

‘Rationalism’ is used here to describe that particular character of Western metaphysics which seeks grounds in ‘presence.’¹⁰² Okrent describes metaphysics as ‘the science of being as the grounds for beings.’¹⁰³ It is the ‘science’ which seeks the ground — the reason, the explanation, the principle, the cause — for the being of all beings. It asks why things ‘are.’ ‘Presence’ refers simply to that which is capable of being encountered, or the way in which things appear (are made present) to us when they are encountered. It refers to that everyday human experience in which things encountered in the world are brought into the *foreground* and apprehended by us *as* something. On this basis then, ‘rationalism’ is used in this dissertation as a

¹⁰²Taylor comments on the difficulty of coming to any unified view of rationalism. Taylor, in *The Cambridge Companion to Heidegger*, *op. cit.*, p. 317.

¹⁰³Okrent, M. *Heidegger's Pragmatism: Understanding, Being, and the Critique of Metaphysics*. Ithaca: Cornell University Press, 1988, p. 227.

marker for that historically constituted understanding which seeks to give the reasons or causes of the being of things in terms of that which is present or can be made present.

Presence as the Ground for Reality

Plato's allegory of the cave establishes a dichotomy between 'reality' and 'appearance.'¹⁰⁴ The allegory is directed toward the difficult problem of explaining how we know a particular thing is a member of a class of entities if each particular entity within the class is slightly different. How do we know, for example, that a tree should be called a tree if every tree is slightly, or markedly, different? Plato proposes that there is an eternal 'idea' or 'form' that is recognisable in every member of the same class of entity. Thus there is an idea or form of a tree, which exists outside of any particular tree, but which is recognisable in every tree, thus making it possible for us to know that it is a tree. For Plato, it is the idea or form which is privileged as the reality, while the particular manifestation of an entity is merely the appearance.

Aristotle modified Plato's theory of forms by arguing that what is real and knowable is a product of both form *and* matter. So the extant and tangible nature of a tree, its 'substance' (*ousia*), is a combination of the tree form and the biological matter which is constituted into the tree form. For Aristotle, it is the substance which is the 'principle' of a thing, 'that which grounds the fact that it is at all.'¹⁰⁵

For postsocratic Greek philosophers, the metaphysical grounds for the being of beings are not considered beyond human knowing. Even for Plato, the eternal forms are accessible through mathematics, or more properly, geometry. Through the use of *reason* it is possible to awaken in us knowledge of the geometric principles

¹⁰⁴Plato. "The Philosopher King Rules." In *Plato's Complete Works*, ed. H. Drake. Patterson: Littlefield, Adams and Co., 1959, pp. 277-80.

¹⁰⁵Okrent, *Heidegger's Pragmatism*, *op. cit.*, p. 228.

— *ratio* — which underlie the appearance of an entity. To do so is to gain *rational* knowledge of that entity. The notion that there are rational structures which inhere in the world is still evident in the modern understanding of the way in which the laws and principles of science inhere in the world. These too are accessible through the rational methods of science.

Until a significant shift occurred with Descartes, the being of a thing lay *with the thing itself*, and was independent of its relation to any human observer. Reality was the *presence* of the thing, regardless of its intelligibility to a human subject.¹⁰⁶ As Dreyfus points out, even for the medieval Christians the being of a thing was not dependent on its relation to a human being: ‘reality was the *presence* of created things [i.e. created by God] as finished products which were simply to be accepted...’¹⁰⁷ [my italics, my gloss in brackets]

After Descartes, and especially after Kant, the being of an object was made dependent on human subjectivity.¹⁰⁸ Thus while the reality of an object was still dependent on the presence of the object, for an object to be present it must now be *capable of being made present* to a human observer. It is with this move that the being of a being comes under the control of human beings.

Dreyfus provides examples of how each of these ways in which entities presented themselves, or were made present to a human subject, actually allowed different sorts of things to show up:

The Greeks encountered *things* in their beauty and power, and people as poets, statesmen and heroes; the Christians encountered *creatures* to be catalogued and used appropriately and people as saints and sinners;

¹⁰⁶Dreyfus, *Being-in-the-World*, *op. cit.*, p. 338.

¹⁰⁷*Idem.*

¹⁰⁸Okrent, *Heidegger's Pragmatism*, *op. cit.*, p. 231.

and we moderns encounter *objects* to be controlled and organized by subjects in order to satisfy their desires.¹⁰⁹

It is important to note that for Descartes the human subject is invariably a *conscious* human subject.¹¹⁰ It is the conscious human mind for which things in the world show up, and it is the workings of the conscious mind — workings that we are aware of, or we are capable of becoming aware of when we introspect — that control our actions and our relationships with the objects of the world. The conscious mind is therefore something which is *present* to us or capable of being made present to us. Thus, even with this shift in understanding of the being of beings, the being of beings remains grounded in presence.

Mind and World

The movement toward the privileging of the consciousness of the human subject was also the movement toward a dichotomy between 'mind' and 'world'.¹¹¹ This movement was in many ways prefigured by Plato's dichotomy between the 'idea' and its worldly 'appearance.' With Descartes it would seem that the 'idea' was simply shifted into the mind, where, from our modern perspective, it now seems quite naturally at home.

Once mind and world are separated, in order for human beings to act in the world it is evident that they then needed to be re-connected in some way. This requires the establishment of a relationship between the content of the mind and the world. Descartes viewed the mind as having internal *representations* of the world which enable the mind to be directed toward the world. The relationship between the

¹⁰⁹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 338.

¹¹⁰*Ibid.*, p. 74.

¹¹¹This assertion, interpreted from the work of commentators on Heidegger, especially Dreyfus, Okrent and Taylor, and Heidegger himself, is contradicted by DiCenso who wants to argue that Plato's writings already contain the mind-world dichotomy. See DiCenso, J. *Hermeneutics and the Disclosure of Truth: A Study of the Work of Heidegger, Gadamer and Ricoeur*. Charlottesville: University Press of Virginia, 1990, pp. 2ff.

representational content of the mind and the objects that it perceives, has beliefs about, imagines, or desires, is described as an 'intentional' relationship.¹¹²

It is not surprising that a representational view of the mind separated from the world should arise at this time. As Taylor indicates, the historical context was one in which the seventeenth century revolution in science was revealing a scientific picture of the world which contradicted the everyday understanding of the world.¹¹³ For science, colour, for example, was no longer a quality that belonged to the coloured object but a secondary effect in the mind produced by the primary properties of the object, and, rather than the sun moving around the Earth, science now held that the Earth span and rotated mechanistically around the sun. To see a coloured object, or to experience the sun rising in the East was therefore to be somehow misled by the distorting effects of the mind.

The division between the world and a mind which has an inner mental content which represents the world, presents a picture in which a human mind exists in the midst of an *objectively present reality*. The mind represents this reality to itself. It might represent this reality with more or less accuracy. If the representation of reality is 'distorted' by the prejudices of the mind it is considered to be subjective. If the representation is able to get free of the prejudices of the mind and gain unmediated access to reality (or rather, following Plato, to the rational structures which *are* the reality) then it is considered to be objective. In his critique of the representational model of the mind, Nagel describes this picture of objectivity which attempts to get beyond the prejudices of the mind as 'the view from nowhere.'¹¹⁴

The advent of this representational model of the mind sponsored a long history of

¹¹²For a discussion of the intentional relationships between mind and world see Searle, J. *Intentionality: An Essay in the Philosophy of Mind*. Cambridge: Cambridge University Press, 1983.

¹¹³Taylor, in *The Cambridge Companion to Heidegger*, *op. cit.*, p. 321.

¹¹⁴Nagel, T. *The View from Nowhere*. Oxford: Oxford University Press, 1986.

philosophical debate which continues to the present. Following Descartes, rationalists such as Leibniz and Spinoza argued that the mind contained a priori organising structures (ideas) which corresponded to the rational structures in the world.¹¹⁵ However, these rationalist theorists struggled to demonstrate convincingly how the connection was made between the ideas of the mind and the reality of the world. Empiricists such as Locke and Hume argued that the mind's knowledge of the rational structures of the world arose from sensory experience of the world, but had trouble explaining why there was any logical necessity that bits of raw sensory data should coalesce into the particular patterns evident in the laws, rules and theories of science. Kant synthesized the empiricist and Cartesian positions and argued that both the rational organising structures of the mind *and* the senses were necessary for making sense of the world.¹¹⁶

Dreyfus points out that current cognitivist theories continue to work with a dualist representational model of the mind:

Cognitivism, or the information-processing model of the mind, is the latest and strongest version of the mental-representation idea. It introduces the idea of *formal* representations and thus seeks to explain human activity in terms of a complex combination of logically independent symbols representing elements, attributes, or primitives in the world. This approach underlies decision analysis, transformational grammar, functional anthropology, and cognitive psychology, as well as the belief in the possibility of programming digital computers to exhibit intelligence.¹¹⁷

¹¹⁵Lloyd, G. *The Man of Reason: 'Male' and 'Female' in Western Philosophy*. London: Methuen, 1984, p. 4.

¹¹⁶Kant, I. *Critique of Pure Reason*. Translated by N. K. Smith. New York: Macmillan, 1968.

¹¹⁷Dreyfus, *Being-in-the-World*, *op. cit.*, p. 5.

While still a permutation of Cartesian representationalism,¹¹⁸ this latest 'information processing' model of the mind differs in that there is no self-reflexive subject which is aware of, and is the 'central controller' for, the processes taking place in the mind.¹¹⁹

Theory and Practice

The information processing model of the mind is the direct heir to the earlier rational models in which 'atomic' ideas are calculatively processed in the mind as the basis of human action.¹²⁰ Inherent in the various historical permutations of this model is the now normalised position that the workings of our conscious human mind determine our behaviour. Thus the 'mental representations' or 'mental content,' in the form of rules, beliefs, plans and desires, direct our actions.¹²¹ Importantly, according to this view, the mental content which is the basis upon which we act is able to be made explicit — that is, it can be brought to *presence*.

Dreyfus argues that Western thinkers, from Socrates right up to the present, have assumed that we know and act by applying rules and principles.¹²² The example of a social action, such as shaking hands when we meet someone, provides an understanding of the way in which rules are thought to translate into actions. There are rules — in this case social rules which belong to the particular community of which we are a part — which govern when it is appropriate to shake hands. It may be a rule that we should shake hands with someone if we have not seen them for a long time. It may be a rule that we should not shake hands with someone if we meet them everyday (we should not, for example, shake the hands of our fellow workers when we encounter them each morning). It may be a rule that men should

¹¹⁸*Ibid.*, p. 116.

¹¹⁹Trigg argues against the cognitivist information processing model of the mind in favour of the necessity of such a central controller. Trigg, R. *Rationality and Science: Can Science Explain Everything?* Oxford: Blackwell Publishers, 1993, pp. 203ff.

¹²⁰Taylor, in *The Cambridge Companion to Heidegger*, *op. cit.*, p. 320.

¹²¹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 74.

¹²²*Ibid.*, pp. 4 and 75.

not shake the hand of a woman if she does not offer it, and so on. A complex system of rules can thus be assembled to guide hand-shaking behaviour.

Even if we are not consciously aware of the rules at the time that we are engaging in the behaviour that the rules govern, it nevertheless appears possible that if we *did* want to search our minds for those rules, we could in fact discover them. In other words, it is possible to make the rules or principles which govern our actions *explicit*. Thus implicit in our normalised understanding of the relationship between our mind and our behaviour in the world is the premise that rules or principles, which are capable of being made explicit, govern our actions: that is, that *theory governs practice*.

Dreyfus summarises the historical development which has culminated in the privileging of theory (in the form of mental content that can be brought to presence) over practice:

Plato's view that everything human beings do that makes any sense at all is based on an implicit theory, combined with the Descartes/Husserl view that this theory is represented in our minds as intentional states and rules for relating them, leads to the view that even if a background of shared practices is necessary for intelligibility, one can rest assured that one will be able to analyse that background in terms of further mental states.¹²³

Dreyfus then explains the various contemporary ways in which the background has been made explicit:

Insofar as background practices contain knowledge, they must be

¹²³*Ibid.*, p. 5.

based on implicit beliefs; insofar as they are skills, they must be generated by tacit rules. This leads to the notion of a holistic network of intentional states, a tacit belief system, that is supposed to underlie every aspect of orderly human activity...¹²⁴

Descartes' recognition that our actions are ultimately guided by a system of rules or principles that can be made explicit, begins to explain the importance which he placed on formulating rules and principles to structure our thinking. In fact Taylor asserts that for Descartes '[r]eason is not that faculty in us that connects us to an order of things in the universe. Rather, reason is that faculty whereby we think properly.'¹²⁵ In order that we should be able to uncover the rational structures inhering in the universe, Descartes developed a rigorous methodology to help us 'think properly.' The rules Descartes proposed included:

1. dividing up the problem into parts,
2. moving in an orderly way from the simple to the more complex, and
3. checking to ensure no errors have been made.¹²⁶

The rise of method, especially in its paradigmatic application in the sciences, was also linked to the desire to overcome the prejudices of the mind and gain neutrality, objectivity and hence an undistorted view of reality. A 'good' method was in itself neutral, and through its neutrality it allowed undistorted access to the objective world.¹²⁷

¹²⁴*Idem.*

¹²⁵Taylor, in *The Cambridge Companion to Heidegger*, *op. cit.*, p. 320.

¹²⁶Descartes, R. *Discourse on Method and the Meditations*. Translated by F. Sutcliffe. Harmondsworth: Penguin, 1968, p. 41.

¹²⁷For a critical discussion of objectivity, see also Johnson, M. *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. Chicago: The University of Chicago Press, 1987, pp. xix-xxxvii.

Truth

By gaining undistorted access to objective reality, one was also gaining access to truth. The emergence of different theories of truth parallels the historical shifts in the metaphysical grounding of reality. The theorising of *truth as correspondence* was given considerable attention in the religious milieu the Middle Ages. Okrent argues that because of the historical context, 'the correspondence view of truth could emerge in the Middle Ages and become entirely natural.'¹²⁸ Okrent is pointing to the fact that the Greeks, particularly Plato and Aristotle, had already put in place an understanding in which the being of a thing lay with the thing itself, and it was this understanding of reality that made it possible for a correspondence theory of truth to arise.

Aristotle's writings on truth, which were subsequently developed by scholars in the Middle Ages, posit a relation between assertions and reality. For an assertion about a thing to be correct, it must correspond to the way the thing 'is.' Recall that for the Greeks, the being of a thing was self-standing, and was not dependent on its relation to any human subject. Thus, while our ability to make assertions may have been determined by some capacity of the mind, there was no sense in which the presence of a thing, its truth, was dependent on the human observer.¹²⁹ Correspondence was between the assertion, which was manifest, and the thing itself, whose being was also independent of the mind. There was therefore no necessity to include within the Aristotelian theory of truth any additional caveats to account for the role of the mind contributing the presence of the thing.

The medieval scholar Thomas Aquinas developed a two tiered correspondence theory of truth. Following the Greek thesis that the reality of a thing depended only

¹²⁸Okrent, *Heidegger's Pragmatism*, *op. cit.*, p. 231.

¹²⁹While Okrent and Dreyfus (following Heidegger) support this view, DiCenso disagrees, arguing that for the Greeks, the mind did play a significant role in their formulation of a correspondence theory of truth. See Okrent, *Heidegger's Pragmatism*, *op. cit.*, pp. 230-231; Dreyfus, *Being-in-the-World*, *op. cit.*, p. 4; and DiCenso, *Hermeneutics and the Disclosure of Truth*, *op. cit.*, pp. 1-13.

on the presence of the thing itself, he maintained that 'the true is that which is.'¹³⁰ He specifically argued against the notion that truth might merely be that which is perceived by a human subject, providing the example that, if this were so, it would therefore follow 'that rocks buried deep in the depths of the earth would not be true rocks because they are not seen.'¹³¹

The second tier of Aquinas' correspondence theory of truth parallels Plato's notion of eternal forms or ideas. Aquinas claimed that 'natural things are called true when they bear a likeness to the divine mind.'¹³² Thus the correspondence is as it was for Plato: between the particular thing and the 'idea,' where the idea is not in the human mind but is outside of time and space. For Aquinas, the idea was in the mind of God.

It is only with the advent of a conception of reality that is dependent on the human subject that a simple correspondence theory of truth becomes problematic. This point appears to be misunderstood by contemporary critics of correspondence theories of truth. Such critics overlook the possibility that they may now be part of a normalised way of seeing centring on the primacy of the human mind.¹³³ The problems they point to with correspondence theories of truth are problems to do with sorting out the role of the mind. Clearly the problems of needing to account for the role of the mind as part of a theory of truth would not exist if the mind was not considered to play a role in determining the being of reality.

When the role of the mind as a ground for the being of reality begins to be normalised in the 17th Century, correspondence theories of truth are faced with problems of subjectivism and relativism. If, as Descartes implied, the presence of an

¹³⁰Aquinas cited in DiCenso, *Hermeneutics and the Disclosure of Truth*, op. cit., p. 10.

¹³¹*Idem.*

¹³²*Idem.*

¹³³See for example O'Conner and Joachim whose criticisms of the Correspondence theory are cited in DiCenso, *Hermeneutics and the Disclosure of Truth*, op. cit., pp. 13-15.

object was grounded in the perceiving subject, then reality had the potential to become no more than that which is apprehended by a particular finite mind. Truth would also become no more than the property of a single mind and could therefore readily vary from one mind to another.

To overcome the spectres of subjectivism and relativism, attempts were made to regain objectivity by grounding the human mind in a relationship with something more absolute. The formulation of this larger ground involved locating the individual mind within a coherent overarching system or framework. DiCenso thus claims that 'the final criterion of truth is transferred from the certainty of the subjective intellect as such to an encompassing system of thought within which the individual intellect is but a moment or aspect.'¹³⁴ This larger system initially relied on some ultimate connection to God, but over time became more secular. DiCenso describes the historical development of this *coherence theory of truth*, beginning with Spinoza's notion of the human mind accessing a pre-existing system of divine ideas,¹³⁵ through Hegel's formulation in which particular truths are incorporated into 'a unifying teleological process that has as its goal Absolute Knowing',¹³⁶ to contemporary manifestations where individual truths are said to be grounded in coherent systems of knowledge.

It is interesting in the light of earlier discussions which highlight the significance of *presence*, that contemporary coherence theories of truth continue to seek grounds in presence. Blanshard claims that 'for all the ordinary purposes of life, coherence does not mean coherence with some inaccessible absolute, but with the system of *present* knowledge'¹³⁷ [my italics]. 'Present' here carries the connotation of both 'current' and of 'that which we are able to become aware.' However, as DiCenso points out,

¹³⁴*Ibid.*, p. 22.

¹³⁵*Ibid.*, p. 17.

¹³⁶*Ibid.*, p. 20.

¹³⁷Blanshard cited in DiCenso, *Hermeneutics and the Disclosure of Truth*, *op. cit.*, p. 25.

because there is in practice no single system of present knowledge, but instead a plurality of competing knowledges, Blanshard has to modify this claim in such a way that the system of present knowledge is reduced to one which is 'apprehended by a particular mind.'¹³⁸ Ironically, this qualification has the effect of making the larger framework, in which the individual human mind was intended to find objectivity, no more the product of an individual human mind. With this move, the very problems of subjectivism and relativism that theories of coherence were originally intended to overcome, are reintroduced.¹³⁹

The Contemporary Legacy of the Mind-World Dualism

Debate continues over the status of reality, objectivity and truth. In the quarter century since Kuhn's *The Structure of Scientific Revolutions*, argument over the role of science in revealing reality and truth has been particularly impassioned. As Dreyfus points out, literary theorists, social scientists and feminists have all challenged science's privileged access to reality and truth:

The literary theorists would like to one-up the scientists by showing that scientific theories are after all just interpretive texts and therefore fall into the domain of the humanities. Similarly, social scientists, by pointing out that scientific truth is a product of shared practices, seek to annex science to the domain of sociology and anthropology. Feminists would also like to undermine the authority of the scientific establishment, which they rightly regard as a bastion of male domination. All these groups would like to believe that natural science is just one more interpretive practice that has somehow conned our culture into thinking that it alone has access to the real. The stakes are high.¹⁴⁰

¹³⁸*Idem.*

¹³⁹*Idem.*

¹⁴⁰Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 251-2.

At the time of writing this thesis, the most recent and most public contestation of these issues had been evidenced in the international furore that followed in the wake of two articles published by the physicist Alan Sokal. In order to discredit those who Sokal believed held the view that reality is little more than a cultural construction, Sokal submitted a hoax article to a prominent cultural studies journal,¹⁴¹ satirising what he saw as the empty and obscurantist language used by cultural studies theorists. The article was accepted, and immediately after its publication Sokal revealed the hoax in the higher education journal *Lingua Franca*.¹⁴²

Issues at the centre of these debates arise directly from the historically constituted understandings of reality, objectivity and truth which have been discussed in this chapter. While it is impossible to capture all of the subtleties of the various sites of disagreement, it could be said that contemporary debates often polarise around two philosophical imbroglios. The first is the question of how to conceive the relationship between the mind and the world. The second is the question of the status of 'independent reality.' The two questions are of course interrelated.

Over the question of how to conceive the relationship between the mind and the world, antagonists often adopt either a 'representationalist' or 'non-representationalist' position. As discussed earlier in this chapter, *representationalists* envisage a model of the relation between mind and world in which the mind holds, and works with, representations of the world. A number of different conceptions of the nature of these representations, and the way they are processed within the mind, are currently in circulation. On the other side, contemporary *non-*

¹⁴¹Sokal, A. "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity." *Social Text* (Spring/Summer 1996).

¹⁴²Sokal, A. "A Physicist Experiments with Cultural Studies (The Conventions of Academic Discourse)." *Lingua Franca* 6 (4 May-June 1996): 62-64.

representationalists, including hermeneutic philosophers influenced by the work of Heidegger, want to collapse the mind-world dichotomy. They hold that what is present to us in our everyday experiences *is* the world.

Over the question of the status of independent reality, antagonists usually adopt either a 'realist' or an 'anti-realist' position. *Realists* hold that there is a reality which exists independent of human beliefs or interpretations, and that this reality is, to some extent, able to be disclosed. *Anti-realists* hold that there is either no reality beyond our beliefs or interpretations, or, if there is, it can never be disclosed and is therefore not worthy of serious discussion.

Because of the number of possible permutations which may arise from this range of stances, debates over these issues are rarely simple bi-lateral contests. Antagonists often champion a variety of nuanced positions, and teasing out these positions is hindered by the tendency of the antagonists to level out their opponents by lumping them together, even though they may each hold slightly or significantly differing positions. An additional difficulty is encountered in sorting out the different positions because the key terms used by the antagonists — 'mind,' 'world,' 'reality,' and 'independent reality' — often mean quite different things within the framework of the various positions that are taken.

In order to come to some understanding of the prominent positions in this debate which have significance for this dissertation, I propose to work briefly through the possible permutations of the stances that are taken on the two vexed questions previously alluded to: the relationship of the mind to the world, and the status of independent reality. This discussion will also allow the meaning of key words and concepts to be established *within* the framework of each position.

On the basis of the division between representationalist and non-representationalist

positions, and realist and anti-realist positions, four stances are discussed which I shall describe as 'realist representationalist,' 'anti-realist representationalist,' 'realist non-representationalist,' and 'anti-realist non-representationalist.' These stances are summarised in the accompanying table.

	Realist	Anti-realist
Representationalist	The mind contains mental representations of a reality which exists independently of the representation of it. Independent reality precedes any representation of it. Independent reality can be accessed. Independent reality does have a determining role in our world.	An 'Idealist' position. The only reality that can be known is the representation in the mind. Independent reality is not accessible.
Non-representationalist	Mind and world collapse. Our understanding of the interpreted world is primary. It is possible to 'strip off' the world and access the causal relations operating in independent reality. Independent reality does have a determining role in our world.	A 'Relativist' position. Mind and world collapse. Only our interpreted world can be known. Our world is culturally constructed. A relativist position in that there can be more than one construction of reality. Independent reality has no determining role in our world.

Representationalist Model of the Mind

Two representationalist models of the mind, each significantly different, were briefly introduced earlier in this chapter. One model postulates a conscious self-reflexive subject, the other is an information processing model. The model incorporating a conscious self-reflexive subject has three components which together comprise the 'Cartesian Theatre' of the mind.¹⁴³ The components of the model are (i) the world,

¹⁴³Trigg, *Rationality and Science, op. cit.*, p. 203.

which is uninterpreted and could therefore also be described as 'independent reality;' (ii) the representation of the world, the theatre stage, which is the content of the mind; and (iii) the subject, the 'I', who is aware of, and controller of, the mental representations, and thus constitutes both audience and director.

The information processing model views the mind as holding a complex totality of representations of the world, along with rules to organise and co-ordinate the combining of these representations, which together direct human action.¹⁴⁴ Any sensory input that is encountered is thus able to be represented and processed, and an action determined in response.

The information processing model could therefore be described as the Cartesian Theatre without an audience. The model has only two components: (i) the world (again uninterpreted and therefore equivalent to independent reality) and (ii) the representation of the world which is in the mind. The information processing model has no subject, no 'I,' which is aware of, and controls, the manipulation of the representations. In other words there is nothing *to which* the representations in the mind are made present. Instead the totality of the representations themselves — the brain function — *is* the subject.¹⁴⁵

Advocates of each of these representational models of the mind are highly critical of the other's positions. Trigg, an adherent to the Cartesian Theatre model, argues that the lack of a conscious subject would mean that there could be no qualitative, subjective experience of the world, 'whether the colour of a sunset, the sound of a waterfall, or the feeling of pain.'¹⁴⁶ Dennett, an advocate of the information processing model, argues that there is no scientific basis on which inaccessible private experiences can be explained, and seeks to construct a theory of mental

¹⁴⁴Dreyfus, *Being-in-the-World*, *op. cit.*, p. 115.

¹⁴⁵Trigg, *Rationality and Science*, *op. cit.*, p. 206.

¹⁴⁶*Ibid.*, p. 203.

events using only the data which scientific method would permit.¹⁴⁷ In a seemingly 'post-modern' inversion of the traditional contention that the subject *has* experiences, Dennett states that '[o]ur tales are spun, but for the most part we don't spin them: they spin us. Our human consciousness, and our narrative selfhood, is their product, not their source.'¹⁴⁸ Trigg heatedly responds to this possibility, complaining that this would mean that there would be 'no real subject, able to make rational decisions. [If this were so] Science has not only undermined the reality of private experiences but has apparently destroyed the subject of that experience'¹⁴⁹ [my gloss in brackets]. But for Dennett such a 'subject of experience' can have no more credibility than a homunculus, a dwarf, inside the brain.¹⁵⁰ Trigg is nevertheless adamant that if the subject becomes nothing more than a myriad of brain processes, then any sense of human's having rational control over their actions is lost:

The brain may be very good at all kinds of techniques of parallel processing, but the idea of reasoning vanishes without some central control acting as a unifying factor able to reflect in a self-conscious way on all the information available. All we would be left with would be the sophisticated interpretation of stimuli in many simultaneous ways. There would be no subject pulling it all together or deciding what to believe ... Without a centre of consciousness 'I' do not exist, and therefore *I* cannot make any rational judgements.¹⁵¹

Both Dennett, who advocates the information processing representationalist model, and Trigg, who advocates the Cartesian Theatre representationalist model, hold a *realist* stance on the status of independent reality. That is, they would contend that

¹⁴⁷Dennett, D. *Consciousness Explained*. Boston: Little, Brown and Co., 1991, p. 71.

¹⁴⁸*Ibid.*, *op. cit.*, p. 418.

¹⁴⁹Trigg, *Rationality and Science*, *op. cit.*, p. 205.

¹⁵⁰*Ibid.*, p. 207.

¹⁵¹*Ibid.*, p. 206.

'there is a world to be investigated which exists independently of human belief and language.'¹⁵² An *anti-realist* representationalist stance would, on the other hand, hold that our minds contain representations of the world, but that we cannot know anything other than the representations themselves. This position, that we simply cannot access independent reality, is 'idealist', has many prominent adherents in the context of the history of philosophy.¹⁵³ Rescher, a recent advocate of idealism,¹⁵⁴ makes it clear that we can never know more than our *conceptions* of reality:

There is no clear and sharp separation between reality and the domain of thought, because our only possible route to cognitive contact with 'the real world' is through the mediations of our conceptions about it, so that, for us, 'the world' is inevitably 'the world as we conceive it to be.'¹⁵⁵

Realist representationalists are, however, sharply critical of idealist difficulties in articulating the causal relationship between matter (ie. independent reality) and mind. Trigg asks ironically whether 'an idealist [can] talk of the causal effects of matter on mind while admitting that the very idea of causation is a mental construction?' [my gloss in brackets]¹⁵⁶

Non-Representationalist Model of the Mind

While the *realist representationalists* are dismissive of the stance taken by the idealist *anti-realist representationalists*, most vitriol is reserved for attacking the *non-representationalist* position. The level of hostile attention currently received by this

¹⁵²*Ibid.*, p. 6.

¹⁵³For example Berkeley, Kant and Hegel. See Armstrong, D., ed. *Berkeley's Philosophical Writings*. Toronto: The Macmillan Company, 1965; Kant, *Critique of Pure Reason*, *op. cit.*; and Hegel, G. W. F. *Selections*. Translated by S. Taubeneck. New York: Continuum, 1990.

¹⁵⁴Rescher describes his position as 'middle-of-the-road idealism, that makes significant concessions to realism.' Rescher, N. *A System of Pragmatic Idealism*. Vol. I: Human Knowledge in Idealistic Perspective. Princeton: Princeton University Press, 1992, p. xiv.

¹⁵⁵Rescher cited in Trigg, *Rationality and Science*, *op. cit.*, pp. 127-28.

¹⁵⁶*Ibid.*, p. 128.

latter position is perhaps a reflection of the prominence which this position has attained as part of the rise of post-modernism.

The non-representationalist position rejects both the representationalist model of the mind, and the dichotomy of mind and world that is its outcome. Non-representationalists collapse the mind-world dualism. They claim that what we are aware of in our everyday experience is *not* a 'mental representation' of the world. Instead we are aware, first and foremost, of the *world* itself. This is where clarifying terminology becomes important. The 'world' referred to by the non-representationalists is not identical to the 'world' referred to in the representationalist models. In the representationalist model presented above, 'world' is used to describe 'independent reality,' that is, reality *prior* to its 'processing' by the human mind. Non-representationalists on the other hand use 'world' to describe 'interpreted reality,' that is, a world which is *already* meaningful.¹⁵⁷ The most fundamental difference between the two positions is revealed in this single point. Representationalists hold the position that *first* there is independent reality, and *then* this independent reality is represented in our minds. Non-representationalists, following Wittgenstein and Heidegger, hold the position that *first* there is the *interpreted* world, and, if it were possible to access independent reality, *then* this would require the interpreted world to be somehow stripped away or 'decontextualised.'¹⁵⁸

Indeed, non-representationalists such as Rorty,¹⁵⁹ and many in the field of social studies of science,¹⁶⁰ hold that independent reality can *never* be revealed. What a thing 'is,' it 'is' only in the context of our cultural practices. In terms of categories

¹⁵⁷For an account of this shift in meaning of 'world' in which Husserl's phenomenology is shown to play a central part, see Carr, *Interpreting Husserl*, *op. cit.*, p. 15.

¹⁵⁸For a discussion of Heidegger's notion of 'decontextualising' or 'deworlding,' see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 202-08 and 256ff.

¹⁵⁹On Dreyfus' account, see *Ibid.*, p. 265.

¹⁶⁰See for example Pickering, A. *Constructing Quarks*. Chicago: University of Chicago Press, 1984.

used in this discussion, this group would be described as *anti-realist* non-representationalists. In the caustic public debate which followed the Alan Sokal Hoax, from which the popular press in Australia was not excluded, it was this position which was the target of fiercest attack.

In the *Lingua Franca* article in which Sokal reveals his hoax, Sokal asks '[i]s it now dogma in cultural studies that there does not exist an external world? Or that there exists an external world, but science obtains no knowledge of it?'¹⁶¹ This quotation reveals the central plank of the criticism which is put forward by those who are committed to the realist position: if the entities that science discovers are merely cultural constructs, if they are, as Lyotard asserts, part of a language game,¹⁶² why should science work? If science does not disclose the structure of reality and its causal relations, how is it that science is able to successfully predict the physical, chemical and biological phenomena from which technologies are developed?¹⁶³

In attempting to defend the cultural studies position (what I am calling anti-realist non-representationalist) pilloried by Sokal, McKenzie Wark makes the following plea in the Australian media:

Sokal asserts that 'there is a real world. Its properties are not social constructions. What sane person would contend other wise?' No sane person...

But one has to question whether the alternative view Sokal seems to

¹⁶¹Sokal, "A Physicists Experiment with Cultural Studies", *op. cit.*, p. 62.

¹⁶²Lyotard, J. *The Postmodern Condition: A Report on Knowledge*. Translated by G. Bennington and B. Massumi. Manchester: Manchester University Press, 1984, p. 40.

¹⁶³The question of 'why science works' runs as an uncomfortable undercurrent through Kuhn's *Structure of Scientific Revolutions*. This question, Rorty suggests, 'binds him [Kuhn] together with his opponents and separates him from his left-wing friends [Rorty himself along with other relativists]'. Kuhn, *The Structure of Scientific Revolutions*, *op. cit.*; Rorty, *Objectivity, Relativism, and Truth*, *op. cit.*, p. 6.

want to propose makes all that much more sense.

Is there a knowledge that we can have that is independent of any social construction whatsoever? Can one imagine a knowledge, for example, that exists without language or controlled observation? The answer is no.

All knowledge is socially constructed, in other words.¹⁶⁴

In response, Keith Campbell, professor of philosophy at the University of Sydney, weighs into the debate in the Australian media claiming that there is a 'fatal ambiguity' in the arguments of those who tow this cultural studies line:

As Wark says, 'All knowledge is socially constructed', and so, naturally, 'Science is a construction.'

But, Campbell continues:

Sokal does not hold that *knowledge* can exist independently of social construction. He holds that molecules, and natural laws, and the Earth can.

To think otherwise is megalomania.¹⁶⁵

In the milieu of this often indiscriminate assault against the non-representational position, *realist* non-representationalists (who might even sympathise with Campbell's criticism) are often lumped together by their opponents with the anti-

¹⁶⁴Wark, M. "Postmodernist Jokers." *The Australian* (June 5 1996): 28.

¹⁶⁵Campbell, K. "Flaw in Universal Belief." *The Australian* (June 12 1996): 40.

realist non-representationalists (whose position is seen here championed by Wark). This is not entirely the fault of those who attack the non-representationalist position. Because the question of the status of independent reality appears to have been occluded from much postmodern discourse, it is often quite difficult to ascertain whether a non-representationalist position is realist or anti-realist. Hermeneutics, which I draw upon extensively in attempting to lay out an alternative understanding of the design process, is no exception. In an insightful and lucid explication of the difficulties of the hermeneutic position in this regard, Carr demonstrates that while post-Heideggerian hermeneutics has either denied or masked its commitment to the possibility of gaining a determination of independent reality, it nevertheless appears to need that very possibility for its whole project to make sense. Carr argues that if, as hermeneutics claims, there can be *many interpretations of the same object*, then there is a de facto commitment to the possibility of a full determination of this object around which the interpretations circle (ie. a de facto commitment to some final disclosure of the independent reality of the object):

But let us recall that we are inquiring here into the validity of the hermeneutical thesis that 'another interpretation is possible'. We have pointed out how this thesis is legitimated in part by the actual encounter, within our everyday experience, with other interpretations of the events and actions around us. But we have also suggested that the thesis has further implications that are not spelled out by the hermeneutical philosophers, implications that we tried to articulate as the commitment to the idea of the object and of the full determination of the object.¹⁶⁶

Even Heidegger himself might be claimed to be ambivalent on the question of the status of independent reality. Okrent argues that Heidegger holds the seemingly

¹⁶⁶Carr, *Interpreting Husserl*, op. cit., p. 193.

anti-realist position that the entities which science disclose are social constructions which are *dependent* upon the practices that disclose them.¹⁶⁷ Dreyfus on the other hand argues that Heidegger is a realist, or more correctly a 'minimal hermeneutic realist.'¹⁶⁸

Like Dreyfus, I shall be arguing that Heidegger should be interpreted as being a realist. However, more than this, in Division III of the dissertation I want to utilise Heidegger's notion of 'Earth' to return to the apparent impasse in this whole chaotic debate between representationalists and non-representationalists, realists and non-realists, and show how the notion of Earth, together with a reinterpretation of *design* grounded in this notion of Earth, may offer a re-solution of not just the particular problems of hermeneutics alluded to by Carr, but the whole unhappy question of the status of independent reality.

Conclusion

This chapter provides an outline of the historical context in which particular rationalist understandings arose. Key understandings foregrounded in this chapter will be shown in the next chapter to underlie contemporary formulations of the design process. The *mind-world dichotomy* which has been shown to be an outcome of Cartesian rationalism, the emphasis on *method*, the privileging of *theory over practice*, and the *information processing model* of the mind, will all be shown to be at work in current formulations of the design process.

This chapter also demonstrates that each of the historical manifestations of rationalism has sought grounds in *presence*. The assumption that understanding and action are grounded in presence will also be shown to be fundamental to contemporary design theory, especially that employed in design computing. The

¹⁶⁷Okrent, *Heidegger's Pragmatism*, *op. cit.*

¹⁶⁸Dreyfus, *Being-in-the-World*, *op. cit.*, p. 253.

introductory discussion of the significance of the role of presence offered in this chapter provides a starting point for the discussion in Division II of alternative ways of theorising design — based on hermeneutics and Heideggerian thought — that are *not* grounded in presence.

The brief historical exploration of the questions of reality, objectivity and truth presented in this chapter provides the background for subsequent discussions of the way in which our naturalised understandings of these questions has prefigured our understanding of what the ecological crisis 'is'. Conceptions of what the ecological crisis 'is', together with rationalist understandings of the way change is brought about, will be shown in the next chapter to have put in place particular understandings of the way in which change toward ecologically thoughtful design might be brought about.

Finally, this chapter provides an introduction to a number of current and very prominent philosophical debates, and situates hermeneutics and Heideggerian thought in relation to these debates. The very preliminary introduction to Heidegger and hermeneutics presented in this chapter provides a departure point for their more thorough discussion in Division II, which explores how hermeneutics and Heideggerian thought might provide the ground to rethink both the design process and the way in which a paradigm shift in design might come about.

CHAPTER 3

RATIONALISM, DESIGN AND THE ECOLOGICAL CRISIS

Introduction

This chapter discusses the implications of the Western rationalist tradition, introduced in the previous chapter, for (i) our understanding of the process of design and (ii) our understanding the way in which a shift toward more ecologically thoughtful design might be brought about.

A number of scholars have made excellent contributions to the understanding of the ways in which various aspects of rationalism underlie Western formulations of the design process. In his critical history of Western design theory, Gelernter demonstrates how the rationalist mind-world dichotomy is embedded in all of the prominent theories of design that have arisen since the Ancient 'Greek Revolution in Philosophy'.¹⁶⁹ Schön demonstrates that the rationalist model of rigorous 'instrumental problem solving,' supposedly employed in science, is common to many contemporary attempts to model the design process.¹⁷⁰ Fry reveals how historical transformations in social and economic practices, particularly the rise of modern industrial culture, have constructed our contemporary understanding of design.¹⁷¹ Winograd, Flores¹⁷² and McLaughlin¹⁷³ demonstrate the ways in which particular aspects of rationalism are embedded in the assumptions that underlie the models of design employed in computer systems design and design computing. Snodgrass and Coyne systematically disclose the ways in which contemporary theories of design, including those employed in the domain of information

¹⁶⁹Gelernter, *Sources of Architectural Form*, op. cit., p. 44.

¹⁷⁰Schön, *The Reflective Practitioner*, op. cit., p. 44.

¹⁷¹Fry, *Design History Australia*, op. cit.; Fry, *Remakings: Ecology Design Philosophy*, op. cit.

¹⁷²Winograd and Flores, *Understanding Computers and Cognition*, op. cit.

¹⁷³McLaughlin, "Practices and Primordial Understanding," op. cit.

technology, are enframed by the deeply held prejudices of rationalism.¹⁷⁴

This chapter does not attempt to provide a complete overview of the influence of rationalism on design theory. Rather, it picks up only *particular threads* of the relationship between rationalism and the historical and contemporary understandings of the process of design and shows how these understandings of design have in turn *constituted many of the prevalent assumptions* about the ways in which design might participate in solving the perceived ecological crisis, including assumptions about the way in which *design itself might be transformed* to achieve this end.

Principle- and Rule-Governed Design

It was argued in the previous chapter that the attributes of Rationalism put in place by the Ancient Greeks included the assumption that we know and act by applying principles. Thus, as Plato for example held, all rational action was based on an implicit theory.¹⁷⁵ For the Greeks it was possible for these principles or theories which were the grounds of knowing and acting to be made *present* in forms such as geometry.

The privileging of theory over practice, and the seeking of grounds in presence, are explicit in the theories of design employed in Classical Greek art and architecture. Gelernter argues that Greek art theory, like Platonic epistemology, drew a distinction between the 'reality' of the timeless ideal forms and the 'appearance' of particular ephemeral things.¹⁷⁶ Rather than portray any *particular* manifestation of

¹⁷⁴Coyne, *Designing Information Technology in the Postmodern Age*, *op. cit.*; Coyne and Snodgrass, "Is Designing Mysterious?", *op. cit.*; Coyne, R. and A. Snodgrass. "Cooperation and Individualism in Design." *Environment and Planning B: Planning and Design* 20 (1993): 163-74; Coyne and Snodgrass, *Problem Setting within Prevalent Metaphors of Design*, *op. cit.*; Coyne, "Inconspicuous Architecture," *op. cit.*; Snodgrass and Coyne, *Models, Metaphors and the Hermeneutics of Designing*, *op. cit.*; Snodgrass, "Hermeneutics and the Application of Design Rules," *op. cit.*; Snodgrass and Coyne, "Is Designing Hermeneutical?," *op. cit.*

¹⁷⁵Dreyfus, *Being-in-the-World*, *op. cit.*, p. 253.

¹⁷⁶Gelernter, *Sources of Architectural Form*, *op. cit.*, p. 54.

a thing, Greek art therefore sought to capture the idealised form of its class or type.

While Plato might have held that art could only imperfectly copy nature, Classical Greek art theory nevertheless drew upon the Platonic notion that geometry could capture the underlying structure of the world: 'The artists naturally concluded that if they arranged their art according to geometrical principles, then it would participate in that which makes the universe intelligible and beautiful.'¹⁷⁷

For the Classical Greeks, design was also held to be 'rule-governed'.¹⁷⁸ In the one substantive surviving work of the ancient world on the subject of design theory, *The Ten Books on Architecture*, the Roman scholar Vitruvius sets out the 'fundamental principles' of Classical design in the fields of architecture and town planning.¹⁷⁹ By following the rules of geometry and proportion, as well as many other more pragmatic principles relating to siting and construction, it was presumed that designers could achieve the timeless forms which imbued their works with 'universal validity and beauty'.¹⁸⁰

The Role of the Mind of the Individual in Design

Employing Classical texts and exemplars, Renaissance theorists pursued the Ancients' conviction that the application of theory, in the form of rules and principles, governed the practice of design. Leonardo Da Vinci, one among many in the Renaissance who investigated the mathematical laws of perspective and harmony, argued that '[p]ractice ought always to be built on sound theory.'¹⁸¹ While there was intense debate about the role of the mind in *accessing* the universal ideals of truth and beauty,¹⁸² for design practitioners and scholars of the

¹⁷⁷*Ibid.*, p. 56.

¹⁷⁸*Ibid.*, p. 57.

¹⁷⁹Vitruvius. *The Ten Books on Architecture*. Translated by M. Morgan. New York: Dover Publications Inc., 1960.

¹⁸⁰Gelernter, *Sources of Architectural Form*, *op. cit.*, p. 62.

¹⁸¹Da Vinci cited in Gelernter, *Sources of Architectural Form*, *op. cit.*, p. 101.

¹⁸²Gelernter describes the fluctuations in emphasis on the role of method and the role of the mind

Renaissance the *grounds* for truth and beauty were still considered to inhere in the world, rather than in the human mind.

By the Baroque period, changing social and economic conditions, the rise of heroic artists and scientists and, as discussed, the particular contradictions which science appeared to be disclosing between everyday understandings and scientific understandings, saw a paradigm shift in the understanding of the relationship between mind and world. With this shift, most sharply evident in the writings of Descartes, the grounds for the being of a thing — its truth, its beauty — moved from the world to the mind of the individual subject. This transformed understanding of the relationship between mind and world, subject and object, inside and outside, became the normalised way of seeing for the modern world: 'Since the time of Descartes this independence of the subject has been held to be self-evident, though problematic.'¹⁸³

By asserting the primacy of the radically separated thinking subject, the human mind became the source of meaning. The designer was thus placed into an entirely different relationship with the world. Rather than being immersed in a world that was *itself* meaningful, the designer was now located in a Cartesian space of meaningless objects to which the mind of the designer *gave meaning*.¹⁸⁴ Locke wrote that beauty is not a 'quality supposed to be in the object, which would of itself be beautiful, without relation to any mind which perceives it'; and later, that if there were 'no mind with a sense of beauty to contemplate objects, I see not how they could be called beautiful'.¹⁸⁵ Locke, however, retained the possibility of objectivity

in discovering the universal ideals of truth and beauty that occurred in the course of the Early Renaissance, High Renaissance, Mannerist and Rococo periods. Gelernter, *Sources of Architectural Form*, *op. cit.*, pp. 92-147.

¹⁸³Coyne, "Cooperation and Individualism in Design," *op. cit.*, p. 164.

¹⁸⁴Guignon claims that '[p]art of the achievement of the new science of the seventeenth century was to dispel the traditional image of reality as a value-laden, meaningful cosmos in favour of our modern naturalistic view of the 'universe' as a vast aggregate of objects in causal interactions.' Guignon, in *The Cambridge Companion to Heidegger*, *op. cit.*, p. 219.

¹⁸⁵Locke cited in Gelernter, *Sources of Architectural Form*, *op. cit.*, p. 147.

by claiming that particular characteristics in an object would always raise the idea of beauty in the mind of the perceiving subject.

The separation of the meaning-giving mind from the objectively existing world allowed for the development of two quite different trajectories, both of which play significant roles in contemporary design theory. Empiricists such as Locke and Hume emphasised the *objective* side of this divide. They focussed on the possibility of gaining objective representations of the world through the direct experiences of the senses. Reason, rationality, objectivity and 'transparency of mind' were privileged over prejudice, mood, opinion and history.¹⁸⁶

Because the world was no longer imbued with God-given order and meaning, Locke was able to argue against the monarch's divine right to rule and advocate the primacy of the individual subject. Locke's treatises on government decisively influenced the movement for Liberalism and Democracy (at least for the landed bourgeois).¹⁸⁷ The ontology of liberalism — with its implication of free will, choice and control — will be shown to contribute significantly to the normalised understandings that underlie contemporary design theory.

The trajectory arising from the *subjective* side of this subject-object divide was explored by the Romantic tradition. The Romantics looked inward at the 'subjectivity of the subject'. They overturned the privileging of reason by giving priority to 'personal opinion, the human spirit, emotion, aesthetic enjoyment, genius, and mystery'.¹⁸⁸ Rousseau claimed that in the natural human state 'emotions and feelings... supply more certain knowledge of the world than can reason itself.'¹⁸⁹

¹⁸⁶Coyne, "Cooperation and Individualism in Design," *op. cit.*, p. 165.

¹⁸⁷Laslett, P. *John Locke: Two Treatises of Government, A Critical Edition*. London: Cambridge University Press, 1967.

¹⁸⁸Coyne, "Cooperation and Individualism in Design," *op. cit.*, p. 166.

¹⁸⁹Gelernter, *Sources of Architectural Form, op. cit.*, p. 157.

Romanticism also had a significant influence on the understanding of the design process. Coyne and Snodgrass illustrate critically how the Romantic view of the design process emphasises those aspects that appear antithetical to rationalism:

...design arises from the mind of the individual, and in a manner that is mysterious and not dependent on the logic of analysis. Design is the result of the 'creative spark', inspiration, and genius, much in the manner of the Romantic conceptions of the creation of a work of art. The mind of the individual is the 'fountainhead' and needs to be given free reign to express itself (Rand, 1972). Design ability has the character of "a spring bubbling out of a hillside" (Belvin, 196, page 10). Counter to the objective language of the rationalists, Romantically inspired discourse about design is poetic and metaphorical.¹⁹⁰

This Romantic characterisation of design remains potent in contemporary design theory. While it appears to offer an entirely different ground for understanding design to that of the Rationalist characterisation, both can be seen to arise from the *same* Cartesian epistemology in which mind is separated from world.

Contemporary Structuralist Theories of Design

For those contemporary design theorists who have recognised the significance of the opposition between mind and world, but do not consider them to be a false opposition (as poststructuralists might), the response has been to attempt to 'harmonise' the two sides rather than dissolve the dichotomy entirely. Gelernter points to twentieth century attempts to harmonise the separation of mind and world, and in fact seems satisfied that relatively recent efforts at harmonisation do adequately overcome the problematic mind-world dualism.

¹⁹⁰Coyne, "Cooperation and Individualism in Design," *op. cit.*, p. 166.

Gelernter argues that Kant began to lay the path toward a solution by proposing that there were organising structures within the mind which ensured the possibility of objective knowledge 'since every mind imposes the same structure onto the sense experience.'¹⁹¹ But, Gelernter contends, as Kant held these organising structures to be innately wired into every human brain, this notion had difficulty accounting for evolution or change in our organising concepts. According to Gelernter, Piaget overcame this problem by showing how the sensory data and the mind's organising structures — what Piaget called mental *schemata* — mutually construct each other:

The mental schemata are not innately given at birth, but rather develop and evolve in regulated response to outside stimuli... Consider a young child attempting to pick up a ball. At first he [/she] cannot co-ordinate his action — he does not yet possess a schema for picking up balls — and so he experimentally thrashes about. Through this play, the child eventually discovers that if he grasps his hands together in just such a way he can pick up the ball. Pleased with the result, the child tries the same action again, and realizes the same effect. He eventually remembers this action as a schema.¹⁹²

In this way the child can add this schema to an inner repertoire of schemata:

Once internalized, the schema gives the child competence to solve the problem of grasping a ball at any time in the future, without further experimentation.¹⁹³

¹⁹¹Gelernter, *Sources of Architectural Form*, op. cit., p. 266.

¹⁹²*Ibid.*, pp. 266-67.

¹⁹³*Ibid.*, p. 267.

In a reference to the process of 'problem solving' in design, Gelernter adds that if the child is '[f]aced with any new problem, he first searches this repertoire to see if any existing schema will solve it.'¹⁹⁴

Piaget's 'structuralist' formulation remains wedded to rationalism in that the schemata which are considered to structure the mind are, firstly, able to be brought to presence and, secondly, are considered the grounds for understanding and acting. As will be seen, many contemporary design models adopt this Structuralist formulation.

Gelernter is persuaded by the Structuralist argument. He claims that 'Piaget's idea — more than any other theory we have seen so far — reconciles free will and causality.'¹⁹⁵ Approvingly, he later adds that:

More than any theories before, this [Piaget's theory] reconciles the differences between Empiricism and Rationalism. Although sense experience provides the content of knowledge, it can only be understood when the mind imposes form upon it; but the mind adjusts its forms as it tests them against the sense experience. Piaget's theory also begins to explain the curious relationship between knowledge and creation...They both employ the same inherent mechanisms in the mind, actively creating 'form' to test against the outside world.¹⁹⁶ [my gloss in brackets]

Adopting a more critical post-foundationalist position than that of Gelernter, Coyne and Snodgrass offer accounts of the ways in which rationalism, especially in its Structuralist manifestation, is embedded in the assumptions of historically recent

¹⁹⁴*Idem.*

¹⁹⁵*Idem.*

¹⁹⁶Gelernter, *Sources of Architectural Form*, op. cit., pp. 267-8.

design theories. Coyne demonstrates how the *Design Methods Movement* of the 1950's and 1960's, and its heirs in the design computing field, all articulate particular aspects of rationalism.

Design Methods

The design methods movement sought to apply the methodological rigour of science to design. The movement drew upon 'system theory' in its attempts to develop methods, theories and models for the design process.¹⁹⁷ When applied to design, system theory was considered neutral, it 'was about principles that underlie all design activity, independently of the kind of artefact produced.'¹⁹⁸

The most widely accepted design model/method that arose from the methods movement (and which still has currency)¹⁹⁹ is that of *analysis, synthesis and evaluation*. As Coyne points out, this model of the design process closely follows the Cartesian method of reasoning,²⁰⁰ described in chapter 1, in which the problem is firstly broken into parts, then new facts are logically deduced, and finally the process is checked to ensure there are no omissions. Applied to design, the model has numerous permutations,²⁰¹ one of which is described in the text *Knowledge-Based Design Systems*:

The first task is to diagnose, define and prepare — that is, to understand the problem and produce an explicit statement of goals. The second task involves finding plausible solutions. The third task concerns judging the validity of solutions relative to the goals and selecting among alternatives. A cycle is implied in which the solution is

¹⁹⁷Coyne, *Designing Information Technology in the Postmodern Age*, op. cit., pp. 210ff.

¹⁹⁸*Ibid.*, p. 219.

¹⁹⁹Coyne et al., *Knowledge-Based Design Systems*, op. cit., pp. 11-15.

²⁰⁰Coyne, *Designing Information Technology in the Postmodern Age*, op. cit., p. 22.

²⁰¹See for example Alexander, *Notes on the Synthesis of Form*, op. cit.; Asimow, M. *An Introduction to Design*. Englewood Cliffs: Prentice-Hall, 1962; and Jones, *Design Methods*, op. cit.

revised and improved by reexamining the analysis. These three phases form the basis of a framework for planning, organizing, and evolving design projects.²⁰²

The three-phase process is thus sequential, in that analysis is followed by synthesis which is followed by evaluation. It is cyclical, in that '[e]valuation results in a revised analysis of the problem, which leads to the synthesis of a new provisional solution.'²⁰³ And, as indicated in the accompanying figure, it is recursive, with each recurrence being less general than the preceding.

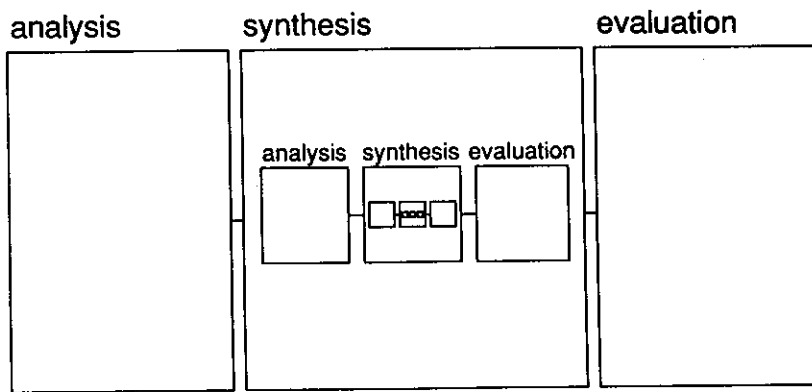


Figure:

'Analysis, synthesis, and evaluation as a recursive process.' (*Knowledge-Based Design Systems*, 1990, p. 15)

Generative Models

The three-phase model has been criticised because it fails to explain where designs arise from in the synthesis stage.²⁰⁴ Indeed, the process of synthesis remains problematic for all such rationalist and methodological descriptions of design. One

²⁰²Coyne et al., *Knowledge-Based Design Systems*, op. cit., p. 12.

²⁰³*Ibid.*, p. 13.

²⁰⁴*Ibid.*, p. 15.

approach to the overcoming of this problem has simply been to treat the synthesis phase as mysterious, as a 'black box' out of which creative ideas emerge. This, as we have seen, is a Romantic characterisation. Gelernter's complimentary description of Hillier's conjecture-analysis model, which is a modification to the three-phase design model, captures perfectly the melding of the Romantic and Rationalist characterisations in the different phases of the design process model:

Like other Structuralist theories, this one [Hillier's] focused attention not solely on mind or the world but on the interactions between the two. It consequently explained more clearly the respective roles of artistic invention and scientific analysis in the design process. In the conjecture mode, the designer draws upon his or her existing cognitive schemata and uses extra-rational and artistic procedures of analogy, metaphor and sudden flashes of insight to create new ideas; while in the analysis mode the designer uses rational and rigorously scientific thinking to study the consequences of that new idea for the design requirements.²⁰⁵ [my gloss in brackets]

However, the problem with any Romantic characterisation of the synthesis phase is that it cannot be made computable. Various models have therefore been advanced to explain the *generation* of designs in ways which appear more amenable to computation. One prominent explanation of the synthesis phase — said to go back at least to Aristotle²⁰⁶ — proposes that the generation of new forms comes about by the combination of pre-existing atomic elements. For example, elements of a bird and a pig may be combined to generate a new creature: a winged, flying pig (or a rotund, snouted, ground dwelling bird).

²⁰⁵Gelernter, *Sources of Architectural Form*, op. cit., p. 274.

²⁰⁶Coyne, *Designing Information Technology in the Postmodern Age*, op. cit., p. 222.

When incorporated into a computational model, the combinatorial method of design generation may be governed by operators or rules which 'direct' the process of combination. This process is employed in generative design models such as *shape grammars*.²⁰⁷ Here geometrical elements, which may represent atomic architectural components, are operated upon by various levels of rules and meta-rules which move the representation from one state to the next. Each change of state brought about by the application of a rule incrementally moves the process toward an end state in which a representation is arrived at which satisfies a set of goals.

State-Space Search Models

Another group of models of the design process which use the notion of searching through a 'state space' are the so-called *automated problem solving systems* which derive from Newell and Simon's 'General Problem Solver'.²⁰⁸ The search is directed by goals and operators which move the search from state to state. Because of the vast number of possible solution paths, rules are incorporated to make the search more efficient. Thus at each step there is a *means-ends* evaluation where the current state is assessed and the best means for achieving the goal state is determined.

One of the methods used to control the state-space search is *optimization*.²⁰⁹ Optimization seeks the 'best' possible design relative to the conditions of the problem formulation.²¹⁰ Optimization requires that the performance criteria, the performance constraints, and the decision variables first be formulated. The decision variables, which are values assigned to the descriptions of the design (such as the dimensions of spaces and components), describe the state of the design. The

²⁰⁷Stiny, G. *Pictorial and Formal Aspects of Shape Grammars*. Basel: Birkhauser Verlag, 1975; Stiny, "Introduction to Shape and Shape Grammars" *op. cit.*

²⁰⁸Newell and Simon, *Human Problem Solving*, *op. cit.*,

²⁰⁹Radford and Gero, *Design By Optimization in Architecture, Building and Construction*, *op. cit.*; Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, p. 19.

²¹⁰*Ibid.*, p. 18.

designer adjusts the value of the decision variables in order to control the performance constraints and meet the performance criteria. Because the optimization method relies upon the development of well-formulated design criteria at the outset of the process, it is felt that '[o]ptimization has failed to influence the field of design greatly...in part because it does not address the question of how to arrive at such well-packaged formulations.'²¹¹

The design methods described above deal with models of the design process which do not claim to represent human cognitive processes: 'The models may have very little value as descriptions of human processes. They serve our purpose, however, if they result in useful systems that fit into a designer's mode of operation.'²¹² Regardless of this disclaimer, it would seem that these methods *are* understood to bear a relation to the human design process. Cartesian method was thought to bring to presence the steps in the process of human reasoning. If only because the long hegemony of rationalism has meant that *method itself* has become ontologised as constitutive of human reason, the methodological models of the design process, which were derived from Descartes' method, are inevitably viewed as attempts to *bring to presence* the steps in the process of human 'design reasoning'. Thus while it is claimed in *Knowledge-Based Design Systems* that the models do not attempt to represent 'how designers do what they do', a tension is revealed when in the same sentence it is stated that the intention is to 'provide models by which we can explain and perhaps even replicate certain aspects of design behaviour.'²¹³

Cognitive Models

One class of design model that does overtly attempt to model the mental processes of the human designer is the group described as *cognitive design models*. Like the methodological descriptions of the design process these too are shown to depend

²¹¹*Ibid.*, p. 19.

²¹²*Ibid.*, p. 9.

²¹³*Ibid.*, p. 37.

upon *presence*. All make the assumption that the workings of the mind are able to be made present or, even more pointedly, that there is a self-awareness of the reasoning process, that is, that the reasoning is made present to us *as* we reason. Thus in his explication of Artificial Intelligence, Schank makes the following assertion about human intelligence:

We expect intelligent entities to have some knowledge about themselves. They should know when they need something; they should know what they think about something; and, they should know that they know it.²¹⁴

Coyne describes numerous cognitive models, all of which can be seen to depend in different ways on the rationalist assumption that human understanding is able to be made present.²¹⁵ In the 'plausible inference model', which is used most successfully in expert systems for medical diagnosis, each of a number of plausible determinations about a particular state of affairs is pursued. Each determination is assigned a probability which is ascertained by the application of rules. The determination with the highest probability — that is, the most plausible — wins. This model relies on the notion that decision making involves bringing to presence alternative possibilities in our mind and performing a mental comparison between these alternatives in order to make a choice.

The 'nonmonotonic inference model' depends upon the notion that we may hold contradictory positions about some state of affairs right up until a decision is necessary, at which point one of the contradictory positions is selected above the others. After describing an example of nonmonotonic inference used in the design of a house where two different lines of dependent reasoning are followed — one for

²¹⁴Schank, "What is AI Anyway?", *op. cit.*, p. 5.

²¹⁵Coyne, *Designing Information Technology in the Postmodern Age*, *op. cit.*, pp. 228-38.

timber cladding and the other for brick — Coyne concludes that '[t]hrough this complicated procedure, we keep mental note of parallel lines of argument and defer a final choice until as late as possible.'²¹⁶ In this model the choice between the lines of reasoning is eventually made on the basis of the number of beliefs that support each option. Numerous rationalist conceptions are embedded in this model. The model relies on the notions that mind holds 'beliefs' about the world that can be brought to presence and that these are the basis for our decision making. It also assumes that our mental lines of reasoning in the design process can be brought to presence to enable us to choose between them.

Coyne also describes models which utilise Structuralist notions of mental 'schemata', similar to that referred to earlier in relation to Piaget's work. In these models, there is assumed to exist a repertoire of generic schemata which have been assembled as an outcome of experience. When a situation is encountered, the most appropriate schema is accessed and used as the basis of the response to the situation. When applied to design, a schema, such as that for a kitchen bench layout, is considered to exist as part of a component, the kitchen room say, which is part of the larger schema for a house, and so on. These models assume that when a design problem is encountered this new problem is matched to some existing generic schema. Taking into account the fact that changes in one component of the design will cause changes in others (the 'inheritance' and 'component' relations), the design process navigates through the schemata towards a solution (an 'instant' of the generic schema) using rules and problem-solving strategies. These models thus rely on the notion that the schemata are held in the mind as a form of presence that can be accessed when appropriate.

Other models, such as those which reason from 'memories' of *specific cases*, and *connectionist* models which utilise remembered connections between nodes in neural

²¹⁶*Ibid.*, p. 230.

networks, also rely on similar assumptions about storing experience as a form of presence. Coyne says of the 'specific case' model, that it assumes that 'human reasoning involves a very sophisticated indexing system,' and that 'in design, we store cases of previously encountered designs and design situations. To design is to make an appropriate recollection and to apply the appropriate modifications so that the old design fits the new situation.'²¹⁷ Likewise, the connectionist model relies on the storage of linkages between remembered features, such as the relations between the pieces of furniture which belong to particular spaces. In designing, the 'network is able to "recall" combinations of features that did not exist in the original training set.'²¹⁸ This newly created set is not an arbitrary combination, but takes into account affinities and inhibitions between features from different sets.

The understanding normalised in all of these rationalist models of the design process — that design involves the manipulation of forms of *presence* — will be contested in Division II and III of this dissertation. Using Heidegger's notion of 'background,' it will be argued that by assuming that the mind 'stores' memories, schemata, or connections between remembered features (which, in terms of the discussion in chapter 1, can be seen to constitute a *representational* view of the mind) these models misunderstand the nature of the mind and its apparent ability to recollect and reprocess memories. It will be contended that if memories were stored, or experiences structured, in a way that made them 'present' in the mind and therefore able to be recalled or manipulated, *then we would simply not be able to design*, as design relies upon the possibility that experiences are never reified as any form of presence (memories or schemata, for example) but are always held open for reinterpretation. Indeed, it is arguable that earlier non-autonomous models of design, such as those proposed by the methods movement, appeared workable *only because* they were not autonomous, that is, they relied on the role of the human

²¹⁷*Ibid.*, p. 232.

²¹⁸*Ibid.*, p. 235.

interpreter. Attempts to make design autonomous through computation has exposed this weakness, as Dreyfus states '...AI research has called the Cartesian cognitivist's bluff.'²¹⁹

Rationalism's Role in Ecologically Thoughtful Design

The rationalist understanding of the design process is evident in much of the discourse on environmentally thoughtful design. In the remainder of this chapter, I want to draw out *four of the key rationalist assumptions* that have been shown to be at work in the various formulations of the design process discussed thus far, and demonstrate both how these assumptions have influenced the discourse on environmentally thoughtful design and how they have led to a particular way of understanding and articulating how design itself might be transformed in order to participate in the overcoming of the ecological crisis. The four assumptions are: (i) that design is intentional; (ii) that the free will of the designer allows control and choice of values, attitudes, beliefs and principles; (iii) that technology is neutral and able to be controlled through design; and (iv) that the design process is itself neutral.

(i) Design is Intentional

Classical design theory was grounded on the assumption that by following the rules of geometry and proportion, together with the more pragmatic rules of construction and siting, the design would acquire universal validity and beauty. Likewise, *Renaissance designers* held that design practice was grounded in pre-established theory. The *methods movement* also held that designing first required getting clear about the goals, objectives, needs, purposes and functional criteria. Having established these, both the generation of design ideas and the evaluation of those ideas would follow. The three-phase model thus begins with the analysis phase in which the problem is clarified and the intentions established. *Optimization*

²¹⁹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 119. For a discussion of the growing awareness of the problems with attempts to automate the design process, see McLaughlin, "Practices and Primordial Understanding," *op. cit.*, pp. 8ff.

models are even more rigorous in their demand that goals, objectives, performance variables, constraints and criteria be established in advance of the generation of designs, as these direct the state-space search. Newell and Simon's model of human problem solving in particular, and *cognitivist models* of design in general, all assume design to be a goal driven process.²²⁰

The various historical interpretations of the design process can thus be seen to have adopted the more general rationalist understanding that *all purposeful activity is goal driven*. Knitted into this understanding is the Cartesian notion that 'there must be some content in our minds — some internal representation — that enables us to direct our minds toward each object.'²²¹ For designers, the 'intentional content' of the mind — that which the mind 'intends toward' — are the goals or objectives, or the satisfaction of needs or functional requirements. For designers to intend toward a goal therefore implies both that they have a representation of that goal *in mind*, and that their minds are directed toward something *in the world*, some future state where this goal is realised.

In accordance with the rationalist understanding that design is directed by conscious intentions, the discourse of ecologically thoughtful design appears to place great importance on the role of goals, objectives, needs and criteria. Because design is held to be goal directed, the key strategy for transforming design is to *transform its goals*. In the very first paragraph of *The Green Imperative*, Papanek states:

All design is goal-directed play. Only our questions change. We no longer ask, 'How does it look?' or 'How does it work?' We are more interested now in the answer to, 'How does it relate?'²²²

²²⁰*Ibid.*, p. 6.

²²¹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 5.

²²²Papanek, *The Green Imperative*, *op. cit.*, p. 7.

Papanek is thus reasserting the rationalist assumption that design is goal directed, and arguing that if design is to transform in response to the ecological crisis it must move away from a focus on aesthetic goals to a focus on relational, that is, ecological, goals.

Likewise Cook, arguing for architectural designers to 'remake the case' for an environmentally responsive architecture, claims that:

Such a remaking must be more than a face-lift. It requires a reconceptualization of *goals* in the built environment. Buildings in their discrete entity are of all built objects the easiest to understand and to design as whole systems. But a radical shift in design *goals* for all aspects of the built environment is required.²²³ [my italics]

In accordance with the understanding that design begins with the establishment of a set of performance requirements, needs, or functional criteria, the literature on environmentally responsible design places great emphasis on setting out appropriate environmental criteria and demonstrating, often through the use of cases, how this criteria may be employed as the generator of the design outcome. Texts such as the Vale's *Green Architecture* and Mackenzie's *Design for the Environment* follow this pattern. Indeed, as was pointed out in chapter 1, McKenzie makes the strong claim that 'the inclusion of environment criteria as an integral part of the design process will be one of the most important and far-reaching developments in the history of design.'

The environmental policy statements of the various national and international design institutions are often almost entirely dedicated to the scheduling of quite

²²³Cook, J. "Environmentally Benign Architecture: Beyond Passive." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994, p. 146.

specific environmental criteria,²²⁴ the clear implication being that such criteria are assumed to be the starting point for redirecting design toward the generation of more environmentally responsible outcomes. Likewise, the body of literature which provides information on the environmental impact of materials and the 'embodied energy' of construction components and systems,²²⁵ also assumes that such criteria will form the basis for the generation of the design outcome, as well as the basis for its evaluation — in line with the three-phase model of design.

Perhaps because the representational model of the mind upon which the rationalist understanding of design is founded allows only the possibility of either subjectivity or objectivity, the ecological design literature places emphasis on seeking to objectively establish (or create the impression of seeking to objectively establish) the requirements and criteria which are to be used as the basis of design. As noted in chapter 1, the first step of the argument in this literature is generally to describe the parameters of ecological crisis. This often involves employing statistical and scientific evidence in support of the description. The credibility of the case for requiring ecological design, it would seem, rests on establishing a 'true' representation of the ecological problem. Having objectively established what the problem is, it becomes possible to assemble the needs and criteria which logically flow from this analysis of the problem. For example, if there is objective evidence that resources are being used at a faster rate than they are being renewed, then the design criterion which would legitimately flow from this would be that the design outcome should minimise the use of non-renewable resources. This formula of legitimizing the design criteria by first establishing the objectivity of the problem is,

²²⁴See for example Royal Australian Institute of Architects, "RAIA Environment Policy," *op. cit.*; and New Zealand Institute of Architects, NZIA - *Duroid environmental Policy Papers (EPP'S)*, *op. cit.*

²²⁵See for example Baird, G. "Materials Selection and Energy Efficiency." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994; Fox, A. and Murrell, R. *Green Design: A Guide to the Environmental Impact of Building Materials*. London: Architecture Design and Technology Press, 1989; Lawson, W. *Building Materials, Energy and the Environment: Towards Ecological Sustainability*. Canberra: RAIA, 1995; Partridge, H. and W. Lawson. *A Method for the Quantitative Assessment of the Ecological Sustainability of Building Materials*. Vol. 1. Proc. Solar 94, Sydney: UNSW, 1994; and the special edition of *Exedra* on Ecologically Sustainable Building Materials, *Exedra* 4 (1 1993).

for example, evidenced in the format of the design criteria scheduled in the Royal Australian Institute of Architects' Environment Policy, where each set of criteria is introduced by an authoritative statement of the parameters of the ecological problem:

Minimise Pollution: Minimise Greenhouse Gas Emissions

Increased concentrations of carbon dioxide (CO₂), methane, chlorofluorocarbons (CFCs) and other greenhouse gases are expected to lead to an enhanced greenhouse effect with resultant climate and environmental changes. The major generator of CO₂ is the combustion of fossil fuels, particularly for the production of electricity. To achieve the 20% reduction in CO₂ agreed by the Federal Government in the Toronto Targets, major shifts must occur in building design and the selection of materials and systems, such as

- Recommending urban forms and buildings that reduce the need for transport
- Encourage the use of energy efficient and less polluting modes of transport
- Encouraging a reduction in the need for energy by maximising passive thermal comfort using renewable energy and by re-evaluating design comfort criteria...²²⁶

The emphasis on establishing an objective basis for design criteria is, perhaps understandably, even more in evidence in the design sciences' approach to ecological design, where methods such as environmental audits, objective assessments of the environmental impact of building materials, and quantitative determinations of the energy efficiency of construction systems and building

²²⁶Royal Australian Institute of Architects. "RAIA Environment Policy," *op. cit.*

configurations have been developed.²²⁷

There is a very real sense in which, having objectively established the presence of the problem and therefore the legitimacy of the needs and criteria which flow from it, design itself is *de-politicised* and becomes primarily a technical exercise which simply seeks the 'best' way to incorporate all of the needs and criteria in order to achieve the goals — much in the fashion of the optimization model of design. The assumption that the problem has an objective existence, and that the role of design is to harmonize as best as possible the established needs and criteria, allow the Vales to make the rather extraordinary claim that:

If architecture is to be subservient, then it must take account, not just of the way the building satisfies the immediate users, or even of the way in which it becomes part of the public realm, but of *every person remotely affected by it*.²²⁸ [my italics]

The assumption appears to be that design is able to incorporate and harmonise the needs of every 'remotely affected' person because what the problem 'is' is objectively fixed, and every person will therefore see the problem in the same way and have similar, or at least compatible, sets of needs in relation to the problem. However, the assumption that the ecological crisis does, or should, have a unitary presence appears unsupportable. The contestation between the different groups *within* a community over the setting of environmental goals and criteria (evidenced in Australia for example in the drafting of the National Strategy of Ecologically

²²⁷See for example Samuels, R. "Environmental Accountability: Users, Buildings and Energy." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994; Vinten, G. "Environmental Auditing and the Built Environment." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994; Lawson, B., H. Partridge, and J. Gelder. *Environment Design Guide: Assessing the Environmental Impact of Building Materials*. Royal Australian Institute of Architects, 1995; and Energy Division of Department of Primary Industries and Energy. *House Energy Rating System (HERS)*. Commonwealth of Australia.

²²⁸Vale, *Green Architecture*, op. cit., p. 13.

Sustainable Development)²²⁹ and the contestation between the *different* communities over the same issue (evidenced, for example, in the marked variance in the perception of environmental problems between countries of 'the North' and those of 'the South' at the Earth Summit in Rio de Janeiro)²³⁰ appear to undermine the understanding that there is *an* objectively existing environmental problem or that design might be an apolitical activity.

Contesting the View that Design is Intentional

McLaughlin puts forward a strong case that the goal-directed view of design is flawed, and suggests that intentions need play no role in the design process.²³¹ Coyne also throws doubt over the role of intentions in design:

There are ways of looking at actions that obviate the need for intention, as in Heidegger's characterisation of the unreflective involvement in the world, notions of tacit knowledge, the pragmatic line on action as a form of thinking, Wittgenstein's identification of the elusive nature of intention in language, Dreyfus' notion (borrowed from Heidegger) that we simply take over practices rather than act intentionally. An intention is constructed in a context.²³²

While I agree that the rational tradition has misunderstood the character of intentionality, I want to argue that intentionality cannot be occluded from any description of the design process. In Division II and III of this dissertation, an alternative to the rationalist formulation of intentionality, also grounded in Heideggerian thought, is shown to have significant implications for an understanding of the design process. It is argued that intentions which are *made*

²²⁹Commonwealth of Australia, *Draft National Strategy for ecologically Sustainable Development*, *op. cit.*

²³⁰Rio: Unravelling the Consequences. Special issue of *Environmental Politics* 2 (4 1993).

²³¹McLaughlin, "Practices and Primordial Understanding," *op. cit.*, pp. 90ff.

²³²Coyne, *Designing Information Technology in the Postmodern Age*, *op. cit.*, pp. 141-42.

present during the process of design in the form of goals and criteria satisfaction *do* play an important role in design, but that these intentions do not simply map onto outcomes in the way that rationalism has assumed theory maps onto practice.

By proposing that needs, functional requirements and criteria are assembled at the *outset* of the design process, rationalist models of the design process appear to assume that needs and requirements are conditions which somehow already exist in the world. That, for example, particular client needs or the requirement to minimise the use of non-renewable resources are *already* present in the world and are therefore able to be gathered through the appropriate processes of pre-design research and analysis. Even where it has been recognised that all of the goals and criteria cannot be gathered at the outset of the design process,²³³ and that requirements emerge as the design develops, the assumption still appears to be that the needs and requirements are 'there' awaiting collection as the understanding of the design situation progresses and becomes more sophisticated.²³⁴ In Division II it will be contended that the needs and criteria which are the basis of the generation of design outcomes do not pre-exist but are in fact 'design outcomes' that have themselves been 'generated'. This also undermines the notion that there is a division between the stage of rational analysis in which needs and criteria are established and the mystical creative phase of outcome generation. With the dissolution of this division, the assumption that the creative act of design is something carried out by a privileged community of 'designers' is also challenged.

Finally, the difficulties of assuming that the ecological problem has an objective existence, and that there are therefore objective needs and criteria that flow from it,

²³³See for example Archer, J. "Puzzle-making: What Architects do when no one is Looking." In *The Computability of Design*, ed. Y. Kalay. 37-52. New York: Wiley, 1987; and Smithers, T., A. Conkie, J. Doheny, B. Logan, and K. Millington. "Design as Intelligent Behaviour: An AI in Design Research Programme." In *Artificial Intelligence in Design*, ed. J. Gero. 293-334. Berlin: Springer-Verlag, 1989.

²³⁴McLaughlin, "Practices and Primordial Understanding," *op. cit.*, p. 102.

are drawn out in Division III of this dissertation. The belief that environmentalism relies for its legitimacy on the objective grounding of environmental problems is articulated by Trigg. He fears that if environmentalists abandon scientific realism because they apprehend dangers in the environmental impact of techno-science then environmentalism loses the very ground for its own movement:

The risk is that they [environmentalists] resist science by acquiescing in the notion that it is just one interpretation of the world amongst many. It is merely yet another form of life. This may cut science down to size, but it does nothing to enhance the claims of environmentalism. They too can easily be dismissed by others as members of some eccentric way of life. They must, instead, appeal to a concept of a nature which exists in itself, independently of human conceptions. In other words, environmentalists can only claim to be heard and only present a coherent theory by being realists.²³⁵ [my gloss in brackets]

In an attempt to encourage designers to take a more ecological view of their design interventions, Lamb appears to contradict the position that the environmental problem has an objective reality.²³⁶ Lamb holds that so-called 'ecological problems' are not problems which have a tangible existence in the environment, but are instead human social problems grounded only in human values:

There are no ecological problems in the natural world: floods, fires, droughts, plagues and species extinction, to name a few, are natural events to which ecosystems are adapted...We may find floods, fires, droughts and plagues to threaten our interests or safety...We therefore conceive of these matters as environmental problems: i.e., as having

²³⁵Trigg, *Rationality and Science*, *op. cit.*, p. 10.

²³⁶Lamb, R. "The Challenge of Ecology to the Design Professions, I: Invention and Intervention." *Exedra* 3 (1 1991): 16-24.

some tangible existence in the environment, and requiring remedial action. As such we are inclined...to look for technical answers to these problems (Passmore, Cotgrove, Tivy and O'Hare), without noticing we have created the notion of "environmental problem" ourselves: it is a construction, and an illusion.²³⁷

Lamb is not however proposing any relativist (non-representationalist anti-realist) notion that all reality is 'a construction'. Rather, like Trigg, he is arguing from within the subject-object or appearance-reality dualism of rationalist scientific realism. However, in this case ecological problems are taken to be the 'illusion', the mere appearance. For Lamb, the 'reality' is the value-free existence of the ecology itself, and it is this reality which designers omit from their design process:

...the consistent failure of designed solutions to environmental problems is derived from the mis-identification of the nature and properties of these problems, and that they are no more than artificial constructs devised to justify developments. The particular values of the human players in the development then describe the environment within which the designed solution is sought. The *substantive natural and social environment, except as a reflection of the values of the players*, is left out.²³⁸ [my italics]

The rationalist framework thus creates particular dilemmas for ecologically responsible design. Accepting Trigg's argument, it would appear that the legitimacy of the environmental problem which designers are addressing is dependent upon it having an objective reality. If the environmental problem were a cultural construction, any ground for action would be lost. Accepting Lamb's thesis, the

²³⁷*Ibid.*, p. 19.

²³⁸*Ibid.*, p. 16.

environmental problem is not an objective reality but an illusion. To avoid the problems created by working within the framework of this illusion, designers need to set aside the human significance of the ecology and integrate into their designing an ecology which has a value-free existence. It is questionable however whether design could work with an ecology 'stripped' of its significance (or whether indeed ecology would even show up as having an existence if it had no significance relative to human beings).²³⁹

It will be argued that the dilemmas inherent in these arguments arise from a choice that is limited to three possibilities: the subjectivity or objectivity of rationalism, or the cultural constructions of anti-realist postmodernism. Using a realist interpretation of Heidegger's post-foundationalist thought, both the rationalist possibility of 'mind-independent' objectivity, and the Rortiesque possibility that objectivity is no more than the solidarity of the beliefs of particular communities, are challenged. It is instead argued that what a thing 'is', it is for a particular way of being, a particular set of practices. This maintains the very tangible and menacing reality of the different manifestations of the environmental crisis for different communities, but allows other ways of understanding the environmental crisis and of conceiving of its overcoming by design. Finally, in Division III, Heidegger's notion of Earth is employed to explore the problems and possibilities of working with a conception of ecology which is free of anthropocentric values.

(ii) Designers Choose their Values, Attitudes, Beliefs and Principles

Rationalism assumes that human behaviour is underlaid and explained by beliefs, values, attitudes, desires and principles.²⁴⁰ It further assumes that these are able to

²³⁹The possibility of nature being value-free — or at least having its own 'intrinsic' value and thereby being free of human value — is critiqued by Fry, who argues that '[i]n the main that debate's argument rests on a refinement of a call to the liberal humanist tradition to criticise and reform itself by recourse to norms drawn from a referential value projected as existing elsewhere, in nature — which is itself of course an anthropocentric construct.' Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, p.18.

²⁴⁰Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 4-5.

be made explicit, that is, are able to be brought to presence.²⁴¹ Beliefs, values, attitudes, desires and principles are held to have a critical role in the design process. The apparent purposefulness of the design process is explained by the fact that 'we have in mind some idea of a desired state'²⁴² which we then press toward. The desire for one particular state, as opposed to some other state, is explained by our attitudes, values and beliefs.²⁴³ To desire an ecologically sustainable house rather than a hedonistic resource-consuming house, for example, is accounted for on the basis of the particular values, attitudes or beliefs that we hold or the principles that we live by. Values, attitudes, beliefs, desires and principles are thus assumed to act as meta-level controllers of our actions, including our design actions.

In methodological models of the design process, attitudes, values, beliefs, and desires are assumed to be embedded in the goals, needs, criteria, and requirements which are assembled as part of the analysis phase of the design process. Our attitudes, beliefs, and values guide our determination of which criteria are important and whose needs deserve inclusion in the design process. In the cognitivist models of the design process, beliefs, values and attitudes might be said to be captured by meta-level rules and strategies. The 'plausible inference model', for example, utilises probability values to capture the 'strengths' of our beliefs, while the 'circumspective inference model' bases the decision to choose one competing line of reasoning over another on the number of beliefs supporting each.

In his book *Envisioning a Sustainable Society: Learning Our Way Out*, Milbrath makes a strong claim for the role of values as the meta-level controllers of our action:

Values are fundamental to everything we do. The values we hold

²⁴¹ *Idem.*

²⁴² Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, p. 5.

²⁴³ Coyne et al. state that '[a] strong determinant of the goals we set is our system of values.' *Ibid.*, p. 6.

govern the way we behave and what we expect from our society. Values differ from preferences in that they are held strongly and generalize readily to many situations, whereas preferences are held less strongly and do not generalize very readily. For example, you might tell me that you prefer ice cream to melon for dessert but, the next time I ask you, I would not be surprised if you were to tell me that you prefer melon to ice cream. Furthermore, that I hold a similar preference would not be important to you. On the other hand, we do strongly desire that other people hold our most important values. If I say I value honesty, it means that it is not only important to me that I am honest with you but that you are honest with me.²⁴⁴

Milbrath contends that if we are to achieve a sustainable future we must transform our values:

My aim is to enlist your participation in this inquiry and encourage you to rethink your own value structure. I seek a structure of values that will make achieving and maintaining a long-running sustainable and harmonious relationship with nature easier for our society.²⁴⁵

As evidenced in chapter 1, this view that the key to the overcoming of the ecological crisis lies in *transforming* our values, attitudes, beliefs, desires and principles is common to much ecological design literature. Vale contends that:

A realization of the problem and the resources in common may form the beginnings of some more fundamental change in attitude which is

²⁴⁴Milbrath, L. *Envisioning a Sustainable Society: Learning Our Way Out*. Albany: State University of New York Press, 1989, p. 58.

²⁴⁵*Idem.*

the necessary precursor to change.²⁴⁶

In *Global Warming and the Built Environment*, Cook similarly argues that :

New attitudes are needed both for those directly in charge [politicians] and the general public if a sustainable welfare is to be reached. Such changes are very slow, and might constitute the most severe barrier for solving acute environmental problems in time.²⁴⁷ [my gloss in brackets]

This view that the key to the overcoming of the ecological crisis lies in *transforming* our values, attitudes, beliefs, desires and principles has also led to an emphasis, evidenced in the review of the ecological design literature in chapter 1, on articulating new *values* and *attitudes*, and setting out new sets of *principles*, including new environmental *ethics*.

Contesting that we may Choose to Change our Values, Attitudes, Beliefs, Desires and Principles

The notion, pervasive in ecological design literature, that we may be able to *choose* to change our values, beliefs, attitudes, desires and principles, is a legacy of Liberalism's ideal of the free will of the subject. As we have seen, the Cartesian separation of the meaning-giving mind from the objectively existing world, together with the idea of the subject controlling objects, prepared the ground for Locke's displacement of the antecedent understanding that the world was imbued with a pre-ordained God given order, and allowed the establishment of the modern understanding of the autonomy of the individual subject. The ontological individualism inherent in the notion of an autonomous subject in control of the objects of the world eventually

²⁴⁶Vale, *Green Architecture*, op. cit., p. 44.

²⁴⁷Samuels, *Global Warming and the Built Environment*, op. cit., p. 217.

extended to the possibility of a subject in control of its values, attitudes, beliefs, desires, and principles. As Guignon says in relation to modern techniques for improving 'the self':

With the tremendous success of instrumental reason in achieving control over the world, a conception of action as based on means-ends calculations became widely accepted. Through a formalizable procedure, it seems, we can work things over in order to achieve our goals. This capacity for strategic calculation and technical control was quite naturally extended to include a psychotechnology for self-improvement.²⁴⁸

Guignon, however, condemns this turn:

For when values are thought of as items on hand for our free choice, we will tend to think of ourselves as dimensionless points of raw will, not attached in advance to anything, who can freely pick and choose among the smorgasbord of values set before us.²⁴⁹

Dreyfus, following Heidegger, is even more scathing of the possibility that we may choose our values:

Choosing one's self-interpretation and all one's "values" would be absurd. If there were no difference between *that which* we choose and *that on the basis of which* we choose, if *everything* were up for choice, there would be no basis left for choosing one thing rather than another, and free choice would amount to an absurdity.²⁵⁰

²⁴⁸Guignon, *The Cambridge Companion to Heidegger*, op. cit., p. 219.

²⁴⁹*Ibid.*, p. 221.

²⁵⁰Dreyfus, *Being-in-the-World*, op. cit., p. 189.

The ecological design literature's assertions that what is required to overcome the ecological crisis is somehow to transform the values, principles, desires, beliefs or attitudes in respect of the environment, is grounded in the rationalist assumption that there is some 'content of the mind' that is our values, principles, desires, beliefs or attitudes. This content of the mind is either considered to be held in contradistinction to the reality of the world (when it is said that our beliefs about the world do not match the actual state of the world) or considered to be the product of the influence of the world (when it is said that our attitudes are 'formed' by the world we live in). In either case there is something 'in the mind' which can be said to be our beliefs, desires, principles, values or attitudes, and to change these is ultimately to change the content of the mind.

It is argued in divisions II and III of this dissertation that the rationalist tradition's mentalisation of attitudes, desires, beliefs, principles and values is misconceived and that there may indeed be *no such mental content*. It is instead held that attitudes, desires, beliefs, principles and values are posterior assertions about ways of being which do not exist as 'mental presences' and therefore cannot be instrumentally controlled in the way assumed by a rationalist understanding. Paradoxically, however, this does not lead to the conclusion that attempts to articulate new ecological values, new ecological attitudes and new ecological principles are futile. Rather, a new understanding of both what it is that is being articulated in these assertions, and the relationship between such assertions and the projects and practices which constitute our way of being, is explored. This in turn highlights the question central to the premise of ecological design: whether it is possible to control or direct the transformation of our ways of being 'by design'.

(iii) Design Controls Neutral Technologies

As has been noted, Cartesian ontology radically changed the understanding of the

relationship between humans and their environment. Rather than being immersed in a world that was *itself* meaningful, the human subject was now located in a Cartesian space of meaningless objects to which the mind *gave meaning*. This has had two significant and related outcomes for the modern understanding of technology. Firstly, it led to the normalising of the understanding that technology has no meaning or agency in and of itself — that it is *neutral*. Secondly, it established the understanding that technology is an instrument, a tool — that it is something *controlled* by the human subject.

The everyday empirical evidence used to support both these understandings is that the same technology appears able to be used for different functional and moral ends. A knife may be used for slicing bread or committing a murder; nuclear technology may be used to produce 'clean' energy or weapons of destruction. It therefore follows that nuclear technologies and knives are in themselves neutral technologies, and that the user, the human subject, is in control of the purposes to which they are put.

Snodgrass contends that discussing technology in terms of this metaphor of instrumentality allows the discourse only two possible conclusions: that technology is either 'under control' or 'out of control'.²⁵¹ In the domain of design theory, including ecological design theory, technology is generally treated as if 'under control'. It is primarily a tool for achieving purposes and goals and meeting functional criteria. In the domain of the wider ecological debate, however, it is not unusual for technology to be characterised as out of control:

- They point to global warming, ozone holes, nuclear arsenals, pollution, smart bombs, genetic engineering, user-friendly means of mass

²⁵¹Snodgrass, A. *Translating Tradition: Technology, Heidegger's 'Letting-be' and Japanese New Wave Architecture*. Working Paper, University of Sydney, pp. 3-4.

extermination, and a host of other potentially destructive phenomena to support their argument that science and technology are running amok, and have escaped human control in the manner of machine whose brakes have failed.²⁵²

Contemporary models of the design process have focussed on either the *methods* or the *mental processes* of designing. In both cases, the emphasis is placed almost entirely on understanding *the agency of the subject* in the design process. The only consideration given to technologies is either in their role as objects that are represented, operated upon and produced by the agency of the subject,²⁵³ or in their role as tools utilized by the subject in the production of those design objects (for example, drafting technology, reproduction technology, computing technology, and manufacturing technology). There is little consideration of the possibility that technologies, the products of design, might themselves be active agents in the design process.

In accordance with the instrumental view of technology, ecological design literature treats the technologies which are the outcome of the design process as tools. The technologies we bring into being through design are instruments for achieving functional requirements, which, in the case of ecological design are functions related to the overcoming of the ecological crisis. Thus the technologies we bring into being may be instruments through which we achieve reductions in energy use, instruments through which we mitigate pollution, instruments through which we maintain biodiversity, and so on. In a discussion of the opportunities for achieving ecological sustainability in the built environment, Rodger instrumentalizes the built environment in his claim that its role is to 'support' our goals and intentions, which,

²⁵²*Ibid*, p. 4.

²⁵³Cognitivist models of design take as their starting point a world of 'objects', 'object properties', and 'object relations', which then become the basis of representation and manipulation. For a discussion of the problems of understanding design as the manipulation of decontextualised objects with properties, see McLaughlin, "Practices and Primordial Understanding," *op. cit.*, pp. 28 ff.

in accord with the rationalist tradition, are held to be primary:

The rate at which the performance of the built environment can be changed to support our new purposes will be limited by our capacity to effect change in the built environment.²⁵⁴

In a paper by Rodger and Fay, the instrumentalizing of the objects of design is even more striking. It begins by establishing that the products of human design are 'tools':

Humans make tools. It is tool-using humans that interact with the biosphere. Their tools are the devices through which they have harnessed extra-somatic energy to their purposes.²⁵⁵

The paper then argues that design must produce new tools to meet the new functions required to overcome the ecological crisis:

To meet future expectations, whatever they may be, we will need appropriate tools. In looking for opportunities to move towards a sustainable future we must therefore look to ways of developing the tools that will help us achieve this objective.²⁵⁶

Finally the paper moves to establish architectural design as the key tool to be utilised in achieving this objective:

Because of the dominant role of buildings and the built environment within our existing tool kit, and because shelter and services will

²⁵⁴Rodger, "Architecture for Sustainable Development," *op. cit.*, p. 10.

²⁵⁵Rodger and Fay, "Sustainable Suburbia," *op. cit.*, p.4.

²⁵⁶*Idem.*

continue to be required in the future, conversion, extension and re-development of this stock becomes an essential component of a sustainable development strategy.²⁵⁷

Contesting that Design Controls Neutral Technologies

Since Marx's recognition that new industrial technologies transform social relations and reflexively *form* our societies,²⁵⁸ numerous theorists have challenged the rationalist contentions that technologies are neutral and that technologies are instruments which are under (or out of) the control of the human subject. Rather than being tools in the service of our culture, Winner, following Wittgenstein, argues that technologies *create* 'forms of life'. In the making and using of technology, '[n]ew worlds are being made',²⁵⁹ and the technologies play back into these worlds and place demands on the human subject:

Often this is the result of the new system's own operating requirements: it simply will not work unless human behaviour changes to suit its form and process. Hence, the very act of using the kinds of machines, techniques, and systems available to us generates patterns of activities and expectations that soon become 'second nature.'²⁶⁰

Borgmann also explores the way in which technologies create worlds. However Borgmann, following Heidegger, wants to differentiate between the positive character of 'things', such as the traditional hearth, which 'gather' worlds around them, and the negative character of 'devices' which are simply tools for satisfying functional requirements:

²⁵⁷*Idem.*

²⁵⁸Marx, K. *The Poverty of Philosophy*. New York: International Publishers, 1963.

²⁵⁹Winner, L. *The Whale and the Reactor*. Chicago: University of Chicago Press, 1986, p. 11.

²⁶⁰*Idem.*

...the commodity of the device is 'what the device is there for.' In the case of a central heating plant it is warmth, with a telephone it is communication, a car provides transportation, frozen food makes up a meal, a stereo furnishes music.²⁶¹

Drawing upon these critical perspectives, especially the work of Heidegger, who has profoundly influenced much of the contemporary debate on technology, Divisions II and III of this dissertation challenge many of the rationalist assumptions about technology and its role in the ecological crisis. It is contended that technologies, which are brought into being by design, may not simply be tools which *satisfy* our functions and purposes, but may instead *put in place* those functions and purposes. Similarly, it is argued that technologies may not simply be instruments for the achievement of *preset* goals or intentions, but may indeed *establish* those goals and intentions. Most contentiously perhaps, it is proposed that technologies are not neutral tools which may be used in different ways depending upon our values, beliefs, desires, principles and attitudes, but instead that the understanding which is constituted by our experience of engagement with technologies *is* our values, beliefs, desires, principles and attitudes. In other words, values, beliefs, desires, principles and attitudes are not mental but technological. These inversions of rationalist understandings place in jeopardy the commonly held notion that the design process might participate in overcoming the ecological crisis by 'changing its functional criteria', 'redirecting goals and intentions' or by 'transforming the values and attitudes' of the designers, clients and users — because what is involved is not simply 'redirections', 'transformations' or 'changes' of mind, but changes to whole technologised ways of being.

²⁶¹Borgmann, A. *Technology and the Character of Contemporary Life*. Chicago: University of Chicago Press, 1984, p. 42.

(iv) The Design Process is Neutral

Descartes' contention that our actions are ultimately guided by a system of rules or principles that can be made explicit led him to formulate a method within which our thinking could be structured. The method was considered to be neutral, and through its neutrality it allowed undistorted access to the objective world. As has been demonstrated, the Cartesian assumption that the rational mind worked according to a method profoundly influenced the modern understanding of the nature of the design process. If designing is a rational process then it too must follow a method. This premise legitimated the search for the method which inhered in the design process.

Although all of the methodological descriptions of the design process have been shown to be problematic, the continuing search for a methodological basis for design, which has now moved into the domain of design computing, would indicate that previous problems are viewed as having arisen *not* from of any weakness in the conception that design follows a method, but simply because a valid representation of the method has yet to be found.

A legacy of the Cartesian assumption that reasoning which is structured by the correct methodology is itself neutral, is the belief that the design process is also, at its 'core', neutral. As noted, contemporary methodological descriptions of design which draw upon systems theory have assumed this methodological neutrality in their contention that the process of design is domain independent:

[s]ystems theory applied to design was about principles that underlie all design activity, independent of the kind of artefact produced.²⁶²

Design methods such as optimization, which were informed by systems theory, aim

²⁶²Coyne, *Designing Information Technology in the Postmodern Age*, *op. cit.*, p. 219.

to find the 'best' possible design relative to the conditions of the problem formulation. It is the conditions of the problem formulation, the *inputs* to the model, which determine the selection of the 'best' design, while the computational processes of the optimization method itself remain neutral.

Cognitivist models of design demonstrate an even greater commitment to the neutrality of the design process. These models appear to separate the operational functions of the brain and neural networks from the 'knowledge' with which they operate. The brain and neural functions, which allow the possibility of the cognitive activities of reasoning, thinking and even designing, are common to all humans. However the 'knowledge' that each human possesses is unique and may vary markedly between different human beings. This results in a picture of mental activity in which knowledge, which is qualitatively different for each human being, is processed by the brain function which, unless physically impaired, is similar and therefore neutrally disposed for all humans. According to this view, the differences in the products of designing can be accounted for by the differences in the idiosyncrasies of the individual knowledge being operated upon by common human mental faculties.

This separation of knowledge from mental processing capacity is evidenced in knowledge-based design systems. Such systems have as their ideal, the separation of knowledge from the computational reasoning processes:

The key to knowledge-based systems lies in distinguishing between knowledge and reasoning, or control... Ideally, we should be able to equip a knowledge-based system with a general-purpose reasoning facility, or controller, and then expose it to our knowledge base.²⁶³

²⁶³Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, p. 36.

However, it is admitted that the achievement of this ideal is problematic:

It soon becomes apparent, however, that a key part of our knowledge, especially in design, is concerned with how we reason with what we know. Controlling knowledge is not just a matter of applying universal principles but involves a kind of *meta*-knowledge that is dependent on the domain.

The generally unquestioned acceptance that artifacts from historical and cultural contexts different than our own *are also* the products of the process of design, demonstrates the normalisation of the notion that there is a single, common, acultural and ahistorical process named design. Again, the separation of domain specific 'knowledge' from a neutral control process is evident in this view: the 'core' activity of design belongs to all humans, while the varying social, cultural, and physical environments which are 'processed' by this common activity result in the generation of historically and culturally unique outcomes.

Consistent with this view, it is not unusual for design texts to employ examples of 'primitive' acts of design to demonstrate that design has an unchanging essence. In *Knowledge-Based Design Systems* it is contended that the most basic quality of design — that it is a purposeful activity, directed by intentions — is demonstrated by the primordial act of deliberately sharpening a stick.²⁶⁴ Nor is it unusual for ecological design texts to employ examples of designing from different cultural and historical contexts. Ecological design literature unproblematically draws upon the vernacular architecture of different communities and different historical periods to demonstrate how various aspects of ecologically responsible functionality has been achieved in these designs.²⁶⁵ Indeed, for a host of pragmatic and ecological reasons, Papanek is

²⁶⁴*Ibid.*, p. 5.

²⁶⁵See for example Papanek, *The Green Imperative*, *op. cit.*, pp. 113ff; Vale, *Green Architecture*, *op. cit.*, p. 141; Farmer, J. *Green Shift: Towards a Green Sensibility in Architecture*. Oxford: Butterworth

able to make the claim that Inuit are 'the best designers in the world.'²⁶⁶

Contesting that the Design Process is Neutral

'Bad design' is bad because it has not *met* intentions, needs or criteria, or has neglected to *include* some needs or criteria, or has selected *inappropriate* needs or criteria, or is *unimaginative*, and so on. Because the 'core' process of design is held to be neutral, the design process *itself* is never held to be good or bad, moral or immoral. It is a neutral tool which may be used well or badly.

It is for this reason that the calls for the 'transformation of the design process' contained in the ecological design literature are, with few exceptions, calls for the transformation of the *attitudes* which direct the design process or the *goals* towards which the design process intends or the *criteria* which the design process seeks to satisfy. They are calls to utilise the design process differently. While they are critical of the use to which the design process has, and is, being put, they are not critical of the design process itself. Indeed the design process is held out as the hope for overcoming the ecological crisis.

In Division III of this thesis the question is entertained as to whether the design process, as it has been rationally constituted, is indeed neutral. Or whether in fact the design process itself — as an intentional and goal directed problem solving process — may be at the very heart of the ecological crisis.

The implication of such a questioning is that the ecological crisis might *never be overcome* by transforming the attitudes which direct the design process, or the goals towards which the design process intends, or the criteria which the design process seeks to satisfy. It may be that to adequately face the ecological crisis a more

Architecture, 1996, pp. 8ff.; and Pearson, D. *The Natural House Book: Creating a Healthy, Harmonious, and Ecologically Sound Home Environment*. North Ryde: Angus & Robertson, 1990, p. 14ff.

²⁶⁶Papanek, *The Green Imperative*, *op. cit.*, p. 223.

profound shift might be required. It may be, as Fry claims, that design itself must be re-designed.²⁶⁷ Division III of this dissertation explores, and questions, the possibility of such a task.

²⁶⁷Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, p. 9.

DIVISION II
DESIGN AND HERMENEUTICS

CHAPTER 4

HEIDEGGER'S ABSENT PRESENCE IN DESIGN

Introduction

The preceding Division demonstrates how contemporary Western interpretations of the design process are underlaid by assumptions set in place by the rationalist tradition, and how these interpretations of the design process have influenced both our understanding of the role of design in the perceived environmental crisis, and our understanding of how design might participate in the overcoming of that crisis.

This Division explores the possibility of laying out an alternative interpretation of the design process that is not embedded in the assumptions of the rationalist tradition. It draws upon contemporary hermeneutics, particularly the explication of human understanding and interpretation contained in the work of the early Heidegger.²⁶⁸



The preceding chapters demonstrate how rationalism seeks to find grounds in *presence*, and how the prominent contemporary models of the design process also seek, in various ways, to ground their formulations in presence. This chapter introduces the possibility of a description of the design process which is not grounded in presence. It takes as its starting point Snodgrass and Coyne's article *Is Designing Hermeneutical?*,²⁶⁹ which persuasively argues that the design process is not grounded in formal logic but is instead an interpretive activity whose operation

²⁶⁸Primarily in Heidegger's magnum opus, *Being and Time*, but also in the lectures which preceded the publication of *Being and Time*. See Heidegger, *Being and Time*, *op. cit.*; and Heidegger, M. *History of the Concept of Time*. Translated by T. Kisiel. Bloomington: Indiana University Press, 1985.

²⁶⁹Snodgrass, A. and R. Coyne. "Is Designing Hermeneutical?" *Architectural Theory Review* 2 (1 1997): 1-29. "Is Designing Hermeneutical?" was initially circulated as a Working Paper, University of Sydney, 1990.

can be described in terms of the 'hermeneutical circle'. Because this article will be drawn upon, and responded to, at length in this chapter, a copy has been Appended.

Using Snodgrass and Coyne's article, this chapter attempts to show that while the hermeneutic description of designing overcomes many of the problems encountered by rationalist models of the design process, it does not appear to account for those characteristics of designing most familiar in the rationalist models. By emphasising the quality of absorbed engagement, the hermeneutic description rejects the 'problem solving' metaphor of designing and marginalises the notion that design is driven by goals, purposes and intentions — characteristics which rationalist descriptions commonly present as definitive of the design process. This point of tension between the hermeneutical and rational descriptions prepares the ground for a discussion in the next chapter of what role, if any, 'deliberative planning' and 'intentions' might have in any hermeneutical rethinking of the design process.

'Is Designing Hermeneutical?'

Snodgrass and Coyne's paper, *Is Designing Hermeneutical?*, begins by demonstrating the way in which much of the current research in design methodology and design computing is built upon positivist concepts of language which assume that atomic verbal tokens (words) correspond to objects in the world, and that these tokens can be brought together in logical sequences to form meaningful statements about the world.²⁷⁰ In the domain of design computing, this may for example manifest in the use of tokens (such as geometric shapes) which correspond to elements of buildings, and which are manipulated according to grammatical rules in order to create coherent formal design representations.²⁷¹

²⁷⁰Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, pp. 1-3.

²⁷¹*Idem.*

In terms of the emphasis this dissertation has placed on the role of presence, there are two important ways in which these positivist concepts of language seek grounds in presence. Firstly they assume that language and design are activities governed by rules that can be brought to presence. Secondly they assume that tokens in the form of words or shapes should unproblematically map onto 'bits' of the world, thereby implying that the bits that make up the world have a fixed presence which is independent of the language (verbal or geometric) which describes them.

Both of these assumptions are effectively undermined by Snodgrass and Coyne. Using the later Wittgenstein's attack on the atomic model of language, they demonstrate both that words (and presumably geometric tokens) are radically polysemic and that language does not simply map onto the world we experience but is *constitutive* of it:

Whatever reality "out there" might be, it is inextricably interwoven with language, and cannot be considered except in the context of language as it is spoken in ordinary discourse.²⁷²

Similarly, they argue that rules, such as grammars, are not *already* present in language (or in the design process), but that 'we construct them according to conventions.'²⁷³ Rather than design activity being an outcome of the application of systems of rules, Snodgrass and Coyne propose that design (like language and all other interpretive activities) is more appropriately and more fruitfully viewed as an interpretive activity structured in the manner laid out by Heidegger and later developed by Hans-Georg Gadamer.²⁷⁴

Hermeneutical studies hold that all understanding and interpretation is made

²⁷²*Ibid.*, p. 6.

²⁷³*Idem.*

²⁷⁴*Ibid.*, pp. 15-18.

possible by the working of the 'hermeneutical circle'. To explain the working of the hermeneutical circle in relation to design, Snodgrass and Coyne employ two analogies: the interpretation of a *text*, and the dialogical context of a *conversation*.

Interpreting a Text

Employing the 'part-whole' description of the hermeneutic circle, Snodgrass and Coyne demonstrate that our understanding of a text unfolds in the manner of a circular interplay between the parts of the text that we are reading at any moment and the text in its entirety. They initially suggest that:

'...we cannot understand the meaning of a part of a language event until we grasp the meaning of the whole; and we cannot grasp the meaning of the whole until we grasp the meaning of the parts. That is, we cannot understand the meaning of the words that make up a sentence until we can locate them in a context of the sentence as a whole; and we cannot understand the meaning of the whole sentence until we understand the meaning of the words that it comprises.'²⁷⁵

Snodgrass and Coyne then point to an apparent 'logical inconsistency' which emerges in conceiving the circle of understanding in this way.²⁷⁶ The problem is simply that, if the circle were to operate in this manner, we would not be able to understand the words of a sentence until we had finished reading the whole sentence (or the sentences until we had finished the book). The phenomenology of everyday experience, however, shows that this is not the case. Our understanding is not delayed, but immediate. As Hoy makes clear, '[w]e do not first see some colors and hear some noises and only secondarily infer that we are seeing or hearing a motorcycle.'²⁷⁷ The motorcycle is seen or heard *as* a motorcycle. Colours and

²⁷⁵*Ibid.*, p. 6.

²⁷⁶*Ibid.*, p. 7.

²⁷⁷Hoy, D. "Heidegger and the Hermeneutic Turn." In *The Cambridge Companion to Heidegger*, ed.

noises are properties which are only *derivatively* attributable to the 'motorcycle object'. In the same way the words of a text are encountered as immediately meaningful, the account offered by a text unfolds with every word that is read.

Snodgrass and Coyne demonstrate that this logical inconsistency in the hermeneutical circle only exists if the 'whole,' which is the prerequisite to understanding the parts, is considered to be complete and final. Following Gadamer, they argue that we do not begin with any such final grasp on the whole, but that 'we have initial intimations and expectations of what the meaning of the whole will be.'²⁷⁸ To explain the working out of the interplay between the 'initial intimations' of the whole with the parts, Snodgrass and Coyne introduce the notion of 'projection.'²⁷⁹ This concept is fundamental to the character of understanding and interpretation as it is laid out by Heidegger, and is central to much of the discussion in the subsequent chapters. Snodgrass and Coyne argue that our initial understanding of the whole is projected ahead of our reading of the text and that as the parts of the text are encountered they are understood in terms of this preliminary projection of the whole. As each part is understood, this understanding modifies and enlarges the understanding of the projected whole. The circle thus involves a dynamic interplay in which the understanding of the parts and the projected whole develop together:

The projection, at first unclear and only existing in outline, plays back into the interpretations of the parts, requiring their revision even as the projected meaning itself is continually revised in the light of the interpretation and increasing understanding of the parts. By this process of to-and-fro reflection the understanding of the whole

C. Guignon. Cambridge: Cambridge University Press, 1993, p. 183.

²⁷⁸Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 7.

²⁷⁹*Idem.*

gradually emerges.²⁸⁰

Using the Heideggerian concept of the 'fore-structure of understanding,' which is also important to discussion in later chapters of this dissertation, Snodgrass and Coyne explain further the nature of the projection of the whole which occurs in any interpretive event:

Heidegger says that in any interpretive event, such as understanding spoken language, a text, or the meaning of an object, before we begin consciously to interpret we have already placed the matter to be interpreted in a certain context, viewed it from a pre-given perspective, and conceived it in a certain way.²⁸¹

Dreyfus explains that the fore-structure of understanding provides the particular orientation, or way of seeing, that we bring to every interpretive event.²⁸² It is described by Heidegger as having three aspects. The first aspect of the structure is a *fore-having* — our unnoticed background of experience. The second aspect of the structure is *fore-sight* — a point of view provided by our background of experience in relation to the context of the interpretation. The third aspect of the structure is a *fore-conception* — the possibilities which our background of experience allows might be encountered in the interpretative context (referred to problematically, I feel, as 'expectations'²⁸³). Thus in the interpretation of a text, we always already have *some* experience/understanding of the domain of the text, and even before we begin to read the text we have unnoticed 'expectations' about what we will find in the text together with an unnoticed position in respect of the subject matter of the text. It could be said that the fore-structure of understanding which we bring to the text,

²⁸⁰*Ibid.*, p. 8.

²⁸¹*Idem.*

²⁸²Dreyfus, *Being-in-the-World.*, *op. cit.*, pp. 198-200.

²⁸³The difficulty of referring to Heidegger's notion of *fore-conceptions* as 'expectations' will be debated in the subsequent chapters.

not only provides us with an orientation from which to interpret, but also grounds the very possibility of our capacity to interpret.

Absorption in a Conversation

The second metaphor which Snodgrass and Coyne use to illustrate the character of the hermeneutical circle of understanding is that of a *conversation*. Gadamer holds that the dialogue arising in an authentic conversation, in which each of the participants 'opens himself [/herself] to the other person,' epitomises the hermeneutical event.²⁸⁴ Such a dialogical context, where both sides are immersed in the discussion and are open to each other, is said to allow the enlargement of understanding.

Snodgrass and Coyne propose that the openness of the participants in an absorbing conversation dissolves the subject-object dichotomy which might otherwise be construed into the relationship between speaker and spoken to:

In genuine dialogue the participants are caught up in the give and take in such an involved way that they lose themselves in the conversation. The conversation has an internal buoyancy, the to-and-fro movement of a wholly absorbing game.²⁸⁵

The operation of the hermeneutical circle is played out in the to-and-fro movement of question and answer that takes place in the conversation. The initial question projects a preliminary way of understanding which is directed by preunderstandings.²⁸⁶ The response to the question is interpreted on the basis of this preliminary way of understanding. But in this event of interpretation, the preliminary understanding is itself transformed. In the on-going reciprocity of

²⁸⁴Gadamer in Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 11.

²⁸⁵Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 12.

²⁸⁶*Ibid.*, pp. 12-13.

question and response, the understanding of both of the participants in the conversation is continually challenged and enlarged.

Hermeneutical Design

Snodgrass and Coyne claim that the hermeneutic circle, exemplified in the projective structure of the interpretation of a text and the dialogical context of a conversation, is both 'primordial and universal':

It operates not only in the understanding of language and texts, but in every act of understanding... The hermeneutical circle applies to one's whole life, which is an on-going process of interpreting experiences. Our interpretation of experiences modifies our perception of the past and our anticipations of the future; and our understanding of the past and the future forms the context in which we interpret experiences. Understanding and experience are in constant interaction.²⁸⁷

As would therefore be expected, the hermeneutical circle of understanding is also able to be shown to be at work in the process of designing. Thus, in the final steps of their argument, Snodgrass and Coyne demonstrate the ways in which the hermeneutical circle is recognisable in the activity of designing. They reveal clear parallels between their detailed explication of the hermeneutical circle and the description of designing contained in Schön's important work *The Reflective Practitioner*.

Schön's description of the design process as 'a reflective conversation with the situation' confirms the dialogical nature of designing.²⁸⁸ Schön's assertion that in design '[t]he principle is that you work simultaneously from the unit and from the

²⁸⁷*Ibid.*, p. 14.

²⁸⁸Schön in Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 15.

total and then go in cycles — back and forth, back and forth...’ articulates the interplay of the whole with the parts which is central to the operation of the hermeneutical circle.²⁸⁹ The Heideggerian formulation of a projected preunderstanding is also shown to be contained in Schön’s description of the way in which design is initiated by projecting ahead a tentative possibility, a ‘what if’:

We “begin with a discipline, even if it is arbitrary,” which, in hermeneutical terms, is the projection of a preunderstanding. This projected discipline, says Schön, is a “what if,” to be adopted in order to discover its consequences, and can always “be broken up later.” The designer thus begins the design task by shaping the situation in accordance with an initial appreciation. The situation then “talks back” and the designer responds to the situation’s back talk by reflecting-in-action on the construction of the problem, the strategies of action, or the model of the phenomena.²⁹⁰

The process is said to develop with the ‘back and forth’ movement of a circle:

Each move draws out the implications of earlier moves, seen as having consequences that are described and evaluated in terms drawn from one or more design domains, and having implications binding on later moves, creating new problems to be described and solved. In this way the designer spins out “a web of moves, consequences, implications, appreciations and further moves.”²⁹¹

The design process, laid out in accordance with Gadamer’s explication of the part-whole interplay of the hermeneutical circle and confirmed by key aspects of Schön’s

²⁸⁹*Idem.*

²⁹⁰*Idem.*

²⁹¹*Idem.*

description of designing, is summarised by Snodgrass and Coyne:

In the design process we project the meaning of the whole and work out the implications of this projection by referring it back to the parts. There is a prescient anticipation of the whole, which is then explicated in the individual parts. The design is continually re-determined by an anticipatory movement of the pre-understanding. The designer has an anticipation of the whole which guides his or her understanding of the particularities. Understanding arises by a process of constant revisions.²⁹²

Presence and Absence

Both Schön's seminal²⁹³ shift of emphasis away from technical rationality toward understanding the activity of design as reflection-in-action,²⁹⁴ and Snodgrass and Coyne's radical reinterpretation of the design process as an activity grounded in hermeneutics rather than formal logic, move the project of understanding the design process a significant way from contemporary methodological approaches which are grounded in the assumptions of rationalism. Snodgrass and Coyne's work, coupled with their reading of Schön's work, hints at a number of potentially fruitful possibilities for further investigation. It is these possibilities I wish to tease out and make the theme of the following chapters of the dissertation, which attempt to build upon this non-foundationalist understanding of design.

A subtle, but potentially productive ambiguity in the Snodgrass and Coyne paper is the status given to 'presence' in relation to the hermeneutical circle of understanding

²⁹²*Idem.*

²⁹³With apologies to those scholars who correctly point to the dangerous normalisation of the privileging of masculine creativity embedded in the gender bias of this term. I have not yet, however, been able to find an ungendered or female gendered alternative which has a comparable meaning (which I suppose reinforces the very criticism women scholars have made about this form of language).

²⁹⁴Schön, *The Reflective Practitioner*, *op. cit.*, pp. 73-167.

and its application to the design process. The paper allows two possible interpretations of the 'whole' in the 'part-whole' relation which constitutes the hermeneutical circle. One interpretation arises from the use of Heideggerian concepts to describe the operation of the circle, the other arises from reading Schön's descriptions of design in terms of the hermeneutical circle (and is perhaps reinforced by a particular Gadamerian interpretation of the hermeneutic circle).

The central feature of Heidegger's radical reworking of traditional objectivist or relativist interpretations of the hermeneutical circle²⁹⁵ is the notion of 'background' (also referred to by Heidegger as 'pre-understanding'²⁹⁶). Background might initially be thought of as our background *experience* — our lifetime of practical engagement with the world. In turn, our particular background of experience might be said to *constitute* our understanding. In this sense it is our understanding, as constituted by our background of experience, which is brought to, and makes possible, any interpretive event.

It is important to understand the full implication of Heidegger's notion of background, which, from a rationalist perspective, may be misconstrued. The critical feature of Heidegger's concept of background is that it *is not a form of presence*. Taylor says of background²⁹⁷ that it is

not a matter of representations. The rationalist epistemology induces us to jump to this conclusion because it construes all our understanding as made up of representational bits...²⁹⁸

²⁹⁵For a discussion of the hermeneutic tradition to which Heidegger was heir, see Hoy, "Heidegger and the Hermeneutic Turn," *op. cit.*, pp.171ff.

²⁹⁶Taylor, "Engaged Agency and Background in Heidegger," *op. cit.*, p. 327.

²⁹⁷Taylor describes Heidegger's notion of background as 'engaged agency.' See Taylor, "Engaged Agency and Background in Heidegger," *op. cit.*, pp. 325ff.

²⁹⁸*Ibid.*, p.327.

Thus for Heidegger, casual questions such as 'what is your understanding of the situation?' or 'what was your experience like?' or 'what is your background?' imply the false impression that it may actually be possible to represent our understanding, experience or background. It is not simply that Heidegger might claim that only our experience *is* our experience, and that the answer to these questions can only ever be assertions *about* our experience and not the experience itself. More profoundly, the background must always be that which *stays in the background*, as it is the condition of possibility for allowing experience to show up in the foreground of our awareness:

It is that of which I am not simply unaware (as I am unaware of what is now happening on the other side of the moon), because it makes intelligible what I am uncontestably aware of; but at the same time I cannot be said to be explicitly or focally aware of it, because that status is already occupied by what it is making intelligible.²⁹⁹

Thus any attempt to represent background understanding will always be partial and perspectival, and will itself be grounded in a background which remains unrepresented. Our background is therefore always a 'nonexplicitable background'³⁰⁰ which is irreducible to something extant, like knowledge.

Not only is our background understanding not able to be represented, it is not the sort of understanding which, as the rationalist tradition has assumed, is held as representations in the mind of a subject.³⁰¹ The polysemy of the term 'background' itself helps explain this point. A person's 'background' refers equally to the shared public events that constitute their past (evident in the question 'what is his/her

²⁹⁹*Ibid.*, p.325.

³⁰⁰Dreyfus, *Being-in-the-World.*, *op. cit.*, p. 4.

³⁰¹Thus Heidegger chooses to use terms such as 'background' and 'pre-understanding' rather than simply 'understanding,' as this term has acquired the problematic connotation of being able to be brought to presence.

background?') as it does to any privative understanding of them. Rather than my background of experiences being considered somehow fixed in the form of images or structural relations held in the 'container' of my mind, the experiences of my life might, as an interim position, simply be considered to be 'in my past.'³⁰² In this way my background is always able to be reinterpreted into the present (and into presence) *in different ways*.³⁰³ For example, if someone were to make the off-hand comment 'hasn't the weather been odd over the last few years?,' in contemplating this comment my experience of the past few years would be disclosed with a particular 'odd weather' orientation. This propensity to continually reorient our background would be problematic if that background were held as a reified content in the mind.

Heidegger's rejection of the possibility that background understanding is held as a cognitive phenomenon is further reinforced by his claim that we do not *have* a background understanding of skilful involvement with the world, rather we *are* such a skilful involvement:

Dasein is not something occurrent which possesses its competence for something by a way of an extra; it is primarily its ability to be. Dasein is in every case what it can be.³⁰⁴

In this way our background may be seen as our 'potentiality', or 'what we are capable of'.³⁰⁵ The particularity of 'what we are capable of' is determined by our

³⁰²As will become evident, our unreifiable past experience is only one dimension of the temporal structure of our background.

³⁰³In this view, the relationship is not one between a subject and an object which is his/her past (for example, that I have memories in my mind that are representations of the objects of my past). My past is neither the product of my subjectivity nor objectively independent. A full discussion of dissolution of subjectivity and objectivity and the possibility of an alternative perspective which employs Heidegger's notion of Earth is contained in Division III.

³⁰⁴Heidegger in Dreyfus, *Being-in-the-World*, *op. cit.*, p. 185.

³⁰⁵See for example Taylor, "Engaged Agency and Background in Heidegger," *op. cit.*, pp. 325-329; and Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 103-104.

particular history of involvement in the shared practices of the world which constitute the background understanding 'that we are.' Thus our background understanding *enables* us to do and think all that we do and think, but it is *not reducible* to that which we do and think. Using Heidegger's much celebrated example, to be able to use a hammer is a skill that is gained from practice in using a hammer. But the skill which allows proficient hammering cannot be captured or reified. A theoretical knowledge of hammering will not make us skilled hammer users, only practice in hammering will do this. Thus the skill (background) we have of using a hammer is not the same as the act of using a hammer (though the skill *will show up* in the act), nor is it the same as knowledge *about* using a hammer (i.e. the assertions we make about the practice of hammering).

Heidegger holds that an *interpretation* is an *articulation* of our background understanding.³⁰⁶ In this sense, interpretation is not simply limited to being a particular 'point of view' (such as might be construed from a phrase like 'that's just your interpretation') or a linguistic assertion. For Heidegger, *all* of our activities might be considered 'interpretations' which articulate our background understanding.³⁰⁷ Thus the act of hammering is an articulation of our background understanding of hammering, and the act of reading is an articulation of our background understanding of books and writing. Clearly the acts of talking and writing are articulations of our background understanding of the use of language, but, importantly, they are at the same time articulations of our background understanding of what we are talking or writing *about*.³⁰⁸ Thus 'knowledge' could be said to be a linguistic interpretation which is itself an articulation of background understanding.

³⁰⁶*Ibid.*, pp. 215-224.

³⁰⁷Hoy, "Heidegger and the Hermeneutic Turn," *op. cit.*, p. 184.

³⁰⁸Which may come to the same thing if language and our practices come into being in same space of possibility.

'Knowledge' for Heidegger is therefore dependent on background understanding. While this may appear to overturn the rationalist privileging of theoretical knowledge, it would be wrong, however, to simply adopt the traditional inversion — that theory depends upon practice — as practice itself has also been shown to be an articulation of background understanding. In a more radical shift, both theory *and* practice can be seen to be dependent on, and articulations of, background understanding. The relationship between background and its articulations is not, however, uni-directional. As the circular structure of hermeneutics implies, interpretive encounters with extant theories and practices also play back into, and transform, background understanding.

Returning to the interreferencing of 'the whole' and 'the parts' which occurs in the operation of the hermeneutical circle, it can be seen that for Heidegger it is our inexplicable background which is 'the whole' that we bring to an interpretative context: our background (the whole) makes the parts intelligible, and in so doing our background understanding is itself incrementally transformed in the interpretive encounter with the parts. Heidegger's description of the fore-structure of understanding makes clear that the background or pre-understanding (the whole) that is brought to the interpretive event is not simply an amorphous agglomeration of past experiences. In an interpretive event the background adopts an *orientation* appropriate to the context. As Snodgrass and Coyne explain:

...before we begin consciously to interpret we have already placed the matter to be interpreted in a certain context, viewed it from a pre-given perspective, and conceived it in a certain way.³⁰⁹

It must however be emphasised that the fore-structure of understanding has no relation to the representational structures or schemata that structuralists might

³⁰⁹Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 8.

argue organise the mind. The 'for-structure' is not a cognitive structure, it is an orientation of our background which shifts with every interpretive context.

Thus the 'orientated background' that we bring to an interpretive event always belongs *to the background*, and remains *in the background*.³¹⁰ It is not a presence. It is an 'absence.' And it is this absence that is the condition of possibility of the legibility of whatever is brought to presence in the event of interpretation.

While Snodgrass and Coyne appear to initially adopt this Heideggerian interpretation of the hermeneutical circle, in their later discussion of the circular interplay of the whole and the parts, especially in the context of designing, the 'whole' that is said to be brought to the interpretive event appears to shift from having the character of absence to having the character of presence. This is notable in their use of Schön's descriptions of the interplay of 'local' and 'global' in the activity of designing:

'The principle is that you work simultaneously from the unit and from

³¹⁰Heidegger is quite clear on this point. Our background understanding, oriented in accordance with the fore-structure of understanding, remains in the background. This is emphasised by the use of the prefix fore- (*Vor-*) in the three aspects of the fore-structure of understanding — fore-having, fore-sight, and fore-conception. The implication that these are *before* the interpretation, before the sight, and before the conception. They are the *ground* for each of these presences and cannot therefore also be present. As Heidegger states in relation to conceptions, the conceiving of something (as a presence) is *grounded* in a fore-conception (absence): 'the interpretation has already decided for a definite way of conceiving it, either with finality or with reservations; it is grounded in *something we grasp in advance* — in a *fore-conception*.' Heidegger, *Being and Time*, *op. cit.*, p. 191. However, Gadamer's interpretation of Heidegger's fore-structure of understanding is ambiguous on this point, and Snodgrass and Coyne could rightly claim that Gadamer infers the possibility that fore-structure could, at least to some extent, be made present to awareness. The ambiguity is evidenced in the following quote where Gadamer is interpreting Heidegger's notion of the fore-structure of understanding (I have inserted in brackets those terms I believe are implied as being in the background of awareness, and those that are in the foreground): 'A person who is trying to understand a text is always projecting. He projects a meaning [background] for the text as a whole as soon as some initial meaning [foreground] emerges in the text. Again, the initial meaning [foreground] emerges only because he is reading the text with particular expectations [background] in regard to a certain meaning [background]. Working out this fore-projection [background], which is constantly revised in terms of what emerges [foreground] as he penetrates into the meaning, is understanding what is there.' Clearly the form of words used by Gadamer allows for sufficient slippage to be interpreted as though the 'whole' were not in the background but in the foreground, ie. as a presence. Gadamer, Hans-Georg. *Truth and Method*. Translated by J. Weinsheimer and D. Marshall. New York: Continuum, 1994, p. 267.

the total and then go in cycles — back and forth, back and forth...³¹¹

The whole (total) and the parts (units) which Schön is describing are presences — they are aspects of the design of which we have an awareness. In the particular example from which Schön is generalising, the whole is ‘an idea’ for the ‘overall geometry’ of a school, while the parts are the smaller architectural possibilities (such as the ‘nooks’) which arise from the reconceiving of the whole:

The global experiment in reframing the problem is also a reflective conversation with the situation in which Quist [the designer] comes to appreciate and then develop the implications of the new whole idea. The reframing of the problem is justified by the discovery that the new geometry “works slightly with the contours,” yields pleasant nooks, views and soft back areas. ³¹²

Snodgrass and Coyne confirm the shift toward conceiving of the whole as a presence when they suggest that it is the *image* of the whole that is projected and initiates the operation of the hermeneutical circle in the design context:

...a single factor in the design situation, perhaps some characteristic of the site or some specific requirement of the client, can illuminate and orient the task, drawing what was without coherence into a preliminary projection of a meaningful whole. The single factor suggests an image of the whole. With this projection, albeit vague, the hermeneutical circle has been entered and can proceed in its back-and-forth way.³¹³

³¹¹Schön in Snodgrass and Coyne, “Is Designing Hermeneutical?”, *op. cit.*, p. 15.

³¹²Schön, *The Reflective Practitioner*, *op. cit.*, pp. 94-95.

³¹³Snodgrass and Coyne, “Is Designing Hermeneutical?”, *op. cit.*, p. 16.

Thus the image, idea, or representation of the whole which is referred to by Schön and Snodgrass and Coyne is not the 'absent whole' of the designer's background, but is instead a 'whole' which is present to awareness. In terms of the Heideggerian formulation of the role of background, a 'whole' conceived as a presence *could not* be the ground for understanding the parts. Rather, both the 'parts' *and* the 'image of the whole' would require the designer's background as the condition of possibility of their legibility. As will be seen, however, I want to argue that this apparent anomaly is not simply a mistake or an inconsistency. Snodgrass and Coyne's familiarity with the design process is revealing something of the character of the design process that is obscured by the particular emphasis adopted by Heidegger.

Texts and Conversations

The two key analogies which are employed by Snodgrass and Coyne to demonstrate the operation of the hermeneutical circle in the context of design — the interpretation of a text, and being absorbed in a conversation — also highlight the tension between the role of presence and the role of absence in the design process.

While the example of interpreting a text is useful in getting clear the role of the projective structure of pre-understanding which is claimed to be involved in all interpretive events, there nevertheless appears to be a significant point of difference between the interpretation of a text and the interpretive activity of designing. In the reading of an text, the possibilities of the text are, in an important sense, *closed* before the reading has even begun. In the hermeneutical process of design, however, the possibilities of the design process are always substantively *open*.

When we sit down to read a text, such as novel, we accept that the plot which is contained within the dust jacket is already fixed. Literary critics may nevertheless be able to arrive at various readings of the text, and different interpreters may find that

it speaks differently to their different contexts. In this way the text *does* remain open to (re)interpretation. But having conceded this, the capacity of the reader to actively direct the contents of the text or the outcome of the plot during the course of reading appears bounded.³¹⁴

As Snodgrass and Coyne explain, in the reading of a text we begin with some pre-understanding or background understanding, no matter how minimal, of what will be encountered in the text. This understanding is projected ahead of our reading. Each part (word, sentence, section etc.) of the text that is encountered is interpreted on the basis of this background. In each event of interpretation of a part, background understanding is itself transformed, and this transformed understanding is projected ahead of the reading of the next part. Thus, in a successful text, the incremental transformation of our understanding by each of the previous parts will provide the ground for interpreting each new part as it is encountered. In this way the understanding of the whole text expands as the reading of the parts proceeds.

If we were to set about reading a novel, simply the understanding that it *is* a novel projects unnoticed expectations about the content (we would be surprised for example if only mathematical formulae were contained between the covers). Reading the title of the novel (an encountered 'part') transforms our understanding and unnoticingly projects new expectations. As we begin to read the possibilities that are offered by the novel, each twist of the plot is interpreted in relation to the current projected understanding; and as each new twist is interpreted, our understanding is transformed, reoriented and projected anew. Thus at any stage of our understanding of the plot there will be projected anticipations and expectations. Depending upon our current expectations, as we read we may experience surprise

³¹⁴The suggestion that the reading of a text may be 'limited' (which appears to contradict the hermeneutic position that there are a unbounded number of possible interpretations of a text) relates to the discussion in Division III of the circumscribed yet unlimited possibilities of 'Earth.'

(if parts of the text do not confirm our expectations), keen interest (if parts of the text appear relevant to other important aspects of our understanding), or disappointment (if parts of the text merely confirm our current understanding and projected expectations).

The significant aspect of this example of the operation of the hermeneutical circle is that it is the interpretation of the *possibilities offered by an already existing text* which 'guides' the projection of our anticipations and expectations. Each possibility offered by the text is interpreted, and in the event of interpretation our understanding is transformed and reoriented and projected ahead as the grounds for the interpretation of the next possibility offered by the text. Because the possibilities offered for interpretation are circumscribed by the text, the interpretational journey through the text is, in an important sense, already mapped out and signposted in advance.

By contrast, the journey taken by the design process has no existing road ahead awaiting to be travelled. As a preliminary sketch of the process, it might be said that, rather than the extant and pre-existing possibilities being *offered* for interpretation on the ground of the currently projected background, the background itself — oriented by the design context — *projects its own possibilities* for interpretation.³¹⁵ Each new possibility that is projected is interpreted, and in the event of interpretation, understanding is transformed and reoriented and projected ahead as the grounds for the projection and interpretation of a new possibility. Schön's example of a 'new geometry' being generated for a school is an example of a possibility projected from the background. The 'nook' which is revealed by this new geometry is an interpretation of the newly projected possibility. In the event of

³¹⁵It should be noted that the projection of 'possibilities' referred to here, and the projection of 'understanding' are discussed separately in *Being and Time*. The difference between each will be discussed in the following chapters of the dissertation. Heidegger, *Being and Time*, *op. cit.* Projection of understanding is referred to on pp. 148, 151, 174, 265, and 324. Projection of possibilities is referred to on pp. 298, 312, 383, and 394.

interpretation of the possibility of the nook, the understanding of the design context is transformed and further possibilities are able to be projected on the ground of that transformed understanding. In this way designing incrementally *lays its own road* as it journeys along ever fresh and unexpected routes — racing forward, dawdling over details, backtracking, taking detours and branching off at the fork of a decision point — always journeying toward a projected possibility, but one which is itself transformed with every step along the road.

Relating this sketch of the design process to the 'part-whole' description of the hermeneutic circle, 'the whole' equates the constantly reorienting absent background, while 'the parts' are those possibilities projected into presence from the absent background. Possibilities projected into presence offer themselves for on-going reinterpretation, and in the process of interpretation the absent background is continually reoriented and the momentum of the design process is ensured. This formulation confirms both the role of 'absence' emphasised by Snodgrass and Coyne in their early discussion of the hermeneutical circle and the shift in emphasis evidenced in their characterisation of the examples of projected 'ideas' or 'images' drawn from Schön's protocol studies as 'presences.'

The second analogy used in Snodgrass and Coyne's paper to exhume the overlooked interpretive character of design is that of a *conversation*. Again, there appears to be a notable point of difference between absorbed engagement in a conversation and prominent contemporary characterisations of the activity of designing. In comparing the activity of design with engagement in a conversation, Snodgrass and Coyne emphasise the absorption experienced by both the conversationalist and the designer:

In the manner of a spirited conversation which carries the speaker along and in which they are wholly involved, the design situation

carries the designer in its flow. Good conversation absorbs the speakers; so likewise the action of designing, when it is proceeding as it should, absorbs the designer. Designers are truly designing when they are so absorbed in the task that they are not aware that they are designing, nor that the design situation is an object outside themselves.³¹⁶

Snodgrass and Coyne note that an important characteristic of absorbed engagement in a conversation is that it does not involve deliberate intentions or plans:

The conditions are conducive when the interpreter is given over to the dialogue, as happens when we are engrossed in a stimulating conversation. In this situation I do not choose my words with care; I do not plan what I am about to say, but speak spontaneously.³¹⁷

Applying this character of absorbed engagement to the process of designing is clearly at odds with the rationalist understanding of the design process discussed in the previous chapter. Methodological descriptions of the design process emphasise goals, intentions, purposes, objectives, and pre-formulated criteria. Rationalist models of the design process thus highlight the *deliberative planning* which they see as central to the activity of designing. It is this *deliberative* character of designing which Snodgrass and Coyne wish to challenge. The danger from a rationalist perspective is, however, that by marginalising the deliberative and intentional aspects which they see as defining features of design, and including design within what Snodgrass and Coyne claim to be the 'primordial and universal' process of hermeneutics, design itself becomes 'flattened' and indistinguishable from any other human activity.

³¹⁶Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, pp. 17-18.

³¹⁷*Ibid.*, p. 14.

The question which is latent in this tension between the rationalist and hermeneutical descriptions is 'what (if anything) does differentiate designing from any other human activity?' Design texts often assume designing to be that activity belonging quintessentially to the domain of the professional designer. Even Snodgrass and Coyne, who are attempting to pry design out of a rigid conventional epistemological framework, draw upon those of Schön's protocol studies involving architectural designers, and employ privileged terms, such as 'client requirements' and 'site characteristics,' which belong to the practice of professional design.

Any presumption that there should be a normalised understanding of design appears problematical. Accepting a hermeneutical view, the understanding of design must be assumed to be culturally and historically specific. In Gadamer's terms, any interpretation of design embodies 'prejudices'³¹⁸ about the nature of design which arise from a history of involvements with the theory and practice of designing. Thus even this dissertation, which, like Snodgrass and Coyne's article, may view its project as critical of the rationalist tradition, nevertheless remains dependent upon the particular background understanding of design that has been constituted by the historicity of the context of those involvements, a context of design theory and practice which is unavoidably embedded in modern Western rationalism.

Fry's *Design History Australia* discloses the historicity of the understanding of design which is often valorized in contemporary design theory and formal design education. Fry points out that '[a]ll modern notions of design are products of the rise of post-Enlightenment reason...' in that '[d]esign's development is inseparable from the attempt to rationally order the world, to "command" nature...'.³¹⁹ The

³¹⁸Gadamer, *Truth and Method*, *op. cit.*, pp. 267 and 269-77.

³¹⁹Papanek cited in Fry, *Design History Australia*, *op. cit.*, p. 17.

contemporary conception of design can be seen to embody both the Enlightenment's rationalist privileging of mind over body and the pragmatics of the capitalist restructuring of the mode of production:

By the 1820's... design activity was being taken out of the heads and hands of craftworkers and made a form of mental labour, a specialisation, in its own right. This is the start of formal design education in Europe.³²⁰

While Fry rejects any narrow understanding in which design is simply posited as the domain of praxis of a specialised division of labour ('the designer'), the studied care with which he attempts to explicate his own understanding of design in *Design History Australia* evidences the tension between resisting falling into narrow, reifying representationalist definitions of design yet still allowing design to have its own identity. Before venturing his own 'definition' Fry prepares the ground by citing a diverse range of definitions from other authors; that from Victor Papanek being particularly germane to this discussion:

All men [/women] are designers. All that we do, almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act towards a desired, foreseeable end constitutes the design process. Any attempt to separate design, to make it a thing-by-itself, works counter to the inherent value of design as the primary underlying matrix of life. Design is composing an epic poem, executing a mural, painting a masterpiece, writing a concerto. But design is also cleaning and reorganizing a desk drawer, pulling an impacted tooth, baking an apple pie, choosing sides for a back-lot basketball game, and educating a child. Design is the conscious effort to impose a meaningful

³²⁰*Idem.*

order.³²¹

While not wanting to imply Fry's concurrence with the entirety of this quote, in a later text on the theme of design Fry himself asserts something which appears similar:

...if we take design at its most basic and general, it can be said that we are all designers. Cooking a meal, dressing, routine repeated actions, renovating a house, buying furniture — design is implicated in these and a myriad of other tasks. The fact that we all design, as we think, also means we act by the direction of design.³²²

Fry chooses his words with great care (note that the activities named are not necessarily claimed to be acts of design but rather that 'design is implicated' in them), leaving the delineation between the domain of design and that of other human activities deliberately blurred. The particular and profound way in which design is 'implicated' in our human activities, alluded to here by Fry, is explicated in subsequent chapters.

Papanek's and Fry's apparent inclusion of such a potentially vast range of activities within the domain of design, like Snodgrass and Coyne's inclusion of design within the ubiquitous category of hermeneutics, contrast the much narrower rationalist characterisations of design, further reinforcing the question of whether and how, within a post-foundationalist framework, a valid distinction might be drawn between designing and other human activities.

³²¹Papanek cited in Papanek cited in Fry, *Design History Australia*, op. cit., p. 15.

³²²Fry, T. *Design in Action and Design Reinvented*. Unpublished, Eco-Design Foundation, Sydney, p. 3.

Conclusion

It has been argued that Snodgrass and Coyne's use of the metaphors of 'textual interpretation' and 'conversation' to describe the design process appear, on first reading, to be incongruous and inappropriate: the interpretation of a text is, in an important sense, 'closed,' whereas the activity of designing is always substantively 'open'; conversation is absorbing and does not involve planning, whereas design has traditionally been viewed as deliberative and goal directed. In addition, the inclusion of design within the 'universal' interpretive structure of the hermeneutical circle has the potential to make design indistinguishable from other human activities.

What then is the value of the confronting analogies drawn by Snodgrass and Coyne in their explication of the interpretive and dialogical character of design? I would argue that Snodgrass and Coyne's positing of the metaphors of textual interpretation and conversation, like Schön's introduction of the concept of reflection-in-action, are themselves openings to a dialogue. In the manner which Snodgrass and Coyne's work itself makes clear, these are the projections of initial positions grounded in particular preunderstandings. By engagement in the dialogue, we open to challenge the prejudices of our own understanding.

As with Heidegger's work, Snodgrass and Coyne's account of designing highlights what the rationalist tradition has overlooked or misconstrued. By drawing on the metaphors of reading and conversing, and grounding their discussion in Heidegger's notion of preunderstanding/background, Snodgrass and Coyne begin to reveal the role of 'absence' in the interpretive activity of designing. But the tension and slippages in Snodgrass and Coyne's discussion when they move to the particularities of the design process also suggest a necessity to recognise the role of 'presence' in the interpretive activity of designing.

As in any conversation, views that are put forward invite further questioning. Snodgrass and Coyne's paper raises questions about the apparent incompatibility of the role of absorbed engagement and the role of deliberative planning in design, and whether there can be a place for deliberative planning in a hermeneutical laying out of the design process; it raises questions about the role of presence and the role of absence in designing, and how these might interrelate in any hermeneutical account of designing; and it raises questions about the nature of the activity of designing itself, and what differentiates it from other human interpretive activities. These questions are pursued in the following chapters.

CHAPTER 5

DESIGN AS DELIBERATION

Introduction

Using a number of key concepts arising from the work of the early Heidegger, this chapter sets in place a broad overview of the structure of the involvements of human beings in the world, and demonstrates how the design process might fit within this structure. In the course of the discussion, questions raised in the preceding chapter are addressed.

Four related concepts are explored: projection, absorption, care and breakdown. It is argued that Heidegger's description of *projection*, which in the preceding chapter is claimed to be central to the design process, can be interpreted as having two quite different aspects. One of these, which is non-deliberative and has the quality of absence, is privileged in the Heideggerian laying out of the structure of understanding. The other, which is deliberative and has the quality of presence, is marginalised in Heidegger's discussion and must be constructed from traces offered in Heidegger's text. It is held that this latter marginalised aspect of projection provides an opportunity to account in non-foundational terms for the character of design valorized by the rationalist tradition. In this way it is shown that deliberative planning *is* involved in the process of designing, but not in the way assumed by the rationalist tradition.

Using Heidegger's account of the way the world discloses itself to human awareness, the discussion examines the notion of *absorption* introduced in the preceding chapter. It is contended that the Heideggerian overturning of the rationalist understanding of the relationship between subject and object allows an account of designing in which it is possible to act deliberately while still remaining absorbed in the process of designing.

Using the two Heideggerian concepts of *care* and *breakdown*, the structure of the involvements of human beings in the world is laid out, and the crucial role of the design process in this structure is demonstrated. The interplay of care and breakdown is shown to operate as an on-going catalyst for the design process.

The examples used in this and subsequent chapters to elucidate how Heideggerian and hermeneutic concepts might relate to the design process may at first appear odd. Unlike the examples generally employed in design texts the examples used here are not necessarily related to the valorized practice of professional design, but are instead deliberately drawn from mundane, everyday activities. This is intended not only to demonstrate the point at which everyday modes of coping might change over to that mode of activity which is recognisable as designing, but also to provide the ground for the discussion in the final chapter of this Division to question whether, and how, it might be possible to differentiate the activities of professional designers. By understanding the scope of the design process and its place within our human practices, it is hoped that this may at the same time lead to an understanding of the full implication of Fry's claim that design is 'implicated' in all we do.

Design as Projection

The English translation of Heidegger's major work, *Being and Time*, gives very little explicit indication that the activity of design was significant to Heidegger's exploration of 'being-human'.³²³ However, in Section V of Division I of *Being and Time*, which sets up the crucial structure of understanding, there is a highly significant footnote. In the main text of this section, Heidegger argues that the reason our understanding is always directed toward bringing something about is because 'understanding has in itself the existential structure which we call

³²³'Being-human' together with 'non-human being' are the two basic ways of being explored in *Being and Time*. See Dreyfus, *Being-in-the-World*, op. cit., p. xi.

"projection."''³²⁴ As discussed in the preceding chapter, the notion of projection is central to Heidegger's formulation of the hermeneutic circle of understanding and interpretation. The English word 'projection' is used as the translation of the German word *entwurf*. However, in the footnote which comments on the selection of this word as the translation of the German word, the translators note the following:

'*Entwurf*'. The basic meaning of this noun and the cognate verb 'entwerfen' is that of 'throwing' something 'off' or 'away' from one; but in ordinary German usage, and often in Heidegger, they take on the sense of 'designing' or 'sketching' some 'project' which is to be carried through...³²⁵

Aside from the fascinating parallel between the sense of 'throwing something off' which is also contained in the etymology of the English word 'design' (discussed in the following chapter), if *entwurf* is translated as 'design', then the emphasis given *entwurf* in Heidegger's laying out of human involvement in the world would indicate that design becomes an extremely significant mode of being-human. All understanding and interpreting, which for Heidegger are at work in everything that humans do, takes on the character of 'design.'

For the most part, however, Heidegger's use of the term *entwurf* does not appear to correspond to rationalist formulations which emphasise the goal directed character of the design process. If, in a critical passage from *Being and Time*, the German word *entwerfen* is translated as 'designing,' then Heidegger might be read as contending that '[designing] has nothing to do with comporting oneself towards a plan that has

³²⁴Heidegger, *Being and Time*, *op. cit.*, pp. 185-86. For a discussion of the notion of projecting and pressing into possibilities, see Dreyfus, *Being-in-the-World.*, *op. cit.*, pp. 187ff.

³²⁵Heidegger, *Being and Time*, *op. cit.*, p. 185. Also see footnote 53 of Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 28.

been thought out...'.³²⁶ Thus, while Heidegger might hold that it is the projective character of 'designing' which is central to all understanding and interpretation, he wants to differentiate projection which is *unreflective* from the kind of deliberative and intentional projection in which goals are brought to thematic awareness.³²⁷

It is this latter mode of projection, however, which is valorized in the modern theory and practice of design. Even those who have begun to challenge the rationalist account of design still appear to require thematic awareness and deliberate intentionality to form some part of their own account. Papanek for example, who in an earlier quote includes a very broad range of activities within the category of design, still recognises deliberativeness as a distinguishing characteristic of design when he concludes that '[d]esign is the *conscious* effort to impose a meaningful order' [my italics].³²⁸ Even Snodgrass and Coyne, when employing Schön's protocols to return their discussion to the particularities of designing, assume that the understandings projected by the designer have the character of 'images',³²⁹ and as such these projections are part of thematic awareness.

Heidegger's privileging of unreflective projection and his corresponding marginalising of reflective projection is premised on his recognition that, even where we are engaged in deliberative and intentional activity, the sort of projection involved in this activity is *always grounded* in projection which is unreflective and non-deliberative. The degree to which he occludes discussion of reflective planning is perhaps also due to the magnitude of the task he sets himself. Faced with the

³²⁶Heidegger, *Being and Time*, *op. cit.*, p. 185.

³²⁷'Thematic awareness' and 'thematic consciousness' refer to the way in which things are brought into the foreground of awareness, such as in the mode of presencing of the unready-to-hand (discussed later in this chapter). In this mode of presencing things are nevertheless still understood on the basis of our background understanding of everyday engagement with the world. That is, they are *not* decontextualised from our everyday involvements. The mode of presencing where things are decontextualised is referred to by Heidegger with a similar term, 'objectifying thematizing.' For a discussion of 'thematic awareness,' 'thematic consciousness' and 'objectifying thematizing' see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 82ff.

³²⁸Papanek cited in Fry, *Design History Australia*, *op. cit.*, p. 15.

³²⁹Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 16.

project of overturning 2,500 years of rationalist epistemology, it is understandable that he should not want to cloud the clarity of his own thesis by dwelling upon a mode of being in which there is thematic awareness of goals and intentions — a mode of being which is, for the rationalist tradition, primary.

Even though Heidegger does marginalize the discussion of the thematic awareness involved in reflective planning, Dreyfus nevertheless holds that Heidegger does see a positive role for thematic awareness. Though, as Dreyfus explains in relation to the construction of his own arguments in *Being-in-the-World*, there is a difficulty in exhuming Heidegger's account of thematizing mental states (what the tradition calls 'consciousness'):

Digging out Heidegger's account of the emergence of thematizing mental states and their proper domain will require what may look like a forced reading of Heidegger's text, since in the published part of *Being and Time* Heidegger does not explicitly try to do justice to the traditional account of intentionality. That he intended eventually to face this issue, however, is shown by a comment on Dilthey on effort. "Within the same consciousness," Heidegger writes in explanation of Dilthey "the will and its inhibition emerge." Heidegger then asks, "What kind of being belongs to this 'emerge'? What is the sense of the being of the 'within'? What relationship-of-being does consciousness bear to the real itself? All this must be determined ontologically" (253) [209]. But Heidegger puts off the promised discussion, and refers to it again only on the last page of *Being and Time* where he asks: "What *positive* structure does the being of 'consciousness' have...?"³³⁰

It is argued in this dissertation that it is the 'positive structure' of *thematizing* mental

³³⁰Dreyfus, *Being-in-the-World*, *op. cit.*, p. 69.

states which gives the practice of design its recognisable character. Unlike the rationalist tradition, however, the discussion in this dissertation of the way in which thematized projection operates in the design process also wants to demonstrate the interdependent relationship between thematized and unthematized projection. Employing Heidegger's work to construct this argument is made awkward because, as Dreyfus makes clear in relation to his own project, putting together an account of how Heidegger's characterisation of thematized projection might operate in the practice of design requires assumptions to be made and connections to be drawn which are often only implicit in Heidegger's text.

Design as Thematized Projection

Being and Time lays out four modalities by which the world can be present to us: (i) 'readiness-to-hand' (referred to by Dreyfus as 'availableness'), (ii) 'unreadiness-to-hand' (referred to by Dreyfus as 'unavailableness'), (iii) 'presence-at-hand' (referred to by Dreyfus as 'occurrentness'), and (iv) 'pure presence-at-hand' (referred to by Dreyfus as 'pure occurrentness').³³¹ Two of these modalities, readiness-to-hand and unreadiness-to-hand, are particularly pertinent to establishing the sort of 'conscious' thinking that is recognisable in the activity of designing.

(i) Technologies in Background Awareness

The term Heidegger uses to describe what he holds to be the most fundamental modality in which the world shows itself is *zuhanden*, which is translated in *Being and Time* as 'ready-to-hand'.³³² In this modality things are simply there and available as part of some current project where everything is going smoothly and neither the things being used nor the project is thematically noticed. This modality is evident in innumerable everyday experiences. Extending an example employed by

³³¹Heidegger, *Being and Time*, *op. cit.*, pp. 91-148. For a discussion of these modalities of presence see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 60-87 with a summary on p. 84.

³³²Heidegger, *Being and Time*, *op. cit.*, p. 98. Dreyfus prefers to translate *zuhanden* as 'available'. Dreyfus, *Being-in-the-World*, *op. cit.*, p. xi.

Dreyfus,³³³ in a situation of using a door handle to enter a room, the project of getting into the room, while being always projected ahead of us, is not thematically brought to presence as such. Nor is the door handle noticed as an 'object,' but rather as something that is simply 'available' in facilitating the smooth flow of other involvements which belong to the current project. Additionally, in this modality we are not thematically aware of the presence of our own 'selves'.³³⁴ In opening the door we do not have any sense of ourselves as subjects exerting effort on a door handle object. Subject and object remain undifferentiated in the smooth flow of the activity.

Dreyfus' commentary on Division 1 of *Being and Time* explains that when we are absorbed in using things, the things we use have a tendency to 'disappear', they have a quality of 'transparency'.³³⁵ Technologies, such as door handles, cars, bicycles, spectacles, pens, computers and so on, withdraw into a sort of background awareness — an 'absence' — most emphatically while in normal use. Dreyfus explains that in this modality the users of equipment also become 'transparent' to themselves: 'there is awareness but no self awareness'.³³⁶ Dreyfus emphasises how basic this modality of experiencing the world is:

We should try to impress upon ourselves what a huge amount of our lives — dressing, working, getting around, talking, eating, etc. — is spent in this state, and what a small part is spent in the deliberate, effortful, subject/object mode, which is, of course, the mode we tend to notice, and which has therefore been studied in detail by

³³³*Ibid.*, pp. 196ff.

³³⁴For a discussion of the transparency of 'Dasein' see *Ibid.*, p. 66.

³³⁵*Ibid.*, p. 64. Weiser, a computer systems researcher for Xerox, makes a similar point: 'The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.' M. Weiser cited in Coyne, R. *Designing Information Technology in the Postmodern Age: From Method to Metaphor*. Cambridge, Massachusetts: The MIT Press, 1995, p. 31.

³³⁶Dreyfus, *Being-in-the-World*, *op. cit.*, p. 67.

philosophers.³³⁷

When we are absorbed in a task and things are going smoothly, Dreyfus points out that our activity is purposeful without our having 'in mind' a purpose. There need be no mental representation of a goal brought to presence in the course of our activity.³³⁸ Again, to stress this point, Dreyfus calls up our common experience of the world:

...in a wide variety of situations human beings relate to the world in an organised purposive manner without the constant accompaniment of representational states that specify what the action is aimed at accomplishing. This is evident in skilled activity such as playing the piano or skiing, habitual activity such as driving to the office or brushing one's teeth, unthinking activity such as rolling over in bed or making gestures while one is speaking... In general, it is possible to be without any representation of a near- or long-term goal of one's activity. Indeed, at times one is actually surprised when the task is accomplished, as when one's thoughts are interrupted by one's arrival at the office.³³⁹

This appears to be what Heidegger means when he states that the projection (*entwurf* — 'design') of possibilities which we are always pressing toward does *not* have the character of a *plan* thought out in advance. The project we are pressing toward, along with the things we are engaged with using as a means toward the project, are not thematically noticed but are part of the background. Dreyfus further argues that this mode of 'transparency' or lack of thematic awareness of the technologies we are using, of ourselves, and of the projects we are pressing toward,

³³⁷*Idem.*

³³⁸*Ibid.*, p. 93.

³³⁹*Idem.*

is associated with things going *as expected*: '...planning is not necessary as long as everything is going in its customary way...' ³⁴⁰

(ii) *Technologies in Thematic Awareness*

It is when things *do not go as expected* that Heidegger's second modality of presence, of being thematically aware of something and giving deliberate attention, ³⁴¹ can be seen to arise. This second modality Heidegger terms *unzuhanden*, which is translated in *Being and Time* as 'un-ready-to-hand' ³⁴² When something being used breaks down, we may become thematically aware of the *thing* itself, the *project*, and of the way the thing being used is *involved* in bringing about the project.

Using the previous example, if the door handle fails to work as expected, it will suddenly cease being 'transparent' and will be noticed *in its failure to work*. In noticing its failure to work we may also notice the blockage of its normal role of allowing us to open the door and achieve the project we are toward. The temporary breakdown thus exposes the system of involvements of door handles, doors, rooms, peoples' activities in and around rooms, and so on. In this context of breakdown we are likely to give the door handle deliberate attention.

Heidegger appears to give this un-ready-to-hand modality of presence a 'graded' character. Things 'stand out' more where the breakdown is more serious. ³⁴³ We move from *deliberate activity* to *deliberation* when simple attempts at rectification of the breakdown fail. If we keep deliberately turning the door handle yet it fails to open the door, we may eventually stand back and think about what else can be done about the breakdown.

³⁴⁰*Ibid.*, p. 187.

³⁴¹*Ibid.*, p. 72.

³⁴²Heidegger, *Being and Time*, *op. cit.*, pp. 103ff. Dreyfus prefers to translate *unzuhanden* as 'unavailable'. Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 70ff.

³⁴³For a discussion of Heidegger's account of the gradations of 'breakdown' and the difficulty of translating these into English see the translator's note in Heidegger, *Being and Time*, *op. cit.*, footnote 1 on p. 104.

Dreyfus believes that this stage of serious breakdown, which arises when things are *not going as expected* and normal deliberate coping is insufficient, 'involves reflective planning.'³⁴⁴ It is argued in this dissertation that this is where the modern understanding of design, as it is practised and as it is valorized in rationalist design theory, locates itself within the Heideggerian schema. It is the *deliberation* which comes about in order to cope with the unexpected or the new that is recognisable as central to the character of design, and it is this modality which differentiates design activity from other activities in which humans engage. This claim is not, however, the same as the rationalist assumption that only what is 'present' counts as part of the process of design. The 'absent' background and 'absent' projects are at work in design just as they are in all human activities.

Interrelation Between Background Awareness and Thematic Awareness

Clearly, reflection and thematic awareness arise in situations other than the types of breakdown Heidegger describes. It is in fact possible to make an effort to be thematically aware of a thing — to think deliberatively about something that is at hand or imagine something that is not. Heidegger's description of what occurs in a breakdown situation is not meant to circumscribe the contexts in which thematic awareness or reflection arise. He uses the explanatory device of 'the breakdown' in *Being and Time* to demonstrate that our everyday transparent involvements in the world are basic, and that the 'objects' which are noticed and the 'properties' which are attributed to them (which the tradition has come to name as grounds) are in fact *derivative* of these transparent everyday involvements.

Background awareness and thematic awareness can be present together. Recall that Dreyfus concludes his example of driving to the office — where we might only have a background awareness of both the equipment we are using (such as the steering

³⁴⁴Dreyfus, *Being-in-the-World*, *op. cit.*, p. 72.

wheel and pedals) and the project of getting to work — with the comment that ‘...at times one is actually surprised when the task is accomplished, as when *one’s thoughts* are interrupted by one’s arrival at the office...’ [my italics].³⁴⁵ We thus have no difficulty being thematically aware of one thing (the thing we are thinking *about*, which may be unrelated to driving) while having a background awareness of other things (the involvements of driving). Indeed, Dreyfus notes that our unthinking comportment ‘provides the nonsalient background that makes it possible deliberately to focus on what is unusual or important or difficult...’³⁴⁶

It could be argued both that to have a background awareness of the things we are dealing with *allows the possibility* of being thematically aware of other things, and that being thematically aware of something *creates the sense* of transparency that background awareness has. If background awareness is a type of ‘absence,’ and thematic awareness is a ‘presence,’ then presence is shown to have an interdependent relationship with absence. To take as an example the reading of a text, although the words are being ‘looked at’ they are arguably part of background awareness. It is what the text is *about* (the details of the murder in a novel, or the construction of the photovoltaic array in an environmental design text) that is present to thematic awareness. In the same way, in drawing a representation such as the plan of a house, the representation withdraws and allows our thematic awareness to be ‘in the house’, checking if the corridors are too narrow or the kitchen too small.

Subjects, Objects and Absorption

Snodgrass and Coyne contend that in the activity of designing there is *complete absorption* in the design context and things *do not* show up as objects. Describing the dialogical nature of the hermeneutical event of interpretation that occurs in a

³⁴⁵*Ibid.*, p. 93.

³⁴⁶*Ibid.*, p. 94.

conversation, they argue that:

To think of the dialogue as an encounter between a subject (I) and an other (thou) is to misread a subject-object dichotomy into a situation where it does not apply. In genuine dialogue the participants are caught up in the give and take, in such an involved way that they lose themselves in the conversation.³⁴⁷

In the same way, immersion in the activity of designing is also said to dissolve the subject-object dichotomy:

Designers are truly designing when they are so absorbed in the task that they are not aware that they are designing, nor that the design situation is an object outside themselves.³⁴⁸

As discussed above, Heidegger argues that the most basic modality of presenting of the world is readiness-to-hand, where things are 'transparently' there and available for use. In a situation such as a temporary breakdown of equipment certain aspects of the things being used are thematically noticed. The aspects which are noticed when things are un-ready-to-hand are, Heidegger claims, derivative of our dealings with them as ready-to-hand. That is to say, what comes to thematic awareness in such a breakdown situation are the very characteristics (or absence of them) that are anticipated in the ready-to-hand mode when things are going smoothly.

In a breakdown situation there is not only a loss of transparency of the things which

³⁴⁷Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 12.

³⁴⁸*Ibid.*, p. 15. From my own experience of the professional practice of designing, I would concur with the phenomenological account of designing provided here by Snodgrass and Coyne. It appears possible to experience long periods of total absorption in the task of designing. At the end of such periods of immersion in designing, it is not uncommon to look up from the task, be surprised by the time on the clock, and wonder 'where has the time gone?'.

are in use, there is also a loss of transparency of the user. Dreyfus states that '[j]ust as temporary breakdown reveals something like what the tradition has thought of as a "subject", it also reveals something like an "object"...³⁴⁹ The claim that design locates itself in the modality where things presence as un-ready-to-hand — where there is thematic awareness, reflective planning, and 'something like' subjects and objects show up — may appear problematic in the light of Snodgrass and Coyne's insistence that in the activity of designing there is *complete absorption* in the design context and we do not have a sense of ourselves as subjects, and things in the world *do not* show up as objects. However, the character of the 'subjects' and 'objects' which Heidegger believes shows up in the un-ready-to-hand mode of presencing of the world does not appear to bring with it the problems of the subject-object dichotomy as it is formulated by the rationalist tradition (against which Snodgrass and Coyne's article is directed).

Heidegger largely attributes the problems which he sees as associated with the separation of subject and object in consciousness to Descartes' representationalist formulation of the mind.³⁵⁰ Heidegger claims that '[w]ith Descartes every consciousness of something is at the same time self-consciousness...'³⁵¹ In other words, for Descartes and much of the subsequent rationalist tradition, being aware of something requires the presence of an agent (an 'I') which is somehow directing this awareness and to whom things are made aware. This sense of the presence of an 'I' is unavoidable in our language when we say something as simple as 'I am aware'. Such language makes it appear that there is some entity to which the awareness is present. Thus in the rationalist tradition the experience of 'imagination', which is so important to design, is considered to be a sort of representational image which occurs in the mind and which the 'I' sees.

³⁴⁹Dreyfus, *Being-in-the-World*, *op. cit.*, p. 76.

³⁵⁰The representationalist view of the mind is discussed in chapter 2 of this dissertation.

³⁵¹Heidegger cited in Dreyfus, *Being-in-the-World*, *op. cit.*, p. 56.

This representationalist view of the mind in which there is a separation of the 'I,' and the object that the 'I' is aware of, then requires the formulation of an intentional relationship between the 'I' and the object which must somehow transcend this separation. Frederick Olafson, in a work which aims to present a Heideggerian perspective on what it is to be a human being, points to the difficulty encountered by the traditional representational view of intentionality when it tries to describe an 'I' which is reflectively aware of its own actions.

Can I, for example, imagine something and at the same time "introspect" this act of imagining? It would seem that a supervening act of introspection would replace the act it is supposed to examine and thereby make it unavailable for examination. But suppose the mind were to turn on itself very quickly; might it not then be able to catch a glimpse of itself in that prior act before it goes off the screen? Tempting as this idea may be, there is also a strong flavour of absurdity about it which must raise serious doubts about the whole picture from which it derives.³⁵²

Heidegger's overcoming of the 'whole picture' of this representational view of the mind and its intentional states appears to be accomplished by a move similar to that made when he claims we do not *have* understanding but that we *are* understanding. In this way it might be said that we do not *have* awareness, we *are* awareness. Thus, rather than stating that 'I am aware (of something),' it would be more correct to say that 'I am the awareness (of something)'.

Olafson, following Heidegger, explains that '..."the self" would simply be the entity — the human being — to which something else is present and which is thereby

³⁵²Olafson, F. *What Is A Human Being?: A Heideggerian View*. Modern European Philosophy, Cambridge: Cambridge University Press, 1995, p. 156.

present to itself as that to which something else is present...'.³⁵³ In other words, if something is present to us, as for example when there is thematic awareness of something like a door handle which is either handy or imagined, the *door handle* will 'occupy our awareness' in the particular way it is being understood. All there is in this situation is the particular awareness of the door handle. There is no awareness of an 'I' which perceives the door handle; rather, the 'I' is the awareness of the door handle. It is of course possible for us to envisage ourselves looking at the door handle. In this situation it is the envisaging of ourselves *and* the door handle which 'fills our awareness'. There is no 'I' which is aware of itself being aware of the door handle. If there were, this formulation would culminate in an infinite regress which Olafson recognises as an absurdity.

Thus the 'something like' a subject and object which Dreyfus says comes to presence when there is a breakdown is very unlike the subject-object dichotomy the rationalist tradition has assumed. Commenting on the need for a self-aware Cartesian subject, Heidegger does however concede that '[t]here is no consciousness without self-consciousness...'.³⁵⁴ By which he appears to simply mean that our awareness of things is quite tangible for us. But Heidegger adds 'which does not mean that the self must become thematic...'.³⁵⁵ This reinforces his claim that no separate 'self' need emerge *aside* from the 'awareness itself'. It is not as if, without the Cartesian 'I' that is aware, the awareness will somehow be unnoticed.

Thus on the basis of Heidegger's schema, for those activities involving deliberation and reflection which arise in the modality of unreadiness-to-hand — where it is argued designing locates itself — the subject-object dichotomy as it is conceived by the rationalist tradition need not be present and the process can be one of absorption. Only where the presencing of the world moves to that modality which

³⁵³*Ibid.*, p. 160.

³⁵⁴Heidegger cited in Dreyfus, *Being-in-the-World*, *op. cit.*, p. 56.

³⁵⁵*Idem.*

Heidegger describes as 'presence-at-hand' and 'pure presence-at-hand' — in which entities are decontextualised and there is a self-contained object and a self-contained subject — would absorption no longer be possible.³⁵⁶

Worlds Constituted by Technologies, Practices and Projects

It is claimed above that design arises where the world is encountered as unready-to-hand, that is, where breakdown is encountered and normally transparent technologies which are part of transparent projects come forward from background awareness and are thematically noticed. By looking more closely at the relation between the technologies, practices and projects which constitute our world, it becomes possible to appreciate the involvements at work in contexts where the world shows up as unready-to-hand and the design process is initiated.

Against any essentialist view of a universal human nature, Heidegger argues that what we 'are' is the outcome of the culturally specific technologies, practices and projects — the worlds — into which we are thrown. As discussed, the particular history of engagement in various of these shared public worlds constitutes our *background* and our *understanding* (which collapse together). Heidegger wants to show that our involvement in the technologically mediated social practices of our worlds are so basic that we lose sight of their significance.³⁵⁷ For Heidegger 'being human' and 'being in a world' are one and the same. The 'in' of 'being in' a world is not a spatial relationship, such as might be said of an object 'in' a box, but has the existential sense of *involvement*, exemplified by Dreyfus in phrases such as 'being in love,' 'being in a good mood,' 'being in business,' and 'being in the working class.'³⁵⁸ Thus our 'place' and the place of our technologies is not a merely spatio-

³⁵⁶Dreyfus prefers to translate 'presence-at-hand' as 'occurrentness,' and 'pure presence-at-hand' as 'pure occurrentness.' For a discussion of these ways of being of entities see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 83-85.

³⁵⁷*Ibid.*, pp. 42ff.

³⁵⁸*Ibid.*, p. 43.

temporal 'world-point,'³⁵⁹ but implies a situatedness in relation to all of the involvements of projects and practices which constitute our worlds.

We unnoticingly take over projects and practices which have already been set in place within the world into which we are thrown. These projects are always already projected ahead of us, and we are always pressing toward them. These already projected projects, which belong to the particular worlds of involvements in which we are immersed, are nested one within the other, each making sense of the other, and each allowing the possibility of achievement of the other. The nesting of smaller and larger projects in which we are always involved and toward which are always pressing, is for a large part unthematized. As Dreyfus points out, the longer-term projects, within which more immediate projects make sense, are not like goals 'thought out' in advance which direct our action.³⁶⁰

Heidegger describes the projects which constitute our world not in absolute terms but in terms of their relationship with each other. Heidegger uses the phrases 'in-order-to'³⁶¹ and 'for-the-sake-of-which'³⁶² to describe their roles within the referential whole of a world. Our involvement in a world is thus structured by relations of in-order-to's and for-the-sake-of-which's.³⁶³ For example, the activity of driving a car, mentioned previously by Dreyfus, can be seen to make sense

³⁵⁹Heidegger, *Being and Time*, op. cit., p. 413.

³⁶⁰For a discussion of the inappropriateness of the use of the term 'goal' to describe our everyday directedness see Dreyfus, *Being-in-the-World*, op. cit., pp. 95-96.

³⁶¹Heidegger claims that 'Equipment is essentially "something-in-order-to."' Heidegger, *Being and Time*, op. cit., p. 97. For a discussion of this notion of equipmentality see Dreyfus, *Being-in-the-World*, op. cit., pp. 62-63.

³⁶²Heidegger explains that '[t]he "for-the-sake-of-which" always pertains to the being of Dasein, for which, in its very being, that very being is essentially as issue.' Heidegger, *Being and Time*, op. cit., pp. 116-117. Dreyfus argues that the end-point of our in-order-to's, which Heidegger describes as our for-the-sake-of-which's, maps crudely onto what might be described as our 'roles'. Dreyfus, *Being-in-the-World*, op. cit., pp. 94ff.

³⁶³The description of our involvements as nesting of in-order-to's and for-the-sake-of-which's is laid out in Part II and III of Division I of *Being and Time*. Heidegger, *Being and Time*, op. cit., pp. 78-122. Heidegger gives the following example of the way in which our involvements are structured: 'With hammering, there is an involvement in making something fast; with making something fast there is an involvement in protection against bad weather; and this protection "is" for the sake of [umwillen] providing shelter for Dasein—that is to say, for the sake of a possibility of Dasein's being.' *Ibid.*, p. 116.

within a nest of projects. Laid out crudely: we might drive in-order-to get to work, in-order-to practice as a professional designer, in-order-to get buildings built, in-order-to obtain fees, in-order-to sustain the office, in-order-to earn income, all for-the-sake-of living comfortably or being satisfied with our lives. Or we might drive to a building site in-order-to monitor our building project, in-order-to get it built the way we want, all for-the-sake-of being satisfied with the building, or for-the-sake-of receiving accolades for the building.

Care

Laid out in this way, it appears that all our nested projects ultimately provide what might be variously described as 'advantage,' 'reward,' 'satisfaction,' 'benefit,' and so on. Indeed, Heidegger indicates that our projects can be seen to be ultimately directed toward 'care' for ourselves, and for those people or things which we care *about*.³⁶⁴ Dreyfus explains that for Heidegger, caring, understood ontologically, implies 'making itself an issue.'³⁶⁵ We act with care because our being is an issue for us. At a basic level, for example, care is articulated when we unnoticingly act in such a way that we do not harm ourselves. We take care when we walk down stairs, when we cross the road, or when we slice cheese with a knife. At another level, we take care with our work, take care nurturing friendships, or take care of our children. Heidegger claims that theory as well as practice can be an articulation of care:

When we ascertain something present-at-hand [objectified/decontextualised] by merely beholding it, this activity has the character of care just as much as does a "political action" or taking a rest and enjoying oneself. 'Theory' and 'practice' are possibilities of Being for an

³⁶⁴Heidegger only implicitly links in-order-to's, for-the-sake-of-which's (which following Dreyfus are here referred to as projects) and being as care. *Ibid.*, pp. 236-237.

³⁶⁵Heidegger cited in Dreyfus, *Being-in-the-World*, *op. cit.*, p. 238.

entity whose Being must be defined as “care”.³⁶⁶ [my gloss in brackets]

Even the apparent failure to care evidenced in reckless behaviour, or the extreme of suicide, may be seen as an articulation of care (we adopt this possibility because we care what others think of us, or because we care that no one appears to care about us).

For Heidegger, *care* and the *temporality of understanding* are interdependent.³⁶⁷ It is because we have a background understanding (*past*) which is always already projected ahead of us (*future*) that we act caringly in the *present*:

...the Being of Dasein [‘there-being’ — the worlded being that we are] must therefore be grasped in the following structure: the Being of Dasein means ahead-of-itself-Being-already-in-(the-world) as Being-alongside (entities encountered within-the-world). This Being fills in the signification of the term “care”...³⁶⁸ [my gloss in square brackets]

Our everyday activities reveal the way in which temporality provides the structure for care. Consider for example the activity of crossing a busy road. It is because we already have a background understanding of roads and their potential dangers, and because in pressing toward the project of crossing the road (as part of some larger nesting of projects that we are pressing toward) we have already unnoticingly projected these dangers ahead of our crossing, that we encounter the road as dangerous and cross it with care. As neither the projects we are pressing toward nor our background understanding are brought to awareness, the character of care

³⁶⁶*Idem.*

³⁶⁷For a discussion of this Heideggerian sense of ‘care’ in relation to design see Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, pp. 97 and 103ff.

³⁶⁸Heidegger, *Being and Time*, *op. cit.*, p. 237.

with which our nested projects are structured is far from readily evident to us.

Caring Technologies, Projects and Practices

The projects that we are unnoticingly pressing toward are facilitated by particular interrelations of technologies, practices and nature. Practices, technologies and nature thus become 'in-order-to's' in pressing toward projects which provide care. Projects, technologies, practices and the nature they appropriate³⁶⁹ arise together and be-long together. For example, the interrelated technologies of motor vehicles, roads, traffic lights and so on, would not make sense outside a terrestrial world constituted by projects of journeying from home to work or delivering goods from warehouse to shop. Read in reverse, the projects of journeying from place to place are made possible by the interrelated technologies of vehicles and roads, and by the strength of the steel which cars appropriate and the firmness of the ground which roads appropriate.

The technologies and practices which facilitate 'caring' projects can themselves be seen to be caring. Technologies and practices 'take care' of the projects, and of nature as it is revealed in those projects. For example, enclosed motor vehicles 'take care' of the rain. Grease and oil takes care of the metal to metal friction in a vehicle's engine. Traffic lights take care of intersections of journeys in different directions.

It may at first seem odd to say that a technology, such as a traffic light, 'cares'. Nevertheless, understanding that a traffic light prevents collisions and injury brings to view the character of its care. For a car driver to safely negotiate a busy road intersection without the technology of traffic lights would require great concentration. However, in a context where there are traffic lights, it is possible,

³⁶⁹Our projects, practices and technologies disclose nature in various ways. We may encounter a 'shady tree' in our project of picnicking or we may encounter 'lumber' in our project of timber-getting. For a discussion of the way nature is taken up and 'discovered' in our practices, see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 109-110. The disclosure of elemental nature ('Earth') by our technologised way of being is one of the themes of Division III of this dissertation.

while waiting for the lights to turn green, to relax and talk on the mobile telephone, listen to the radio or prepare for the first meeting of the day; and then, when the lights do turn green, to turn safely with little thought. In this way the intersection is negotiated safely while largely remaining part of our background awareness. Thus through the traffic control technology, the intersection, and driving itself, is made ready-to-hand.

In a wholly mythic architectural example, the first shelter technologies made by our ancestors could be said to have been caring in that they 'freed' their users from the need to be constantly alert for predators and allowed them to direct their attention toward cooking, eating, procreating or nursing their children. Caring technologies and practices thus have the character of themselves contributing to caring projects but also *withdrawing* (to varying degrees) into a ready-to-hand transparency and 'freeing' thematic awareness for related or unrelated projects, or for the unexpected. Warm clothes free us from the need to be constantly aware of the cold. Shoes free us from the need to be constantly aware of where we tread. Medical drugs free us from awareness of pain. Pop-up toasters free us from the need to constantly check if the toast is burning. Door locks free us from constant concern about our property when we leave it unattended. All of the technologies and practices which constitute our world can be seen to exhibit this character of care.

Human beings are themselves an interdependent part of the technologically mediated practices which constitute our caring projects. Our participation in these techno-practices means that we are integral to the caring character of technologically constituted projects. Everyone participates in some way in the bringing into existence and delivery of technologies and technologized practices. As participants in caring projects, human beings thus become 'in-order-to's' alongside the technologies which constitute those projects. In this way human beings may also withdraw to become transparent ready-to-hand 'resources' which facilitate our

care.³⁷⁰

Giddens describes in rich detail the interdependence of modern techno-practices and the way in which the modern individual is enmeshed within, and has a trusting relationship with, these 'abstract systems.'³⁷¹ Heidegger might, however, object to Giddens's attempt to characterise our relationship with the people and technologies which constitute these systems as being one of 'an attitude of trust,' as this may be interpreted as some sort of mentalistic content which directs behaviour. When we are absorbed in our normal engagement with the world we have no sense of acting out of trust. Trust in this sense has been interpreted back into our relation with the world. For Heidegger, it could be expected that to act caringly would be articulated in *both* acts of trust and acts of distrust.

The Limits of Caring Worlds

The care offered by a particular world is circumscribed within limits determined by the *particular interrelation of projects, practices, technologies and the 'nature' they appropriate*, all of which constitute that world.³⁷² Because the interdependent involvement of technologies, practices, projects and nature, which constitute a caring world, arise and be-long together, it is *only within the limits of a particular world* that those projects, practices and technologies can care. It has been said, for example, that a pop-up toaster cares. But only in a world where there are nested projects which produce and supply electricity, only in a world which mines, smelts and fabricates metals, only in a world which allows metal filaments to give off radiant heat, only in a world where bread is eaten for sustenance, and only in a

³⁷⁰The notion of humans and nature being taken merely as resources for the care of human worlds, which becomes a theme in the work of the later Heidegger, is explored in Division III of this dissertation.

³⁷¹Giddens, A. *The Consequences of Modernity*. Stanford: Stanford University Press, 1990.

³⁷²Dreyfus states that '[o]ccurrent nature sets limits on what can be done with equipment.' Dreyfus, *Being-in-the-World*, *op. cit.*, p. 110. Rather than nature simply 'setting' limits, it will be argued in Division III of this dissertation that different technologically mediated practices disclose nature's limits differently.

world where there is a consumer culture, can something like a pop-up toaster 'care.' If any of the involvements which the technology interdepends shift in such a way that they move *outside the limits* which constitute the world of care of a current project, a difficulty will show up in pressing toward that project. If the electricity supply is interrupted, for example, the pop-up toaster becomes a mere object which no longer participates in the nesting of in-order-to's, and therefore no longer cares.

Where a difficulty is encountered in pressing toward a project, the technologies and practices in use and which were previously part of background awareness are brought to the foreground as unready-to-hand. In this situation we become thematically aware of the technologies and practices, which show up as no longer facilitating the smooth flow of the current project.³⁷³ In this situation there is a sense of breakdown and the technologies and practices are no longer encountered as caring. A toaster with a faulty thermo-stat, a road intersection that has become treacherously busy, a car that has broken down, a shoe that has lost a sole, a shirt that is too thin when the day becomes cool — each no longer contributes caringly to the project of which it is a part, and each comes forward into thematic awareness.

Design Initiated by Breakdown

Breakdown arises when the world is encountered as being beyond the limits of the relation of involvements within which the current project is able to care. Heidegger points out that when breakdown is encountered in pressing toward a project there is a point at which we stop struggling on in the face of the difficulty, and change our stance toward the situation. At this point Heidegger says that *deliberative activity* changes to *deliberation*: "[i]n deliberation one stops and considers what is going on and plans what to do."³⁷⁴ It is the shift to the deliberative envisaging of possibilities

³⁷³In terms of the gradations of Heidegger's modality of un-readiness-to-hand, this would be a temporary breakdown involving 'deliberate coping.' *Ibid.*, p. 72. Also see Heidegger, *Being and Time*, *op. cit.*, pp. 104-105.

³⁷⁴Dreyfus, *Being-in-the-World*, *op. cit.*, p. 72.

ahead of action which, it has been argued, is where the valorized activity of designing is recognisable.³⁷⁵

While Heidegger makes it clear in *Being and Time* that ready-to-hand 'caring' equipment becomes unready-to-hand if there is a breakdown and that this unready-to-hand mode requires deliberate attention, he does not make explicit the structure within which the un-ready-to-hand is again made ready-to-hand, or even more pointedly, how the world of ready-to-hand 'caring' technologies, practices and projects in which we exist *came to be*. Nevertheless, even without the promised discussion of the 'positive' role he sees for traditional conceptions of consciousness, thematic awareness, and deliberation, it seems evident from the indicators given in Heidegger's text that the kind of deliberation which he sees arising when there is a breakdown is centrally implicated in bringing into being the modality of the ready-to-hand.

In his discussion of understanding and interpretation, Heidegger notes almost incidentally that 'all preparing, putting to rights, repairing, improving, rounding out' is brought about when 'the ready-to-hand comes *explicitly* into the sight which understands.'³⁷⁶ Heidegger's point is not to explain what occurs when the ready-to-hand does come to thematic awareness, but instead to show that whatever does show up when there is a breakdown is always grounded in a prior understanding put in place by our unnoticed everyday involvement with the ready-to-hand. Nevertheless Heidegger's own italicisation indicates that in designing ('putting to rights, repairing, improving') the normally absent world of involvements is made explicit and deliberated upon in order to overcome breakdown.

³⁷⁵Winograd and Flores recognize that 'breakdown' in the Heideggerian sense plays 'a fundamental role in design,' and claim that the domain of action for a person 'are those that emerge in breakdown.' Winograd and Flores, *Understanding Computers and Cognition*, *op. cit.*, p. 166.

³⁷⁶Heidegger, *Being and Time*, *op. cit.*, p. 189.

Technological Progress

The history of technological 'development' appears to provide evidence that design is directed toward overcoming breakdown and restoring the care of the involvements of technologies that constitute our world.³⁷⁷ Breakdown might show up in any aspect of the caring world of involvements of a project that is being pressed toward. That is, breakdown may reveal itself wherever the limits of care are exceeded in the technologies, the practices, the other projects upon which the current project is interdependent, or the 'nature' which is appropriated by the technologies and practices. Where breakdown shows up in any of these involvements, design may be directed toward remaking the world of involvements which constitute the project, thereby bringing into being a caring, transparent, and ready-to-hand world. In this process, existing projects are transformed and new projects are brought into being.

While the way in which breakdowns show up is determined by the *relation* of the involvements which constitute a project rather than the involvements themselves, it is nevertheless valuable to see how the different constituents reveal themselves in a breakdown and catalyse the projection of design outcomes. Pursuing an example introduced by Dreyfus, it can be seen that the project of journeying by car involves a relation among *technologies, practices, other projects, and nature*. The 'progress' evident in the historical development of the world of journeying by car can be interpreted as having been constituted by attempts to overcome breakdowns arising in these involvements. Thus design has been directed toward overcoming breakdowns in the *technologies* involved in driving, overcoming breakdowns arising from the *practices* of drivers, overcoming breakdowns arising from involvements with *other projects* upon which driving is interdependent, and overcoming breakdowns arising where the vagaries of *nature* exceed the limits of care of driving

³⁷⁷Ihde describes this trajectory as one in which humans seek ever greater transparency of technology. Ihde, *Technology and the Lifeworld*, *op. cit.*, p. 75.

involvements.

Beginning with breakdowns arising in respect of *nature*, the relation of involvements constituting the project of journeying by car can be seen to care *only within certain limits of nature*. Breakdowns thus show up where nature shifts beyond some current limit of care of the world of involvements of driving. This may occur where, for example, roads ice over and reduce tyre traction, fog reduces visibility, or flood waters wash away the road. Design outcomes to overcome the occurrence of these breakdowns have historically included changes to tyre tread patterns, lights tailored specifically for fog, macadamized roads and culverts to divert storm water.

Considering next the breakdown arising from the *practices* which constitute the project of journeying by car, the relation of involvements can be seen to care *only within certain limits of practices*. Breakdowns thus show up where practices shifts beyond some current limit of care of the world of involvements of driving. This may occur where, for example, a car wanders onto the wrong side of the road. Design outcomes directed toward overcoming the occurrence of this breakdown have historically included the installation of visually detectable centre-line markers, centre-line markers which are aurally and tactilely detectable when crossed, and median barriers which make it physically difficult for cars to wander to the wrong side.

Considering the breakdowns which arise from the *technologies* which constitute the project of journeying by car, the relation of involvements can be seen to care *only within certain limits of the functioning of the technologies*. Breakdowns thus show up where technologies function beyond some current limit of care of the world of involvements of driving. This may occur where, for example, the brakes in a car 'lock up' when applied firmly, or where standard float glass windscreens break into dangerous shards in an accident. Design outcomes directed toward overcoming

these breakdowns have historically included anti-locking brakes and safety glass windscreens.

Considering lastly the *other projects* upon which the project of journeying by car is dependent, the relation of involvements can be seen to care *only within certain limits of the operation of other interdependent projects*. Breakdowns thus show up where the operation of interdependent projects shifts beyond some current limit of care of the world of involvements of driving. This may occur where, for example, oil prices increase dramatically making journeying by car unaffordable. Design outcomes to overcome this might include more fuel-efficient engines or shifting toward travel by public transport.

In each of these simple examples of a breakdown event, the limit of care of the world of journeying by car is exceeded and some aspect of the involvements of car travel is brought to the foreground (as inconvenience, danger, discomfort, annoyance, etc.). The design outcome is directed toward overcoming the breakdown by remaking the involvements, thereby bringing into being a caring and ready-to-hand driving world in which all of the involvements of driving, including the project of driving itself, withdraws into the background.

What is understood as 'progress' or 'development' might then be interpreted as the continual transformation of technologies and practices directed toward overcoming breakdowns which show up when a world of involvements is encountered as outside its limit of care. The transformation of technologies, practices and projects at every level of magnitude and complexity could be interpreted as following this trajectory: the development of effluent treatment systems could be seen to be directed toward overcoming breakdown events such as the transmission of water-borne diseases; installing a police force could be seen to be directed toward overcoming breakdown caused by the antisocial actions of others; developments in

sound reproduction technology such as compact disks could be seen to be directed toward overcoming the sense of breakdown in the imperfections of the sound reproduction of records and cassettes; even making deliberative changes to a hairstyle or a way of dressing could be seen to be directed toward overcoming the sense of breakdown encountered when it is noticed that the existing 'just doesn't do anything for you.' Consumer products — new clothes, hair gels, toasters, CD players and so on — can be seen to *offer themselves* as means to overcome points of breakdown (though, as will be seen, this relationship is perhaps far less self-evident and innocuous than is implied here).

Contested Care

The one-dimensional, heroic view presented above — of neatly nested projects each allowing the possibility of the next, and of design overcoming points of breakdown in these projects and moving on a trajectory of progress toward an ever more caring world — while necessary as an introduction to the involvements at work, is nevertheless a dramatic oversimplification. Indeed, if such a uni-directional trajectory of technological progress were operating, we might reasonably expect to be now living in a world of almost perfect care.

What is perceived as caring is always perspectival. Care is culturally, temporally and geographically specific. But this does not mean that having different perspectives of care is in any way arbitrary or relativistic. We cannot simply 'choose' another perspective from which to care, as shifting our perspective does not involve a mere 'change of mind,' but instead involves a change to the world of projects and practices within which the perspective is grounded.

Progress toward more caring technologies and practices is only the appearance of progress from one perspective of care among many. Indeed, commonplace perceptions of progress measured against interpretations of the past or against

interpretations of other contemporaneous cultures are entirely misleading because they understand earlier, or other, technologies or practices in relation to some *current* world of involvements rather than in relation of the world of involvements to which they be-longed and which facilitated their character of care.

Contestation arises continually between projects that care from different perspectives. The practices and technologies which constitute a caring world from the perspective of one project, do not necessarily constitute a caring world from the perspective of another. The world of technologies and practices of one project may cut across and exceed the limit of care of the technologies and practices of another. The intersection of the technologies and practices of the worlds of the different projects thus become loci of contestation which show up as points of breakdown.

Drawing again upon an earlier example, something as commonplace as a pedestrian crossing at the intersection of a footpath and a road can be seen to be a locus of contestation — the site of interface between the projects of motorists and those of pedestrians. Footpaths care for pedestrians in their projects of walking to the school or shops because they enable pedestrians to talk, daydream, or shepherd their children *without paying thematic attention* to their own feet, as they might on rough terrain. Likewise, in the manner described earlier, roads and their associated technologies provide care to motorists for the project of journeying from home to work. But the world of involvements of a busy road is beyond the limits of care for the projects of pedestrians. The intersections of roads and footpaths therefore become loci of contestation, which are points of breakdown for both pedestrians and motorists, *requiring thematic attention* and care.

In the same way, a toaster can be seen to be the site of contestation between the projects of different members of a household. A two slice toaster cares for dad's project of getting mum her breakfast quickly in order to get her to work in the

morning. The same toaster cares for the project of the kids getting their breakfast quickly in order to get to school in the morning. But demand for more than two slices at a time is beyond the limit of care of the toaster. The toaster may therefore become the locus of contestation of the two projects and be brought to thematic attention as a point of breakdown as family members wait impatiently for their toast.

Old growth forests can be seen to be the site of interface between the projects of environmentalists and those of forest industries. Old growth forests could be said to be involved in, and to care for, the project of providing biodiversity for human (and others') survival. Old growth forests are also involved in, and care for, the nested projects of timber production, the manufacture of timber products, forest industry employment, and so on. A world transformed such that the forest is clear felled can no longer care for long term human survival, and a world transformed such that the forest is conserved in toto can no longer care for short term human survival (at least in the context of that particular relation of involvements). Old growth forests become the loci of contestation of these intersecting projects and intersecting perspectives of care.

Design Outcomes Distributing Care

Breakdowns encountered at sites of contestation may initiate the design of outcomes directed toward caring for the contesting projects. Pedestrian crossings or traffic calming devices might be outcomes which care for both the projects of pedestrians and those of motorists. Legislative and policy instruments might be outcomes which care for the projects of environmentalists and those of forest industries. And a four slice toaster might be an outcome which cares for the morning projects of all of the members of a household. In each case the boundaries of the limits of care of contesting projects are adjusted in some way within the remade world of the design outcome.

However, design outcomes directed toward overcoming breakdowns at sites of contestation should also themselves be recognised as *perspectival* as they arise as part of pressing toward particular projects and are grounded in particular background understandings. As a result, design outcomes arising from points of contestation *do not necessarily care equally* for the contesting projects. At a site of contestation, it is conceivable, from the perspective of care of one project, to envisage design outcomes which are completely outside the limits of care of other projects. For example, at the site of intersection of a road and footpath it may be conceivable, from the perspective of the project of a pedestrian, to envisage an outcome such as 'block off the road.' This would bring into being a world that cared for pedestrians' projects, but would totally block motorists' projects.

Design outcomes rarely, however, articulate only one perspective of care. We are involved in innumerable projects which are perceived as caring. In pressing toward one project we are inevitably pressing toward many other interdependent and nested projects which constitute our worlds. As part of participating in these worlds we have an understanding of the value and significance of many different projects which contribute to our care. Thus even though we may for example experience a breakdown from the perspective of a pedestrian, because we are likely to also travel by car or bus, to use consumer goods delivered by truck or van, and to be reassured by the presence of emergency vehicles such as fire appliances and ambulances, then we will also have an understanding of the value and significance of projects involving vehicular transportation to our own care.

We can be seen to share a similar background, and therefore a similar understanding, with some people but not with others. As a result we may interpret particular contexts in similar ways to some people but not to others. Contemporary hermeneutics employs the notion of 'interpretive communities' to overcome the

problem of firstly explaining, without recourse to the rationalist concept of objectivity, how there can be *agreement* over an interpretation, and secondly explaining, without recourse to the rationalist concept of subjectivity, how there can be *disagreement* over an interpretation.³⁷⁸ An interpretive community is a community which shares a particular way of understanding and interpreting. An interpretive community should not, however, be thought of as an *homogeneous* community whose members interpret *all* things in the same way. Instead, as Fish points out, an interpretive community was conceived as being 'not so much a group of individuals who shared a point of view, but a point of view or way of organising experience that shared individuals...'³⁷⁹

In terms of Heidegger's emphasis on involvements of projects and practices, an interpretive community could be said to be a community which participates in the shared involvements of a project, its practices and technologies, and thereby acquires a common outlook in relation to that project. Indeed, Fish concludes that '[i]nterpretive communities are no more than sets of institutional practices...'³⁸⁰ Because we participate in the numerous interdependent projects that belong to numerous different worlds, we therefore belong to numerous interpretive communities which many others also share (and, of course, which many others do not). Yet, while each human being shares its interpretive communities with many others, each human being could also be said to be unique in that each is the unique site of intersection of a particular set of interpretive communities.

As designers, we cannot understand beyond the limits of that current set of interpretive communities which constitutes our understanding (though we can, over time, transform that set by participating in the involvements of further projects). In a design context, we are able to adopt the perspective of a range of different projects

³⁷⁸Fish, *Doing What Comes Naturally*, *op. cit.*, p. 141.

³⁷⁹*Idem.*

³⁸⁰*Ibid.*, p. 153.

that fall within the limits of that current understanding. In this way the orientation of our understanding shifts continually as we participate in the interpretive event of articulating each new design outcome. We may for example envisage a design outcome for a road intersection from the perspective of the concerns of a pedestrian's pram, and then move to the perspective of the concerns of a car with a large turning circle. The designer's capacity to envisage from multiple perspectives, shifting from the orientation of one technologically mediated practice to the next, will be shown in subsequent chapters to be a significant constituent of a hermeneutic laying out of the design process.

Design Outcomes Articulating Power Relations

A design outcome is thus an articulation of an understanding of the value and significance of the contesting projects at a site of breakdown. Depending upon the particular understanding of the projects disclosed in the context of breakdown, the concerns of some projects may be favoured over others in the outcome (while the concerns of still others may be omitted entirely). In articulating the value and significance of contested projects, the design outcome is, at the same time, articulating the power relations at work in the context of breakdown. The contention underlying this assertion, that power is not situated in the individual or in fixed social or political hierarchies, but is played out in the 'mobile'³⁸¹ relations of projects and practices which the individual takes over and in which the individual participates, is closely allied to Foucault's description of bio-technico-power.³⁸²

Just as the uncompromising design of Bentham's panopticon³⁸³ might be seen as the one-sided articulation of the contestation between the value and significance of the project of ensuring social order and the value and significance of the project of

³⁸¹Dreyfus, H. and P. Rabinow. *Michel Foucault: Beyond Structuralism and Hermeneutics*. Chicago: The University of Chicago Press, 1982, p. 185.

³⁸²For a discussion of Foucault's concept of bio-technico-power see *Ibid.*, pp. 184-204.

³⁸³For a discussion of the implications of the power relationships inherent in Bentham's design for the ideal prison, see *Ibid.*, pp. 191-93.

upholding prisoners' dignity, so too the timing mechanism which determines the interval between 'walk' signals at the traffic lights of a pedestrian crossing is the articulation of an understanding of the value and significance of the projects of pedestrians relative to the value and significance of the projects of motorists.

The designer does not, however, *determine* the power relations at work in the involvements of projects, but instead works with a background understanding acquired through shared engagement with these projects. Thus, rather than the 'creativity' and 'freedom' of the 'individual' designer controlling the power relations, and therefore the care, embodied in the design outcome, the power relations already at work in the involvements of projects, practices and technologies *work through* the designer. This point is made in a more general context by Dreyfus and Rabinow, when they speak of Foucault's contribution to the understanding of power:

This is the insight, and this is the problem. How to talk about intentionality without a subject, a strategy without a strategist? The answer must lie in the practices themselves.³⁸⁴

By viewing power as embedded in the mobile relations of projects and practices which the individual takes over and in which the individual participates, the normalised understanding that power relations exist between people and groups, and that technologies, projects and practices are merely instruments at the service of these human power relations, is inverted. Individuals and groups do not organise, but *are organised by* the power relations at play in the involvements of projects. To further reinforce this movement away from the notion that power relations operate *between* individuals or groups, it is evident from the hermeneutic concept of interpretive communities that because an individual participates in numerous

³⁸⁴*Ibid.*, p. 187.

projects and can therefore understand the value and significance of those projects, a single individual may 'embody' the tensions of the power relations operating between contesting projects.

Nature's projects

Contestation between projects is not only evident in the relationships of human projects to other human projects, but also in the relationship of human projects to the projects of nature. Discussion of this is made treacherous, however, by the fact that any naming of the 'projects of nature' must always remain an anthropocentric endeavour.

As discussed, our projects appropriate 'nature' as part of the interrelation of involvements which constitute a caring world. Thus, within limits particular to the world of involvements of a project, nature be-ongs to the care of that project. But nature is also encountered as beyond the limits of care of a particular world of involvements. The later Heidegger describes how 'nature'³⁸⁵ 'juts through' the human world,³⁸⁶ and demonstrates the significance of the way in which human worlds and nature strive in contestation with each other.³⁸⁷ We encounter nature's 'striving' when it reveals itself outside the 'limits' of care of a relation of involvements of our projects. Our projects thus come into contestation with those of nature and reveal points of breakdown. To encounter a wolf on the prowl, a virus searching for a host, or the tremors of an earthquake, is to encounter the striving of nature's projects. In the previous and more mundane example of tyres slipping on an icy road, this weather condition could also be seen as nature jutting

³⁸⁵Heidegger uses the polysemic term 'Earth,' which implies not just that which is encountered as 'interpreted nature,' but also all that is prior to interpretation. The implications of Heidegger's notion of Earth are explored in Division III of this dissertation.

³⁸⁶Heidegger, M. "The Origin of the Work of Art." In *Poetry, Language, Thought*, ed. J. Gray. 15-88. New York: Harper & Row, 1975, p. 49.

³⁸⁷In a manner that prefigures the later Heidegger's understanding of 'Earth,' Heidegger refers in *Being and Time* to 'the nature which stirs and strives...' Heidegger, *Being and Time*, *op. cit.*, p. 100. Also see Dreyfus, *Being-in-the-World*, *op. cit.*, pp.109ff.

through into the caring world of involvements of a project.

In the same manner as that described at the site of contestation of one human project and another, breakdowns encountered at the site of contestation with 'nature's projects' initiate design outcomes directed toward overcoming that breakdown. Shelter technologies or weapons may be outcomes directed toward overcoming the breakdown arising from the potential for confrontation with predators; vaccines may be outcomes directed toward overcoming the striving of micro-organisms; and stringent construction codes may be outcomes directed toward overcoming the potential stirrings of an earthquake.

In any context of contestation between human projects and the projects of nature, nature shows up as having significance and value in relation to our care. In this way, nature is understood to be woven into the power relations of our projects. Like all understanding, the understanding of the *value* of nature, and the understanding of the *power relation* between human projects and those interpreted onto nature, are historically and culturally constituted and vary among different interpretive communities. In certain historical and cultural contexts where nature's projects may have been understood to be powerful, mysterious and uncontrollable, and may have been valued only for their potential role in human projects, the design outcomes at the sites of contestation might, out of care, have been directed toward bringing into being a world which extinguished the perceived power of nature. Land clearing, fencing, and the general 'settling' of the striving of the bush during the early history of European colonization of Australia could be cited as evidence of this.³⁸⁸

In a contemporary technologized world where nature may be understood by

³⁸⁸For an account of the adverse impact of the 'settling' of the Australian landscape see Flannery, *The Future Eaters*, *op. cit.*

certain interpretive communities as threatened, weak and already overly dominated, the design outcomes at sites of contestation may be directed toward a different distribution of care. An architecture which values the ecological might for example attempt to make a building while still preserving the ecological systems of its site. The design might therefore be interpreted as bringing into being a world which 'distributes care' toward the projects of nature on that site.

Against the claims of those who propose a theory of intrinsic value of nature,³⁸⁹ on the above analysis it would appear that the value of nature in such environmentally motivated design outcomes is still grounded in an understanding of the way in which the relations of involvements, which now includes an understanding of the positive role of nature in our projects, *contributes to our own care*. In this view, biodiversity for example, would be considered to be ultimately valued because it is now understood to care for human survival. It might therefore be claimed that the care articulated in the current outcomes of environmentally motivated design remains enframed by instrumentalism.³⁹⁰

Breakdown and Perspectival Expectations

In the light of the discussion of the perspectival nature of care, it is possible to clarify further the role of background awareness and thematic awareness in relation to Heidegger's modalities of readiness-to-hand and the unreadiness-to-hand, and their involvement in the process of design. As discussed, Heidegger shows that in a situation of breakdown — the modality in which things presence as unready-to-hand — we become *thematically aware* of technologies and practices which normally facilitate the project we are currently pressing toward. That is, we become

³⁸⁹For a discussion of intrinsic value in the context of environmental ethics see, for example, Plumwood, V. "Ethics and Instrumentalism: A Response to Janna Thompson," *Environmental Ethics* 13 (Fall 1991); Russow, Lilly-Marlene. "Why Do Species Matter?" *Environmental Ethics* 13 (Summer 1981); Rodman, J. "Ecological Sensibility." In *Ethics and the Environment*, ed. D. Scherer. Prentice Hall, 1983.

³⁹⁰Division III of this dissertation explores the ecological ramifications of such an enframement of design by instrumental rationality.

thematically aware of the very things which are ready-to-hand when the project is going smoothly, and which allow the project to go smoothly when they are not part of thematic awareness. However, what counts as a ready-to-hand technology or item of equipment (and is therefore required to remain in background awareness to ensure the smooth flow of a project) is not fixed, but is instead dependent on the particular project being pressed toward.

In an article entitled 'Inconspicuous Architecture,'³⁹¹ which draws upon Heidegger's discussion of the modalities of presence of equipment, Coyne proposes that architecture might be well served if it were designed to withdraw into the modality of presence of the ready-to-hand. Coyne states that ready-to-hand architecture is that which is encountered as 'part of an equipmental whole; part of the background of living and working.'³⁹² He describes such a ready-to-hand architecture as 'inconspicuous.'³⁹³ Coyne recognises the perspectival rather than absolute nature of the things we encounter as ready-to-hand and transparently available:

"Inconspicuous" or "available" architecture is that with which we are comfortable. Something with which we are comfortable is culturally and environmentally appropriate... Comfort is largely a matter of expectations being met. What determines our expectations? This is our collective experience as building users.³⁹⁴

If our expectations are met, then the architecture remains ready-to-hand and inconspicuous, if they are not, it comes forward into awareness as unready-to-hand and conspicuous.³⁹⁵

³⁹¹Coyne, "Inconspicuous Architecture," *Ibid.*

³⁹²*Ibid.*, p. 67.

³⁹³*Idem.*

³⁹⁴*Idem.*

³⁹⁵Coyne equates 'conspicuousness' with 'presence at hand.' In terms of the discussion in this dissertation, however, 'conspicuousness' would imply the modality of 'unreadiness-to-hand' or 'unavailableness.' Dreyfus also equates conspicuousness and unavailableness. Dreyfus, *Being-in-*

What is expected to be in background awareness and what is expected to be in thematic awareness is dependent on the context of the project being pressed toward. Returning to an example used earlier of reading a book, it was argued that the text remains in background awareness and 'what the book is about', its plots and scenarios, occupies our thematic awareness. But if we were pressing toward a different project, say that of type-setting, it would be the abstract arrangement of the text, the 'shape' of the paragraphs and columns, which would occupy our awareness. If the scenarios of the text began to occupy our awareness, the project of type-setting would not proceed (and the typesetter might be accused of malingering).

'Unreadiness-to-hand' cannot therefore be conflated with 'conspicuousness' if conspicuousness simply implies 'being noticeable.' There are situations where the awareness of a thing is *necessary* to the transparency of the involvements of the project being pressed toward. In such situations, for something *not* to be noticed would itself cause a breakdown in the project. In the project of marketing products through advertising, for example, it would show up as a breakdown for the advertiser if a billboard was not conspicuous. In the project of carrying out day-to-day Muslim religious practice it would show up as a breakdown if the call to prayer did not jolt the faithful out of sleep and thereby allow them to arrive at the mosque at the appropriate hour. In the project of being suave, chic or desirable, it may show up as a breakdown if an expensive and garish new car failed to attract attention (to it and to its owner). In the project of courting important clients, it may show up as a breakdown if the wealth of a corporation was not brought to awareness in the sumptuousness of the architecture.

Rather than the conspicuousness of the unready-to-hand modality of presence of a

the-World, *op. cit.*, pp. 71-72.

thing simply implying its noticeability, it would appear that for Heidegger, and for Coyne, conspicuousness implies something *inappropriately* being brought to attention or thematic awareness as a result of it no longer contributing to the involvements of a project — that is, of being outside the limits of care of the involvements that constitute the project. What it is that shows up in awareness in a breakdown situation is also different to what might be present when something is simply ‘noticed.’ In noticing a car as expensive or a billboard advertisement as enticing, we are *participating* in the properly functioning relations of involvements of a particular project, but in a breakdown situation we instead stand apart from, and are aware of, the very involvements of the projects of which the technology forms a part (this mode of awareness is shown in subsequent chapters to contribute positively to the process of designing). Thus a billboard that is obscured might incite us to comment ‘what a waste of money,’ and in this way bring to attention the involvements of capital and consumer goods which drives the placement of a billboard advertisement — something which billboard advertisers would wish to remain transparent.

In arguing for an architecture that withdraws into the background involvements of the ready-to-hand, Coyne recognises that architecture, like all design outcomes, is polysemic. In terms of the discussion of this chapter, design outcomes participate in caring for, and maintaining as ready-to-hand, numerous intersecting projects (and these projects in turn care for those who participate in the ready-to-hand involvements held in place by these design outcomes). Depending upon the perspective being pressed toward at any moment, a design outcome may be understood in numerous different ways. When these understandings are brought forward as interpretations, design outcomes show up as polysemic.

In order to maintain the ‘primacy’ of ready-to-hand architecture,³⁹⁶ Coyne suggests

³⁹⁶*Ibid.*, p. 68.

that the design process should be a 'participatory enterprise'³⁹⁷ which accommodates the various perspectives of the different projects which the design holds in place. This in itself is not problematic, as it is agreed that the care of many projects, and therefore many interpretive communities, is at stake in a design outcome. It would appear problematic, however, if this position were extrapolated to embrace an argument which contended that design outcomes could (or should) care equally for all of the contesting projects at a site of breakdown, and in this way harmonise all of the interpretive communities involved. As has been argued, the care embodied in an outcome directed toward overcoming breakdown at the site of contested projects is inevitably perspectival. Indeed, there are situations where maintaining readiness-to-hand from the perspective of one project is mutually exclusive to the achievement of readiness-to-hand from the perspective of another project. In this context it would appear that a universally caring outcome could only be achieved by homogenising contesting projects and thereby normalising expectations. The mono-culture which would be the outcome of such an intervention would itself be an act of domination and marginalization.

Foucault confirms that power relations are always 'nonegalitarian and mobile.'³⁹⁸ However, his recognition of the inevitable inequality and shifting nature of power relations is not simply a criticism. For Foucault, power relations have a productive role.³⁹⁹ In terms of the argument presented in this chapter, the power relations operating among contesting projects can also be seen to have a productive role. It is the contestation of projects at sites of breakdown which initiates the projection of new design outcomes. In this way, every current power relation holds open the possibility of its own overturning, and with it the possibility of the constant remaking of our worlds.

³⁹⁷*Ibid.*, p. 67.

³⁹⁸Foucault, M. *The History of Sexuality*. Vol. I. Translated by R. Hurley. New York: Pantheon Books, 1978, p. 82.

³⁹⁹Dreyfus and Rabinow, *Michel Foucault: Beyond Structuralism and Hermeneutics*, *op. cit.*, p. 185.

Catalysing the Cycle of Change

A productive circularity emerges from the characterisation of design striving to overcome breakdown and install new worlds of perspectival care. New outcomes brought into being by design, which care from the perspective of the projects which they constitute, may intersect with other projects which care from different perspectives. Breakdown disclosed at the site of contestation of projects which care from different perspectives may in turn bring into being new design outcomes directed toward overcoming these breakdowns. The projects constituted by these new outcomes may in turn thrust through into yet other projects and disclose further breakdowns, catalysing the projection of still further design outcomes, and so on.

For example, the new technologies and practices directed toward overcoming breakdowns in the project of journeying by car can be seen to have transformed the project itself and sponsored the increase in personal vehicle use. The increase in car usage facilitated by design has in turn disclosed new sites of contestation with other projects. As crude tracks have been transformed by design into busy roads, new sites of contestation with the projects of pedestrians have arisen. The breakdowns disclosed at the sites of intersection of the projects of pedestrians and those of motorists have catalysed further design outcomes, such as pedestrian crossings, traffic lights, pedestrian bridges and traffic calming devices, directed toward overcoming those sites of breakdown.

The significant aspect of the process by which new projects brought into being by design thrust through into other projects and disclose breakdowns, is that the design outcomes which are then directed toward overcoming these breakdowns *cannot do so by returning the context to a state that existed prior to the disclosure of the breakdown*. The design outcome directed toward overcoming the breakdown arising

from the contestation between vehicles and pedestrians cannot, for example, return car technologies, traffic volumes, and so on, to some state which existed prior to the dangers of motor vehicle traffic being brought to thematic awareness. The relational whole of contemporary motor vehicle and road technologies are now constitutive of the projects of delivering goods, getting to work, shopping, visiting friends, and so on, which in turn are constitutive of a wider relation of involvements of social, economic and industrial projects, *all of which provide care*. It is because the involvements of technologies and practices brought into being by design provide care for all of those who currently participate in the projects constituted by those technologies and practices, that new design outcomes cannot simply reverse the involvements of those preceding design outcomes that now thrust through and cause the disclosure of breakdown, but must instead take those involvements into account in bringing into being new design outcomes.⁴⁰⁰

Conclusion

The interpretation of aspects of Heidegger's laying out of being-in-the-world discussed in this chapter provides an overall structure within which to locate the design process. The worlds in which we participate are shown to be constituted by involvements of technologies, practices and projects which we unreflectively encounter in our everyday engagement with the world as nestings of in-order-to's and for-the-sake-of-which's. The nested interdependent projects that constitute our worlds provide care, but only within the limits particular to the involvements of the projects, practices and technologies themselves.

Contestation arising at sites of intersection of projects may result in the limits of care of a current project being exceeded, disclosing a breakdown in which the project is no longer able to be pressed toward and is therefore no longer able to care. In a

⁴⁰⁰This structure is significant to the discussion in Division III, where it is shown that technology has a tendency to devalue any attempt to resist its striving.

situation of breakdown the normally ready-to-hand involvements which constitute our projects are brought to thematic awareness and revealed as un-ready-to-hand. In order to deal with the breakdown and bring into being a caring ready-to-hand world, we shift from the mode of transparent coping to that of deliberation and reflective planning. *It is in this mode of deliberation and reflective planning that it is argued the valorized understanding of design locates itself.*

The deliberation of designing is directed toward installing a new outcome — a new local world of caring involvements — in which the breakdown is overcome. The new outcome is inevitably an articulation of a perspectival understanding of the value and significance of contesting projects. In this way the new outcome put in place by design does not care equally for the projects which intersect the new world of involvements, nor, therefore, does it care equally for the interpretive communities which participate in those projects. Each new perspectival outcome that is put in place has the potential to thrust through and cause breakdown in other projects with which it intersects and cause further breakdown, thereby initiating further designing to overcome the breakdown, and so on, in a cycle without closure. From a long term historical perspective, it could be argued that it was the contestation of multiple perspectives of care which catalysed the making of the world in which we now dwell, and it is the unabating contestation of multiple perspectives of care which continues to catalyse its remaking.

CHAPTER 6

DESIGN AS THEMATIZED PROJECTION

Introduction

The previous chapter lays out an overview of the larger world of involvements of caring projects and practices in which design situates itself. This chapter focuses more closely on the phenomenology of the human designer, and demonstrates the way in which the modes of human understanding and awareness that show up in the process of design operate within the thrall of the larger world of involvements of projects and practices. As an interim position, the structure of the design process that is laid out in this chapter is presented as a simple cyclical process. By building upon this interim position, the subsequent chapter demonstrates the way in which the full richness and complexity of the design process may be accounted for within the Heideggerian hermeneutical formulation.

Existential Possibilities

A 'possibility' is anything that 'can be.' From the perspective of our human activities, our possibilities are circumscribed by the historicity of our existence in the world. That is, our possibilities are culturally, temporally and geographically bounded, and vary from one interpretive community to another. In terms of the preceding discussion, our possibilities can be seen to be held open by the innumerable trajectories of projects and their involvements which constitute the world. Everything that it is possible to be, to do, and to understand is grounded on the background of projects and involvements which constitute our world — no possibility is meaningful beyond this horizon. If, as has been argued, design brings into being and transforms the world of our projects and involvements, then design also brings into being and continually transforms our horizon of possibilities.

Heidegger states that we are always pressing forward into possibilities.⁴⁰¹ We are always engaged in being, doing and understanding some possibility or other. Clearly, all the possibilities that are open to us do not necessarily show up as sensible. Heidegger explains that, on the basis of our particular background of involvements and the projects we are pressing toward in the current situation, there are a limited range of possibilities which, *without deliberation or reflection*, show up as making sense for us to press toward. This space of possibilities bounds our range of possible actions without in any way determining what we do.⁴⁰² Heidegger refers to this range of possibilities which we know without reflection as *existential possibilities*. Dreyfus illustrates this idea as follows:

If Heidegger's carpenter⁴⁰³ sees that it is lunch time, it is logically possible for him to eat rocks, and physically possible for him to eat acorns. He could also arbitrarily choose not to eat at all and go fishing. However, given his cultural background, his current mood of, let's say, professional seriousness... and his current involvement in his work, only a certain range of possibilities, say knackwurst or bratwurst, are actually available to him.⁴⁰⁴

If it is considered that our nested projects are facilitated by particular technologies and practices, then what existential possibilities appear to amount to are the 'in-order-to's' that facilitate our projects. When we are pressing toward some project, there is a range of technologically mediated practices (i.e. nesting of smaller projects) *already in place as constitutive of that project*, which stand as possibilities that we might unreflectively choose to adopt. That this choice is unreflective, and neither the

⁴⁰¹Dreyfus, *Being-in-the-World*, op. cit., pp. 186ff.

⁴⁰²Heidegger, *Being and Time*, op. cit., p. 185. Also see Dreyfus, *Being-in-the-World*, op. cit., p. 189.

⁴⁰³For those unfamiliar with Heidegger's work, this is a play upon Heidegger's use of the example of a carpenter's workshop, which he employs to illustrate certain important concepts relating to the nature of equipment.

⁴⁰⁴Dreyfus, *Being-in-the-World*, op. cit., p. 190.

available possibilities are thought about in advance nor is there any awareness of actually making a choice, relates both to the fact that these possibilities are *already* constitutive of the project, and that these possibilities have been chosen in similar situations before. The German carpenter, for whom 'eating German sausage' has previously worked well in satisfying the project of a lunchtime meal, may require no deliberation to choose this possibility. In this context, the German sausage already fits as an 'in-order-to satiate hunger,' and is encountered as such in the unreflective act of taking the sausage from the fridge. Or, using again the example of journeying, it is not necessary to thematically plan the trip to work each morning. We unreflectively adopt the practices and technologies that have gotten us to work on other mornings.

Breakdown Disclosing Desire

In familiar contexts, existential possibilities allow us to press transparently toward caring projects. However, in a situation of breakdown where our normal practices and technologies fail, the context is unfamiliar and existential possibilities are no longer adequate. As has been argued, such breakdown occurs when the limits of care of the relation of involvements of a project are exceeded. In the unfamiliar situation of breakdown there are no familiar or practised possibilities which are available to overcome that breakdown and which can be pressed toward *without reflection*. That is, there are no practices or technologies that can be adopted as a means to overcome the breakdown *while still remaining ready-to-hand*.

Drawing again on Dreyfus' example of a door handle, consider the situation of arriving home in the evening and opening the front door of our house with a key. Everything is going smoothly, our thematic awareness is engaged in debating what to have for dinner, and the door we are opening with a key remains in background awareness. Suddenly the key snaps off in the lock. In this context there are unlikely to be any available possibilities to overcome the situation that we can switch to

which would still remain in background awareness.

When the key breaks, making it impossible to get into the house, we suddenly find ourselves *wanting* to get in, *needing* to get in, *desiring* to get in. If there appears to be no way to get inside, we find ourselves wondering where we will eat, what we might miss on T.V., and where we will sleep. Thus, while we may have been previously unaware of the projects we were pressing toward, when the projects become blocked they come forward to thematic awareness. As discussed, Heidegger stresses that the projects we are always pressing toward are not normally thematically *present* in awareness in the form of goals.⁴⁰⁵ The nesting of possibilities that we are pressing toward are *absent* when things are going smoothly. In breakdown they are made present.

In the first chapter of this Division, a potential difficulty with the normalised understanding of 'expectations' was flagged. The difficulty is that 'expectations,' along with 'needs,' 'wants,' and 'desires,' are treated by the rationalist tradition as presences which somehow pre-exist in the mind. When we are pressing toward projects and things are going smoothly, however, it would be entirely inappropriate to say that we are *needing, wanting, desiring* or *expecting* to achieve the projects we are pressing toward. It is only in breakdown that what are described as needs, wants, desires and expectations come to presence as such.

Extending a previous example, when we are walking on a footpath, it would be inaccurate to say that we *expect* the footpath to be solid under foot. We do not walk around the city with such an expectation. It is only when we encounter a section of footpath that has the consistency of a sponge or the spring of a trampoline under foot that we could actually say that 'we did *not* expect it to feel like that.' Prior to coming to presence, our 'expectations' could be said to be that range of possibilities

⁴⁰⁵*Ibid.*, pp. 95-96.

which are understood to be within the limits of care of the projects we are pressing toward. All that pre-exists is our background which is always already projected ahead, and expectations have no particular form until breakdown discloses something other than the projected background.

The coming to presence of needs, wants, desires and expectations is thus *dependent* upon the possibilities and projects that are always already being pressed toward. Thus while *needing* or *wanting* a new hair style, for example, might not be said to exist until we look in the mirror and our hair shows itself as 'a mess', the grounds of possibility of needing or wanting a new hair style is nevertheless dependent upon us *already* pressing toward the often unnoticed project of presenting our appearance to others in a manner that we find satisfying. That is, the disclosure of needs, wants and desires is grounded in the temporal structure of care.

Rationalist design theory often sights needs and wants as initiating the design process.⁴⁰⁶ This in itself is not incorrect. However, because rationalist design theory seeks grounds in presence it fails to recognise that the needs and wants are themselves only made present on the basis of the largely absent nesting of projects that are always already being pressed toward.

The Projection of Thematized Possibilities

In our everyday coping with the world it is the unthematized, 'absent,' existential possibilities that are *already* projected ahead and that are *already* unnoticingly being pressing toward. When breakdown occurs, an absent possibility that is already being pressed toward is brought to *presence* as desired. With breakdown, therefore, there is a change over: rather than pressing toward an existential possibility, it is

⁴⁰⁶Broadbent notes that '[t]he pioneers of modern architecture assumed that user needs should provide the basis of their 'functional' brief. There was a conflict, certainly, between what they said and what they actually did, but their intentions at least were reasonable.' Broadbent, *Design in Architecture*, op. cit., p. 390.

now a *thematized possibility* — a possibility thematically present to awareness — that is already projected ahead and that we *desire* to press toward. Thus when the key breaks in the lock we find ourselves desiring to press toward the now *thematized possibility* of getting into our house.

Heidegger indicates that in a breakdown situation, because we are blocked from pressing toward the possibility that shows up as desired, two outcomes might follow: we might either struggle over the breakdown by *deliberative* activity,⁴⁰⁷ or we might, at some point, stand back and *deliberate*.⁴⁰⁸ When our key breaks off, we may, for example, try to deliberately turn the broken key in the lock in order to make it work. If this fails, we may stand back and deliberate about the situation.

Standing back and deliberating could be claimed to initiate the process which is recognisable as designing. In deliberation we commence *projecting further thematized possibilities* that have the potential to allow us to press toward the possibility that has shown up as desired. Thus when our front door key snaps and the desired possibility of getting into the house shows up, the thematized possibility of 'calling a locksmith' might be projected. In a more conventional architectural example, if the addition of children to a family brings into being a world beyond the limit within which their small house can 'care' and a sense of breakdown is encountered in projects such as entertaining, bathing, relaxing etc., then thematized possibilities such as 'getting a larger house' or 'extending the existing house' might be projected. The projection of thematized possibilities, which might in the language of design theory be referred to as generating design outcomes, is thus recognisable as the valorized activity of designing.

⁴⁰⁷Heidegger, *Being and Time*, *op. cit.*, p. 105. Also see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 71-2.

⁴⁰⁸For a discussion of the changeover from deliberative activity to deliberation see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 72-3.

Latent Breakdown

If, rather than moving to the stage of deliberation and the projection of thematized possibilities, we instead 'struggle over' the breakdown and simply put up with the difficulty, then the experience of the need for deliberative activity in the particular context of that project is retained as part of 'absent' background understanding. It is this retained understanding of prior breakdown which offers an explanation of why things should suddenly show up as desirable: why, when something is encountered, we might think 'that looks really useful,' or why we might notice a consumer product and think 'I want one of those.'⁴⁰⁹

If, for example we find that it is possible, by turning it forcefully, to use half the key to open the door we may not get the lock repaired immediately, but we will henceforth understand that it requires deliberative attention to unlock the door. If we have a two slice pop-up toaster and this causes small delays in getting through breakfast and pressing on with other projects, we may do nothing about this situation, but we will have a background understanding that it is a context which will (annoyingly) draw thematic attention every morning. Similarly, if the sites of breakdown that show up for a family that has outgrown its house are simply struggled through, then there will be background understanding of these annoying cramped conditions.

There are innumerable sites in the structure of 'in-order-to's' of our everyday projects which are understood as requiring deliberate attention but which may not immediately (or ever) become the subject of deliberation directed toward overcoming the breakdowns, that is, the subject of design activity. The sites of breakdown that show up as requiring deliberate attention are at the limits of care of the involvements of our projects. The limits of care of our projects, understood as

⁴⁰⁹Heidegger does not explicitly discuss this situation. The account here is constructed from Heidegger's discussion of breakdown and the role of background generally in all interpretive encounters.

unaddressed sites of breakdown, lay dormant in background understanding and, as will be shown, may offer themselves as the target of future design activity, including the design and marketing of consumer products.

Imagine that after some weeks we have still not repaired our lock and we are still struggling each evening to enter the house with a broken key. If, while having a dinner party at the house, a guest happens to mention she is a locksmith, it is likely that 'a possibility' will leap forward into thematic awareness. The guest's skills will be 'seen as' an in-order-to in overcoming the dormant breakdown in the project of entering the house each evening and the words 'would you mind having a look at my...' might tumble out.

Thus for a possibility to be brought to presence as desired there must already be a project which is being pressed toward, and what shows up as a possibility must be understood as capable of *extending the limit of care of the involvements* of that project and thus *appear to provide advantage* in pressing toward it. As we have seen, a pedestrian crossing may be seen as a possibility for extending the limit of care of the involvements of pedestrians trying to cross a busy road; or a faster, safer, or more comfortable car might be seen as a possibility for extending the limit of care of the involvements of the project of journeying by car, and so on.

Importantly, however, because the possibilities that are brought to presence as desired are not already part of the involvements of these projects *they cannot simply be unnoticingly adopted* in the manner of existential possibilities. Some change is needed to the current world of involvements to incorporate these thematized possibilities and thus allow them to become existential possibilities: the pedestrian crossing must be built, the car must be purchased. It appears therefore that these possibilities show up, and show up as desirable, both because they are interpreted as providing care in some current project and *because thematic attention is required to*

transform the world and incorporate the possibilities within the structure of in-order-to's of the current projects.

By way of example, consider two clichés of desire: a woman/man, and an exotic car. Imagine that the car or the man/woman are encountered by chance and spontaneously noticed as desirable — that is, that there is no current intent to seek out a new car or a new partner. In terms of this discussion, each might be said to overcome a limit in some current, though absent, project and therefore be interpreted as *advantageous* in relation to that project: an exotic car might be interpreted as a possibility which extends the limit of care and is therefore perceived as advantageous in the project of seeking prestige, pleasure or sexual attraction; a woman/man might be interpreted as a possibility which extends the limit of care for the project of seeking affection, companionship, or sexual enjoyment (in each case these interpretations are appropriations of background understanding).⁴¹⁰

If the car or woman/man could simply be 'taken' without effort, without thematic awareness, without the need to transform the world of involvements, they would *not* show up as desirable (in Heidegger's terms they would simply be existential possibilities). It is *because* of the necessity of transforming the world of involvements by changing our economic circumstance, or entering into socially arbitrated courtship rituals, that desire is made present. If, as has been argued, design is central to the process of transforming the world of involvements of our projects, then design could also be said to be the process by which *possibilities brought to thematic awareness as desired are transformed into existential possibilities*.

⁴¹⁰In order that this example not be misunderstood, it must be emphasised that the claim that a desired possibility is 'interpreted as providing advantage' is not a form of thematized rational analysis which precedes a determination that something is desirable. Rather, it is simply the event of something *showing up* as desirable which is itself the interpretation. As has been argued, the background understanding of latent breakdown which is appropriated in the event of something showing up as desirable *is absent*. It is this absent background which allows desire to show as desire *without* any prior or accompanying rational analysis.

As noted, because our projects and their practices and technologies are nested and interdependent, we are never simply pressing toward one project. While as an architect I may be working toward the completion of a housing project, because this project is also bound to my earning of income, I am at the same time unnoticingly pressing toward the projects of providing financial support for my child (as part of the project of being a father), of providing food in order to satiate hunger and maintain health, of being materially comfortable, of procuring a car (which in turn may be understood as an in-order-to gain affection, companionship, prestige, and pleasure), and so on.⁴¹¹ Even when we temporarily leave off our engagement with one project and take up another, the suspended project remains part of background understanding and is always already projected ahead of any current activity. As an outcome of prior experiences of breakdowns, there is therefore always a background understanding of innumerable sites of breakdown in the absent projects that are already projected ahead. This background understanding may, at any moment and without prior analysis, allow something encountered to show up as a desired possibility.

Consumer products, which are paradigmatic of the way in which possibilities show up as desirable, target the background understanding of latent sites of breakdown. Consumer products show up as desirable *because* they offer themselves as possibilities to overcome these latent sites of breakdown and extend the limits of care of the projects already projected ahead. Thus a car, a toaster, or hair gel, offers itself as an in-order-to in projects *we are already pressing toward*. These products show up as desirable by holding out the possibility of extending the limits of care of

⁴¹¹A note of caution must be sounded here. This discussion provides 'examples' of the 'absent' projects that are always being pressed toward. While this is necessary to make the discussion accessible, to reify our projects in this way, to bring what is most often absent to presence, does not do justice to Heidegger's notion of the projects and involvements which constitute our world. Quite simply, our projects and the world they constitute cannot be captured as a linguistic presence. Any linguistic assertion is only an interpretation which makes the projects present in a certain way from the perspective of a particular background understanding. A linguistic description of a project is not the project. A project 'is' our engagement in it, its doing. A project, like the world it constitutes, is an endlessly multivalent possibility which offers itself to be captured in endless interpretations — but none of these are ever what it 'is.'

projects already projected ahead and thereby offering some perceived advantage in pressing toward those projects. It is thus the absent projects we are pressing toward, and our understanding of the limits of involvements of those projects, which allow a consumer product encountered by chance to show up with the thought 'that looks really useful,' or 'I want one of those.'

In a structure which is more covert, however, the marketing of consumer products does not restrict itself to simply offering a product as a means of overcoming a point of breakdown. The marketing of consumer products actively works toward exposing, and even creating, the points of breakdown that are the target of the product — thereby putting in place a cycle which is self-fulfilling. As will be shown in Division III, by transforming our expectations of the world, consumer products, like all products of design, set in place new relations of involvements which makes their adoption difficult to resist.

The 'If-Then' Structure of Thematized Possibilities

The preceding discussion has illustrated two circumstances in which everyday non-deliberative coping may change over to the deliberation of designing. Firstly, an event of breakdown may bring an absent possibility already being pressed toward to presence as desired. As the existential possibilities normally adopted without reflection are blocked, further thematized possibilities must be projected in order to facilitate pressing toward this desired possibility. Secondly, absent background understanding of latent breakdown may allow something unintentionally encountered to come to presence as a desired possibility. Again, as there are no existential possibilities already in place that can be adopted without reflection, further thematized possibilities must be projected in order to facilitate pressing toward the desired possibility.

In one of the few brief passages of *Being and Time* which is perhaps identifiable as

referring explicitly to the valorized understanding of design, Heidegger sketches how the working out of the process of design might proceed.

All preparing, repairing, improving, rounding-out, are accomplished in the following way: we take apart in its "in-order-to" that which is circumspectively ready-to-hand, and we concern ourselves with it in accordance with what becomes visible in this process.⁴¹²

This confirms that what we attend to in the process of design ('repairing, improving') are the nestings of technologically mediated practices and projects — 'in-order-to's' — that are being pressed toward. The in-order-to's show up in the design process in two ways. Firstly, breakdown reveals the in-order-to's which are part of the normally absent projects that we are pressing toward. The deliberation of the design process concerns itself with the in-order-to's which are thus made visible at the site of breakdown. Secondly, our experience of the many nestings of in-order-to's that constitute current and previous projects means that these in-order-to's are already part of background understanding. In the deliberation of the design process this background understanding is appropriated in the projection of new possibilities directed toward overcoming breakdown.

Much later in *Being and Time*, Heidegger makes a number of telling observations about deliberation itself.

This specific way of bringing the object of concern close by interpreting it circumspectively, we call "*deliberating*" [*Überlegung*]. The scheme peculiar to this is the 'if—then'; if this or that, for instance, is to be produced, put to use, or averted, then some ways or means,

⁴¹²Heidegger, *Being and Time*, op. cit., p. 189.

circumstances, or opportunities will be needed.⁴¹³

Heidegger thus holds that deliberation projects its possibilities as an 'if—then' structure. As we have seen, Schön's analysis of the process of designing also recognises the significance of the operation of the 'if—then' structure:

...there is a literal logic of design, a pattern of "if...then" propositions that relates the cumulative sequence of prior moves to the choices now confronting the designer.⁴¹⁴

Returning momentarily to consideration of existential possibilities, the nesting of in-order-to's that constitute our everyday projects can also be seen to unfold in and 'if—then' structure. Previous examples might be reframed to demonstrate this structure: " 'if' Heidegger's carpenter is hungry, 'then' she will need to go to the fridge," and " 'if' she wants to get to the fridge, 'then' she will need to walk across the room," etc. The 'then' can be seen to be an 'in-order-to' in pressing toward the 'if.' However, as the 'if's' and 'then's' of our everyday unreflective coping with the world are existential rather than thematized possibilities, the 'if —then' structure is not brought to presence.

It is in a situation where existential possibilities are blocked or unavailable, and we move to the mode of deliberation, that the 'if — then' structure becomes explicit. If breakdown has disclosed a desired possibility — an 'if' — but there are no existential possibilities already available to allow us to unnoticingly press toward this possibility, a further possibility — a 'then' — may be *thematically* projected. In this way the structure is explicitly brought to presence as: 'if' we are to press toward this possibility, 'then' a further possibility will be needed. If pressing toward this further

⁴¹³*Ibid.*, p. 410.

⁴¹⁴Schön, *The Reflective Practitioner*, *op. cit.*, p. 99.

possibility also shows up as blocked, a still further possibility may be thematically projected. Deliberation thus proceeds by the unfolding of thematized 'if's' and 'then's' which are projected ahead and pressed toward.

Returning to the preceding example of the key that breaks off in the lock, it can be seen that this technologically mediated practice which is the site of breakdown is an in-order-to which holds a place in a nesting of in-order-to's facilitating the project of entering the house. The key is in-order-to unlock the lock, and unlocking the lock is in-order-to open the door, and opening the door is in-order-to enter the house, and so on. When the key breaks, the *desired possibility of getting inside the house* is brought to thematic awareness. The blockage of the normally ready-to-hand in-order-to's does not allow this desired possibility to be unnoticeably pressed toward, and the need for a further possibility 'in-order-to' press toward this desired possibility may be disclosed. Thus in the process of deliberation a further thematized possibility such as 'break in through the window' may be projected. The 'if — then' structure of possibilities thus unfolds as: 'if' we are to get into the house 'then' we may need to break in through the window. But deliberation may also reveal this possibility to be blocked, as no familiar existential possibilities are ready-to-hand to be unnoticeably adopted in-order-to break in through the window. A further thematized possibility such as 'using an implement of some sort' may therefore be projected. The 'if — then' structure of possibilities may thus show up as: 'if' we are to break in through the window 'then' an implement of some sort may be needed. In this way the unfolding of 'if's' and 'then's' continues until a 'bridge' of in-order-to's is assembled which facilitates movement from the present context of breakdown toward the desired possibility.

'Being With' Projected Possibilities

Heidegger points out that in deliberation the projects being pressed toward reveal the things encountered in our immediate environment *in a particular way*. Pursuing

the example of the broken lock, if the possibility of breaking in through the window with an implement of some sort is projected, we may proceed to look around our immediate environment for something to use. If we happen upon a brick, we may momentarily consider the possibility of using it to break the glass in-order-to get through the window. Heidegger, continuing his discussion of deliberation, refers to the situation of such an encounter:

Circumspective deliberation illumines Dasein's current factical situation in the environment with which it concerns itself. Accordingly, such deliberation never merely 'affirms' that some entity is present-at-hand or has such and such properties.⁴¹⁵

In a sharp critique of rationalist models of perception, Heidegger is pointing out that not only in everyday non-deliberative coping, but also in deliberation — the mode in which it is argued design situates itself — things in the environment are never encountered as mere objects with properties, but are always taken *as* something or other in the context of some current project. If we are searching around for an implement with which to use to enter through the window, then the brick we happen upon in the yard will *not* first show up as an extant object to which we attribute properties such as 'hard' and 'heavy.' As Dreyfus makes clear:

Heidegger does not make the mistake, criticized by Wittgenstein, of supposing that some *uninterpreted* matter is *used as* or *seen as* equipment... Rather, "in the mere encountering of something, it is understood in terms of an involvement-whole" (189)[149]. Heidegger is clear that things are always already understood, although we only subsequently explicitly see them *as* something.⁴¹⁶

⁴¹⁵Heidegger, *Being and Time*, *op. cit.*, p. 410.

⁴¹⁶Dreyfus, *Being-in-the-World*, *op. cit.*, p. 197.

Thus the brick which is encountered or envisaged as a possibility to break in through the window is not first seen as uninterpreted matter and *then* taken as a possibility to smash the glass of the window. Nor is the brick first seen as its most common manifestation, 'something for building walls,' and *then* seen as an implement for breaking through the window. It is seen *immediately* as a possibility for breaking into the house through the window.

As Heidegger points out, when something is encountered it is always seen as something in terms of an unnoticed 'totality of involvements'.⁴¹⁷ That is, it is encountered as an in-order-to in the nesting of in-order-to's of the projects we are unnoticingly pressing toward. Thus in the deliberation of designing, things encountered in the local environment may be seen as possibilities which fit into the nesting of in-order-to's being put in place to overcome breakdown. A brick may therefore be seen as a possibility which fits into a nesting of in-order-to's which gains us entry to our house. But Heidegger goes on to explain that deliberation need not restrict itself to the *local* environment:

Moreover, deliberation can be performed even when that which is brought close in it circumspectly is not palpably ready-to-hand and does not have presence within the closest range. Bringing the environment closer in circumspective deliberation has the existential meaning of a *making present*; for *envisaging* is only a mode of this. In envisaging, one's deliberation catches sight directly of that which is needed but which is un-ready-to-hand. Circumspection which envisages does not relate itself to 'mere representations'.⁴¹⁸

⁴¹⁷'In the mere encountering of something, it is understood in terms of a totality of involvements; and such seeing hides in itself the explicitness of the assignment-relations (of the "in-order-to") which belong to that totality.' Heidegger, *Being and Time*, *op. cit.*, p. 189.

⁴¹⁸*Ibid.*, p. 410.

Envisaging is the mode of deliberation where things which are not necessarily physically close are 'brought close'. In the deliberation of designing, envisaging allows that which is not present in the immediate environment to be projected as a possibility in the design context. Faced with the initial breakdown event of the key which has snapped off in the lock, in the process of deliberation other possibilities such as 'ring a locksmith' or 'go to a friend's house' might be projected to overcome the breakdown. These possibilities are not present in the immediate environment. If we were to stand outside our disabled front door and envisage ringing a locksmith, for example, it is evident that neither a locksmith nor a phone could be said to be 'palpably ready-to-hand.'

Envisaging also makes possible deliberation about contexts of breakdown which are not in the immediate environment. In the event of finding ourselves unable to enter our house, we may, as mentioned, project the thematized possibility of 'going to a friend's house.' We may then press toward this possibility and arrive at the friend's house. In this new context there would be no difficulty in continuing to project possibilities to overcome the breakdown from the comfort of the friend's house, even though the site of breakdown is not 'palpably ready-to-hand.' This of course is the common situation of professional designers who design from their office (or indeed, their car, their shower, or wherever they happen to be), and neither the site of breakdown nor the possibilities projected to overcome the breakdown are necessarily 'palpably ready to hand.'

The German word used by Heidegger and translated in *Being and Time* as 'envisaging' is *Vergegenwärtigung*. The first syllables of the German word have the meaning 'to make present,' and a footnote in *Being and Time* discussing the use of this word notes that the first syllable of the word is italicised by Heidegger to accentuate this reading. In this way, Heidegger is emphasising that envisaging does

not have the character of, say, a subject viewing an object. What is envisaged is *present with us*, not present as a some form of mental image (an object that furnishes the mind) which is separate from the viewing subject. When we envisage, we are *with* that which is envisaged.⁴¹⁹

'Being with' the possibilities that are projected in a design context begins to make sense of both the way possibilities show up in the activity of designing, and the way in which design navigates the space of possibilities projected into the design context. As has been discussed, Heidegger argues that in our everyday engagement in the activities of the world, we are always pressing forward into possibilities. We unnoticingly press forward into existential possibilities until we encounter an event of breakdown which may catalyse the projection of thematized possibilities to overcome the breakdown. If, in envisaging the possibilities projected in the design context, we are 'there' with the possibilities, then it would follow that *envisaged possibilities would be encountered in a similar manner to those possibilities encountered in our everyday engagement with the world*. Thus, when we follow the unfolding of the 'if-then' structure of *envisaged* possibilities, we may either encounter places where existential possibilities are adequate to allow us to press forward, or we may encounter blockages where existential possibilities are not adequate and which require further thematized possibilities in order to allow us to press forward. In envisaging a flow of possibilities, it is the blockages, the sites of breakdown, which are brought to presence as needing thematic attention while the existential possibilities which move us 'between blockages' remain absent.

⁴¹⁹Apparent in Heidegger's treatment of envisaging is a critique of the rationalist tradition's difficult relation with the concept of imagination, discussed earlier in this dissertation. The rationalist tradition's privileging of permanent presence has made it difficult to accept that what is envisaged in imagining counts as a mode of presencing, treating it instead as a 'representation' of some permanently present object. By stating that what is envisaged 'does not relate itself to "mere representation"', Heidegger is emphasising that what is brought to presence in envisaging are not simply 'mental images.' Olafson concurs that '[w]hat is imagined is not present to me in the form of an image that counts as an item of experience alongside all the rest. Instead, it is present to me in its own distinctive manner as something possible, and its presence in absence is not dependent on the actuality of an image that would be an occurrent element in my experiential field.' Olafson, *What Is A Human Being? op. cit.*, p. 128.

Returning again to the event in which our key breaks off in the lock, in envisaging the flow of possibilities to overcome this breakdown event, it would therefore be expected that only those sites would show up where existential possibilities were *not* available. When we unthinkingly put the key in the lock of our front door and the key breaks, the *desire* to get into the house may be disclosed. We may, as previously described, deliberate about the breakdown and project the thematized possibility of 'breaking in through the window.' In envisaging ourselves trying to break in through the window, our hands may show up as inadequate to the task, and we may find ourselves *needing something* in-order-to force open the window. In the envisaging of the flow of possibilities in this example, it is unlikely that *existential* possibilities that are already understood to belong to the thematically projected possibilities would show up. In envisaging the possibility of 'breaking in through the window', we would not, for example, thematically envisage each footstep of the trip from the front door to the window, as these are already understood to be available existential possibilities which belong to the project of moving from place to place. Rather, it is the momentary breakdown at the window, where ready-to-hand possibilities are not available, that is brought to presence. Heidegger's claim that deliberation catches sight of 'that which is needed but which is un-ready-to-hand,'⁴²⁰ confirms that in deliberation, envisaging discloses the sites of breakdown in the flow of in-order-to's where existential possibilities are not available.

Possibilities Appropriated from Background Understanding

Heidegger continues the brief discussion of the role of deliberation by showing how the 'if—then' structure which is evident in deliberation is 'grounded' in prior understanding:

Circumspective making-present ... is grounded in a *retention* of that

⁴²⁰Heidegger, *Being and Time*, *op. cit.*, p. 410.

context of equipment with which Dasein concerns itself in *awaiting* a possibility. That which has already been laid open in awaiting and retaining is brought closer by one's deliberative making-present or envisaging. But if deliberation is to be able to operate in the scheme of the 'if—then', concern must already have 'surveyed' a context of involvements and have an understanding of it. That which is considered with an 'if' must already be understood *as something or other*.⁴²¹

Both the envisaging of a possibility as an 'if,' and the disclosure of the need for a 'then,' are grounded in a prior understanding ('a *retention*')⁴²² of the 'context of involvements' of the breakdown situation and a prior understanding of the situation from which the possibility arises. Heidegger later states that '[t]he involvement-character of the ready-to-hand does not first get discovered by deliberation, but only gets brought close by it...'⁴²³ thereby emphasising that the possibilities are not the 'product' of deliberation, but that deliberation allows what is *already understood* to be brought to awareness in a particular way in the context of breakdown.

Arguing that *already understood* possibilities drawn from prior experience are projected into contexts of breakdown might be seen to be similar to Schön's claim that designers draw from a 'repertoire' of possibilities that have been used before, and (re)use them in the 'unfamiliar' situation of the design context.⁴²⁴ As Schön explains:

⁴²¹*Idem.*

⁴²²The term 'retention' is probably used here in the same sense as it is used in the work of Heidegger's teacher, Husserl. Husserl pairs the term 'retention' with that of 'recollection.' 'Retention' might be said to be the experiences of the world which we unnoticingly retain, while 'recollection' is an appropriation of retention which is brought to presence as, for example, memories. 'Retention' might be considered to correspond in some ways with Heidegger's notion of preunderstanding. For a discussion of retention and recollection in Husserl's work, see Carr, *Interpreting Husserl*, *op. cit.*, pp. 251-66.

⁴²³Heidegger, *Being and Time*, *op. cit.*, p. 411.

⁴²⁴Schön, *The Reflective Practitioner*, *op. cit.*, p. 138.

It is our capacity to see unfamiliar situations as familiar ones, and to do in the former as we have done in the latter, that enables us to bring our past experience to bear on the unique case.⁴²⁵

For something to be envisaged or encountered as a possibility (an 'if') to overcome a blockage in pressing toward a project (and thus to 'operate in the scheme of the 'if—then''), requires both that there *already* be experience of this possibility, and that there *already* be experience of the context of involvements into which the possibility is projected.⁴²⁶ Experience of a possibility allows there to *already* be an understanding of its capability. Mirroring this, experience of the context of breakdown into which the possibility is to be projected allows there to *already* be an understanding of what capability is required to overcome the breakdown.⁴²⁷

Thus for a brick to be envisaged or encountered *as a possibility* to break through a window would require a background understanding of both the relations of involvements (in-order-to's) of the glazed windows of the house, and an understanding of the relations of involvements of bricks. From previous experience we may, for example, already understand what sort of capability is required to break the glass of a window and how that might allow subsequent possibilities which would enable us to enter through that window. From experience of the projects which constitute our world, there may also be a background understanding

⁴²⁵*Ibid.*, p. 140.

⁴²⁶The claim that projected possibilities are appropriated from a background of involvements should not be equated to the claim, sometimes made by design methodologist and CAAD researchers, that projected possibilities are drawn from 'memory.' In *Knowledge-Based Design Systems*, for example, it is claimed that '[a] human designer calls up certain constraints, subgoals, and generators from his or her long-term memory.' Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, p. 17. Rather than memories being the ground for the projection of possibilities, memories are themselves grounded in the same background as projected possibilities. Memories are made presence *as* memories when past experience is disclosed from the perspective of pressing toward some current project. This event of disclosure results in new interpretations of past experience.

⁴²⁷This should not however imply that the possibility projected to overcome breakdown will therefore inevitably be capable of overcoming breakdown. The finitude of understanding and its implications for the design process are discussed in the following chapter.

that bricks can be 'in-order-to's' in various practices, including building walls, paving floors, breaking open nuts, throwing at intruders, *and* smashing the glass in windows. Thus we may already understand the capability that is required to break glass in order to enable us to open the window and enter the house, and we may already understand that bricks may satisfy the capability that is required.

Originality and Innovation

Arguing that the thematized possibilities which are projected toward overcoming breakdown are grounded in a background of prior experience appears to place in jeopardy the most valorized of design discourses — innovation and originality. In drawing upon Heidegger's work, this difficulty is accentuated by his own often reiterated insistence that 'things are always already understood.'⁴²⁸ Envisaging a brick as an implement for smashing glass and breaking in through a window, for example, might therefore be interpreted as requiring that the brick must necessarily have already been experienced as used in this way and therefore already understood as this possibility.

Heidegger's emphasis on the notion that we always already understand makes his work difficult to appropriate in any description of the design process which is to include creativity.⁴²⁹ Heidegger's work lends itself to this conservative

⁴²⁸Dreyfus asserts that 'Heidegger is clear that things are always already understood, although we only subsequently see them explicitly *as* something.' Dreyfus, *Being-in-the-World*, *op. cit.*, p. 197.

⁴²⁹McLaughlin explains clearly how CAAD researchers, cognitive scientists and rationalist philosophers struggle with theorising human creativity: 'The assumption that to understand is to possess and manipulate descriptions creates a problem when we come to explain "creativity." If in order to understand a situation we must possess a description of that situation, how is it that we can ever think of anything new?' McLaughlin, "Practices and Primordial Understanding," *op. cit.*, p. 47. McLaughlin then goes on to argue that the 'problem of creativity' dissolves when we instead employ Heidegger's account of understanding. Using Heidegger's notion that we take over cultural practices that are already in place, and drawing support from Fish that 'anything' can cause change, she concludes that '[o]nce we recognise that we are adaptive creatures and that the very possibility of our participating in a shared understanding rests on taking over cultural practices then we will recognise that change is inevitable.' *Ibid.*, p. 48. While I agree entirely with McLaughlin's critique of the theoretical positions of CAAD researchers, cognitive scientists and rationalist philosophers, I do not however believe that this entirely addresses the problem of creativity in relation to Heidegger's work. To argue that we are constantly changing and developing ourselves by 'taking over cultural practices' reinforces the conservative Heideggerian rhetoric that we are taking over *what is already there*, that we are developing only within the limits of the cultural and social practices *that already exist*. What this does not explain is how the new is brought into being,

interpretation because, as part of the emphasis on absence rather than presence, Heidegger concentrates the discussion in *Being and Time* on *existential* possibilities, and, as has been discussed, for something to be an existential possibility and be unthematically pressed toward it must *already* be understood to be part of the relation of involvements of the project being pressed toward.

A similar problem appears to arise when the status of the design project that is brought into being by the process of deliberation is considered. In the event of breakdown it is the possibilities and projects which are *already being pressed toward* that thematically show up as desired and which therefore direct the projection of subsequent design possibilities. Because design appears to press toward possibilities which are merely those which belong to projects already being pressed toward, it might be concluded that there are no 'original design projects.'

Both the conclusion that there can be no original 'design solutions' because projected possibilities are drawn from already understood contexts, and the conclusion that there can be no original 'design project' because the possibility that is pressed toward already belongs to a current project, misunderstand the critical shifts which occur when breakdown gives rise to deliberation and thematized design possibilities take over from existential possibilities. It is these shifts which allow, indeed *necessitate*, originality in the process of designing.

Consider firstly the shift that occurs when a design project is brought into being. As discussed, in our everyday engagement with the world we unreflectively adopt existential possibilities in pressing toward projects which are themselves constituted by those existential possibilities. In an event of breakdown, a possibility already being pressed toward may show up as desired. Because of the breakdown, existential possibilities are no longer available to allow the desired possibility to be

how the cultural practices and artifacts that we take over can themselves change.

pressed toward. Thematized possibilities may therefore be projected toward overcoming the breakdown. In this event a critical shift occurs. The thematized possibilities which are projected as in-order-to's in pressing toward the desired possibility are *not* the same as the existential possibilities which previously constituted the project. With the projection of the new nesting of in-order-to's, *the project is no longer what it was*. In being constituted by new possibilities, a new and different project has been brought into being.

Consider secondly the shift that occurs in the projection of *already understood possibilities* which are drawn from background understanding. As argued, the thematized possibilities which are disclosed in an event of breakdown are those which, on the basis of background understanding, are already understood to be capable of allowing the desired possibility to be pressed toward. In drawing a possibility from a context in which it is already understood and projecting it into the context of breakdown, as before, a critical shift occurs. *The projected possibility is no longer what it was*. In the context in which the possibility was already understood, it was an in-order-to in a particular relation of involvements and was therefore 'seen as' something in terms of that world of involvements. In its shift to the world of involvements of the context of breakdown, the possibility becomes an in-order-to in a *new* relation of involvements constituted by the thematized possibilities that are being projected. In relation to the new world of involvements the possibility is therefore 'taken as' something which is (either inappreciably or vastly) different.

To illustrate the shift in the meaning of both the possibility and the project which occurs with the projection of each thematized possibility, consider another mythical example. Imagine a particular community of peoples that had only ever encountered the limbs and branches that occasionally fell from trees as 'something that gets in the road when walking,' and had therefore never involved them in their practices beyond picking them up and moving them out of their way. Imagine that

all digging for food in this community was done by hand. Envisage further that on one particular day in this mythical community someone has injured their hand, but, being community spirited, still wants to pull their weight and continue digging for food. In this context of breakdown the desired possibility of continuing to dig is therefore disclosed. As an outcome of prior experience of digging with fingers, there is already a background understanding of the involvements of digging.

Our mythical community member may therefore look around her environment in search of a possibility. She may encounter a small fallen limb and, having a background understanding of tree limbs which is grounded in experience of picking them up and tossing them to one side, the limb may immediately be disclosed as a possibility in-order-to press toward the project of continuing to dig. At the moment of the limb being seen as 'something to dig with' its meaning has shifted. In the context of the project in which it is now envisaged, it is no longer what it was. In addition, the project into which the possibility is projected is also transformed. Although the project might still be described as 'digging for food,' the technologically mediated digging for food which incorporates the use of a new possibility in the form of a digging stick is a different project to that of digging by hand.

The shift that takes place when the limb is 'taken as' a stick, cannot merely be described as a change of function, that what is really a branch — a biological entity — is now being used for the function of digging. For the early Heidegger, what a thing 'is,' is grounded in the context of involvements to which it belongs.⁴³⁰ Thus from the perspective of the involvements of biology the limb 'is' a biological entity, and from the perspective of the project of digging for food it 'is' a digging stick. The implications of such a pluralist conception of reality, and the way in which it avoids

⁴³⁰Heidegger's view on the grounds for the meaning of being appears to shift in his later work. For a full analysis of the turn in Heidegger's thinking on the understanding of the meaning of being see Okrent, *Heidegger's Pragmatism*, *op. cit.*, pp. 177-297.

collapsing into relativism, are discussed in Division III.

Through the limb's participation in the involvements of the project of digging, the meaning of the limb is transformed. While the shift in the meaning which occurs in the projective act of design might be described as a metaphorical shift in that the limb is now seen 'as' a digging implement, it is not metaphor that grounds the shift. The shift is instead grounded in possibilities opened by already being in a world. It is only by being in a world of involvements of digging for food, and being in a world of involvements of moving limbs out of the way, that the possibilities of one are able to be drawn into the context of the other. Nor is the shift in meaning circumscribed by language.⁴³¹ While language may be involved in, and therefore constitutive of, the practices of digging and moving aside tree limbs, language does not determine the shift that occurs in the projective act of design. Indeed, at the moment the limb is disclosed as something in-order-to dig, the first 'stick' comes into being *and* a space of possibility is opened for language. New meaning and the possibility for new language arrive *with* the shift in being.

'What is Needed' Seeks a Possibility

In the discussion to date, it has been argued that in the event of breakdown thematized possibilities are appropriated from background understanding and projected ahead in an if-then pattern. To say that 'thematized possibilities are appropriated from background understanding' may be read as implying that thematized possibilities are somehow 'chosen' from our background of experience and projected ahead. This, however, assumes a rationalist notion of human willing and choosing. Just as it has been shown that absent possibilities which are already being pressed toward *show up* as desired in the event of breakdown — that is, that

⁴³¹Both Snodgrass and Coyne have discussed the possibility of a notion of metaphor which is not grounded in language. See Snodgrass, A. "Angkor: Mandala, Myth and Metaphor." In *The Age of Angkor: Treasures from the National Museum of Cambodia*. Conference at The National Gallery, Canberra, 1992; and Coyne, *Designing Information Technology in the Postmodern Age*, op. cit., pp. 249ff.

we do not 'choose' these possibilities, but they are instead disclosed to us when breakdown occurs — so too the thematized possibilities that are projected toward overcoming breakdown can be seen to be disclosed by the absent background understanding that has already been projected ahead.

As discussed in the previous chapter, Heidegger describes the particular orientation of understanding in any context as the 'fore-structure' of understanding. This oriented understanding is always already projected ahead. In always already being projected ahead, it discloses the world that it encounters in a particular way. Our oriented understanding can be seen to be put in place by the background of current projects that are already projected ahead and being pressed toward. In terms of the preceding discussion of the way in which possibilities are disclosed in an event of breakdown, it can be seen to be the particular orientation of our understanding that determines the possibilities that may come to presence as desired in the event of breakdown. Thus, depending upon the possibilities currently being pressed toward, the 'same' event of breakdown may disclose different desired possibilities. Importantly, in the event of breakdown in which a particular possibility comes to presence as desired, background understanding is itself reoriented. *It is this newly oriented background which is projected ahead and discloses a thematised possibility.*

Returning to a previous example in which the possibility of breaking into our house through the window is projected to overcome the breakdown of a snapped key, when we envisage ourselves at the window we may find ourselves blocked as there are no existential possibilities available to facilitate opening the locked window. In this breakdown event the desire to break open the locked window may be disclosed. As a result of our everyday experience of using the window in various ways, we will already have a background understanding of the window. We may understand how this particular window catches the warm shafts of late afternoon sun, how the lock of the window sticks annoyingly, how the window lets in flies and

mosquitoes, and how the children climb out of it to escape secretly from the house. But it is not the amorphous totality of our background of experience that is projected ahead in seeking a possibility to overcome breakdown — this would amount to no more than an undirected assemblage of previous experience. Instead, in an event of breakdown our background of experience of the context of breakdown is reoriented by the possibility that shows up as desired. Thus in the event in which a desired possibility comes to presence, our already projected understanding is reoriented and in this way is *already* projected ahead in seeking a further possibility to facilitate pressing toward this desired possibility. In this example, our background of experience of the window is oriented by the desired possibility of breaking open the window. Thus while the workability of the lock and the gap between the window sash and frame may be part of the oriented understanding that is unreflectively projected ahead, the beauty of the grain of the timber sash or the way the glass allows the sunlight to flood into the house is not.⁴³²

Heidegger's claim that '[c]ircumspective making-present... is grounded in a *retention* of that context of equipment with which Dasein concerns itself in *awaiting* a possibility'⁴³³ confirms that it is the 'retained' understanding of the particular context of breakdown that 'awaits' a possibility. In the previous example, it is the understanding of the window, oriented by the desired possibility of breaking open the window, that 'awaits' a possibility. By *already* understanding the context into which the possibility that is sought must fit, it can be seen that there is already an understanding 'what is needed.' The understanding of 'what is needed' is not, however, an understanding that a *particular* possibility is needed. It is not, for example, an understanding that 'a screwdriver' or 'a jemmy' is needed to break in through the window (although the understanding of 'what is needed' may disclose these as possibilities). Nor is it a set of criteria, present in mind, that the thing which

⁴³²Again, while it is necessary to use examples to make the discussion accessible, our background cannot be reified as a presence.

⁴³³Heidegger, *Being and Time*, *op. cit.*, p. 411.

is needed must meet (as will be shown, background understanding is itself the ground for such criteria). It is instead an unreifiable understanding of the context of breakdown, oriented by the particular interpretation of the breakdown event, which goes ahead in seeking a possibility.

To get clear about the unreified nature of the absent background understanding that goes ahead in seeking a possibility, a commonplace example can be considered. If we find that the table we are using is wobbling, and we look and discover that one of the legs is short, we may press toward the possibility of 'stabilising the table' in order to overcome the breakdown. In this breakdown event, our background understanding of tables and floors is oriented by the desire to stabilize the table. This oriented understanding of the context of breakdown — the understanding of 'what is needed' to stabilize the table — is projected ahead in seeking a possibility. Because the understanding of the context of breakdown has *already* been projected, as we look around the room for 'something' to do the job, we *already* understand what we are after, without necessarily having any *particular* 'thing' in mind. Yet without knowing the particular thing we are after, we understand the sorts of things that will be appropriate for supporting the table and the sorts of things that won't. Again, as we look around the room, we do not have in mind criteria that the thing must meet. We simply understand, without any awareness of that understanding, that we will 'know' what will do the job when we come across it. Thus as we look around the room, a book may show up as a possibility, a piece of wood may show up as a possibility, the corner of a mat may show up as a possibility, and so on.

In the same way, when we look around the yard of our house for possibilities to break in through the window, the things that are encountered are immediately seen *as* possibilities. Our oriented background understanding of 'what is needed' goes ahead of seeking a possibility, and we immediately 'know' whether or not each thing that is encountered is a suitable possibility. The screwdriver, the hammer, or

the brick which is encountered in the yard or shed might each therefore show up as a possibility to break in through the window. The way in which these possibilities might be used is not, however, fixed in advance. When encountered, each is envisaged as being differently employed, as each is understood within its own limit of possibility in relation to the oriented understanding that goes ahead of seeking a possibility. Thus the screwdriver might be disclosed as a possibility in-order-to *lever* open the window sash (as the oriented understanding of the gap between the sash and frame together with the workability of the lock has already gone ahead of seeking the possibility). The hammer, on the other hand, might be revealed as a possibility in-order-to break the glass (as the oriented understanding of the breakability of the glass has already gone ahead of seeking the possibility).

Thus the understanding that goes ahead in seeking a possibility allows only *certain* things encountered in the environment to show up as possibilities. While the screwdriver and the hammer which is encountered while searching around the yard might show up as possibilities, the clump of daisies would not. Indeed the clump of daisies would probably not show up at all, but would stay in background awareness. Rather than there being any rational analysis of suitability when the clump of daisies is encountered, the very fact that it stays in background awareness is itself the interpretation of the clump of daisies' unsuitability in relation to the understanding of 'what is needed' that has already gone ahead in seeking a possibility.

As would be expected given Heidegger's emphasis on the temporality of all understanding and interpretation, the full significance of the way in which background understanding discloses thematized possibilities is found in temporality. The understanding of 'what is needed' is a particular orientation of a background of projects (*past*) that is projected ahead (*future*) to allow possibilities to be made *present*. The projection of a background understanding of 'what is needed' is

therefore an absence, a space, a clearing, into which possibilities may presence.⁴³⁴ Possibilities may either be disclosed from the *local environment* as we intentionally press toward a desired possibility (as in the example of physically searching our yard and having things that are encountered show up as possibilities), or they may be disclosed from *background understanding* as we *envisage* pressing toward a desired possibility (as in the example of standing outside our disabled front door envisaging pressing toward getting into the house and having possibilities which are not present in the local environment show up). Possibilities may also be revealed unintentionally, as in the situation where something encountered unexpectedly shows up as desirable (evident in the earlier example of the car or the toaster which shows up in the space opened by latent breakdown). In each of these situations the absence, the clearing opened by the oriented background of projects and practices that is projected ahead, allows the possibilities to come to presence as *thematized* possibilities.

De-sign

The event in which a thematized possibility is disclosed involves an *already understood* possibility coming to presence 'as something' in the clearing opened by the oriented background that is projected ahead. As discussed, in this event the possibility is disclosed as having a new meaning. It is only because possibilities allow themselves to be interpreted in a variety of different ways — that a limb allows itself to be taken as something to throw to one side and as something to dig with, or that a book allows itself to be taken as something to read and as something to wedge under a table leg — that design is itself possible.

Hermeneutical theory is founded on the possibility of multiple interpretations. Carr points out that central to the hermeneutical concept of understanding is the notion

⁴³⁴For a discussion of Heidegger's concept of the 'clearing' (*Lichtung*) see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 163-67.

that every human being's understanding is finite, and that no matter how many extant interpretations there may be of a thing, there is always the possibility of a *further* interpretation:

It may be that the object — a person, a social event, a text, even a natural event — is accessible to us because it belongs to the same sphere, because it [is] within the same horizon with us in some sense. But if our grasp is limited, one-sided, incomplete, this is because there is *another* possible sphere, another horizon, to which the object *also* belongs while we do not. The term 'horizon' suggests perspective, of course, and we could say there is another possible perspective on the object. Put simply, in the language of hermeneutics, *another interpretation* is possible.⁴³⁵

Because the object of interpretation always has the potential for still further interpretation, the object might therefore be said to bring with it an *excess* of meaning. It is this excess, held open for interpretation from different perspectives, upon which design depends.⁴³⁶ By projecting a possibility into a new context of involvements (in Carr's terms, a new 'sphere'), the possibility is revealed from a new horizon takes on a new meaning. The etymology of the word 'design' resonates with the notion of 'projection' and its implications for meaning.

THE OXFORD DICTIONARY OF ENGLISH ETYMOLOGY:

design... plan purpose, intend... L. *designare* mark out, point out, delineate, depict, contrive... All the meanings derive ult. from the L. word...

de- ...(2) off, away, aside, as in *decline, deduce, defend, deport, design,*

⁴³⁵Carr, *Interpreting Husserl*, op. cit., p. 185.

⁴³⁶In Division III of this dissertation, this excess of meaning is discussed in terms of the later Heidegger's notion of 'Earth.'

desist, deter;

sign...gesture to convey a meaning; mark having a meaning, token...(O)F. *signe* - L[atin]. *signum* mark, token...So **sign** vb. mark with a sign...(O)F. *signer* - L. *signare*, f. *signum*.⁴³⁷

THE COMPREHENSIVE ETYMOLOGICAL DICTIONARY OF THE ENGLISH LANGUAGE:

design, tr. and intr. v. — F. *désigner*, fr. L. *designare*, 'to mark out, trace out, designate, point out, appoint', fr. **de-** and *signare*, 'to mark'. See **sign**, v.

de-, pref. meaning:... 2) away from... Fr. L. *de*, 'from, away from, down from...'

sign, tr. and intr. v... fr. L. *signare*, 'to set a mark upon, mark, sign'...⁴³⁸

'De-sign' thus carries with it the sense of 'projecting away the sign'. As noted in the preceding chapter, the German word *Entwurf*, which Heidegger uses to indicate the way in which the possibilities we press toward are always already 'projected' ahead, contains the same etymological elements as the English word 'design': 'throwing off' or 'away from' one.⁴³⁹

Heidegger demonstrates that a 'sign' has a special place in the involvements of our projects and practices. A sign is part of the technological whole, but while '[a]ll equipment is *serviceable*, only signs *indicate*.'⁴⁴⁰ For Heidegger a sign is neither a self-contained object, nor is it merely a ready-to-hand technology. Instead, it is a technology with the capacity to disclose the context of involvements of which it is a

⁴³⁷Onions, C. T., et al., ed. *The Oxford Dictionary of English Etymology*. Oxford: Clarendon Press, 1966, pp. 246, 259 and 826.

⁴³⁸Klein, E. *A Comprehensive Etymological Dictionary of the English Language: Dealing with the Origin of Words and their Sense Development thus Illustrating the History of Civilization and Culture*, Vol. I A - K. Amsterdam: Elsevier Publishing Company, 1966, pp. 404 and 432.

⁴³⁹Heidegger, *Being and Time*, op. cit., footnote 1 on p. 185.

⁴⁴⁰Dreyfus, *Being-in-the-World*, op. cit., p. 100.

part:

Motor cars are sometimes fitted up with an adjustable red arrow, whose position indicates the direction the vehicle will take — at an intersection, for instance. The sign is an item of equipment which is ready-to-hand for the driver in his concern with driving... [but other drivers] also make use of it, either by giving way or by stopping... The sign is *not* authentically 'grasped' if we just stare at it and identify it as an indicator-Thing which occurs. Even if we turn our glance in the direction which the arrow indicates, and look at something present-at-hand in the region indicated, even then the sign is not authentically encountered. Such a sign addresses itself to the circumspection of our concerned dealings, and it does so in such a way that the circumspection which goes along with it, following where it points, brings into an explicit 'survey' whatever aroundness the environment may have at the time.⁴⁴¹ [my gloss in brackets]

Thus the sign does not draw attention to itself as an object, but points away from itself. It does not however point to other objects in some sort of network of object relations which are themselves basic (as semiotics might hold),⁴⁴² but instead lights up the context of involvements from a particular perspective. Commenting on Heidegger's description of the car indicator, McLaughlin makes clear what the sign discloses:

What is it that the indicator on the car draws to our attention? It is not, generally speaking, the indicator itself. Nor is it some object or scene in the direction that the indicator points. Rather what is brought into

⁴⁴¹Heidegger, *Being and Time*, op. cit., pp. 108-110.

⁴⁴²Dreyfus, *Being-in-the-World*, op. cit., pp. 100-101.

“sight” is a field of action. We become aware that the car is going to turn, of the street into which it will turn, of how long it will take for the car to turn, of how we should modify our activity so as to allow the car to turn. But what kind of awareness is this? We have seen that Heidegger uses the term “circumspection” to refer to the kind of sight that allows us to go about what we are doing. It is the kind of sight that would allow us to go about the business of allowing a car in front of us to turn without having to explicitly think “car” or “street” or “car turning right into street.” Thus Heidegger’s claim is that the indicator is used to bring to our attention a holistic appreciation of the situation that allows us to act appropriately.⁴⁴³

Importantly, Heidegger claims that the sign gives a particular *orientation* to our understanding of the context:

This circumspective survey does not *grasp* the ready-to-hand; what it achieves is rather an orientation within our environment.⁴⁴⁴

If the thematized possibility that is projected ahead in the process of de-sign acts in the capacity of a sign, then it cannot be considered simply as a representation of some object or an outcome. Rather, as a sign, a projected possibility would point toward and disclose the context of involvements into which it is projected *from a particular orientation*.

The full significance of the notion of de-sign as ‘projecting the sign’ is revealed when considered in the context of the preceding discussion of the way in which thematised possibilities are incrementally disclosed and projected in the design process. It has

⁴⁴³McLaughlin, “Practices and Primordial Understanding,” *op. cit.*, p. 68.

⁴⁴⁴Heidegger, *Being and Time*, *op. cit.*, p. 110.

been argued that when breakdown discloses an already projected possibility as desired, an absent understanding of 'what is needed' in order to press toward that desired possibility is unnoticingly projected ahead and brings to presence a *thematized* possibility. Thus when the breakdown event of an annoyingly wobbly table discloses the desire for a stable table, an understanding of 'what is needed' may be unnoticingly projected ahead and disclose a nearby book as a thematized possibility to put under the table leg and stabilise the table. The thematized possibility that is disclosed does not, however, come to presence merely as an object. Rather than drawing attention to itself, the thematized possibility points away from itself toward the context into which it has been projected. In this example, it discloses the wobbly table leg from the orientation of using this particular book to stabilize it. In this way it acts to reorient our absent understanding and allow us to 'be with' the context of breakdown from the perspective of pressing toward the projected possibility. Thus the disclosure of the book as a possibility acts as a sign which orients us toward 'being with' placing the book under the table leg. By allowing us to 'be with' the context of breakdown from the perspective of this newly projected orientation, it may also allow further breakdowns and further possibilities to be brought to presence.

Design as the Play of Presence and Absence

In the account presented to date, designing is shown to involve a play of presence and absence in which the disclosure of each desired or thematized possibility (a *presence*) reorients our already projected background (an *absence*), in turn disclosing a further thematized possibility (a *presence*), and so on. This unfolding cycle of presence and absence might be summarised as follows:

In an event of breakdown where existential possibilities are blocked or unavailable, an *absent* possibility that is already being pressed toward as part of a background of already projected projects may come to

presence as desired. (When we are unnoticingly pressing toward entering our house in-order-to watch television in-order-to relax after work and the key snaps in the front door lock, the desired possibility of 'getting into the house' comes to *presence*).

The event in which the desired possibility comes to *presence* reorients our already projected background, and in so doing, an *absent* understanding of 'what is needed' in order to press toward the desired possibility is (already) projected ahead. (In the event in which the desire to get into our locked house comes to *presence*, the background understanding of the involvements of our house is reoriented by the projected possibility of gaining entry. While the background understanding of potential points of entry into our house might be lit up as part of this reoriented background, the background understanding of the colour of the carpet would not.)

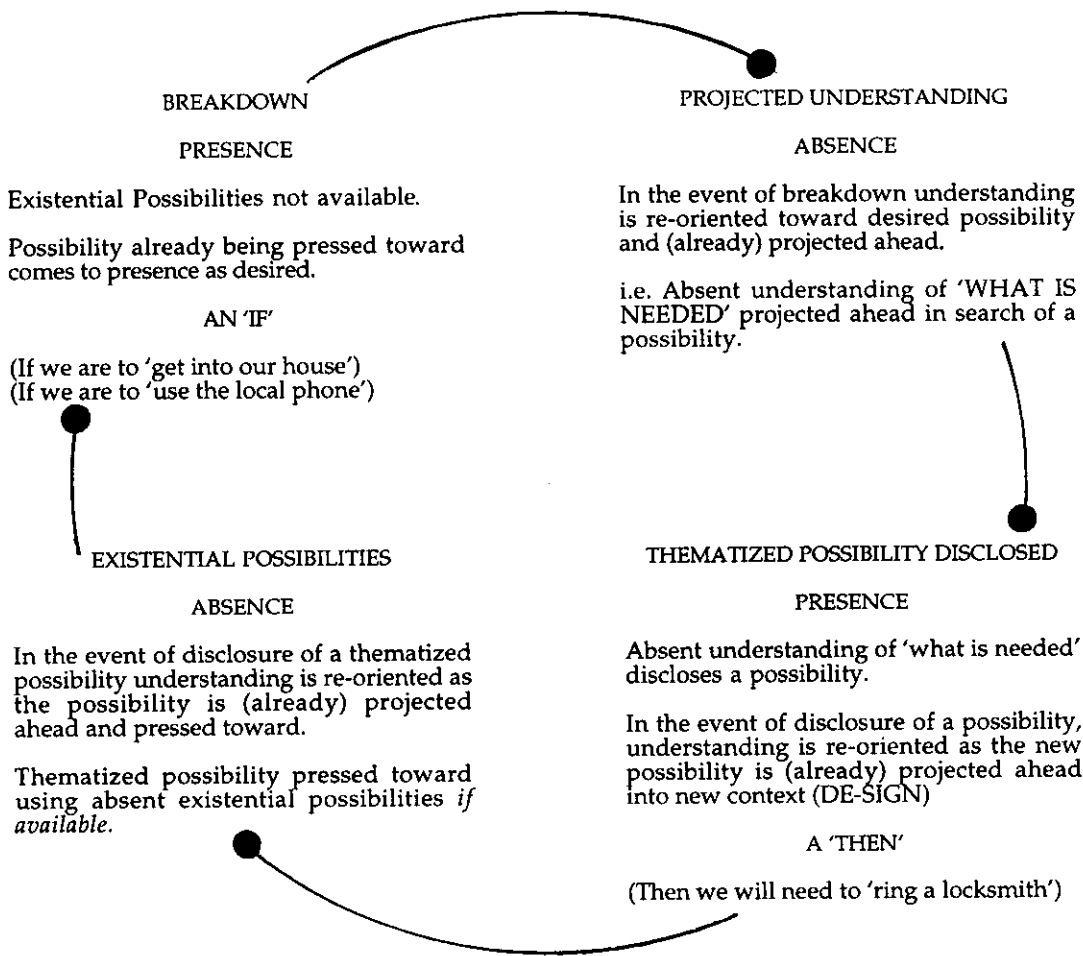
The projection of the *absent* understanding of 'what is needed' opens a clearing into which a possibility, which is also part of the background of experience, comes to *presence* as an in-order-to press toward the desired possibility. (The background understanding of our recently burglar-proofed house, oriented by the desire to gain entry, is projected ahead and discloses the already understood possibility of 'ringing a locksmith.')

In the event in which a thematized possibility comes to *presence*, our already projected *absent* background is reoriented toward this possibility. The possibility acts a sign and allows us to 'be with' the context of breakdown from the perspective of pressing toward this new possibility. Pressing toward this possibility is unnoticingly

facilitated by *absent*, already understood, existential possibilities. (Our current context is disclosed from the perspective of pressing toward 'ringing a locksmith.' In 'being with' this possibility, we find we have already projected ourselves to the local phone box.)

Where *absent* existential possibilities are unavailable to facilitate pressing toward the thematized possibility, a possibility which is an in-order-to in pressing toward the thematized possibility comes to *presence* as desired. (While the existential possibility of the footsteps that took us to the local phone box were not disclosed in projecting ourselves toward the thematized possibility, the already understood lack of coins to operate the phone shows up as a breakdown. This breakdown discloses the desire for 'something' to allow us to make a phone call.)

Importantly, however, it is only the presences which are part of awareness. Thus the events described above are likely to be noticed only as: the desire to get into the house; the thought of 'ringing a locksmith'; and annoyance at the lack of small change for the telephone.



Conclusion

It is evident from the interim description of the design process presented thus far, that design cannot be accounted for entirely in terms of presence, as the rationalist tradition holds. Nor can the rationalist assumption that design involves thematized goals or reflective planning simply be overturned and the design process accounted for entirely in terms of absence. Rather, design has been shown to involve an unceasing play of presence and absence, where each presence reorients and projects an absence which in its turn discloses a presence, and so on, as the design process unfolds. In rationalist descriptions of the design process, however, only the presences — the thematised 'if's' and 'then's' — are seen, while the absences which ground their disclosure remain occluded.

CHAPTER 7

FINITUDE AND DESIGN

Introduction

The previous chapters in this Division provide an elementary account of the way in which the projective structure of the design process brings a design outcome into being. It is argued that when breakdown is disclosed and a possibility shows up as desired, but existential possibilities are *not* available to press toward that desired possibility, the design process *projects thematized possibilities*. The thematized possibilities that are projected are *practices* and *technologies* (together with the *nature* they appropriate) which have the potential to facilitate pressing toward the desired possibility. By projecting and pressing toward thematized possibilities, the design process *brings into being* the nestings of practices and technologies which act as in-order-to's in pressing toward a desired possibility.⁴⁴⁵ The outcome that is brought into being by the process of design can therefore be seen to be an *assemblage of nestings of in-order-to's* that enable desired possibilities to be pressed toward.

The description of 'design moves' involved in assembling the nestings of in-order-to's that constitute a design outcome has to date been limited to the way in which the possibilities disclosed by the play of presence and absence unfold in a cyclical 'if-then' structure. Building upon this account, this chapter, the final in the Division, demonstrates the rich variety of design moves involved in assembling the nestings of possibilities that constitute a design outcome. It also demonstrates the way in which these design moves are able to be accounted for in terms of the Heideggerian formulation of understanding and interpretation, particularly the central hermeneutical concept of the finitude of understanding.

⁴⁴⁵What is brought into being may be ephemeral, such as the various actions involved in breaking into a window, or may leave in place extant entities which can be appropriated as in-order-to's in future projects.

Because the account of the design process provided in this Division builds largely upon Heidegger's work, it reflects the priority Heidegger places on our absent background of shared involvements in a world of projects and practices. It is for this reason that, rather than beginning with discussion of those familiar aspects of the design process — such as analysing needs, developing goals and criteria, employing representations, and so forth — which are often treated as originary or primordial in much design theory, the description of the design process presented to date gives priority to the way in which design fits within, and arises out of, a shared world of involvements. While the examples used in previous chapters have been drawn deliberately from the everyday practices of life, this chapter introduces examples from the professional design domain to demonstrate that the process laid out in this Division also underlies the valorized practices of design.

Having put in place an understanding of the way in which the variety of moves which constitute the design process can be accounted for in terms of the designer's absent background of involvements, the concluding section of this chapter demonstrates how familiar aspects of the professional design process, including the use of representations and formalised design programs/briefs, may be understood in terms of this laying out of the design process, and how rationalist formulations of the design process, which focus upon needs, goals, functional criteria, constraints, and the potential for automation, may also be reinterpreted on the basis of this account.

Texturing the Design Process

Snodgrass and Coyne provide a rich description of the variety of interpretive moves which structure the process of design:

The process is fluid, repetitive and continuous. It furnishes a kaleidoscope of ever-changing reflections, revisions, false starts and

back-tracking, leading eventually to a clarification of the projection...

The efficacy of the process depends on keeping it moving. It also depends on an openness that allows for the intrusion of rival projections. Every projection contains the potentiality of itself projecting a new design. Alternate projections can develop side by side until they coalesce or one drops out of view.⁴⁴⁶

Snodgrass and Coyne draw upon Schön's description of designing⁴⁴⁷ to demonstrate the back and forth play of the hermeneutical circle as the designer's constantly changing understanding moves the process along:

The designer thus begins the design task by shaping the situation in accordance with an initial appreciation. The situation then "talks back" and the designer responds to the situation's back talk by reflecting-in-action on the construction of the problem, the strategies of action, or the model of the phenomena. The process then develops in a circle—"back and forth, back and forth." Each move draws out the implications of earlier moves, seen as having consequences that are described and evaluated in terms drawn from one or more design domains, and having implications binding on later moves, creating new problems to be described and solved. In this way the designer spins out "a web of moves, consequences, implications, appreciations and further moves."⁴⁴⁸

As these descriptions illustrate, design not only proceeds as a neat flow of projected possibilities of the type evidenced in the linear 'if—then' structure described in

⁴⁴⁶Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 14.

⁴⁴⁷Schön, *The Reflective Practitioner*, *op. cit.*, pp. 78ff.

⁴⁴⁸Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 13.

previous chapters, but also involves dead ends, revisions, projection of rival possibilities, and a constant shifting of appreciations which reveals new problems and possibilities.

Always Already Understanding

The description of the design process provided in the preceding chapters places significance on Heidegger's notion that, as a result of our background of shared involvements in the world, we 'always already understand.' It is because we always already understand and because we are always pressing toward projects that are already projected ahead that a breakdown event is able to show up in a particular way. It is also because we always already understand that in a breakdown event we are able to unnoticingly project an understanding of 'what is needed.' And it is because we always already understand, that a thematized possibility which is already understood to be capable of overcoming the breakdown is able to show up in the clearing opened by the projection of the understanding of 'what is needed.'

The question raised by this account of the design process is that if the projection of a possibility is grounded in both *already* understanding what is needed in the context of breakdown and *already* understanding the capability of the possibility that is projected toward overcoming the breakdown, then why are possibilities found to be inadequate or unsuitable? Why does the flow of some nestings of possibilities lead to dead ends? Why is there a need for revisions to previously projected possibilities? Why is there a need to project and test rival possibilities? Put simply, why is it necessary to spin out a web of moves — why can't we get it right with the first move?

The Finitude of Understanding

The answer lies, quite simply, in the finitude of human understanding. While we 'always already understand', what it is we 'always already understand' is finite.

Contemporary hermeneutical theory, under the influence of Heidegger, emphasises the *bounded* possibilities of human understanding. As Carr makes clear:

...hermeneutics stresses above all the finitude of the human condition and the resultant finitude of human knowledge, even self-knowledge.⁴⁴⁹

The finitude of human understanding is not something that we can work toward overcoming:

Understanding is not a human faculty or a particular sort of act but a fundamental dimension or *Existential* of Dasein [the worlded being that we are]. It is a mistake to suppose that the one-sidedness, incompleteness, and lack of certainty that is characteristic of our understanding can be overcome... Above all, it is a mistake to think that the presuppositional or prejudice-laden character of our comprehension is something to be put aside. It is the very nature of our understanding to be ahead of itself, to approach its objects and its world with a prior structure of comprehension, a prejudice in the literal sense.⁴⁵⁰ [my gloss in brackets]

For hermeneutics, all understanding is self-understanding. All that we understand is on the basis of the possibilities opened by the understanding that has already been put in place by our background:

...hermeneutical theory makes the point that self-understanding is *no exception* to the conditions of human comprehension. In fact, according

⁴⁴⁹Carr, *Interpreting Husserl*, *op. cit.*, p. 180.

⁴⁵⁰*Ibid.*, p. 181.

to Heidegger's theory, all understanding is self-understanding, the projection of one's own possibilities.⁴⁵¹

Human understanding may be thought of as finite in two ways. Firstly, what is able to show up as present to awareness at any moment is finite. The limit of what is 'seen' in an interpretive event is the *horizon* of understanding of that event. Discussing the horizon of historical understanding, Gadamer explains:

Every finite present has its limitations. We define the concept of "situation" by saying that it represents a standpoint that limits the possibility of vision. Hence essential to the concept of situation is the concept of "*horizon*." The horizon is the range of vision that includes every thing that can be seen from a particular vantage point.⁴⁵²

The horizon of what shows up in an interpretive event is determined by the orientation of pre-understanding allowed by the projects already being pressed toward. The pre-understanding that is brought to an interpretive event means that things may only show up in *one* way at any moment of an interpretive event. For example, if we are pressing toward finding something to put under a table leg to stabilize the table, the book we encounter will be seen only as 'packing' for the table leg. Even though our background allows the possibility of understanding the book as 'something to be read,' the particular interpretive situation occludes the book from showing up in this way. Thus in any moment of any interpretive event the world is present to us in only one way.

The second manner in which understanding may seem to be finite is in terms of the

⁴⁵¹*Ibid.*, p. 182.

⁴⁵²Gadamer, Hans-Georg. *Truth and Method*, *op. cit.* p. 302. Note that the Heideggerian descriptions of this phenomenon tend toward giving agency to what is viewed rather than the viewer. Thus Heideggerian descriptions emphasise the way in which things 'show up' or 'reveal themselves.'

limitation of each human being's background. Each human being's background of involvement in shared projects and practices determines the range of possible ways in which the world may be understood. Our background therefore allows some interpretations, but precludes others. While for one interpretive community it may be a possibility for a particular context to disclose a book as 'something that can be read,' for a community that has never encountered books this interpretation is not a possibility. Whatever this community's interpretation might be, it will be bounded by the possibilities allowed by their background of involvements in the world.

Design Weaves a Web of Moves

It has been suggested that possibilities projected into the design context are *provisional*. Heidegger has been interpreted as suggesting that in a context of breakdown a thematized possibility is projected as an 'if.' Schön provides evidence in his analysis of design protocols that possibilities brought into the design context are explored as a sort of 'on-the-spot experiment':⁴⁵³ 'In the most generic sense, to experiment is to act in order to see what the action leads to. The most fundamental experimental question is, "What if?"'⁴⁵⁴

The provisional nature of projected possibilities can be seen to be grounded in the finitude of human understanding. Each possibility that is projected is understood only within the horizon allowed by the particular context, and within the horizon allowed by the particular background of the designer. As each possibility is projected, however, the horizon of what is understood shifts and understanding is itself transformed. The transformation of understanding may disclose the potential for breakdown, or it may disclose the potential for new possibilities. If it discloses breakdown, then this may lead either to the projection of further possibilities along the same trajectory, or to the suspension or abandonment of the projection of the

⁴⁵³Schön, *The Reflective Practitioner*, *op. cit.*, pp. 141ff.

⁴⁵⁴*Ibid.*, p. 145.

current nesting of possibilities and the projection of an entirely new nesting of possibilities along a new trajectory. If the transformation of understanding discloses new possibilities, then this may divert the projection of possibilities and disclose new nestings of possibilities. In this way, the transformation of understanding brought by each new projection discloses 'a kaleidoscope of ever-changing reflections, revisions, false starts and back-tracking.'⁴⁵⁵

The following discussion examines the ways in which the finitude of understanding manifests the complex texture of the design process, aptly described as the spinning out of a web of moves. The ways in which (1) *the horizon of what is present to awareness in a particular interpretive context*, and (2) *the horizon of our background understanding*, each play into the web of moves that constitute the design process, are considered separately.

1. *The Shifting Horizon of Presence*

An event of breakdown is only 'seen' within a limited horizon. While it may be possible to project an understanding of 'what is needed' *within* that horizon, and therefore to disclose a possibility which satisfies what is understood to be needed, in a context that is new or unusual it is not possible at the moment of being within that horizon to 'see' *beyond* that horizon and therefore also to understand what further problems or possibilities may arise as an outcome of the disclosure of that thematized possibility. Only when the newly projected possibility is itself made present does the horizon of what is 'seen' change. When the horizon does change it may disclose a further breakdown, or it may show up a further possibility.

To demonstrate the role of the shifting horizon of presence in creating the rich variety of moves evident in the design process, the way in which three different trajectories spin out from the shifting horizon of presence are illustrated:

⁴⁵⁵Snodgrass and Coyne, "Is Designing Hermeneutical?", *op. cit.*, p. 14.

- (i) the way in which the shifting horizon of presence incrementally discloses *further breakdowns* and *further possibilities* as part of some *current* nesting of projected possibilities;
- (ii) the way in which the shifting horizon of presence discloses *breakdowns* in projects which are *contiguous* with some current nesting of projected possibilities;
- (iii) the way in which the shifting horizon of presence discloses *possibilities* for projects which are *contiguous* with some current nesting of projected possibilities.

(i) *Disclosing Further Breakdowns and Further Possibilities*

As has been argued, in the event of breakdown, a possibility that is already being pressed toward may show up as desired. As existential possibilities are blocked, an understanding of 'what is needed' to press toward the desired possibility may be unnoticingly projected ahead and disclose a thematized possibility which has the potential to facilitate pressing toward the desired possibility. The situation of our front door key snapping off in the lock may, for example, bring to presence the desire to get into the house. In this event, an understanding of 'what is needed' to get into the house may be unnoticingly projected ahead and disclose a thematized possibility such as 'break in through the window.'

When the thematized possibility is disclosed in the clearing opened by the understanding of 'what is needed,' *the horizon of what is present to awareness shifts*. Where awareness was previously with the particular way in which the breakdown showed up, awareness is now with the possibility that has been disclosed to overcome the breakdown. In the above example, the event of disclosure of a thematized possibility moves our thematic awareness from the frustrations of 'the snapped key' to the possibility of 'getting in through the window.' With this shift in awareness it is now possible to 'see' what could not have been seen from the

previous horizon of breakdown.

We are now able to 'see' the in-order-to's that constitute the possibility of breaking in through the window, and may therefore envisage ourselves attempting to open the sash of the window. Because we *already* understand that a locked window needs to be pried open, and we *already* understand that there are no implements handy to the window (i.e. there are no existential possibilities available to be unnoticingly pressed toward), then we may find the projection of this nesting of possibilities momentarily blocked. With the disclosure of this blockage, an understanding of 'what is needed' to overcome the blockage and allow us to continue to press toward the desired possibility of prying open the window may in its turn be projected ahead and open a clearing into which a further possibility can be disclosed. Thus, only when awareness shifts and we are 'with' the possibility of breaking in through the window, can a further breakdown show up and a further possibility be disclosed.

A complete nesting of thematized possibilities cannot therefore be projected in one motion. The 'if-then' pattern, recognised by Schön and Heidegger, and demonstrated in previous chapters to be a basic movement in the projection of design possibilities, can be seen to be structured by the shifting horizon of presence. Until awareness shifts to the newly projected possibility (an 'if') in its new context and we are able to 'see' from this new horizon, a new breakdown cannot be disclosed, an understanding of what is needed cannot be projected, and a new possibility (a 'then') cannot be disclosed.

Where the shifting horizon of presence does disclose a breakdown, and an understanding of 'what is needed' is projected ahead, this may spin out moves in various directions. If a further possibility is available, then this may be disclosed and the current trajectory continued to be pressed toward. If a further possibility is not

available, then the current nesting of possibilities may be suspended or abandoned and the design process may divert to another nesting of possibilities.

(ii) *Disclosing Breakdowns in Contiguous Projects*

As well as the shifting horizon of presence disclosing breakdowns *in the immediate nesting of possibilities* projected as part of the design process, the shifting horizon of presence that accompanies the projection of a possibility may disclose breakdowns produced *in other projects* that intersect the design context.

As argued, we are always pressing toward numerous absent and often *interdependent* projects. The technologies and practices which constitute our projects may be a nexus for many of these interdependent projects. A technology such as the window in our house, for example, may be seen to hold a place in the nestings of in-order-to's of numerous projects. The window may be an in-order-to in projects which include caring for the security of the house, keeping out the rain and wind, caring for the aesthetics of the house, and so on. In the course of the design process, a possibility projected toward overcoming a breakdown in one project has the potential to thrust through and bring about breakdown in the practices and technologies (the in-order-to's) that care for other interdependent projects. It is only as each new possibility is projected and the horizon of awareness shifts that the potential for a projected possibility to bring about breakdown in other projects is able to be disclosed. Schön recognises the implications of the shift in awareness that occurs with each new projection in the design process when he states that '[m]oves also lead to the apprehension of new problems...'⁴⁵⁶

For example, having projected the possibility of 'breaking in through the window' in order to get into our house, some means may show up as being needed. This may in turn disclose the further possibility of using a brick to break the glass.

⁴⁵⁶Schön, *The Reflective Practitioner*, op. cit., p. 100.

Immediately our awareness shifts to this possibility, however, we may envisage shards of glass on the carpet that will require cleaning, we may envisage the appearance of the house with the shattered window, we may envisage the inconvenience of the repairs required to fix the broken window, and so on. Prior to projecting the possibility of employing a brick to break in through the window, the horizon of awareness did not extend beyond the particular perspective of seeking a means to enter the house. Immediately the newly projected possibility is disclosed, the horizon of what is 'seen' changes and the implications for *other* projects are able to show up. Thus, as the horizon of presence shifts to be 'with' the possibility of smashing the glass, breakdowns produced in other projects for which the window is an in-order-to — such as the project of security, the project of keeping out rain and wind, the project of maintaining the neat appearance of the house — may be disclosed. While the breakdown that is produced in other projects does not *directly* block the flow of thematized possibilities projected as part of the current project (the mess made by broken glass does not necessarily prevent entering the house through the window), depending on the understanding of the significance of the breakdown produced in other projects, it may nevertheless result in revision, suspension, or even the abandonment, of the current nesting of possibilities projected toward getting into the house.

In a *professional design context* such as architectural design, the outcome that is brought into being by design holds a place in a potentially vast number of interdependent projects. A design outcome, such as a house, holds a place in projects that might include providing physiological comfort, providing security, providing spaces and technologies for preparing food, for eating, for entertaining, for relaxing, and for performing ablutions, providing technologies for communication, and providing an image that reinforces, and perhaps even helps construct, the self-image of those who dwell in the house. Because of the multiplicity of projects that is held in place by a complex design outcome, it is a

familiar aspect of the design process that in assembling the design outcome possibilities projected toward overcoming a breakdown in one project may disclose breakdowns produced in other projects.

In the process of the detailed design of a house fronting a busy road, for example, the possibility of 'installing inoperable double-glazed windows' might be projected to overcome a breakdown caused by high levels of traffic noise. Immediately this possibility is projected, the designer may add 'but then air-conditioning will be needed, won't it!' In this example, the designer already understands that a window, as an aspect of the design outcome of a house, must not only care for the project of noise reduction which is an in-order-to in the larger project of human aural comfort, but must also care for the project of providing ventilation which is an in-order-to in the larger projects of physiological comfort. Immediately the possibility of inoperable windows is projected, the horizon of what is 'seen' shifts and breakdowns produced in the other interdependent projects of providing fresh air and ventilation are able to show up.

In another architectural example, a new window may be proposed as a possibility to overcome a problem which shows up as 'insufficient natural light to this part of the room.' With the addition of this window to the building design, the external elevation may in turn be disclosed as 'just not looking right any more.' In this example, the window can be seen to be an in-order-to in the intersecting projects of maintaining physiological comfort and providing an appropriate aesthetic.⁴⁵⁷ Prior to projecting the possibility of inserting a new window, the horizon of awareness did not extend beyond the concern for the potentially dark corner in the room. However, when the possibility of an additional window in the external wall is

⁴⁵⁷In this analysis it is suggested that aesthetics, art, beauty etc. are instrumentalised, in that they are taken as a resource in achieving some project. This is perhaps in the spirit of the work of the early Heidegger. However, as is discussed in Division III, the later Heidegger recognises the instrumentalism of his own earlier analytic and gives a special place to art in overcoming what he perceives to be the instrumentalism of rationalist Western modernity.

disclosed, the horizon of what is 'seen' shifts and breakdown produced in the project of providing an aesthetically appropriate building form is able to show up. (The role of representations in reorienting our understanding and thereby participating in the disclosure of breakdowns and possibilities from shifting perspectives is discussed later in this chapter.)

The projection of possibilities to overcome a breakdown in one project, not only has the potential to disclose breakdowns produced in other interdependent projects which are already understood to facilitate our care, but also has the potential to disclose breakdowns produced in the *contested* projects of other interpretive communities which also intersect the design context. Drawing on an example used earlier, from the perspective of an interpretive community of forest conservationists, the possibility of 'stopping all logging in old growth forests' may be projected to overcome the breakdown disclosed by loss of forest biodiversity. This outcome has the potential to produce breakdowns in numerous of the projects of the other interpretive communities whose care is dependent on the exploitation of the resources of old growth forests. Whether or not the breakdown in these other projects is disclosed when this possibility is projected and the horizon of awareness shifts, is, however, dependent upon whether or not the interpretive community projecting this possibility has an understanding of the projects of those other interpretive communities, and to what extent they understand those projects as contributing to (or detracting from) their own care.

The potential for the shifting horizon of awareness that accompanies the projection of a possibility to disclose breakdowns produced in contested projects also plays a significant role in spinning the web of moves in a *professional design context* such as architectural design. Aspects of the built environment can be seen to act as in-order-to's in innumerable projects. A building and its site might, for example, have a place in numerous nestings of in-order-to's that care for its neighbours. By its bulk and

positioning, the building may be an in-order-to in the project of ensuring the access of sunlight to adjacent properties. By the distribution and orientation of its windows, the building may be an in-order-to in the project of ensuring the privacy of adjacent properties. By the appropriateness of its use, scale and character, the building may be an in-order-to in the project of maintaining the resale values of adjacent properties. And, by the nature of its materials and its proximity to neighbouring buildings, the building may be an in-order-to in the project of minimising the fire risk to adjacent buildings.

Design interventions directed toward transforming an existing building or an existing site in such a way that they care for the projects of those intending to dwell in the building, may, in the same movement, diminish the care for these other projects in which the building and site also hold a place. An architectural design outcome may therefore create a site of contestation between the projects of those dwelling in the building and the projects of the community dwelling around the building. A designer's background understanding of the way in which a building participates in projects other than those of the client and users, allows the shifting horizon of awareness that accompanies the projection of a possibility to disclose breakdowns produced in these other projects.

For example, in the process of designing an extension to an existing house to overcome a breakdown brought about by the increasing size of the household, the possibility of 'adding an extra storey' may be disclosed to the designer. The projection of this possibility may show up immediately as 'no, that would mean it would overview and overshadow the neighbours!' Prior to projecting this possibility, the horizon of the designer's awareness did not extend beyond the particular perspective of seeking a means to add space to the house. Immediately the newly projected possibility of 'an extra storey' is disclosed, the horizon of what is 'seen' changes and the implications for *other* projects which also intersect the

design outcome are able to show up. Because the designer has a background understanding of the way in which the building participates in the projects of its neighbours, and because the designer also has an understanding of the regulative structures (such as local planning controls intended to minimise over-viewing and overshadowing) that are put in place by (a privileged section of) the community to care for the projects of (a privileged section of) the community, then as the horizon of presence shifts to be 'with' the possibility of an extra storey, the breakdown produced in those other projects in which the building also participates are able to be disclosed.

The disclosure of breakdown as 'the potential problem of over-viewing and overshadowing' may move the design process in various directions. The breakdown may be ignored and the *current* nesting of 'upper storey' possibilities continue to be pursued. The current nesting of 'upper storey' possibilities may be revised to take account of the breakdown — for example, a *revised* possibility of, say, 'a small, carefully sited, partial upper storey,' may be projected. The current nesting of possibilities may be *suspended* or *abandoned* and the process of may return to some *previous* nesting of possibilities — for example the previous idea of 'extending the house at ground level' may be revisited, and further possibilities may be projected along this trajectory. Or the current nesting of possibilities may be suspended or abandoned and a *new trajectory* may be initiated — for example, the possibility of, say, 'a basement addition' may be projected and pressed toward.

Thus, as the horizon of presence shifts with each newly projected possibility, breakdown may be disclosed in both interdependent and contested projects which intersect the design context. Depending upon the way in which the breakdown shows up, the disclosure of breakdown has the potential to spin moves in various directions. If breakdown shows up as not having significance, then it might be ignored and the current nesting of possibilities may continue to be projected and

pressed toward. If the breakdown shows up as being significant, then modified possibilities may be projected along the current trajectory; the current trajectory may be suspended or abandoned and a new nesting of possibilities may be initiated; or the current trajectory may be suspended or abandoned and the process may revert to some earlier nesting of possibilities.

(iii) *Disclosing Possibilities for Contiguous Projects*

As well as the shifting horizon of presence *disclosing breakdowns* produced in other projects that intersect the design context, the shifting horizon of presence may also *disclose unsought possibilities* for projects that intersect the design context.

As discussed in previous chapters, among the absent projects that we are always already pressing toward, there are innumerable sites of breakdown which have not become the subject of design activity. These sites, which must be 'struggled over' and given deliberate attention, are described in this dissertation as sites of 'latent breakdown.' In the design context, a possibility projected to overcome some current breakdown in one project, may, in the same movement, bring into being a possibility that has the potential to overcome a latent breakdown in another project. In this way, outcomes brought into being by the design process to facilitate pressing toward one project may open a space of possibility to allow other projects to be pressed toward.

As an outcome of a lifetime of involvement in the projects that constitute our worlds we embody a background understanding of innumerable sites of latent breakdown in the projects that we are unnoticingly pressing toward. It is this absent background understanding of the sites of latent breakdown that allows the shifting horizon of presence accompanying the projection of a possibility directed toward overcoming a breakdown in one project to be disclosed as a possibility for overcoming a site of latent breakdown in another project.

For example, of the numerous small, everyday household projects that are already projected ahead and that we are always pressing toward, there is a likelihood that some will be incomplete. They may have been put off for lack of time, they may have been temporarily overlooked, or they may have simply been avoided. These incomplete household projects will therefore be part of background understanding. With such a background, we may go to the fridge and find that the supply of German sausage is exhausted. As an outcome of the disclosure of this breakdown, an understanding of 'what is needed' may be projected ahead. The clearing opened by the projection of the understanding of 'what is needed' may disclose the possibility of 'going to the mall and getting some groceries.' Immediately this possibility is disclosed we might add 'Oh good! That would also mean I can pay the electricity bill and pick up the toaster that we need while I'm there.'

There is already a background understanding of our local mall and the type of shops that are in it. There is also a background understanding of our other absent shopping projects that have been left incomplete. Prior to projecting the possibility of going to the mall, the horizon of awareness did not extend beyond the particular perspective of seeking a means to overcome the sausage shortage. Immediately the newly projected possibility of shopping at the mall is disclosed, the horizon of what is 'seen' changes and the implications for other projects that intersect our everyday domestic existence are able to show up. Thus, as the horizon of presence shifts to be 'with' the possibility of shopping at the mall, we are able to 'see' the various other department stores and agencies that belong to the possibility of the mall. Immediately these 'come to view,' the possibility of going to the mall is also able to show up as a possibility for overcoming breakdowns in other absent, incomplete shopping projects.

As discussed, in a *professional design context* such as architectural design, the outcome

that is brought into being by design holds in place a potentially vast number of projects. At any stage during the process of assembling the nestings of possibilities that constitute a design outcome, there are nestings of possibilities that are incomplete, blocked, or unresolved. Mirroring this, and as an outcome of the designer's involvement in a current design process, at any stage during the design process the designer has a background understanding of both the projects that the process is pressing toward facilitating, and the current state of the nestings of possibilities that have been projected toward facilitating those projects. It is because the designer has a background understanding of the previously projected nestings of possibilities that are incomplete, blocked and unresolved, that a possibility projected as part of a nesting of possibilities to facilitate pressing toward *one* desired project has the potential to show up as a further possibility in nestings of possibilities directed toward facilitating pressing toward *other* desired projects. In short, as Schön observes, each move in the design process may 'lead to new potentials for the creation of desirable artifacts...'⁴⁵⁸

Adapting a previous architectural design example, when the possibility of 'installing double glazed windows' is projected toward the desired project of providing an aurally comfortable space uncompromised by high levels of traffic noise, this may show up immediately as 'great, that may help with heat loss as well!' In this example the designer already understands that the projects of providing thermal comfort and minimising resource usage are being pressed toward, and that nestings of in-order-to's that may facilitate these projects are not fully in place. The designer also already understands that double glazed windows have a significantly better thermal performance than single glazed windows. Immediately the possibility of double glazed windows is projected and the horizon of awareness shifts to be 'with' the possibility of the double glazed windows, the designer is able to 'see' the potential for this possibility to facilitate the other absent projects that are also being

⁴⁵⁸Schön, *The Reflective Practitioner*, *op. cit.*, p. 100.

pressed toward.

Supporting his thesis that the design process has the character of a 'reflective conversation,' Schön provides a detailed description of the interplay between a design master and his student as the design master demonstrates how a current impasse in the student's design might be overcome. At one point in the encounter the design master projects a series of possibilities toward overcoming some current difficulty with the student's design. As the design master speaks and draws, new possibilities for other aspects of the design show up:

Quist's demonstration. Q: Now in this direction, that being the gully and that the hill, that could then be the bridge, which might generate an upper level which could drop down in two ways.

[One way from the classrooms] We get a total differential potential here from one end of classroom to far end of the other. There is 15 feet max, right? — so we could have as much as 5-foot intervals, which for a kid is maximum height, right? The section through here and the differentiation between this would be at two levels.⁴⁵⁹

As the design master describes and draws the sections through the stepped classroom spaces, the small (5-foot high) spaces that are left between classroom levels are immediately disclosed to the design master as potential 'nooks' for the children to use. In accordance with the argument presented here, it would be expected that, from his previous experience both of school children and of designing schools, the design master already has a background understanding that 'intimate child-size spaces' facilitate the valued child development projects of play, small group work, peer socialization, and so on. The design master has therefore already

⁴⁵⁹*Ibid.*, pp. 85-6.

projected ahead and is pressing toward the absent project of providing a range of spaces that include this type of intimate space. Immediately the new sectional relationship is projected and the horizon of awareness shifts to be 'with' the spaces left between the classrooms, the design master is able to 'see' the potential for this possibility to facilitate the other absent project that is already being pressed toward.

In this way, as the horizon of presence shifts with each newly projected possibility, potential new possibilities for other absent projects that are already being pressed toward may be disclosed. The disclosure of a possibility for other absent projects may spin out moves in a number of directions. It may *divert* the design process toward the other project for which the newly projected possibility has shown up as a possibility. This project may then be pursued by projecting further possibilities along the new trajectory. In terms of the previous example, the current trajectory of projecting possibilities toward the overall classroom layout may be suspended, and the design possibilities opened by the disclosure of the 'nooks' pursued. Alternatively, the diversion toward the new trajectory might be postponed, and the current nesting of possibilities may *continue* to be pressed toward. Thus, in the previous example, pursuing the design possibilities opened by the disclosure of the 'nooks' may be deferred, and the current trajectory of projecting possibilities toward the overall classroom layout may continue.

2. *The Shifting Horizon of Understanding*

The designer's background understanding is finite. The moves that are possible at any stage during the design process are circumscribed by the designer's *current* background understanding. As the horizon of presence shifts, new needs, new breakdowns, and new possibilities which could not previously be 'seen' are able to show up. Background understanding does not, however, remain fixed during this process. As each new possibility is projected and the shifting horizon of awareness brings into view new needs, new possibilities, or new breakdowns, *background*

understanding is itself transformed. The new horizon allowed by the transformed background understanding in turn makes possible the disclosure of further needs, further breakdowns and further possibilities. With their disclosure, background understanding is again transformed. In this on-going cycle, the designer's horizon of background understanding of the design context is always shifting, allowing new moves to continually spin out.

It has been argued that when breakdown discloses a desired possibility, an understanding of 'what is needed' in order to press toward that possibility is projected ahead and may disclose a further possibility. Both the understanding of 'what is needed,' and the further possibility that is disclosed, are grounded in a background understanding that is already in place. However, when the clearing opened by the projected understanding of 'what is needed' discloses a thematized possibility, the understanding of both the thematized possibility, and the current nesting of in-order-to's (the project) into which the thematized possibility is projected, is transformed.

While the thematized possibility that is disclosed is already understood in the context of the various projects in which it has previously been experienced, in the projective movement it is now 'seen' from the perspective of a different project. In being seen as an in-order-to in a nesting of possibilities of which it was not previously a part, the way in which the possibility is understood shifts. The previous chapter discusses the radical shift in understanding that occurs when something already understood is disclosed from a new perspective. When a tree limb, for example, is projected as a possibility in the project which it was not previously a part and it is 'taken as' something to dig with, the understanding of both the limb and the project of digging are transformed.

Although often less dramatic, the same transformation of understanding occurs in

every projective movement in the design process. Thus, while 'a broken window,' 'an additional storey on a house,' or 'a nook' might have been experienced in the context of various other projects, when they are projected as possibilities in projects which are marginally, or markedly, different, these possibilities come to presence in subtle, or significantly, new ways. The possibility of 'adding an extra storey to a house,' for example, may have been understood in the context of many previous house addition projects. When envisaged as an in-order-to in the project of extending 'this particular house,' however, the singularities of the house's architecture, its setting, its neighbours, and so on, inevitably brings the possibility to presence in a new way.

In the same movement, the understanding of the project into which the possibility is projected is also transformed. When, in the previous example, the possibility of 'adding an extra storey' is disclosed in pressing toward the project of 'extending the house,' the understanding of 'what the project is' shifts. The project is now constituted by a further possibility which determines its character in a particular way. If a different possibility of say, 'adding a basement,' had been disclosed, the project would be constituted by a different nesting of in-order-to's and the project of 'extending the house' would have an entirely different character. Thus, even though the projection of the possibility is grounded in *already* understanding both the possibility and the project into which it is projected, in the event in which the possibility is disclosed 'as something' in a project of which it was not previously a part, the background understanding of both the possibility and the project is transformed.

As discussed, the disclosure of each new possibility may in turn disclose further breakdowns, the need for further possibilities, the potential to precipitate breakdown in other contiguous projects, or the potential to offer unsought possibilities for other contiguous projects. While the new needs, new breakdowns

and new possibilities which are brought to presence are grounded in background understanding, it is only when the possibility is disclosed in its new context that the horizon of awareness shifts and the new needs, problems and possibilities are able to be 'seen.' When the horizon of awareness shifts and these previously unseen implications come into view, background understanding of the projected possibility and the project of which it is part is transformed. In this way, as the design process incrementally assembles the nestings of possibilities that constitute the design outcome, the background understanding of the current state of those possibilities, their needs, the further possibilities they may facilitate, and the breakdowns they may precipitate, is also incrementally transformed.

Thus, as previously discussed, at any stage of the design process there is an understanding of those sites in the nestings of in-order-to's of the design outcome which are incomplete and in need of further possibilities, and those sites which have the potential to bring about breakdown in other projects or have the potential to act as possibilities for other projects. This background understanding of the current state of the design outcome is appropriated in the projection of each further possibility. Pursuing a previous example, at a particular stage in a design process for a house, background understanding of the current outcome may include an understanding that one room has inadequate natural light (i.e. that the current nesting of in-order-to's does not facilitate the project of providing natural light), that the new upper storey overshadows and overviews part of the neighbour's yard (i.e. that the current nesting of in-order-to's thrusts through and causes a breakdown in the neighbour's projects), that the windows which are double glazed for noise reduction also provide good thermal insulation and an appropriate external aesthetic (i.e. that the current nesting of in-order-to's projected to facilitate the project of aural comfort also facilitate the projects of thermal comfort and appropriate image projection), and so on.

It is this absent background understanding of the current state of the design outcome which in turn grounds the disclosure of each new possibility and determines which moves may show up as desirable and which may not. Returning to the preceding example, if a possibility disclosed to facilitate pressing toward some other project inadvertently reduces the bulk of the upper storey addition, the absent background understanding that the current outcome blocks the neighbour's projects of enjoying light and privacy may be appropriated and may immediately disclose this newly projected possibility as also being desirable from the perspective of these other contiguous projects. This trajectory may therefore continue to be pressed toward. On the other hand, if a possibility is projected in which the proposed double glazed windows are changed to less expensive single glazed windows in order to facilitate some other project, the current background understanding may be appropriated and may immediately disclose breakdowns in the absent projects which the double glazed windows also facilitate. Pressing toward this possibility may therefore show up as undesirable, and this trajectory may be suspended or abandoned and alternative moves may be spun out.

Each new move that is spun out in the design process can thus be seen to be an articulation of the current background understanding of the design context. With each new move, the horizon of presence shifts and new needs, new breakdowns, and new possibilities are able to show up. As these are disclosed, background understanding is itself transformed. This transformed understanding of the design context is, in turn, appropriated in spinning out subsequent moves, and as these moves are spun out the horizon of presence shifts and background understanding is again incrementally transformed. In this way the nestings of possibilities that constitute the design outcome are assembled in an on-going interplay between the shifting horizon of presence and the shifting horizon of background understanding.

Seeking to Shift the Horizon of Understanding

The discussion to date has emphasised the way in which background understanding *that is already in place* is appropriated in spinning out the moves by which the design outcome is assembled. There are, however, common situations where an adequate background understanding is *not already in place*. If the designer does not have experience of either the projects that intersect the design context or the possibilities that might facilitate those projects, then the design process cannot proceed: breakdowns cannot show up, an understanding of 'what is needed' cannot be projected ahead to disclose capable possibilities, and the implications of projected possibilities for other projects that intersect the design context cannot be disclosed. In such a situation, where the limit of the designer's current background understanding is revealed and the design process shows up as blocked, *further understanding may be sought*.

The incremental unfolding of the design process has been said to have an 'if-then' structure: 'if' this desired project is to be pressed toward, 'then' this possibility may be needed. Where there is an inadequate understanding of the desired project that is being pressed toward — the 'if' — there can be no understanding of 'what is needed' and a further possibility — a 'then' — cannot be disclosed. In the same way, where there is no background understanding of capable possibilities that may act as in-order-to's in facilitating pressing toward a desired project, again, a further possibility — a 'then' — cannot be disclosed. Depending upon the way in which the limit of the designer's background is revealed, understanding may be sought to be transformed in either of these two mirrored aspects. If the inadequacy in the current background is disclosed as an insufficient understanding of the projects that are to be facilitated by the design outcome, then (i) *further understanding of the possibilities that constitute the projects that intersect the design context* may be sought. If the limit of the current background shows up as an inability to disclose capable possibilities, then (ii) *further understanding of the possibilities that are available in the*

design context may be sought.

(i) *Seeking an understanding of the projects that intersect the design context*

Returning to an earlier example, if we are sitting at a table and pressing toward the project of writing a letter, we may suddenly notice an annoying wobble in the table. In this event it is unlikely (as indicated in the earlier, interim account) that we would immediately begin projecting possibilities such as 'putting something under the table leg.' The first (noticed) action may instead be to look under the table and 'see what the problem is.' In other words, we are likely to *seek to understand* where the breakdown is in the nesting of in-order-to's that facilitates the stability of the table.

Seeking to transform our understanding arises within the same projective structure as do all moves in the design process. When the breakdown event of the wobbling table shows up, an understanding of 'what is needed' may be unnoticeably projected ahead and disclose the possibility of 'fixing the wobble in the table.' As there are no existential possibilities at hand to allow us to press toward this possibility we may find ourselves blocked and the need for a further possibility may show up. However, without an understanding of the nesting of in-order-to's that the further possibility must facilitate in order to 'fix the table,' it is not possible to project a further possibility. In this breakdown event an understanding of 'what is needed to transform our understanding' may be unnoticeably projected ahead and may disclose the possibility of 'checking the legs of the table.' When this possibility is pressed toward and we put our head under the table, it may disclose that one leg is shorter than the others.

The involvements of the floor, the table legs, the table top, and so on, can be seen to be a nesting of in-order-to's which constitutes the project which cares for the stability to the table. In the interpretive event in which the breakdown in this nesting of in-order-to's is understood, background understanding is also

transformed. With the transformation of background understanding, it becomes possible to project an understanding of 'what is needed' to overcome breakdown. The clearing opened by the projection of this understanding of 'what is needed' may, for example, disclose the possibility of 'putting something under the table leg.' If this possibility shows up as sensible, we may press toward finding something suitable to put under the table leg.

The process of seeking to transform the horizon of understanding can be seen to be 'directed' by the *current* background understanding. From our previous experience of wobbling tables we already have a background understanding that the breakdown is likely to be found where the table legs meet the floor, or perhaps where the legs meet the table top. The oriented background understanding that is projected ahead in seeking to disclose further understanding of the breakdown in the nestings of in-order-to's that facilitate the stability of the table therefore allows some aspects of the design context to show up but not others. The clearing opened by this projected pre-understanding, may allow 'the uneven legs' to come to presence while other aspects, such as 'the chrome plating on the table legs' or 'the chewing gum stuck to the underside of the table,' are likely to remain in the background.

In the practice of *professional designing*, seeking to transform background understanding of the projects which are to be facilitated by the design outcome plays a significant role. It has been argued that a background of involvements in the projects handed over by the world, a background which is always already projected ahead, grounds the very possibility of designing. The background allows breakdowns to show up, allows what is needed to be unnoticingly projected ahead, and allows possibilities to be disclosed as the design process unfolds. However, one of the key characteristics of professional designing is that many of the projects professional designers press toward in the design process *are not their own*. As a

result, designer's do not necessarily begin the design process with a background understanding of all of the projects that are likely to intersect the design context. In the course of the design process, professional designers 'take over' the projects of other participants in the design context. Architectural designers will for example project possibilities from the perspectives of their clients, the users of their building, the builders of their building, and so on. The process of taking over the projects of others involves a transformation of the designer's background understanding and grounds the very possibility of professional design.

Pursuing the case of architectural design, prior to an architectural designer's involvement, the client will have already commenced projecting possibilities and assembling a design outcome. For example, in a breakdown event, the client's existing house may show up as 'too small,' and an understanding of 'what is needed' may be projected ahead and disclose the thematized possibility of 'building a larger house.' As part of the client's own design process, further possibilities might be projected to facilitate this possibility. The client may, for example, project and press toward possibilities such as 'buying land,' 'gaining finance,' and so on. As part of this design process, the client might also project the possibility of 'engaging an architectural designer.' With the projection of this possibility, the architectural designer becomes an in-order-to in pressing toward the client's desired possibility of 'building a larger house.' The architectural designer can therefore be seen to enter the design context and 'take over' the client's project well after the assembling of the nestings of in-order-to's that constitute the design outcome has begun.⁴⁶⁰

The professional designer may therefore be invited to take over pressing toward a design possibility which is as basic as 'a larger house.' While the family of the client projecting this possibility will have a background understanding of the myriad of

⁴⁶⁰Therefore undermining the privileging of the professional designer as the source of design ideas.

projects that they desire to be facilitated by this design outcome, at the outset of the design process the designer's background understanding of these projects is likely to be limited. If the designer was, at this stage, to attempt to project further possibilities toward assembling the design outcome of 'a larger house' they would immediately find themselves blocked, as there is no understanding of the nestings of in-order-to's which constitute the projects that any further possibility must facilitate. They would not, for example, have an understanding of even the number of persons that were to be accommodated, and could therefore not project further possibilities which might include the size of the house or the number of bedrooms. In this breakdown event, an understanding of 'what is needed' to transform the designer's understanding of the projects which are to be facilitated by the outcome may be unnoticingly projected ahead, and may disclose thematized possibilities such as 'arranging meetings with the client,' 'talking to the users' and so on.⁴⁶¹

During the course of the design process, an architectural designer thus seeks to transform their own background understanding of the projects of those whose care is facilitated by the outcome. The designer may, at particular stages of the design process, seek to understand the projects of the client, the users, the neighbours, the authorities whose legislation cares for the wider community, the builder, the materials suppliers, and so on. From a Heideggerian perspective, the process by which designers attempt to build an understanding of the design context and 'document the design requirements' (as a brief or program for example) cannot simply be one of gathering information or data. Building an understanding of the projects which intersect the design context, including the projects of nature, is a process which involves the *interpretation* of the projects of others, including

⁴⁶¹For experienced designers, however, the breakdowns and possibilities described here would be unlikely to be brought to presence in this way. Experienced designers would have already established a pattern of *existential possibilities*, which has worked before on numerous similar occasions, and which they unnoticingly press toward in building their understanding of the design context. There would, nevertheless, be innumerable situations encountered in the ongoing process of professional designing where an understanding of the projects which are to be facilitated by the outcome is not yet in place, and the need to seek further understanding is projected ahead.

interpretation of the assertions others make about their own projects. Any interpretation of the projects of others is inevitably a perspectival interpretation which is grounded in the designer's own background understanding. In the event of interpretation, the designer's background understanding is itself transformed, and this transformed background understanding is able to appropriated in spinning out subsequent moves in the design process.

Importantly, an understanding of all of the projects to be facilitated by the outcome *cannot* be sought at the outset. Understanding 'what further understanding needs to be sought' only arises *during the course of designing*. It is only as each new possibility is projected and the horizon of understanding shifts that it becomes possible to see what new understanding is needed. Pursuing the earlier example of a house extension, it is not until the projection of the nesting of possibilities has proceeded a certain way that the design outcome might be disclosed as potentially intersecting the projects of the neighbours, and that their projects therefore need to be understood. Thus it is only when the possibility of 'a larger house' is projected, the further possibility of 'an upper storey addition' is projected, and the further possibility of 'a window in the room' of that upper storey addition is projected, that it becomes possible to see that a neighbour's property might be over-viewed. It is only with the projection of this last possibility that the designer may seek to find out about those of the neighbour's projects which are cared for by that portion of their yard that may be over-viewed, and therefore determine if the projected possibility precipitates a breakdown in their projects. Had the nesting of projected possibilities followed a different trajectory, say an extension at ground level, seeking to understand the backyard projects of the neighbours may not have arisen. The designer may, instead, have disclosed the need to seek an understanding of tree roots, to determine how much can be cut from a nearby tree before the roots no longer care for the tree.

As further understanding is sought and the designer's background understanding transformed, the new horizon of understanding may disclose breakdowns or possibilities in current or previously projected nestings of in-order-to's. If, for example, seeking further understanding discloses that the neighbour's backyard projects are insignificant, then the current nesting of possibilities for the upper storey addition may continue to be pressed toward. If seeking further understanding discloses that the tree may be jeopardised by cutting its roots, then the current nesting of possibilities may be suspended or abandoned and the process may return to an earlier nesting of possibilities, or a new nesting of possibilities may be initiated. In this way, the transformation of background understanding can be seen to spin out new moves which lead to the suspension or abandonment of current trajectories, the revision of previous trajectories, and the initiation of new trajectories.

(ii) *Seeking an understanding of available possibilities*

As well as the situation in which there is a limited background understanding of the *projects* to be facilitated by the possibilities which constitute the design outcome, there are also situations where there is a limited background understanding of the *capable possibilities that may be available* to facilitate the projects being pressed toward. In this situation, further understanding of the possibilities available in the design context *may be sought*.

Returning to an earlier example, in envisaging pressing toward the possibility of breaking in through the window in-order-to get into our house, our hands may show up as inadequate to the task and we may find ourselves *needing something* in-order-to force open the window. If we do not often use tools or gardening equipment we may find that background understanding is unable to disclose in any definite way whether possibilities are available in the immediate environment. In this breakdown event, we may find ourselves *desiring to disclose a possibility* to allow

us to press toward forcing open the window. This may simply come to presence in wondering to ourselves 'now what *can* I use?' In this breakdown event an understanding of 'what is needed to transform our understanding of the possibilities that are available' may be unnoticingly projected ahead and disclose the thematized possibility of 'searching around the yard and the shed.' If this possibility is pressed toward and tools such as a screwdriver and a hammer are encountered, they may immediately show up as possibilities.

Again, the process of seeking to transform the horizon of understanding is 'directed' by current background understanding. Both the existing understanding of 'the kind of thing that is required to pry open the window' and the existing understanding of 'the likely places where such a thing may be found' give directionality to the search for new possibilities and with it the transformation of background understanding. In this way the background understanding already in place can be seen to ground both the search for new understanding and what is able to show up in that search.

With the disclosure of the screwdriver and the hammer, the horizon of understanding shifts. The transformed background understanding, which now includes an understanding that these possibilities are available in the immediate environment, is able to be appropriated in continuing to press toward the current nesting of possibilities. If, however, the search is not able to disclose any capable possibilities, then this current nesting of possibilities may show up as blocked. Pressing toward the current trajectory may therefore be suspended or abandoned, and the process may divert to some previous nesting of possibilities, or a new nesting of possibilities may be initiated. Thus the disclosure of the *lack* of capable possibilities also transforms background understanding. This new horizon of understanding, from which it is now possible to 'see' that no capable possibilities are available in the immediate environment, is appropriated in spinning out new moves in the design process.

Seeking to transform background understanding of the possibilities that may be available in the design environment also plays a significant role in the *professional design context*. Many of the projects that intersect the design environment bring into being possibilities that have the potential to act as in-order-to's in the design outcome. In an architectural design context for instance, there is a vast range of projects that intersect the design environment which make possibilities available that may be appropriated in the design process. The projects of financial organisations make financial resources available, the projects of the real estate industry make land and property resources available, the projects of timber millers make construction timbers available, the projects of glass manufacturers makes glazing available, the projects of window manufacturers makes windows available, and so on. For these possibilities to be projected as in-order-to's in assembling the design outcome they must already be part of the designer's background understanding. In situations where the designer's background understanding of available possibilities shows up as inadequate, the professional designer may seek further understanding.

If, for example, one of the projects being pressed toward in assembling the design outcome for a house is 'energy efficient thermal performance,' then this may disclose the need for 'a window that allows the transmission of solar radiation, but prevents heat loss through convection, conduction or radiation.' If the designers' experience of the current window market is limited to conventional low performance domestic windows, then when the understanding of 'what is needed' is unnoticingly projected ahead it may disclose an uncertainty as to the availability of capable possibilities. In this breakdown event where capable possibilities are unable to be disclosed, the designers may find themselves *desiring to disclose a possibility* to allow them to press toward finding a window with the appropriate thermal performance to facilitate the larger project of energy efficiency. This may simply

come to presence in a designer's aside that 'I'm not sure whether we'll get a window that will perform the way we want!' In this breakdown event an understanding of 'what is needed to transform the designer's understanding of what is available' may be unnoticingly projected ahead and disclose the thematized possibilities of 'checking window catalogues' and 'ringing window suppliers' in-order-to discover whether any possibilities are available. In this way, the process of seeking to transform the horizon of understanding can again be seen to be 'directed' by the *current* background understanding. Both the existing background understanding of 'the sort of window that is needed' and the existing understanding of 'expedient ways to find out about available window products' give directionality to the search for new possibilities.

Again it is evident that an understanding of all of the available possibilities that may ultimately constitute the design outcome *cannot* be sought at outset. The need to seek further understanding of available possibilities only arises *during the course of designing*. It is only as each new possibility is disclosed, and an understanding of the further possibilities that may be needed is projected, that the limit of the designer's current understanding of capable possibilities may be revealed. In the preceding example, it may only be when the possibility of 'an energy efficient house' is projected, disclosing the further possibility of 'using the thermal mass of the floor to store solar heat energy,' in turn disclosing the further possibility of 'windows with particular solar orientations,' that it becomes possible to disclose the need to understand whether particular high performance windows are available.

During the course of the design process there are numerous situations where the designer's background of experience of the projects which may offer possibilities to the design context is inadequate, and background understanding may be sought to be transformed. In an architectural design context, these situations might include seeking an understanding of the financial resources that are available ('establishing

the budget'); seeking an understanding of those aspects of 'nature' that are available to be appropriated in site features such as prevailing breezes, views, shady trees, or soil bearing capacity ('analysing the site'); seeking an understanding of construction materials, construction technologies, or the availability of subcontract labour in the design environment; and so on. As each new understanding is sought and the designer's background understanding transformed, the new horizon of understanding has the potential to disclose further needs, further breakdowns and further possibilities, and in turn spin out new moves as the design process proceeds.

New Understanding Thrusting Through

The discussion to date has illustrated the way in which the horizon of understanding shifts as the designer *seeks* to understand aspects of the world that are beyond their current background. However, the transformation of background understanding is not limited to the *seeking* of new understanding. Even without seeking new understanding, new aspects of the world are continually *thrusting through* and disclosing themselves. New aspects of the world are interpreted on the ground of the current background understanding. In every event in which the new is interpreted, the horizon of understanding shifts, new possibilities and new breakdowns are able to be 'seen,' and new moves are able to be spun out in the design process.

Returning to an earlier example, if we unexpectedly encounter a door handle that is sticking, this mundane event will be interpreted in terms of our previous background of using door handles generally, of our previous background of using this door handle in particular, of our previous background of problems encountered with door handles, and so on. In this event in which the door handle is interpreted as sticking, our background understanding is transformed. We now have an understanding that this particular door handle is not working properly, and that this sort of door handle may occasionally stick in this way. In this way, background

understanding transformed by the thrusting through of the sticking door handle is available to be appropriated in subsequent interpretive events. If we were to encounter this particular door handle again, for example, the background understanding that it is sticking will have already been projected ahead, and this understanding might be appropriated in the simple act of *deliberately* turning the handle more forcefully than we would have on previous occasions.

The design contexts in which *professional designers* play a role commonly involve many intersecting projects, many participants pressing toward those projects, and, therefore, many perspectives. As an outcome, opportunities may arise for any current state of the design context to be 'seen' from many different perspectives. In situations where other participants in the design environment interpret the current design context from the perspective of the projects they are pressing toward, their interpretations have the potential to thrust back and transform the designer's background understanding.

In an architectural design context for instance, there are many opportunities for reinterpretation of the current state of the design outcome by other participants in the design environment. If for example the designer takes a preliminary sketch of the design of a house to their client, the sketch offers itself for interpretation. While the designer may have been quite pleased with the current possibilities articulated in the sketch, the client may look at the sketch and immediately comment: 'No! The kids will hate having their bedroom next to ours.' In this event, the clients' background of experience of their children is appropriated in their interpretation of the possibilities articulated by the sketch. From the perspective of the projects of their children, the possibility of adjacent bedrooms is immediately disclosed as a breakdown. In the event in which the designer interprets the client's terse response, the designer's own background understanding of the projects of the client's children is transformed, and, on the basis of this transformed understanding, further

possibilities are able to be projected.

In an architectural design context, the nestings of possibilities which constitute the design outcome offer themselves for both formal and informal interpretation at various stages of the design process. At the development approval phase,⁴⁶² the public exhibition of the possibilities articulated in design drawings may be interpreted adversely by neighbours concerned about privacy, over-viewing, overshadowing, property devaluation, and so on. The thrusting through of these interpretations may disclose the perspectives of projects which had previously been beyond the limit of the designer's background understanding. At the tender stage, the builder may interpret possibilities articulated in the construction drawings with the pleased comment that a particular unused part of the site is perfect for materials' storage. This interpretation discloses an unnoticed possibility from a perspective which had previously been beyond the limit of the designer's background understanding. At the construction stage, in pressing toward the possibility of digging a footing in soft earth, the builder may unexpectedly strike rock. The thrusting through of the rock's own project into the project of preparing the foundation thus discloses the limit of the design team's background understanding of the ground conditions.

The transformation of background understanding as an outcome of new aspects of the world thrusting through thus has the potential to spin out new moves in the design process. Depending upon the way in which the new aspects of the world are interpreted, the new needs, new breakdowns and new possibilities that are disclosed may lead to the suspension or abandonment of current trajectories, the revision of current or previous trajectories, and the initiation of new trajectories. As with all moves spun out in the design process, the moves that show up as sensible to the

⁴⁶²This example refers to the steps which are required to be taken to gain approval for the erection of a building under Australian environmental planning legislation.

designer distribute care *differently* to the different projects that intersect the design context. By revising, suspending or abandoning nestings of possibilities to avoid breakdowns in *some* intersecting projects while *failing to* revise, suspend or abandon nestings of possibilities that may precipitate breakdowns in *others*, the designer is participating in the distribution of power to all of those projects which are cared for by the design outcome.

Summary

The moves spun out by the design process have a projective structure. Breakdown brings an already projected possibility to presence as desired. As there are no existential possibilities available to allow the desired possibility to be pressed toward, *thematized* possibilities which have the potential to facilitate the desired possibility may be disclosed. In the event of disclosure these thematized possibilities are already projected ahead. By pressing toward these thematized possibilities, the possibilities *are brought into being*. In being brought into being, the possibilities are made available to act as in-order-to's in facilitating pressing toward the desired possibility. The nestings of possibilities which act as in-order-to's are thus projected and brought into being by the process of design. However, all of the possibilities that constitute the nestings of in-order-to's of a design outcome are neither projected in a single movement, nor are they projected in an orderly incremental pattern in anything but the simplest of design contexts. The account presented to date in this chapter demonstrates how the rich web of moves spun out in the design process is grounded in the interplay between understanding that is already in place, and encounters with the limits of that understanding.

Because of the finitude of human awareness, it is only when one thematized possibility has been projected and the horizon of awareness shifts to be with that newly projected possibility, that the need for any further possibility to facilitate that projected possibility can be 'seen.' The projection of thematized possibilities

therefore follows an 'if-then' pattern which moves incrementally from 'larger' possibilities to 'smaller' facilitating possibilities: Possibility₁ shows up as desired; from the horizon of possibility₁ it can now be seen that in order to press toward possibility₁ a further possibility (possibility₂) is needed; from the horizon of possibility₂ it can now be seen that in order to press toward possibility₂ a further possibility (possibility₃) is needed. Thus the projected possibility of eating German sausage might disclose the possibility of going to the mall, which might disclose the possibility of driving the car. The order in which thematized possibilities are pressed toward and brought into being, however, is the reverse of that in which they are projected: Possibility₃ would be pressed toward in order to facilitate possibility₂ to be pressed toward in order to facilitate possibility₁ to be pressed toward. Thus driving the car would be pressed toward in order to facilitate getting to the mall in order to facilitate getting German sausage. A nesting of possibilities must therefore be incrementally projected before the desired possibility can be pressed toward.

This apparently orderly movement from the projection of 'larger' to 'smaller' possibilities is evident only in the simplest of design contexts. The understanding of existential possibilities that is already in place means that design does not consist simply of *thematized* possibilities but is also interspersed with nestings of *existential* possibilities that do not come to awareness. As a result, rather than thematized possibilities being projected in a nested pattern moving invariably from the 'largest' possibilities to the 'smallest' — starting from an overall house layout, for example, and moving toward details of fitments — the designer's understanding of the availability of existential possibilities means that the shift to the projection of thematized possibilities may occur at any situation which is non-standard or special, that is, at a site of breakdown. Thus, because it is *already* understood that a kitchen is an existential possibility that constitutes the possibility of a house, and it is *already* understood that the existential possibilities of kitchen fitments constitute the possibility of a kitchen, it would not be impossible for a designer to *begin* the

thematized projection of possibilities for designing a house with the projection of possibilities for a special kitchen fitout.

Because of the *finitude of human awareness*, the many projects that may be facilitated by a complex design outcome cannot be present to awareness at once. Possibilities projected to facilitate one project have the potential to precipitate breakdowns, or act as possibilities, in other interdependent projects that are also being pressed toward. The designer has a background understanding of both the various interdependent projects to be facilitated by a design outcome and the current state of the nestings of possibilities projected toward these projects. As each possibility is projected as part of one nesting of possibilities, and awareness shifts to be with the newly projected possibility, background understanding may disclose the potential to precipitate breakdowns or offer possibilities in other projects also being pressed toward. When the potential for new breakdowns or possibilities is disclosed, the design process may spin out new moves: modifying, suspending or abandoning current nestings of possibilities, revising previously projected nestings of possibilities, or initiating new nestings of possibilities. In this way the design process may leap between different nestings of possibilities as the design outcome is assembled.

Because of the *finitude of human understanding*, the designer's background understanding of both the projects that constitute the design process, and the possibilities that have the potential to facilitate those projects, are inevitably limited. At any stage in the design process new understanding may thrust through, or inadequate understanding of either the projects intersecting the design environment or the possibilities available in the design environment may be disclosed as a breakdown and new understanding may be sought. When new understanding thrusts through, or new understanding is pressed toward and brought into being, the designer's background understanding is transformed. This transformed

background understanding is appropriated in disclosing new breakdowns, new possibilities and new needs. As these are in turn disclosed, the designer's background is further transformed. The continual shifting of the designer's horizon of understanding allows the design context to be 'seen' from ever new perspectives and in turn allows the disclosure of ever new possibilities.

If one of the nestings of in-order-to's that constitute a design outcome is projected then pressed toward, an *interim outcome*, which is itself an in-order-to for a larger possibility that is being pressed toward, is brought into being. Pressing toward and bringing an interim outcome into being provides a determinate horizon from which further possibilities may be projected. In the design process for a house, for example, by securing finance or purchasing a site these possibilities are brought into being and thereby provide a determinate horizon of understanding from which to project further possibilities for the design of the house. While actualising a possibility that is to act as an in-order-to in the subsequent projection of possibilities delimits the design context and provides certainty of understanding, it also entails risk. If the incremental transformation of understanding that accompanies the projection of subsequent possibilities were to disclose a breakdown in those possibilities that have *already been brought into being* — if, for example, the finance was found insufficient or the site too small to facilitate the desired outcome — the situation can no longer simply be rectified by projecting alternative possibilities. This is where design, as the process within which potential breakdowns are disclosed and resolved *in advance* of possibilities being brought into being, has its potency.

•

With this account of the design process in place, it is now possible to revisit a number of questions raised but left unanswered in the preceding chapters.

The Specialist Designer

On the basis of the work of the early Heidegger, it is claimed that the projective temporal structure evident in designing is a possibility for a worlded being.⁴⁶³ As human beings, we all design. When a new or difficult situation is encountered and breakdown is disclosed we move from pressing toward already projected existential possibilities to a mode of being in which we act deliberately and project thematized possibilities. Fry, however, points out that in modernity 'design activity was being taken out of the heads and hands of craftworkers and made a form of mental labour, a specialisation, in its own right.'⁴⁶⁴ What then differentiates specialist or professional design from the 'everyday' designing in which we all engage?

Background understanding has been shown to play a critical role in designing. It is background understanding which allows available possibilities to be disclosed, allows further needs to be disclosed, and allows breakdowns and possibilities to show up for other projects. Professional designers 'take over' the projects of others in domains which are unfamiliar, that is, in domains where background understanding is limited. In this view, professional design need not be restricted to the valorized design professions, but might include any domain with a specialist background of experience — accountants, economists, solicitors, chefs, child carers, and so on. Because professional designers gain extensive experience in a narrow domain, they bring that specialist background understanding to the design context. This appears to offer the design process advantages of efficiency and certainty.

Because a designer with a specialist understanding of a design context is likely to

⁴⁶³The notion of humans as 'worlded beings' reflects Heidegger's rejection of the rationalist tradition's position that humans are 'conscious subjects' and his argument that humans are, instead, beings who are always already involved in a context of projects and practices handed over by a world. For a discussion of Heidegger's understanding of humans (*Dasein*) as worlded beings see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 13ff.

⁴⁶⁴Fry, *Design History Australia*, *op. cit.*, p. 17.

have a greater understanding of the possibilities available in that context, when breakdown discloses the need for a further possibility the specialist designer is more likely to *already* understand a range of capable possibilities that may be available, and therefore have less circumstances where new understanding must be sought. Thus an architectural designer may have a background understanding of the window types available in the market place, whereas designers without experience in the architectural context may not. In the same way, where the design process discloses the limits of the designer's background understanding, the specialist designer may be more likely to already understand the further possibilities available in order to seek to transform background understanding. Thus the architectural designer may already understand that trade catalogues are in-order-to's in seeking further understanding about double glazed windows.

Also as an outcome of their extensive background of experience in a narrow domain, specialist designers may be more likely to already understand the other interdependent and contested projects that intersect the design context. As a result, when a possibility is projected toward one project, the breakdowns or further possibilities this may precipitate for other interdependent and contested projects may be more likely to be disclosed to the specialist designer. Thus possibilities for a house projected in an architectural context may be immediately disclosed to the specialist designer as having the potential to bring about a breakdown in the neighbour's project of privacy, or the building occupant's project of fire safety, or the plumber's project of accessing pipework. If the designer has only limited background understanding of the design domain and potential breakdowns are not disclosed until after the possibilities are brought into being, the ramifications may be serious enough to require the 'dismantling' of outcomes after they are brought into being.

Beyond simply *allowing* breakdowns and possibilities to be disclosed from the

perspectives of different projects, as an outcome of a prior background of experience of designing in complex design domains (and perhaps also as an outcome of design education) designers have a background understanding of the role of 'seeing' the design context from different horizons. Deliberate changes of orientation by the designer minimise the opportunity for the perspectives of the numerous other projects that intersect the design context being overlooked. An architectural designer's ever-shifting perspective on the design context may, for example, allow needs, breakdowns and possibilities to be disclosed from perspectives which might include: the projects of the space requirements of building users; the projects of the physiological comfort of users; the projects of neighbours; the projects of regulative authorities; the project of structural integrity; the project of fire safety; the project of materials access to the building site; the project of constructability; and so on. With experience, the practice of continually 'reorientating' and adopting new perspectives may become an unnoticed existential possibility for the professional designer.

It has been argued that the need to project thematized possibilities is only disclosed in breakdown situations where existential possibilities are unavailable. Where the designer has an extensive background of experience in a narrow domain, the existential possibilities belonging to projects in that domain may *already* be understood and there may therefore be less need to incrementally assemble the possibilities that constitute the outcome by projecting thematized possibilities. An architectural designer experienced with high rise office buildings, for example, is likely to already understand that the nestings of existential possibilities constituting the larger possibility of a 'typical office floor' includes 'the lettable office space,' 'one or more lift banks,' 'a lobby,' 'two fire stairs,' 'toilets,' 'a kitchenette,' and 'air handling ducts.' This background understanding of existential possibilities avoids the need to incrementally work through the projection of thematized possibilities in a manner such as: *'if the windows of the office building are inoperable, then air-*

conditioning will be needed,' 'if air-conditioning is required *then* space will be needed on each office floor for air handling ducts.' Thus because specialist designer's are likely to already understand the existential possibilities belonging to the design domain, thematized possibilities need only be projected where the new or unusual is encountered.

As Fry points out, rather than design outcomes being brought into being by individual craftsmen, different participants with specialised roles now contribute to bringing an outcome into being. Because the specialist designer commonly passes their outcome to other participants for manufacture, construction, and so on, the division between 'designers' and 'makers' has been categorised as that between 'heads and hands.' On the basis of the account presented in this dissertation, however, the split is less one between the mental and the manual (a dichotomy which perpetuates the rationalist understanding of design as a cognitive activity) than between those 'projecting thematized possibilities' and those 'bringing thematized possibilities into being.' Thus in the modern division of labour 'workers' are often given the role of pressing toward possibilities *that have been projected by others*, thereby reducing work to little more than a process of pressing toward predetermined *existential* possibilities.

The Role of 'Representations'

Because specialisation requires that professional designers 'take over' the projects of other participants in the design process and in turn pass their outcomes to yet other participants, the role of *assertions* about the possibilities that constitute the current state of the design outcome has become significant to the specialist design domain.⁴⁶⁵ Assertions of the clients' own understanding of their projects and the initial possibilities they have projected toward their projects (sometimes formalised

⁴⁶⁵For a Heideggerian perspective on the role and value of 'assertions' see Okrent, *Heidegger's Pragmatism*, *op. cit.*, pp. 52-109.

in an architectural context as a 'brief' or a 'program'), allow the professional designer to 'take over' the possibilities that have already been projected. Assertions about the current state of the possibilities assembled in the outcome by the designer (formalised in an architectural context as 'design drawings,' 'specifications,' 'schedules,' 'site instructions,' and so on) allow subsequent participants in the design process to take over the possibilities projected by the designer. Assertions about projected possibilities are referred to in design theory as 'representations.'⁴⁶⁶

For rationalist design theory, a representation employed in the design context is taken as a 'description' of something,⁴⁶⁷ whether that be a description of the 'designs and their vocabulary,' the 'design goals, intended interpretations or performances,' or the 'knowledge about design.'⁴⁶⁸ The rationalist explanation for the meaningfulness of descriptions is grounded in the representational view of the mind, discussed in Division I. In critiquing the assumptions made about 'descriptions' in the theoretical framework employed by CAAD, McLaughlin summarises various rationalist explanations for the meaningfulness of descriptions:

There is a strong trend in CAAD research to attempt to endow graphic descriptions with "meaning" by augmenting those graphic descriptions with additional descriptions — descriptions of intention or function... A related notion of meaning is...the idea that the elements of a description such as words and symbols are meaningful because they bring to mind images that constitute the meaning of those words and symbols. Both the notions...are founded on the idea that the "external" descriptions that we employ — texts and graphics — are a kind of shorthand. These "shorthand" descriptions are taken to evoke more complete "internal

⁴⁶⁶For an example of the use of 'representations' in rationalist design theory see Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, pp. 87-150.

⁴⁶⁷*Ibid.*, p. 87.

⁴⁶⁸*Ibid.*, p. 88.

mental" descriptions that constitute the "meaning" of the "shorthand" descriptions.⁴⁶⁹

To these two, McLaughlin adds a third, closely related explanation for the meaningfulness of descriptions, which she refers to as 'meaning as underlying structure:'

This is the idea that the meaning of a description is in some sense derived from the composition of, or overall form created by, its parts. The concept...is a manifestation of the belief that to understand is to possess "mental representations." The assumption operating is that we recognise certain compositions or forms as being meaningful because they *correspond* to "internal representations" of ideal forms.⁴⁷⁰

On the basis of these accounts, the *production* of representations and the meaningful *interpretation* of representations would appear to be dependent on the relationship between 'internal' representations or images and the externalized re-presentations of those internal descriptions. Thus the production of descriptions would involve a re-presentation of the internal representations, while the interpretation of descriptions would involve evocation of, or correspondence to, internal representations. Heidegger rejects these rationalist accounts of the meaningfulness of representations or descriptions. As would be expected, Heidegger's account instead depends on the role of absent background understanding.

From a Heideggerian perspective, a 'representation' produced in the design context should not be conceived as a re-presentation of something already *present* in the mind, as for example, in the paradigmatic notion of a designer thinking of an *image*

⁴⁶⁹McLaughlin, "Practices and Primordial Understanding," *op. cit.*, p. 55.

⁴⁷⁰*Ibid.*, p. 56.

in the mind and then re-presenting it as a drawing.⁴⁷¹ This misunderstands the role of background understanding and the way in which the background is articulated in all we do, including the making of representations. Heidegger's work allows the radical claim that all of the possibilities that are projected as 'representations' in the design context, whether they be drawings, written words, spoken words, or, most contentiously perhaps, *thoughts*, are an articulation of background understanding.⁴⁷² In this view, if we were to *think* of an image of an object, and then *draw* that object, the drawing would *not* be a re-presentation or an articulation of the object that was thought. Rather, in the first instant the 'thought' of the image would be an articulation of background understanding, and in thinking this image, background understanding would itself be transformed. The 'drawing of the image' in this situation would therefore be an articulation of background understanding transformed in the experience of thinking of the image.⁴⁷³ Drawings, like all 'representations,' are therefore articulations of background understanding, not re-presentations of presences in the mind. This makes sense of the designer's common experience of the spontaneity of drawing — that what is drawn does not necessarily have to first be thought — and is even more apparent in the spontaneity of both speaking and writing, which are also articulations of background understanding.

In this view, it is possible to project thematized possibilities as *thoughts* which articulate background understanding, and then press toward bringing those possibilities into being. We may, for example, think of the possibility of going to the mall to shop, and then press toward bringing that projected possibility into being by going to our car and driving to the mall. (Again, however, pressing toward bringing the possibility into being should not be conceived as an appropriation of

⁴⁷¹For a Heideggerian view of the nature of 'images' in the mind see Olafson, *What Is A Human Being?* *op. cit.*, pp. 127-31.

⁴⁷²The sense of 'articulation' used here equates the Heideggerian 'Articulation' (upper case A). For a discussion of Articulation see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 215ff.

⁴⁷³In the same way, a drawing of something in the world would be an interpretation grounded in background understanding, not a 'copy' of the thing.

the thought which is made present, but as an appropriation of background understanding transformed in thinking the thought.) In design contexts involving multiple participants there is evident value in projecting thematized possibilities as assertions, or, in the tradition's terminology, as externalized representations. Possibilities projected as assertions offer the potential of being *reinterpreted by other participants* in the design process. Before going shopping, for example, we might sit and project thematized possibilities by writing a shopping list. As a presence, the shopping list offers itself for reinterpretation in some later context, either by us or by someone else we might ask to shop for us.

On the basis of Heidegger's account, an assertion, such as a shopping list, is not found meaningful as a result of a correspondence to internal representations or images. McLaughlin points out that for Heidegger, the representation instead acts as a sign, reorienting us toward whatever the representation is about.⁴⁷⁴ The shopping list therefore acts to reorient us and allow us to 'be with' particular grocery items. It is only because we *already* have a background of experience of language and of shopping lists that we can 'read through' and 'be with' whatever the shopping list is about. In the same way, the interpretation of common representational modalities in a specialist design domain depends upon the interpreter already understanding the conventions of the representation. Different interpretive communities in the design context have a background of experience of different conventions. In the architectural design context for example, while a mechanical engineer may be able to 'read though' a mechanical services drawing to 'be with' the duct work, it is unlikely that the drawing could be interpreted in the same way by a lay client.

Those things which a 'representation' reorients us toward and allows us to be with,

⁴⁷⁴McLaughlin, "Practices and Primordial Understanding," *op. cit.*, pp. 67ff. Also see the discussion in the preceding chapter of the role of signs in re-orienting understanding.

do not, however, have an objectively fixed presence. The value of representations employed in the design context is that, in being with the possibility that is represented, the possibility is available to be interpreted from *different* perspectives. This polysemy would not be possible if, as rationalism assumes, externalized representations simply correspond to 'internal representations.' In accordance with Heidegger's laying out of the temporality of understanding, the way in which the possibility to which a representation points is interpreted is dependent upon the oriented background understanding of the interpreter. Thus a design drawing of an external elevation of a house allows interpreters to be with the house in different ways, depending upon their background understanding and the projects they are pressing toward. The client, in being toward the project of presenting an appropriate image, may 'read through' the drawing and immediately see a pleasingly grand house. The neighbour on the other hand, in being toward the project of privacy, may 'read through' the same drawing and immediately see a devastatingly intrusive house. Even for the author, a drawing offers itself as a possibility for multiple reinterpretations from different perspectives. Thus in interpreting a plan of a house, a designer might, from the perspective of the project of circulating through the house, 'move around' the house and discover that a corridor is too narrow, or the dining room is too far from the kitchen. The same drawing may later be reinterpreted by the designer from the perspective of the project of having sufficient ventilation, and so on.

Goals, Objectives, Constraints, Criteria and Functional Requirements

Division I demonstrates that contemporary rationalist design theory assumes design to be goal driven, and that goals, objectives, constraints, criteria and functional requirements are instrumental in directing the search for a design outcome. On the basis of the account of the design process presented to date, it becomes possible to see how these formulations arose, and to question the rationalist assumptions of the role of intentionality that are embedded in these formulations.

While there appears to be slippage in the terminology,⁴⁷⁵ *Knowledge-Based Design Systems* defines 'constraints' or 'criteria' as the range within which design decisions are constrained.⁴⁷⁶ Among the examples of constraints the text provides are 'that the manufacturing cost of an artifact is to be less than \$200,' 'that a building design must fit within the shape imposed by its site boundaries' and 'that the partition is to have a sound insulation factor greater than or equal to 50.'⁴⁷⁷ On the basis of the account of the design process given to date, it is held that constraints do not pre-exist *as* constraints. They are instead the limits of care of particular technologized practices. It is only where the limit of care is exceeded that breakdown discloses that limit of care as a constraint. It is only when, for example, the noise of neighbours in adjacent occupancies causes a breakdown in the project of enjoying aural comfort that the limit of care is disclosed. In this example the disclosure of the limit of care may lead to the further project of legislating to limit noise transmission between occupancies (a possibility which cares for the projects of those dwelling in the occupancies).

It is evidence of situations in which limits of care have been disclosed as constraints that appears to ground the assumption that *all* design outcomes may be able to be delimited by pre-existing constraints and that the task is therefore to assemble these constraints at the outset of the design process. As already demonstrated, however, the limits of care of projected possibilities might only be disclosed *as the design process proceeds*. Additionally, as the designer may already have a background of experience of many of the projects that intersect the design context, and as possibilities are projected on the ground of that background, the design process

⁴⁷⁵In *Knowledge-Based Design Systems*, constraints are said to be stated in 'specific terms' while criteria are said to be stated in 'directional terms.' Coyne et al., *Knowledge-Based Design Systems*, *op. cit.*, p. 17. In the same text it is said that an 'objective' may also be a constraint. *Ibid.*, p. 159. Also in the same text, it is stated that 'the goal may be considered a constraint that has been relaxed.' *Ibid.*, p. 135.

⁴⁷⁶*Ibid.*, p. 27.

⁴⁷⁷*Ibid.*, p. 159.

may simply *never* disclose the limits of care of many projects. In other words constraints may never need to show up and direct the design process. During the course of an architectural project, for example, an architectural designer would be unlikely to specify wool carpet for an external balcony. This would not be because there is a pre-existing constraint that 'carpet should not be laid in areas subject to rain' which in turn maps onto and therefore precludes that possibility, but because the designer has a background of experience of carpets left in the rain and would therefore simply not project that possibility.

Where a possibility is projected that *does* disclose a breakdown by exceeding the limit of care of a technologized practice, this breakdown is understood on the ground of background understanding. In being understood, background understanding is itself transformed. This transformed understanding is then available to be appropriated in the projection of subsequent possibilities. When, for example, the projection of a second storey addition discloses the potential for overshadowing the neighbour's property, understanding this breakdown may transform the designer's background understanding, and the appropriation of this background may ensure that no further possibilities with the potential to overshadow are projected. Thus even where something like a constraint is disclosed during the course of designing, it is not the *presence* of the constraint which maps onto and delimits the projection of subsequent possibilities.

In the same way that rationalist design theory assumes that *constraints* map onto and delimit the design outcome, *goals, objectives and functional requirements* are also assumed to be causally related to the generation of the design outcome. This assumption of causality is evident in design methods such as 'functional decomposition,' which, as McLaughlin explains,

...consists of attempting to isolate relationships between individual

aspects of a design proposal (eg. properties of an artefact) and individual functions of that artefact... we might functionally decompose a teacup by associating the *stability* of the cup (a function) with the fact that the cup has a *flat* bottom; the function of *containment* with the fact that the cup is *concave*; and our ability to *lift* the cup (another function) with the fact that the cup is *light* and has a *handle*. In line with the strategy of "functional decomposition," *design generation* can be accounted for as the manipulation [of] form-function relationships in such a way as to generate a proposal that satisfies a set of desired functions.⁴⁷⁸

Kalay explains further that such a method attempts

To evaluate the correspondence between the effects of the proposed actions and the specified objectives, the designer must translate between two different representational schemes: the physical representation that is used to describe the designed artefact, and the functional representation that is used to describe the design objectives.⁴⁷⁹

In terms of the account of the design process layed out in this dissertation, goals, objectives and functional requirements appear to be simply 'possibilities' projected as in-order-to's at various levels in the design process. In this view, the rationalist mapping of objectives, requirements or goals onto design outcomes is an attempt to formalise and reify the 'if-then' structure in which possibilities are projected. Thus the functional decomposition of the tea cup might instead be rewritten as incrementally projected possibilities: *if* the possibility of a stable tea cup is projected

⁴⁷⁸McLaughlin, "Practices and Primordial Understanding," *op. cit.*, p. 99.

⁴⁷⁹Kalay cited in McLaughlin, "Practices and Primordial Understanding," *op. cit.*, pp. 99-100.

then this may disclose the need for the further possibility of the tea cup having a flat bottom; *if* the possibility of a liftable tea cup is projected *then* this may disclose the need for the further possibility of a light tea cup with a handle. In this example, the projection of the possibility of a stable tea cup discloses a breakdown, and an understanding of 'what is needed' is projected ahead. A background of experience of using stable objects which have flat bottoms allows the further possibility of a tea cup with a flat bottom to be disclosed. Thus the presence of one possibility does not, as rationalist design theory assumes, determine the presence of the next. Rather than being a relationship between *presences*, the understanding of what is needed and the disclosure of the further possibility are grounded in the designer's *absent* background.

McLaughlin offers a further criticism of the attempt to describe the projection of possibilities as a relationship between presences. Drawing support from both Heidegger and Dreyfus, McLaughlin demonstrates that purposeful activity *need not* have goals or intentions in mind. She extends this argument to design activity, concluding that

Design activity too may be purposeful without recourse to goals or intentions... For example, good circulation might be achieved between the kitchen and dining areas by simply taking over a preferred kitchen-dining arrangement. This preferred arrangement might well be adapted to the situation in the way in which we might adapt a skill or a practice to the contingencies of a situation. The goal of *achieving good circulation between the living and dining areas* need not necessarily have been considered.⁴⁸⁰

While it is the case that our everyday activities may be purposeful without having

⁴⁸⁰McLaughlin, "Practices and Primordial Understanding," *op. cit.*, p. 96-97.

intentions in mind, the notion of intentionality for the deliberative activity of design appears more nuanced than McLaughlin allows. It has been argued that all of the nestings of possibilities that constitute a design outcome need not be thematically projected. Where there is a background of experience of the design context and existential possibilities are already understood to be available, these may be unnoticingly indispersed with thematized possibilities. Thus thematized possibilities might only be projected at sites of breakdown where the new or unusual is encountered. Projected alongside the thematized possibility of 'breaking in through the window,' for example, may be the unthematized possibility of 'walking to the window' in order that we be able to break through. Because the possibility of walking to the window did not come to awareness in the projection of the possibility, it could not however be said to have been 'intended.'

While not described in the same terms, an example of the difficult relationship between intentional activity and the outcome of intentional activity is described by Bratman.

Suppose I intend to run the marathon and believe that I will thereby wear down my sneakers. Now it seems to me that it does not follow that I intend to wear down my sneakers... Even so, if I proceed to run the marathon and actually do wear down my sneakers, then I might well do so intentionally... So although what I intend does not include wearing down my sneakers, the motivational potential of my intention does.⁴⁸¹

It could therefore be said that for Bratman to wear down his sneakers is an existential possibility that 'belongs' to the intended possibility of running the

⁴⁸¹Bratman, M. *Intention, Plans, and Practical Reason*. Cambridge: Harvard University Press, 1987, p. 123.

marathon, but is not itself intended.

In McLaughlin's example, it is agreed that if there was no awareness when the plan was being prepared of the goal of 'achieving good circulation between the living and dining areas,' then it could not be said to have been intended. Nevertheless, in assembling the possibilities that constitute the plan arrangement, this existential possibility of 'good circulation' would have been projected *alongside* other possibilities that *were* thematically projected. It may have been, for example, that a thematized possibility was projected for some special kitchen fitout detail, but because of designer's background of experience of plan arrangements of kitchens and dining rooms, as an unnoticed aspect of that thematically projected drawing of the kitchen, a satisfactory kitchen-dining relation was also projected. While this account — in which unintended possibilities are inevitably projected alongside thematized, or intended, possibilities — undermines any notion of a simple intentional relation between the presences of intended possibilities and the presences interpreted as the outcome (between function and form, for example), it does not undermine the recognition that design is nevertheless an intentional activity.

Analysis-Synthesis-Evaluation

The character of intentionality in this account of the design process differs significantly, however, from that implicit in contemporary rationalist models of the design process. While rationalist accounts place emphasis on the will of the designer in intending toward goals, and, as discussed in Division I, allow the possibility of designers choosing their beliefs, values and attitudes, the account presented in this Division challenges the autonomy of the will of the individual. By re-examining rationalist models of the design process, such as the prominent 'analysis-synthesis-evaluation' model, from the perspective of the account presented to date, it is not only possible to recognise the difference in emphasis on the role of the will of the

individual, it is also possible to see how the occlusion of the role of background may have led to a rationalist account which is grounded in an intentional relation between presences.

The starting point for the account of the design process laid out in this Division is the existence of a world of technologically mediated projects which are already projected ahead and which we are always already pressing toward. In the event of breakdown, a possibility that is already projected may show up as desired. In terms of rationalist design theory, this desired possibility would be considered a primary 'goal.' *Knowledge-Based Design Systems* argues that '[g]oals themselves are products of processes that are little understood.'⁴⁸² From the perspective of the account presented to date, the inability of rationalist formulations satisfactorily to explain the appearance of goals is perhaps due to rationalism's occlusion of the absent background upon which our possibilities are already projected. With this occlusion, rationalist formulations are left only with the possibility of explaining goal-setting in terms of the autonomous functioning of human will.

In the event that breakdown discloses a desired possibility, this thematized possibility is already projected ahead. As breakdown means that there are no existential possibilities available that may unnoticingly facilitate pressing toward the desired possibility, the need for a further possibility may be disclosed. As discussed, in situations where there is a limited background understanding of the projects that intersect the design context or of the available possibilities, the inability to disclose further possibilities may itself show up as a breakdown and disclose the thematized possibility of seeking further understanding. In terms of rationalist design theory, the need to seek further understanding might equate to the 'analysis' phase of the three-phase design model. By placing analysis as the initial phase of the design process, the model occludes the structure within which a background understanding

⁴⁸²Coyne et al., *Knowledge-Based Design Systems*, op. cit., p. 6.

of 'what understanding is needed' has *already* been projected ahead to give directionality to the search for further understanding. If design simply began with the analysis process as the rationalist model implies, then the analysis process would have no directionality. The untenable implication would be that *everything* in the design environment would therefore need to be analysed from every possible perspective.⁴⁸³

Returning to the event in which a possibility shows up as desired, the lack of existential possibilities may disclose the need for further possibilities to allow the desired possibility to be pressed toward. In this breakdown event an understanding of 'what is needed' may be projected ahead. If the designer's background of experience is adequate, the projected understanding of 'what is needed' may disclose a further thematized possibility with the potential to act as an in-order-to in pressing toward the desired possibility. The disclosure of the further possibility is an articulation of the designer's background of experience, but in being projected into the context of the new project, both the possibility and the project are transformed. In terms of rationalist design theory, this process of disclosure of possibilities might correspond to the 'synthesis' phase of the three-phase design model. As discussed in Division I, the synthesis of possibilities is regarded by the rationalist tradition to be a mysterious process. Again, it could be argued that the mystery surrounding the source of creativity arises from rationalism's occlusion of the role of the background, leaving only possibilities such as creativity generating 'black boxes' or 'glass boxes' inside the heads of designers.⁴⁸⁴

In the event that a further possibility is disclosed as an in-order-to in pressing

⁴⁸³This problem is recognised in rationalist design theory, and has led to modified versions of the three phase model, including the recursive 'synthesis-analysis-evaluation' model and the 'conjecture-analysis' model. See Hillier, B., J. Musgrave, and P. O'Sullivan. "Knowledge and Design." *EDRA 3* (1972): 29/3/1 - 29/3/14.

⁴⁸⁴For a description of the 'black box' and 'glass box' characterizations of designing, see Moore, G. *Emerging Method in Environmental Design and Planning*. Massachusetts: MIT Press, 1970.

toward a desired possibility, this further possibility may immediately disclose potential breakdowns or possibilities for other contiguous projects. In this event, it is the absent background understanding of other projects which intersect the design context that grounds the disclosure of potential breakdowns or possibilities for those projects. In terms of rationalist design theory, the process by which breakdowns and possibilities are disclosed in other contiguous projects might correspond to the 'evaluation' phase of the three-phase design model. In the account presented in this Division, however, rather than evaluation being a process in which the implications of an outcome are sought *by* the designer, breakdowns and possibilities for other projects are instead disclosed *to* the designer.

In the analysis-synthesis-evaluation model, it is evident that only what comes to *presence* in the design process is taken into account. Because the rationalist assumptions upon which the model is grounded fail to recognise that the disclosure of each presence is an articulation of an absent background, the model is reduced to relationships between successive presences. In the account presented in this Division, however, the design process is revealed as an unending play of presence and absence: each presence transforms and reorients the absent background, and the absent background provides the clearing for the disclosure of each new presence.

In the rationalist tradition, the will of the individual designer is held to control the selection of aspects of the design environment to be analysed, the different outcomes that are generated, and the aspects of outcomes to be evaluated. These choices are the product of the beliefs, values or attitudes of the designer, which, as argued in Division I, are themselves subject to the will of the individual designer. In the account presented to date, however, rather than the designer 'willing' the disclosure of needs, breakdowns and possibilities, the designer becomes a site of understanding in which needs, breakdowns and possibilities are able to presence.

In this view, the designer's understanding is not constituted by beliefs, values or attitudes which are held as pre-existing qualities present in the mind. The designer's understanding is instead constituted by a lifetime of engagement in a *unique* set of *shared* projects that have been handed over by the world. The different ways in which things come to presence is therefore an outcome of the designer's own shared yet unique background. If actions, including design actions, *are* to be held to be the outcome of beliefs, values and attitudes, then these beliefs, values and attitudes cannot be considered as presences, but must instead be taken to be the unreifiable background of unique but shared technologically mediated projects which are always already projected ahead.

In this analysis, the question of whether individuals, as designers, can choose their values, beliefs and attitudes collapses into the more enigmatic question of the extent to which individuals can choose their own background.

Automating Design

Drawing upon the work of Heidegger and the insights of contemporary hermeneutics, Dreyfus, Winograd, and Wingrad and Flores, question the rationalist cognitive paradigm that grounds the AI quest for automated reasoning.⁴⁸⁵ Their argument against the possibility of the AI project is that it is premised on the assumption that the world and the way humans reason in relation to the world is able to be represented by occurrent elements.⁴⁸⁶ For computers, this implies building a capacity to reason using data and rules. Dreyfus argues that Heidegger would show this to be implausible in two ways:

⁴⁸⁵Dreyfus, H. *What Computers Can't Do: The Limits of Artificial Intelligence*. New York: Harper and Row, 1979; Winograd, T. "What Does It Mean to Understand Natural Language." *Cognitive Science* 4 (1980): 209-241; Winograd and Flores, *Understanding Computers and Cognition*, *op. cit.*

⁴⁸⁶Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 115-16.

First, there is the argument from *holism*. Just adding to the representation of a table the fact that it is to eat at or sit at barely scratches the surface of its involvement with other equipment and for-the-sake-of-whichs that define what it is to be a table... Second, there is a related argument from skills. Computers programmed as physical symbol systems, that is, using rules and features, do not have skills; they do not come into a situation with a readiness to deal with what normally shows up in that sort of situation. Such a computer can only process occurrent elements. So when we program it, we must feed it the data and the rules it needs in order to build up a model of the situation and deal with tables... so the cognitivist would try to capture in rules our *savoir faire* concerning tables. These would of course be *ceteris parabis* rules depending on background circumstances for their application, and this would in turn lead the cognitivist to search for strict rules to capture these background conditions, which would only reveal more *savoir faire*. For AI researchers... this promises to be an infinite task.⁴⁸⁷

From a Heideggerian perspective, for a being to be 'intelligent' it must be a worlded being. To be a worlded being it must have already taken over possibilities opened by that world and have already projected those possibilities. It is only in pressing toward those possibilities that entities encountered in the world are able to show up as meaningful. No matter how they are assembled, occurrent entities, as presences, can never add up to such a projective temporal structure of understanding. Even the structuralist notion, advocated by theorists such as Piaget and appropriated by AI, of a background of human experience that is captured as mental schemata, is inadequate. Beyond the problem of explaining how experience can be reduced to a system of presences, such a system of presences can never constitute a temporal

⁴⁸⁷*Ibid.*, p. 117.

projective structure within which the world can show up as meaningful. Thus according to this argument, a computer that processes using presences can never reason.

In the context of design, the problems inherent in current attempts to automate human reasoning are brought into even sharper relief. The account presented in this Division has shown how, in the process of design, new possibilities and new projects are brought into being. Bringing new possibilities into being — valorized by the tradition as creativity — is grounded in the character of the world which constitutes the designer's background. The designer's background (which cannot be reduced to a content of the mind) is constituted by a world of technologically mediated projects which are taken over and which are always already projected ahead. It is thus a background that is constituted by a world of experiences, not presences.

In the process of design, possibilities are disclosed and projected into a nesting of in-order-to's which itself constitutes a project that is able to be pressed toward. In being projected into the new project, a possibility which is already understood is disclosed 'as something' marginally or markedly different for the new project that is being assembled. In other words, the possibility is brought to presence 'as something' which it was not previously present as. If the being of a possibility were only constituted as an assemblage of presences — if a book for example was constituted only by descriptions of features such as 'a literary composition long enough to make one volume,' and 'a form in which a literary work is made available for reading' — it could not then be disclosed as a different presence in a different context. Returning to the simple example of the wobbling table, a book described only by its literary features could not be disclosed *as something* to put under a wobbling table leg.

It might however be objected that in the context of automated design, as well as describing a book in terms of its bookish qualities, other features not normally thought of in relation to books, such as density or mass, might also be specified. The problem here is not simply that this would require anticipation of all of the projects for which the entities described might be taken as possibilities (that the entities be de-signed in advance by a worlded being), but more significantly, because properties and features of possibilities *are disclosed by the projects of which they are part*, the properties and features may simply not be present *until they have been disclosed by the new project*. Thus the resistance of a book to crushing under point loading might only be made present by including the book in projects unrelated to normal literary projects.

Why then, it might be asked, would a human designer who had not previously employed a book in such unusual contexts be able to see the book as a possibility for propping up a table leg? Because human designers do not store understanding as presences, but instead have a background of experience of the world. Whereas the possible interpretations of an entity described by presences cannot be interpreted beyond that range of presences, the world that constitutes the background is able to be reinterpreted and reappropriated in new ways. Thus while properties such as the mass and density of a book may never have been made *present* to the human designer, experience of a book in the everyday projects of reading would include an unnoticed *background* understanding of its feel, its heaviness, its firmness, and its thickness. It is this background understanding which remains open for reinterpretation in the context of new projects (and only in the new context are the properties and features, which rationalist formulations assume ground interpretation, made present).

The history of the on-going transformations of our technologised way of being provides evidence of the way in which the possibilities which are held open by the

world are continually reinterpreted in assembling new projects which constitute new ways of being and therefore new worlds. Fireworks used in a festival context in China offered possibilities which were reinterpreted into the military projects of Medieval Europe.⁴⁸⁸ Automated prayer wheels used in a Hindu religious context in Asia offered possibilities which were reinterpreted in the project of pumping the marsh water from the Dutch lowlands.⁴⁸⁹ Nitrous oxide used in the context of fashionable nineteenth century American drug parties held open possibilities which were reinterpreted in the project of obviating pain in dental surgery.⁴⁹⁰ Tin can lids discarded by twentieth century Australian colonizers held open possibilities which were reinterpreted into the fashion projects of the elaborate headdresses of the New Guineau highlanders.⁴⁹¹ In being seen as possibilities for the projects of which they were not previously a part, both the possibilities and the projects themselves were transformed.

On this account, the technologically mediated projects that constitute our current world can be seen to be put in place by the interpretative processes of previous designing. Thus the world of projects that is put in place by design is able to be taken over and become our background understanding. The significant implication is that it is this background, put in place by design, which is articulated in new design contexts. The discussion has therefore arrived at the point of recognition of the self-grounding circularity of design. As Fry states '[d]esign always goes on designing.'⁴⁹²

⁴⁸⁸ Ihde, *Philosophy of Technology*, op. cit., p. 65.

⁴⁸⁹ Jnr, L. White. "Cultural Climates and Technological Advance in the Middle Ages." *Viator* 2 (1971).

⁴⁹⁰ ABC Radio Audio Archives. "Radio National's The Science Show: 150th Anniversary of Anesthesia, produced by S. Carleton." Sydney: ABC Radio Tapes, 1997.

⁴⁹¹ Ihde, D. *Postphenomenology: Essays in the Postmodern Context*. Evanston: Northwestern University Press, 1993, p. 36.

⁴⁹² Fry, *Remakings: Ecology Design Philosophy*, op. cit., p. 10.

Conclusion

This Division has presented an interpretation of the design process which appropriates possibilities opened by the insights of contemporary hermeneutics and the work of the early Heidegger. In this account, design is shown to be a deliberative process initiated by breakdown and structured by the temporality of care. As the process proceeds, projects which care from a particular perspective are assembled by the projection of thematised possibilities. The design moves which are spun out in assembling the possibilities are shown to arise from the play of presence and absence, and the richness and complexity of these moves are shown to be the outcome of the finitude of human understanding.

In this account, the moves which are spun out in the design process, and which determine the distribution of care in the design outcome, are not held to be controlled by the individual designer's will or intentions as they are traditionally conceived. The moves that show up in the design context as sensible are instead circumscribed by the designer's background understanding, which is itself seen to be the outcome of prior designing. In the same way, values, attitudes and beliefs, which are assumed in the rationalist tradition to act as meta-level controllers of the choices humans make, including choices made in the design context, are held instead to be reifications of background understanding.

As discussed in Division I, much of the discourse on environmentally thoughtful design argues that for design to participate in the overcoming of the ecological crisis, the values and attitudes of designers need to be transformed, and design moves, such as goal setting and establishing criteria, need to be re-oriented. By problematising the role of values, attitudes, goals and criteria, and challenging rationalist assumptions about the extent to which the will of the individual designer controls the design process, the question is raised as to how such a paradigm shift toward ecologically thoughtful design might come into being.

With the account of the design process layed out in this Division as background, Division III employs the work of the later Heidegger to explore the role of the design process in the ecological crisis and address the question of how, or whether, the design process might participate in the overcoming of that crisis.

DIVISION III
DESIGN AND THE EARTH

CHAPTER 8

STRUGGLE BETWEEN WORLD AND EARTH

Introduction

This Division explores the involvement of the design process, as laid out in the previous Division, in the contemporary ecological crisis. Employing the work of the later Heidegger, it is contended that the design process itself may be instrumental in contributing to the ecological crisis. This contention throws into question the possibility, championed by ecological design texts, that design might be employed to contribute to the overturning of the crisis.



This chapter employs the work of the later Heidegger, especially his notions of Earth, World, Dwelling and Enframing, to demonstrate the possibility that the design process itself may be complicit in the ecological crisis.

The chapter first introduces Heidegger's non-dual concepts of 'Earth' and 'world.' In the previous Division it is demonstrated that the design process is dependent upon the possibility of multiple interpretations. It is contended here that the notion of Earth may offer an account of the possibility of multiple interpretations without the necessity of a collapse into either relativism or idealism. The notion of Earth also offers itself as one re-solution to the passionate debate, introduced in Division I, among the realist, non-realist, representationalist and non-representationalist positions.

The later Heidegger's notion of a world being brought into being by the 'struggle' between world and Earth is related to the discussion in the previous Division of the way in which a world is brought into being by the process of design. In the process

in which a world is brought into being, Earth is said to be disclosed as part of a caring world in which 'dwelling' is made possible. Heidegger, however, differentiates between the way in which both art and poetry create a world, and the type of producing which involves modern technology. Heidegger argues that our modern technologised way of being is 'enframed' in such a way that all things, including Earth, are revealed merely as a resource for our care. In this way, design itself is shown to be enframed and set upon a cycle of striving to install caring worlds which concludes, ironically, in the situation where care and dwelling are no longer possible.

Another Interpretation

The account of the design process laid out in the previous Division is dependent upon a world which offers itself for reinterpretation in the new projects that design brings into being. In the context of these new projects, an aspect of the world is taken *as* something which it previously was not. But what could be the nature of a world, of our reality, which allows itself to be interpreted in this way?

As discussed, Carr argues that hermeneutical theory is founded on the possibility of multiple interpretations. No matter how many extant interpretations there may be of a thing, '[p]ut simply, in the language of hermeneutics, *another interpretation* is possible.'⁴⁹³ Carr claims that this commits hermeneutics to the position that there must be a 'common object'⁴⁹⁴ around which these interpretations circle. If this is accepted, Carr argues, it must also commit hermeneutics to '[a] certain notion of the *object*':

...we are saying that the object is not exhausted by the understanding we have of it. It may be accessible to us in virtue of belonging within

⁴⁹³Carr, *Interpreting Husserl*, *op. cit.*, p. 185.

⁴⁹⁴*Ibid.*, p. 186.

the horizon to which we ourselves belong. But *it has an identity and a set of possible determinations* which transcend this horizon, determinations that may be accessible to others under other circumstances.⁴⁹⁵ [my italics]

Carr contends that this notion of an object with a set of determinations which transcend any single perspective brings the hermeneutic view very close to the Kantian notion of the 'limiting concept:'

...the notion of object as limiting concept goes hand in hand with a concept of the alternative perspective. In Kant's case, of course, the latter is the *intellectus archetypus*, a mind of intellectual intuition that knows the object as it is in itself, that is, presumably, in all its possible determinations...⁴⁹⁶

In terms of the discussion in Division I, Kant's position might be described as 'anti-realist representationalist.' Reality, the 'thing in itself' in all its determinations, is inaccessible. All that we can experience are a variety of mental representations of the thing from alternative perspectives. For Carr, the parallel for hermeneutics is that all possible determinations of the object around which interpretations circle cannot be grasped, and our experience is limited to a variety of interpretations from different perspectives. On Carr's account, therefore, hermeneutics comes close to becoming a species of Kantian Idealism, and therefore located within the category described here as anti-realist representationalist.

While Carr may be correct in his intimation that there is a paucity of discussion among post-Heideggerian hermeneutic philosophers on the nature and implications

⁴⁹⁵*Idem.*

⁴⁹⁶*Idem.*

of the 'object' of interpretation,⁴⁹⁷ it is nevertheless arguable that Heidegger himself cannot, without much resistance, be shoe-horned into the position Carr is attributing to him. To provide an interpretation of what I believe to be Heidegger's position (and perhaps at the same time offer one possible resolution of the tension between realists, anti-realists, representationalists, and non-representationalists) it is necessary to turn the discussion to the later Heidegger's concept of Earth.

Earth

The notion of Earth was introduced into Heidegger's work a number of years after the publication of *Being and Time*, and while not always named, nevertheless resonates throughout his later work.⁴⁹⁸ The introduction of the notion of Earth marks a turn in Heidegger's work. This is not so much a turn away from, as a return to the themes of *Being and Time* from a new direction. Thus, rather than being a rejection of his own early work, his later work is a reinterpretation of the place of the early work within a larger picture which Heidegger now saw.

While the early Heidegger focuses on the temporal character of the world and the character of our involvement (as worlded beings) in the world, he does not dwell on the significance of the 'ahistorical' and its potential role in grounding the possibility of the world.⁴⁹⁹ In his later work the focus on the phenomenology of individual

⁴⁹⁷ 'To be sure, the dependence of the position and its articulation upon this *it* [the object of interpretation] is for the most part unrecognized or unacknowledged.' Carr, *Interpreting Husserl*, *op. cit.*, p. 188

⁴⁹⁸ The terms 'Physis' and 'Earth,' as new ways of thinking on elementary nature, are introduced in Heidegger's *An Introduction to Metaphysics* and *The Origin of the Work of Art*. Heidegger, M. *An Introduction to Metaphysics*. Translated by R. Mannheim. New Haven: Yale University Press, 1959; Heidegger, "The Origin of the Work of Art," *op. cit.* Haar holds that '[t]he rediscovery of the Earth also signifies a reintegration of the "sensible" and the body in Heidegger's meditation. The body "proper" or the senses which are quasi-absent, or present in a rather oblique or marginal manner in *Being and Time*, appear in a number of interpretations of the hand, vision, and hearing in the course on Heraclitus (G.A. 55), in *The Principle of Reason*, and in *What is Called Thinking?* as belonging to a dimension that is neither sensible — in opposition to the intelligible — nor simply "natural," but "terrestrial".' Haar, *The Song of the Earth*, *op. cit.*, p. 14.

⁴⁹⁹ Heidegger indicates that he is considering the issue of the historicity of nature, but does not pursue it in any detail. He states in *Being and Time*, for example, that 'even Nature is historical' but adds that 'it is *not* historical to be sure, in so far as we speak of 'natural history.' Heidegger, *Being and Time*, *op. cit.*, p. 440.

worlded beings shifts as Heidegger recognises the implications of his own disclosure that the possibilities open to human beings are circumscribed by the historicity of their world.

As Zimmerman points out, had Heidegger simply concluded that the being of entities was no more than the way they showed up in our world of involvements, 'he would have been open to the charge that he was a subjective idealist.'⁵⁰⁰ (Indeed, Carr seems to be making exactly that charge.) For the later Heidegger, human interpretations do not determine the being of the entities that show up in the world, that is, the entities are not simply cultural constructions. But neither do entities that show up in the world have their own determinations outside their involvement in a world. Heidegger's introduction of the notion of Earth provides an understanding of this apparent paradox.⁵⁰¹

Heidegger's texts pair 'world' with Earth,⁵⁰² but he does not set up a dichotomy between world and Earth. The world is our world of involvements and possibilities, which includes all of the ways things show up for us in that world. World is a particular disclosure of Earth. In this way world *is* Earth. But Earth is always more than its disclosure in a particular world. Heidegger thus holds Earth to be both self-concealing and self-emerging:

By "earth," Heidegger came to mean, in part at least, this self-concealing dimension of all entities. Earth resists the world's disclosive assault and thus can never be brought completely into the realm of history. Earthly things are not simply self-concealing, however, they do also emerge into presence. A blossoming flower, for example,

⁵⁰⁰Zimmerman, *Heidegger's Confrontation with Modernity*, *op. cit.*, 1990, p. 226.

⁵⁰¹'Earth' does not have a single role in Heidegger's later work, but is used in a number of different ways. Haar points to four different senses in which Earth is used in Heidegger's later work. Haar, *The Song of the Earth*, *op. cit.*, pp. 57-63.

⁵⁰²See especially in Heidegger, "The Origin of the Work of Art," *op. cit.*

unconceals itself by putting forth its colors. Animals and plants involve a spontaneous surging forth. Their modes of being include giving birth, growing, blooming, and perishing. Because earthly things always turn in upon and conceal aspects of themselves even while coming into presence, Heidegger described earth as "abysmal" (*Abgrundig*). Earth, then, is not merely self-concealment but a spontaneous self-emergence which always involves a self-concealing dimension.⁵⁰³

Earth might be considered close to elemental nature,⁵⁰⁴ in that elemental nature has traditionally been held to hand over all of the possibilities that allow the building of human worlds. But again, Earth cannot be reduced to 'nature.' Our understanding of nature is limited to only that which is able to show up in our world, and, as previously stated, Earth is always more than world:

Earth is older than Adam, older than History. And yet Earth is not "pure Nature." Though appearing in the *epoché* and clearing of being as does every being, it is not reduced to a being nor even to the epochal, but it holds itself back, *like being*, thus preserving an extra-epochal dimension. Historical and yet nonhistorical, it appears as the most elementary ground of the world, as its body, to which our body is necessarily connected.⁵⁰⁵

Earth is taken by Heidegger to be 'possibility.' But it is neither the sort of possibility that determines its actualisations,⁵⁰⁶ nor is it the sort of possibility that can be

⁵⁰³Zimmerman, *Heidegger's Confrontation with Modernity*, *op. cit.*, pp. 121-22.

⁵⁰⁴A reading reinforced by Heidegger's introduction of Earth in conjunction with the Greek *Physis*. See Heidegger, "The Origin of the Work of Art," *op. cit.* Also see Haar, *The Song of the Earth*, *op. cit.*, p. 11.

⁵⁰⁵*Ibid.*, p. 5.

⁵⁰⁶*Ibid.*, pp. 99-101.

actualised in any way the world wishes. Earth has its own 'limit and measure.'⁵⁰⁷ As much as it may allow itself to be taken in one way, it may resist being taken in another. Haar claims that Earth '...possesses its own tendency not only to repel the historical but, following a certain bent, to attract it from its side.'⁵⁰⁸ It is this intrinsic quality of Earth, its 'innerness' (*Innigkeit*), that allows the particularity of its disclosure in a world. But the innerness, the Earthiness of Earth, cannot be said to be a determinable property of Earth. Zimmerman points out the problem of attempting to explain such a conception:

Heidegger's difficulty... was how to speak of the intrinsic measure and limit of living things ("the law of the earth") without resorting to one of the foundationalist doctrines of productionist metaphysics: that entities are "grounded" upon their "essence." Equally unpalatable to Heidegger were scientific explanations for the enduring structure of living things, e.g. the role played by DNA in determining cell reproduction in plants and animals.⁵⁰⁹

Heidegger does not, however, wish to deny the correctness of scientific explanations. On the contrary, Heidegger appears to hold that scientific assertions can be correct for the world in which they are disclosed.⁵¹⁰ The key point of difference between Heidegger's notion of Earth and rationalist attempts to posit grounds, whether scientific or metaphysical, is that every positing of a ground must be a disclosure of Earth *in a world*. It is not a determination that belongs to Earth *prior* to it being revealed in a world.⁵¹¹ The 'limits and measures' attributable to Earth can therefore only show up as limits and measures of Earth in its disclosure as

⁵⁰⁷Zimmerman, *Heidegger's Confrontation with Modernity*, op. cit., p. 226.

⁵⁰⁸Haar, *The Song of the Earth*, op. cit., p. 58.

⁵⁰⁹Zimmerman, *Heidegger's Confrontation with Modernity*, op. cit., p. 227.

⁵¹⁰Dreyfus, *Being-in-the-World*, op. cit., pp. 251-265.

⁵¹¹'Like the "land of a people" — which the Earth always is — it seems more inclined to receive certain forms, certain styles of existence rather than others, *without being able to be conceived as a reservoir of pre-existing forms*.' [my italics] Haar, *The Song of the Earth*, op. cit., p. 58.

world. This inverts the usual rationalist conception that properties are permanently present in nature, even *prior* to their discovery. Haar notes the insistence of Heidegger's repeated assertion that properties are *first* disclosed in a world.

The temple gathers around itself a world (cult, laws, customs) solely within which "natural" things can *first, initially* (*erst* is repeated several times), appear as such.⁵¹²

Heidegger thus puts in place a conception of a relation between Earth and world in which neither Earth nor the involvements which constitute the world are wholly deterministic — both contribute to the way in which the properties and features of things show up in a world. In this way, the different involvements of worlds (whether cultural, historical, or disciplinary) may disclose aspects of Earth as different determinations. Pursuing an example from the preceding Division, in the encounter between the Earthiness of the limb of a tree and the project of digging, the properties appropriate to a digging stick — strength, lightness, resilience, comfort of grip — are disclosed. In the encounter between the Earthiness of a tree and the projects of fire-making, the properties appropriate to tinder are disclosed. In the encounter between the Earthiness of a tree and the projects of making shelters, the properties appropriate to a lumber are disclosed. In the encounter between the Earthiness of a tree and the projects of technologically mediated plant biology, the properties appropriate to the physiological categories of organic life are disclosed. And, in the encounter between the Earthiness of a tree and the projects of animism the properties appropriate to tree gods are disclosed.

It is the Earthiness, the self-concealing aspect, of all things, including the practices and technologies already disclosed in a world, which allows new properties to be disclosed by new projects and thus allows the very possibility of the design process.

⁵¹²*Ibid.*, p. 47.

It is because 'Earth resists the world's disclosive assault and thus can never be brought completely into the realm of history'⁵¹³ that the world always conceals within itself an extra dimension. It is this extra dimension, the Earthiness of all things, which allows an aspect of the world to be taken *as* something which it previously was not. Thus the properties which were not previously present, which were part of the Earthiness of a world, are appropriated and made present in the design process. The previously absent dimension of the 'physical power' of the religious prayer wheel is, for example, appropriated and disclosed in bringing into being the windmill; and the 'violence' of beautiful and celebratory fireworks is appropriated and disclosed in bringing into being gunpowder. If world was constituted simply by objects with circumscribed sets of determinations, the ongoing re-interpretative events of design would not be possible.

Rationalism, Representations and Reality

The argument which Carr employs to draw Hermeneutics close to Kantian Idealism hinges on his assumptions about the 'object' around which interpretations circle. Carr presumes that both the 'object' and all of its possible determinations exist *prior* to the event of interpretation. For Heidegger, there is neither an object, nor any determinations of that object, until the event of interpretation, that is, until world and Earth collide. Thus the event of interpretation is not simply the event in which Earth is disclosed in its pre-existing form. Earth has no 'form.' The concept of form belongs to world. Prior to disclosure in a world, Earth, from the perspective of world, is pure possibility. Only when world struggles with that possibility is the Earth freed into the world.

Thus in this account, the Kantian *intellectus archetypus* could never know the object and all of its determinations prior to the event of interpretation, because there is no object or determinations to know. Indeed, even an explanatory device such as 'the

⁵¹³Zimmerman, *Heidegger's Confrontation with Modernity, op. cit.*, p. 121.

mind of God' would need to be reworked in respect of this account because the object and its possibilities are *not* disclosed by minds. The Earth is only disclosed in a world by being taken *as* something in the practices of a worlded being. Thus for the explanatory device to work, rather than God as an all-knowing intellect, God would need to be reconceived as an 'all-practising' incarnate God.

In Division I, it was suggested that two questions were at the heart of the continuing debates between realist representationalist, anti-realist representationalist, realist non-representationalist, and anti-realist non-representationalist philosophical positions. The first is the question of how to conceive the relationship between the mind and the world. The second is the question of the status of 'external reality.'

The difficulty for the realist-representationalist position is that because the mind is conceived as holding representations of external reality, there is no way of accounting for the fact that human beings appear to arrive at different accounts of the 'same' reality. The difficulty for anti-realist representationalists is that because the mind can only ever hold conceptions of reality, there is no way of convincingly articulating the causal relationship between matter (ie. external reality) and mind. The difficulty for anti-realist non-representationalists is that because reality is held to be culturally constructed, there seems no way to explain why science is able to successfully disclose and predict the causal relations of matter.

The Heideggerian formulation of the relationship between world and Earth appears to overcome each of these difficulties. In Heidegger's account there is no separation of mind and external reality. The mind does not *hold* representations of external reality. Rather, our interpretations *are* disclosures of reality. The possibility of multiple interpretations is accounted for not by differences in mental representations of external reality, nor by differences in the 'constructions' of reality. Different interpretations arise because different human practices and projects

disclose Earth differently. In this view, science 'works' because it is a disclosure of *reality* for a world of (scientific) practices.⁵¹⁴ (Two observations flow from this. Firstly, different practices within the domain of science may disclose reality differently — readily recognisable, for example, in the disclosure of light as having the properties of both waves and particles.⁵¹⁵ Secondly, as the technologically mediated projects and practices of science transform by design there may be the appearance of revolutions in 'ways of seeing.'⁵¹⁶) The fact that different interpretations of reality are possible does not, however, mean that Heidegger's account collapses into relativism. Because a particular reality can *only* be disclosed by the practices and projects of a world, it is not possible to simply *choose* between realities. To disclose a particular reality one must *participate* in the projects and practices of a world, not simply adjust one's 'mental outlook' or one's 'way of seeing.' In this view, to arbitrarily choose another way of seeing is an impossibility.

Heidegger's account also has significant implications for the discourse of an environment in crisis. Because Heidegger's account is realist, the environmentalists' position is not weakened by the possibility that environmental crises are merely mental representations or arbitrary cultural constructions.⁵¹⁷ While Heidegger's account is realist, it nevertheless allows the disclosure of more than one interpretation of environmental crisis. Different worlds of projects and practices may disclose the crisis differently. The ecological crises of the industrialised 'North,' and the substantively different crises of the less industrialised 'South,' each have epistemological legitimacy (this would come as no surprise to those suffering in these real and pressing crises). Thus the competing accounts of ecological crises from different players are not, as Lamb contends, epistemological mistakes.⁵¹⁸

⁵¹⁴Also see Dreyfus for an account of Heidegger's Realism, science as the disclosure of truth, and the possibility of a plurality of realities. Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 248-65.

⁵¹⁵Kuhn, *The Structure of Scientific Revolutions*, *op. cit.*

⁵¹⁶*Idem.*

⁵¹⁷Trigg, *Rationality and Science*, *op. cit.*, p. 10.

⁵¹⁸Lamb, "The Challenge of Ecology to the Design Professions", *op. cit.*, p. 16.

They are disclosures of reality for different worlds of projects and practices. The ways of being-in-the-world where each way of being has different consequences for the environment. Finally, while this account may suggest that the crisis is only a reality from the perspective of the projects of worlded beings — that is human beings — it does not necessarily follow that the crisis has no consequences for Earth, simply that the consequences — the damage wrought upon Earth by world — can only show up as such in a human world.

The Struggle Between World and Earth

Heidegger describes a struggle between world and Earth in which both 'strive':

The opposition between world and earth is a striving... In essential striving... the opponents raise each other into the self-assertion of their natures. Self-assertion of nature, however, is never a rigid insistence upon some contingent state, but surrender to the concealed originality of the source of one's own being. In the struggle, each opponent carries the other beyond itself.⁵¹⁹

Haar explains that this is not strife between beings, but between regions of disclosure:

There is a strife because there is a reciprocal menace of absorption, since each of the two adversaries tend to encroach upon the domain of the other, and more profoundly, because each of the two need the other and is inclined to capture the other.⁵²⁰

In this strife between world and Earth, worlds are brought into being and maintained, resisting the self-concealing striving of Earth. In the previous Division it was asserted that the deliberative process of design brings into being worlds. This raises the obvious question, if the later Heidegger's rich and poetic language is describing the bringing into being of worlds, and the pragmatic laying out of the design process in the preceding Division is also describing the bringing into being of worlds, then what is the relation between the two?

Even though the laying out of the design process in the previous Division arises from the work of the early Heidegger, and the work of the later Heidegger adopts a new orientation and a new language, it is nevertheless argued that there is a strong relation between the two, and that this relation can be evidenced by thinking through Heidegger's later work in terms of the design process laid out on the basis of his earlier work.

As discussed in the previous Division, central to the work of the early Heidegger is the temporal structure of care. While the term 'care' largely disappears from the lexicon of the later Heidegger, I would concur with Fry that the concept of care nevertheless remains potent in his later work through notions such as 'dwelling.'⁵²¹ For Heidegger, *care* and the *temporality of understanding* are interdependent: it is because we have a background understanding (*past*) which is always already projected ahead (*future*) that we act caringly in the *present*. It will be argued here that Earth, prior to its being brought into world, cannot facilitate care, and that the struggle between Earth and world is the struggle to install and maintain a world in which care is possible. It will also be argued that design has a critical role in this struggle.

⁵²¹In his insightful essay, *The Architecture of Care*, Fry draws out the relation between the Heideggerian notions of 'care' and 'dwelling,' and explores their implications for the rethinking of architecture. Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, pp. 103-112.

Design as the Struggle Between World and Earth

Earth that has not been disclosed as world is, by self-definition, that which is beyond our current understanding. That is, it is not part of our background of experience. As such we cannot be said to *already* understand, and we cannot therefore project understanding ahead of us in pressing toward our projects. If, by way of (another) mythic example, we were to encounter terrain which had features unlike anything we had encountered before, then, *before* we encountered it, it might be said that for us it was 'Earth that had never been disclosed as world.' Even at the first encounter, however, it would become, in a basic way, part of our world. It would immediately be taken into our world *as* 'something we do not understand.' (In terms of our care, the implications of it being taken in this way are clear, as this understanding allows us to approach it hesitantly and deliberately.)

Because of our limited background understanding of this unfamiliar terrain, we would not be able to unnoticingly project existential possibilities in respect of the terrain to allow us to press toward our projects. If we are travellers pressing toward travelling onward, we would have no background understanding of what this terrain might feel like under foot. Will it absorb us like a sponge? Will it be searingly hot and burn the soles of our feet? Will it be as sharp as razor blades? It is because this terrain is not already understood, that it cannot facilitate care.

On terrain that we have experienced many times, terrain which is therefore part of background understanding, our steps are unthinkingly projected ahead and pressed toward. In terms of the discussion in the preceding Division, our steps are always already projected as existential possibilities. In such situations we do not need to pay thematic attention to our feet. We can therefore attend to other things which may be difficult or unusual. In this situation it could be said that the regular terrain which has become part of background understanding cares for our feet and we do not therefore need to attend to their care by carefully watching each step. As

'already understood,' this terrain is thus part of our (caring) 'world.'

Bringing Earth into world — into the clearing where it is already understood and therefore facilitates care — is not merely a matter of imposing onto Earth whatever world may desire. Earth strives in its own way, and therefore resists simply being dominated by the projects of world. In this struggle between the world's desire to continue to press toward its projects and Earth's resistance, practices are 'worked out'⁵²² in which Earth and world attain an impermanent compromise.

When, for example, we encounter an unusual terrain that we desire to cross, we do not simply dominate it by imposing upon it the same gait that we always use. When we make the first tentative steps, we 'feel' the unusual terrain resisting our attempts to walk 'normally.' If the terrain is gluggy like porridge it will resist our attempts to take brisk steps. If the terrain rises steeply upward it may encourage us to grip with the balls of our feet. By attending to our steps — thematically projecting the possibility of stepping in certain ways, pressing toward those possibilities, adjusting our step where possibilities don't work — we may quickly work into a rhythm which allows us to press forward (and thereby continue with our projects). Thus with experience of different terrains — bitumen, snow, sand at the beach, and mud on a river flat — different walking practices may be 'worked out' and become existential possibilities which are unnoticingly adopted in those different contexts. In this 'working out,' which involves thematic attention, adjustment and compromise, neither Earth nor world dominate, nor are they dominated.

But if the 'working out' of the struggle between the projects of the world of the walker and the Earthiness of the unusual terrain involves *deliberative* attention and

⁵²²Having the same sense of 'work' as that done by a work of art in *The Origin of the Work of Art*. Heidegger, "The Origin of the Work of Art," *op. cit.*

the projection of *thematized* possibilities, then, in accordance with the account laid out in the previous Division, *the struggle between world and Earth is 'worked out' by the process of design*. In this view, it is through the process of designing that a world is brought into being. The world brought into being is constituted by possibilities wrought by struggle from Earth. These caring existential possibilities — which are Earth brought into human practices and thus made part of human understanding — arise amidst an uncaring Earth which is not part of human practices and therefore not already understood.⁵²³

Every possibility brought into being by struggle with Earth cares only within certain limits of the Earth-world nexus. The limit of care of a possibility is the limit within which it continues to transparently facilitate the projects being pressed toward. Returning to the example of walking, a particular walking practice — a style of walking belonging to a particular terrain — will only remain an unnoticed existential possibility within a certain range of terrain variation (that is, the range 'worked out' in the initial struggle which, by practice, has become part of a background of experience which is projected ahead — what the tradition describes as an 'expectation'). If while walking on flat terrain we were to tread on a sharp object, our attention would be drawn to our feet and our project would temporarily lose its transparency. The sharp object is thus outside the limit of care of the walking practice — the world-Earth nexus — which is facilitating the current project. In a more extreme case, if while walking we were to unexpectedly encounter a deep river, this too would be beyond the limit of care of the Earth-world nexus of the practice of walking. Rather than being a temporary breakdown, this practice could

⁵²³The similarity to many creation myths in which chaos is made ordered is worthy of note. See Eliade, M. *Myth and Reality*. Translated by W. Trask. New York: Harper and Row, 1975; Eliade, M. *The Myth of the Eternal Return*. Translated by W. Trask. Great Britain: Arkana, 1989; Coomaraswamy, A. *The Dance of Siva*. New Delhi: Sagar Publications, 1987; Coomaraswamy, A. *Symbolism of Indian Architecture*. Jaipur: The Historical Research Documentation Centre, 1983; Snodgrass, A. *Architecture, Time and Eternity: Studies in the Stellar and Temporal Symbolism of Traditional Buildings*. Vol. 1 & 2. New Delhi: Aditya Prakashan, 1990; Snodgrass, A. *The Symbolism of the Stupa*. Delhi: Motilal Banarsidass, 1992; and Chakma, K. and G. Hill. "Of Other Universities: The Contested Space of the Ancient Viharas of Bangladesh." *Architectural Theory Review* 2 (1 1997).

no longer facilitate the project being pressed toward and would therefore show up as blocked.⁵²⁴ In these examples, Earth, as the sharp object or deep water which is beyond the understanding that is already projected ahead, 'juts' through into world.⁵²⁵

As discussed in the preceding Division, when existential possibilities are no longer able to transparently facilitate the project being pressed toward and the project therefore shows up as blocked, our mode of being 'changes over' and *thematised* possibilities may be projected toward the overcoming of the breakdown. In this way, *the breakdown brought about by the thrusting through of Earth into world initiates the design process*. Pursuing our mythical example, if, in pressing toward the existential possibility of walking barefoot, sharp objects keep thrusting through into our world and causing breakdown in the practice, we may stop, deliberate, and project thematised possibilities toward overcoming the breakdown. If the possibility of 'protecting the feet in some way while walking' is projected and pressed toward, then the 'shoes' that are brought into being may be seen to constitute a new technologised practice with a *different* limit of care to the previous practice of walking barefoot. Sharp objects may now be *within* the limit of care of this technopractice, as we no longer need to attend to our feet as we encounter them.⁵²⁶ Encounters with rivers would, nevertheless, remain outside the limit of care of the world-Earth nexus of this new technopractice.

In this account, the struggle between world and Earth, 'worked out' through the process of design, becomes the struggle to situate us, and maintain us, within the

⁵²⁴The stages of 'breakdown' are described in Division II. Also see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 60-87.

⁵²⁵'The world grounds itself on the earth, and earth juts through world.' Heidegger, "The Origin of the Work of Art," *op. cit.* p. 49.

⁵²⁶Thus, speaking of Van Gogh's painting of the peasant shoes, Heidegger states that 'By virtue of this reliability [of the shoes] the peasant woman is made privy to the silent call of the earth; by virtue of the reliability of the equipment she is sure of her world, World and earth exist for her, and for those who are with her in her mode of being, only thus — in the equipment. We say "only" and therewith fall into error; for the reliability of the equipment first gives to the simple world its security and assures the Earth the freedom of its steady thrust.' *Ibid.*, p. 34.

limits of care of a world constituted by existential possibilities wrought from Earth. In situations where Earth thrusts through and causes breakdown, world struggles back, putting in place possibilities — technologies and practices wrought from Earth — to overcome the breakdown and allow the projects of world to be unnoticingly pressed toward. As they incrementally arise, all situations of breakdown become potential sites of struggle to bring Earth into world and thus bring us within the limits of care of world. In situations where the Earthiness of rough terrain which is outside the limits of care of the practice of walking thrusts through, paths may be deliberately beaten from the Earth, or footwear may be wrought from the leather or timber of the Earth. By using paths and shoes we are kept within the limits of care of the practice of walking, allowing us to unnoticingly press toward the projects of journeying without needing to attend to our feet. In the same way, a bridge over a river keeps us within limits of care as we do not need to attend to the treachery of the water. Or again, shelter technology keeps us within limits of care as we do not need to attend to the possibilities of wolves, snakes, storms, rain, or extremes of heat or cold.

It needs to be reiterated, however, that it is not simply the material existence of shoes, bridges, houses, and so on, that allows these technologies to care. It is only in being made part of the temporality of our understanding that technologies are able to care. By bringing into being and experiencing a world of possibilities capable of facilitating our projects, the possibilities are made part of background understanding. This understanding of the possibilities already in place to facilitate our projects is able to be unnoticingly projected ahead and pressed toward. Because these existential possibilities are not brought to thematic awareness, our attention is free to care for other aspects of our environment. By already understanding that the soft, flat floors of our carpeted house are within the limits of care of the practice of walking, for example, and by already understanding that they are likely to remain within those limits, this understanding is able to be unnoticingly projected

ahead as we move around our house. With the understanding of our caring floors always already projected, we do not need to thematically 'look out' for the sudden thrusting of hidden divots, unnoticed rocks, projecting tree roots, and so on. Our floors, our walls, our furniture, our potted plants and our light switches, in being already understood, have become part of a caring, in-habited world.

In the same way, by deliberately picking out from Earth the rhythms of nature⁵²⁷ — day, night, winter, spring, summer, the signs of rain — they too become part of the temporal structure of understanding which facilitates a caring world. By already understanding each morning that there will be a full day of daylight (not random spasms of light and dark), we are free to plan and attend to the projects of the day. By already understanding the rhythm of the seasons, the farmer is free to plan and attend to the projects of farming. Even where a world cannot be put in place which maintains Earth *permanently* within limits of care, by already understanding the possibility of the rhythmic or arhythmic thrustings of Earth beyond those limits, existential possibilities can be put in place to take care of the breakdowns which may arise from the thrusting of Earth. By already understanding that Earth may thrust through with sudden ferocity as cyclones, earthquakes, or floods, it is possible to put in place existential possibilities such as civil defence services, ambulance services, clean-up services, insurance services, and so on, to await Earth's thrusting. By understanding that Earth may thrust through with creeping stealth as weeds, corrosion, and disease, it is possible to put in place existential possibilities such as lawn mowers, building maintenance services, and medical services in order to return Earth to within the limits of care of world.

But Earth cannot simply be reduced to aspects of *elemental nature* which have not been brought within the clearing of a world. Aspects of the technologically

⁵²⁷In this view the rhythms are not given, but must be deliberately struggled with to be disclosed. Scientific disclosure is one manifestation of that struggle.

mediated practices of one *human world* may also thrust through (as Earth) into another human world. Even within a world, aspects of one project may thrust through (as Earth) into another project. Thus the striving of any project which is outside the background of experience that is already projected ahead has the potential to thrust through and disrupt the care of a world. Extending the preceding example, the project of the world of a child may, through the unseen menace of a roller skate left lying around on the floor, thrust into and disrupt the care offered by the flat, even floor of our house.

As exemplified in the preceding Division, there are numerous situations where striving projects might thrust through into each other's worlds, causing breakdown and initiating a struggle that is 'worked out' through the process of design. Possibilities such as new road and motor vehicle technologies put in place to provide transparency to the projects of motorists may thrust through and disrupt the transparency of the projects of pedestrians. Possibilities such as house additions put in place to provide transparency to the projects of a growing family may thrust through and disrupt the transparency of the projects of its neighbours. The significance of these examples is that the new worlds of technological involvements continually brought into being by the struggle 'worked out' by design *do not* simply follow a trajectory of technological 'progress' in which *all* of our projects are more transparently facilitated. Rather, the design process distributes care unequally to projects in the design environment, transparently facilitating some projects while precipitating breakdown in others. Where new breakdowns are precipitated by design, further designing may be initiated to overcome these breakdowns, in turn precipitating further breakdowns, and so on.

Environmental Implications

In the discussion in Division I of the possibility of a paradigm shift toward more ecologically responsible design, the question was raised as to how a new paradigm

might first be thought, and, when thought, what might motivate the adoption of such a paradigm. Ecological design texts often assume the mechanism of the shift toward ecologically responsible design to be one of *choosing* new goals, new design criteria, and new values and attitudes. However, the discussion in the preceding Division undermines the rationalist valorization of individual will and choice. The question which is therefore raised is how a reorientation toward a more ecologically thoughtful design trajectory might arrive.

The notion that the striving of one project may thrust through and precipitate breakdowns in another project and thereby initiate a struggle in which the process of design brings into being a new project, offers the potential to explain the structure within which paradigm shifts comes into being. It has been shown that there is always already a background understanding of the myriad of involvements which unnoticingly facilitate, and thus care for, the projects which constitute our world (which also includes an understanding of others' assertions about those involvements). There may be, for example, an understanding of the way in which rivers care for fish, and fish care for the technologically mediated practices of fishing, and the practices of fishing care for our practices of eating. There may be an understanding of the way in which rivers care for dams, and dams care for the technologically mediated practices of irrigation in dry spells, and the practices of irrigation care for the practices of farming, and the practices of farming care for our practices of eating. There may be an understanding of the way in which a forest cares for the quality of the water in its watershed. And there may be an understanding of the way in which a forest cares for the technologically mediated practices of logging, and the practices of logging care for the practices of the construction industry, which in turn care for our shelter.

As part of the striving of the myriad of projects that constitute our world and the worlds of others, it is possible that one caring project may thrust through and

precipitate breakdown in another caring project. The project of damming a river may thrust through (as Earth) into the downstream projects of fishing, disclosing itself as dwindling fish stocks. The project of logging and forest clearing may thrust through (as Earth) into the projects of collecting and distributing drinking water, disclosing itself as impurities in the water. With the disclosure of such breakdowns, absent possibilities which were already being pressed toward show up as desired. Thus in terms of the previous examples, the desire for rivers which support abundant aquatic life might show up, or the desire for adequate unpolluted water may show up.

In accordance with the laying out of the design process in the preceding Division, with the disclosure of breakdown, thematized possibilities may be projected toward facilitating the desired project. The thematized possibilities of 'stopping the disruption of river flows by dams,' or 'stopping the destruction of forest ecosystems by logging' may be disclosed and projected. If these possibilities cannot simply be pressed toward, further thematized possibilities may then show up as needed in order to facilitate these possibilities. Possibilities such as changing the demand for water use so that there is less requirement for dams, or changing the demand for construction timbers so that there is less demand for logs, may be disclosed. These may in turn disclose possibilities such as changing farming practices to minimize water use or changing construction practices to minimize lumber use. The thematised possibilities that are disclosed as in-order-to's in facilitating 'larger' thematised possibilities equate to what ecological design texts which are grounded in rationalist design theory often describe as 'goals' and 'criteria.' Thus the 'design criteria' and 'goals' advocated by such texts, which might include minimising pollution, minimising the consumption of resources, and maintaining or restoring biodiversity, can be seen to be in-order-to's which are projected at some level in the design process, and which in turn direct the projection of further possibilities. By reifying these thematised possibilities as 'goals' and 'criteria,' the larger absent

projects which are always already projected ahead are occluded.

In this account it can be seen that breakdown brought about by Earth's thrusting may initiate the projection of nestings of thematized possibilities which constitute new 'environmentally oriented' projects. In this way, environmentally oriented projects may be seen as manifestations of the ongoing cycle of striving to install worlds which care. Importantly, because things encountered in the world are understood 'as something' in terms our projects, then *pressing toward new projects will disclose our world in new ways*. If the possibility of 'minimising pollution' is projected and pressed toward, for example, then technologically mediated practices which may have previously been understood as caring — such as private motor vehicle use — might suddenly be disclosed as polluting. Likewise, if the possibility of 'maintaining biodiversity' is projected ahead and pressed toward, then technologically mediated practices which may also have previously been understood as caring — such as the monoculture of a grassed lawn — may now show up as environmentally damaging. By deliberately and repeatedly pressing toward these new 'environmentally oriented' possibilities, they may become existential possibilities. With these new possibilities always already projected ahead, no deliberation would be required for things in the world to show up as polluting, resource hungry, or environmentally damaging. In this event, a paradigm shift has occurred. Thus in this account it is in pressing toward new projects initiated by breakdown, not by willing a change in 'mental orientation,' that a paradigm shift arrives.

But of course these new 'environmentally oriented' projects may themselves thrust through into other caring projects, bringing about breakdown and initiating further struggles to be 'worked out' by the process of design. Projects directed toward curtailing the technologically mediated practices of logging may for example precipitate breakdown in the practices of logging communities, initiating the

projection of further thematized possibilities in response. Whether a project shows up as caring or uncaring thus depends upon the position within the totality of involvements from which it is 'seen.' Although it may be tempting to claim that environmentally oriented projects have a sort of 'ontological pr-eminence' over other projects because they are situated closer to the origin — closer to the Earth which grounds all other projects — this too is perhaps merely a judgement made from the particular position of already pressing toward environmentally oriented projects (a position which I myself feel situated).

The 'Essential' Environmental Danger

The picture painted to date is one of striving to bring into being and maintain caring worlds; worlds whose constitutive possibilities are always already understood and projected ahead; worlds whose constitutive possibilities transparently facilitate the projects we are pressing toward. Wherever Earth thrusts through (as the concealed dimension of either the striving of nature or the striving of our techno-practices) a struggle is initiated to bring Earth into the open and thereby put in place a caring, transparent world. This struggle is 'worked out' by the process of design. Thus the picture is one of striving to overcome breakdown, where each overcoming has the potential to precipitate new breakdown and therefore initiate new striving in an unending cycle.

But it is with this picture that I believe we are brought to the very heart of what the later Heidegger came to see as the dire predicament of rationalist, technological modernity: the incessant striving to overcome breakdown and maintain a caring world which transparently facilitates our projects.⁵²⁸ While not presented as such, the structure of the problem is articulated in Heidegger's early work. *Being and Time* discloses a world which is constituted by a network of instrumental 'in-order-to's'

⁵²⁸The later Heidegger's negative reinterpretation of equipmental relations which were a central theme of *Being and Time* is one aspect of Heidegger's 'turn.' Also see Okrent, *Heidegger's Pragmatism*, op. cit., p. 234.

which maintain the transparency of our projects.⁵²⁹ The most memorable metaphor of *Being and Time* is the work-world of the workshop, in which things are there and available to transparently facilitate the projects of the workshop.⁵³⁰ Any breakdown in the equipment used in the workshop withdraws its transparency and disrupts the projects of the world of the workshop. In the laying out of the design process in the preceding Division of this dissertation the instrumental metaphor of Heidegger's workshop world is extended, and demonstrates how, by deliberately bringing to presence the in-order-to's which constitute the world (that is, by designing), these breakdowns are overcome and transparency is restored.

Heidegger's 'turn' is not, however, the outcome of any recognition that the laying out of the world accomplished in the early work was somehow mistaken. On the contrary, it was perhaps the truth disclosed by the early work that was so alarming. The world of instrumental involvements which functioned to transparently facilitate our projects was the world Heidegger saw around him — it was our modern, technologized world. It is perhaps this recognition itself that marks the turn in Heidegger's thinking. Rather than holding that *Being and Time* provided an ahistorical account of the world — an account that would be valid for any human world regardless of its historicity — Heidegger's later writings recognise that the world described in *Being and Time* is historically constituted:

...when analysing the equipmentality in *Being and Time* he [Heidegger] disregarded the epoch as well as the structures passed on by history. Yet it will become clear that the sense of the being of phenomena is indissociable from their situation in an "epoch of being."⁵³¹ [my gloss in brackets]

⁵²⁹Heidegger, *Being and Time*, op. cit., pp. 91ff.

⁵³⁰*Ibid.*, pp. 95-122.

⁵³¹Haar, *The Song of the Earth*, op. cit., p. 79

The dire predicament Heidegger recognizes in our current epoch is, I believe, the outcome of the nexus between our mode of being-in-the-world, and our mode of bringing the world into being. Much of Heidegger's later work is directed toward articulating this predicament. While the vehicles of his meditations vary — art, poetry, building, thinking, technology, things — he consistently returns to the same 'essential' conditions which he recognizes as underlying the problem.

In *The Origin of the Work of Art*, Heidegger's discussion of the way in which a world is produced by the struggle between world and Earth begins with the recognition that both technology *and* art are a mode of producing.

What do being created and creation mean here in distinction from making and being made?⁵³²

We think of creation as a bringing forth. But the making of equipment, too, is a bringing forth.⁵³³

The readiness of equipment and the createdness of the work [of art] agree in this, that in each case something is produced.⁵³⁴ [my gloss in brackets]

During the course of the essay, however, Heidegger moves to sharply differentiate the kind of creating that the work of art facilitates and the kind of producing that technology facilitates. The central difference which Heidegger draws out is that while the functionality of technology withdraws into transparency and thereby conceals a world of involvements, the work of art 'works' to disclose a world of involvements. In the context of a discussion of the peasant shoes depicted in a Van

⁵³²Heidegger, "The Origin of the Work of Art," *op. cit.* p. 57.
⁵³³*Ibid.*, p. 58.
⁵³⁴*Ibid.*, p. 64.

Gogh painting, Heidegger therefore claims that '[a] single piece of equipment is worn out and used up... [o]nly blank usefulness now remains visible', but in contrast 'the equipmentality of equipment first genuinely arrives at its appearance through the work [of art] and only in the work.' In the same vein, Heidegger differentiates the fate of stone when taken into technology and when taken into art:

In fabricating equipment — e.g., an axe — stone is used, and used up. It disappears into usefulness. The material is all the better and more suitable the less it resists perishing in the equipmental being of the equipment. By contrast the temple-work, setting up a world, does not cause the material to disappear, but rather causes it to come forth for the very first time and to come into the Open of the work's world.⁵³⁵

Here we see the same understanding of equipment as that found in *Being and Time*.⁵³⁶ As an existential possibility, equipment withdraws into the background when in use. Its transparency 'cares' in that it frees thematic attention to be given to what is difficult or unusual. In the context of Heidegger's later work, however, the caring quality of technology reveals its darker side. By withdrawing into the background when in use, equipment at the same time conceals its consumption of the very materiality, the Earthiness, that endows it with its possibility of being. Art, by contrast, cannot be considered an in-order-to in a world of functional involvements. It does not transparently facilitate any project and does not therefore care in that it frees us to thematically attend to what to what is difficult or unusual.⁵³⁷ By its refusal to withdraw into transparency, art reveals what technology conceals. It reveals both our world of involvements and the Earth from

⁵³⁵*Ibid.*, p. 46.

⁵³⁶Indeed, in this essay Heidegger even repeats the example of the hammer previously used in *Being and Time*: 'The more handy a piece of equipment is, the more inconspicuous it remains that, for example such a hammer is and the more exclusively does the equipment keep itself in its equipmentality.' *Ibid.*, p. 65.

⁵³⁷Art can, of course become commodified, in which case it becomes merely an in-order-to in a world of economic involvements.

which it arises.

In the essay *Building Dwelling Thinking*, Heidegger argues that in order to build we must first be able to 'dwell.'⁵³⁸ The notion of dwelling which Heidegger proposes reflects closely the temporal structure of care laid out in *Being and Time*. As in *Being and Time*, objectified notions of existing in physical space are said to depend more primordially on always already being in a world of involvements:

To say that mortals *are* is to say that *in dwelling* they persist through spaces by virtue of their stay among things and locations. And only because mortals pervade, persist through spaces by virtue of their very nature are they able to go through spaces.⁵³⁹

It is only because we have already experienced a space which has become part of our background, that are we then able to unnoticingly project our background ahead in caringly pressing toward moving through space. Thus Heidegger is able to say of his own movement through space:

When I go toward the door of the lecture hall, I am already there, and I could not go to it at all if I were not such that I am there.⁵⁴⁰

The relationship between building and dwelling is reciprocal. To dwell is to already understand and to have always already projected that understanding ahead. Building puts in place caring possibilities which, when they are experienced and become part of understanding, are able to be already projected ahead. Thus the example in the preceding discussion demonstrates how already understanding the

⁵³⁸Heidegger, M. "Building, Dwelling, Thinking." In *Poetry, Language, Thought*, ed. J. Gray. 143-62. New York: Harper & Row, 1975.

⁵³⁹Heidegger, "Building, Dwelling, Thinking," *op. cit.*, p. 157.

⁵⁴⁰*Idem.*

flat floor of our house cares for our movement around the house. Heidegger's claim that '[w]e do not dwell because we have built, but we build and have built because we dwell' implies that it is only because we are the sort of being that is capable of projecting our understanding ahead that we are able to build.

In order that we be able to dwell — that we fulfil our possibility as beings that have already projected our understanding — it is evident that we must spend time experiencing our world and making it part of our understanding. Heidegger thus notes the etymology of those words which signify dwelling — *wuon*, *wunian*, *bauen*⁵⁴¹ — pointing out that they mean 'to remain, to stay in a place.'⁵⁴² On this basis, Heidegger is able to differentiate *genuine* building from the type of building which threatens dwelling. *Genuine* building is that which arrives from already understanding a particular world in which we have long remained (and to which we therefore be-long). The example Heidegger provides of genuine building is the vernacular farmhouse in the Black Forest, whose presence arises from the dwelling of many generations. It is a building which embodies an understanding of the local winds, the snows, the storms, as well as an understanding of those who have passed on yet still dwell there.⁵⁴³

In contrast to the type of building (verb) that preserves dwelling, Heidegger holds that the type of building which threatens dwelling arises in 'our precarious age'⁵⁴⁴ of technological modernity. The vernacular farmhouse, which may have been built and rebuilt over its long history, is likely to have changed little. On the other hand, the buildings that are exemplified by Heidegger as threatening dwelling are paradigmatic of design's continual struggle to overcome breakdown. In the context of this essay, the example provided of ingenuine building is an outcome of the

⁵⁴¹*Ibid.*, pp. 148-49.

⁵⁴²*Idem.*

⁵⁴³*Ibid.*, p. 160.

⁵⁴⁴*Ibid.*, p. 161.

attempt to overcome the breakdown of a housing shortage left by the war. Like the 'equipment' described in the *Origin of the Work of Art*, these houses succeed in transparently achieving their required functionality, but they mask a larger danger:

today's houses may even be well planned, easy to keep, attractively cheap, open to air, light, and sun, but — do the houses in themselves hold any guarantee that *dwelling* occurs in them?⁵⁴⁵

The role of design in contributing to the danger recognised by Heidegger is even more evident in the essay *What are Poets For?*⁵⁴⁶ In this essay Heidegger appears to come close to describing the circular structure which, it has been claimed in this Dissertation, maintains the unending cycle of design's striving to overcome breakdown. Two significant terms drawn from the work of the poet Rilke which are at play throughout the essay are 'the Open' and 'unshieldedness.'⁵⁴⁷ 'The Open' is the world. But it is never the world which is objectified and represented. It is the world in which we are unnoticingly in-volved, and is therefore similar to the world of *Being and Time* and *The Origin of the Work of Art*. As world, the Open is always already understood and therefore maintains us in care. 'Unshieldedness,' on the other hand, is interpreted here as that which is outside the limit of care. In terms of *The Origin of the Work of Art* it is the Earthy aspect which is *not* already understood.

In this essay, Heidegger provides what appears to be a description of the multifarious aspects of modern designing:

Where Nature is not satisfactory to man's representation, he reframes or redispenses it. Man produces new things where they are lacking to

⁵⁴⁵*Ibid.*, p. 146.

⁵⁴⁶Heidegger, M. "What Are Poets For?" In *Poetry, Language, Thought*, ed. J. Gray. New York: Harper & Row, 1975.

⁵⁴⁷For a critical discussion of Heidegger's interpretation of Rilke's poetry, see Haar, *The Song of the Earth*, *op. cit.*, pp. 120-38.

him. Man transposes things where they are in his way. Man interposes something between himself and things that distract him from his purpose. Man exposes things when he boosts them for sale and use. Man exposes when he sets forth his own achievement and plays up his own profession. By multifarious producing, the world is brought to stand and into position.⁵⁴⁸

By producing in this way it is argued that we are brought into unshieldedness,⁵⁴⁹ or, in terms of this Dissertation, to a situation of breakdown where the world (the Open) no longer provides care:

By building the world up technologically as an object, man deliberately and completely blocks his path, already obstructed, in the Open. Self-assertive man, whether or not he knows and wills it as an individual, is the functionary of technology.⁵⁵⁰

Placed in this situation, Heidegger claims that 'man' is driven to turn unshieldedness into the Open,⁵⁵¹ that is, to return the world from breakdown to care. While it may appear sensible to strive to turn a world which does not care into a world which does care, Heidegger argues that such striving is where the danger lies:

...this transmutation replaces the frailties of things⁵⁵² by the thought-contrived fabrications of calculated objects. These objects are produced

⁵⁴⁸Heidegger, "What Are Poets For?" *op. cit.*, p. 110.

⁵⁴⁹In his discussion of Heidegger's employment of Rilke's poetry, Haar describes the 'fall' from the Open to the unshieldedness: 'It is through his reflective and objectifying gaze that man extracts himself from the world and exposes himself.' Haar, *The Song of the Earth*, *op. cit.*, p. 122.

⁵⁵⁰Heidegger, "What Are Poets For?" *op. cit.*, p. 116.

⁵⁵¹*Ibid.*, pp. 122 ff.

⁵⁵²'Things' is used here in contrast to 'objects.' In the essay *The Thing*, Heidegger differentiates between the way in which things gather a rich world of involvements and the way in which objects are reduced to mere presence. Heidegger, M. "The Thing." In *Poetry, Language, Thought*, ed. J. Gray. New York: Harper & Row, 1975.

to be used up. The more quickly they are used up, the greater becomes the necessity to replace them even more quickly and more readily.⁵⁵³

Human beings seem unable to leave the unshielded as unshielded, but are driven to overturn breakdown and produce a caring world. The unlimitedness of this drive to overturn breakdown becomes the subject of Heidegger's essay *Poetically Man Dwells*.⁵⁵⁴ Following a familiar theme, Heidegger argues that in striving to produce ever new objects to meet the needs of dwelling, dwelling itself is jeopardised:

Things that are built in this sense include not only buildings but all the works made by man's hands and through his arrangements. Merits due to this building, however, can never fill out the nature of dwelling. On the contrary, they even deny dwelling its own nature when they are pursued and acquired purely for their own sake. For in that case these merits, precisely by their abundance, would everywhere constrain dwelling within the bounds of this kind of building.⁵⁵⁵

Heidegger speaks positively of poetry as a 'taking measure,' and contrasts this with modern technologized humanity's refusal to dwell within any measure. Heidegger's argument appears to be that everything which once marked the measure — the limits — of humanity's striving has been overthrown in technologized modernity. Where God once marked the limits of what was understood and what was possible, there are now no limits to what may be understood and what may be possible. The promise of technology leads us to understand that everything may one day be achievable. In such a context, God can have no meaning. By heeding no limit to our striving for care, the possibility of

⁵⁵³Heidegger, "What Are Poets For?" *op. cit.*, pp. 129-30.

⁵⁵⁴Heidegger, M. "...Poetically Man Dwells..." In *Poetry, Language, Thought*, ed. J. Gray. 211-229. New York: Harper & Row, 1975.

⁵⁵⁵*Ibid.*, p. 217.

dwelling within the limits of care — dwelling poetically — appears to recede:

For dwelling can be unpoetic only because it is in essence poetic. For a man to be blind, he must remain a being by nature endowed with sight. A piece of wood can never go blind. But when man goes blind, there always remains the question whether his blindness derives from some defect and loss or lies in an abundance and excess. In the same poem that meditates on the measure for all measuring, Hölderlin says (lines 75-76): "King Oedipus has perhaps one eye too many." Thus it might be that our unpoetic dwelling, its incapacity to take the measure, derives from a curious excess of frantic measuring and calculating.⁵⁵⁶

The constant striving to overturn breakdown in the modern technologized era inevitably results in a world which is constantly changing. The manifestation of this condition in architecture was recognized by Mies Van der Rohe who stated despairingly toward the end of his life that 'one cannot have a new architecture every Monday morning.'⁵⁵⁷ If a caring world is dependent upon there being an understanding of that world which is already projected ahead, then clearly a world that is in constant flux as a result of striving for care cannot be already understood and cannot therefore care. This paradox is beautifully articulated by Heidegger in *Building Dwelling Thinking* when he states that '[t]he real dwelling plight lies in this, that mortals ever search anew for the nature of dwelling, that they *must ever learn to dwell*.'⁵⁵⁸

The structure within which the 'plight of dwelling' arises, and the role of modern techno-rationality in this structure, is explored in Heidegger's essay *The Question*

⁵⁵⁶*Ibid.*, p. 228.

⁵⁵⁷Jencks, C. *The Architecture of the Jumping Universe*. London: Academy Editions, 1995, p. 145.

⁵⁵⁸Heidegger, "Building, Dwelling, Thinking," *op. cit.*, p. 161

Concerning Technology.⁵⁵⁹ In this essay, Heidegger argues that technology cannot be reduced to its manifestation as technological object, nor can it be reduced to mere means. Heidegger contends instead that technology is in essence a mode of revealing.⁵⁶⁰ In contrast to the mode of revealing in which Earth reveals itself — such as in the blooming of a flower — technology reveals by *bringing* something into being. In this sense, design is involved. And indeed the description Heidegger gives of the process in which something is brought into being (*techné*) is close to the description of the design process laid out in the previous Division:

*Techné... reveals whatever does not bring itself forth... Whoever builds a house or a ship or forges a sacrificial chalice reveals what is to be brought forth according to the perspectives of the four modes of occasioning. This revealing gathers together in advance the aspect and the matter of ship or house, with a view to the finished thing envisioned as completed, and from this gathering determines the manner of its construction.*⁵⁶¹

What is evident here is that revealing occurs in the *projection* of a thematized possibility ('revealing gathers together in advance') and is prior to any making. From the projection of the desired possibility follows the assembly of in-order-to's to facilitate this desired possibility ('and from this gathering determines the manner of its construction'). Heidegger emphasises the importance of the fact that revealing occurs in the projection of the thematized possibility:

Thus what is decisive in *techné* does not lie at all in making and manipulating nor in the using of means, but rather in the

⁵⁵⁹Heidegger, M. *The Question Concerning Technology and Other Essays*. Translated by W. Lovitt. New York: Harper & Row, 1977.

⁵⁶⁰For a critique of the notion of 'essence' in Heidegger's later writing, see Caputo, J. *Demythologizing Heidegger*. Bloomington: Indiana University Press, 1993.

⁵⁶¹Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 13.

aforementioned revealing. It is as revealing, and not as manufacturing, that *techné* is a bringing forth.⁵⁶²

Heidegger notes, however, that there is something significantly different about the nature of the revealing brought about by modern technology. He claims that 'the revealing that rules in modern technology is a challenging.'⁵⁶³ As part of the laying out of the design process in the preceding Division, it was argued that the possibilities disclosed in the design process are always taken *as* something in terms of the project that is being pressed toward. Or, in terms of the language of this Division, the Earth, or the Earthy possibilities of world, are interpreted *as* something for a project which is constitutive of a caring world. In being interpreted *as* something, the Earth is 'revealed' in a particular way. What Heidegger appears to be getting at by describing the revealing of modern technology as a 'challenging' is that in being revealed *as* something for a world, the Earth is being *forced to conform* somehow to what the world demands.

What the world demands Earth be revealed as, is described by Heidegger as 'standing-reserve.'⁵⁶⁴ That is, as a *resource* that stands ready and waiting to be taken and consumed (made transparent as equipmentality) in facilitating human projects. Thus coal is revealed only as an energy source — mined, stored and standing by for the worlds' projects. Architecture is revealed as a building resource to be bought and sold in order to satisfy changing user needs. A flower is revealed as a commodity to be sold in a market place of emotional exchange. Or again, a flower is revealed as a biological or genetic resource for the industries of medical or agricultural science. In this way the Earth is understood to be that which stands ready to be taken as possibilities, in-order-to's, to facilitate the projects of world.

⁵⁶²*Idem.*

⁵⁶³*Ibid.*, p. 14.

⁵⁶⁴*Ibid.*, p. 23.

Again, Heidegger's description of the modern technologized world, and the way in which things are disclosed for the modern technologized world, is reminiscent of the description of the work-world of the workshop in *Being and Time*. Just as everything in the workshop has already been set in place as a 'ready-to-hand in-order-to' in the projects of the workshop, so too the totality of involvements of techno-practices brought into being by design are there and available to facilitate the projects which constitute the world:

Everywhere everything is ordered to stand by, to be immediately at hand, indeed to stand there just so that it may be on call for a further ordering.⁵⁶⁵

This ordering is not, however, simply the product of human willing. Rather than conceiving that humans challenge the Earth in order to reveal it as a resource, Heidegger holds that it is '[o]nly to the extent that man for his part is already challenged to exploit the energies of nature can this ordering revealing happen.'⁵⁶⁶ Heidegger therefore recognises that human beings are themselves 'enframed' (*Ge-stell*) within a larger structure in which they are challenged to reveal the Earth as a resource. The larger structure within which humans are enframed is claimed to arrive as the 'essence' of modern technology:

The essence of modern technology starts man upon the way of that revealing through which the real [Earth⁵⁶⁷] everywhere, more or less distinctly, becomes standing-reserve.⁵⁶⁸

One possible interpretation of Heidegger's argument might again be found in the

⁵⁶⁵*Ibid.*, p. 17.

⁵⁶⁶*Ibid.*, p. 18.

⁵⁶⁷The 'real' refers to that which is prior to interpretation, and in this sense corresponds to Earth. For a discussion of the real in Heidegger's work, see Dreyfus, *Being-in-the-World*, *op. cit.*, pp. 248ff.

⁵⁶⁸Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 24.

metaphor of the work-world of the workshop. Once the world of the workshop has been brought into being, it becomes part of the background understanding of those who work in that world. In this way everything in the workshop is already understood to be present to facilitate the projects of the workshop, and the things in the workshop are therefore inevitably disclosed as resources for those projects. Thus the world of the workshop, its projects and technologies, have a determining role in the way those who use the workshop 'see' their world. They do not 'will' the tools in the workshop to be disclosed in a particular way, rather, the understanding which grounds the disclosure of the tools has already been put in place by the equipmental world of the workshop itself. In the same way the world in which we are thrown is already constituted by technologically mediated projects and practices. These become part of our background understanding, and in this way the world is inevitably revealed *as* something for those technologically mediated practices. As the world becomes more technologised, the technological way of revealing becomes more totalizing.

The 'work-shop' world in which we dwell is the product of design. The design process which brought this world into being and which continues to transform this world is therefore also enframed by this technological way of revealing. The background understanding that is appropriated in the design process has *already* been put in place by the technologically mediated world into which we are thrown. Available possibilities are taken 'as' something to overcome breakdown in existing technologically mediated projects, and in this way new technologically mediated projects are brought into being. Thus the small limb of a tree may be taken *as* something to facilitate the project of digging, or a pedestrian crossing may be taken *as* something to facilitate the project of safely crossing a road that has become dangerously busy. Confirming Heidegger's claim that the essence of technology is 'revealing', the Earth, or the Earthy aspects of the existing technologies of a world, can be seen to be revealed as a resource for our technologically mediated projects.

Significantly, however, when the Earth is taken into our techno-practices, it withdraws into transparency. As equipment, the limb and the pedestrian crossing withdraw into the background. Thus in the event that design reveals the Earth as a resource for our technologically mediated projects, the Earth itself is 'used up' in the functionality of that technologically mediated project.

While this account is satisfying on one level, it does not explain what was significant or different about the Western experience that it should be so enframed as to be set on a trajectory of ever more confident technological striving. After all, every human culture, every civilization, has brought into being and employed equipment to create and maintain their world of care. The significance of the word enframing — *Ge-stell* — and the play of etymological associations that accompanies it, may offer a pointer to the origin of the technologically enframed trajectory Heidegger recognizes. *Ge-stell* gathers the sense of numerous words which have their root in the verb *stellen*, meaning 'to place' or 'to set.' Among these are words such as *herstellen*, 'to produce,' *darstellen*, 'to present,' and *vorstellen*, 'to represent.'⁵⁶⁹ Heidegger argues repeatedly that enframing has to do with the way the Earth, the real (in other words, that which is prior to interpretation and prior to being brought into a world), is made 'present' as standing-reserve:

Where do we find ourselves brought to, if now we think one step further regarding what Enframing itself actually is? It is nothing technological, nothing on the order of a machine. It is the way in which the real reveals itself as standing reserve.⁵⁷⁰

At the end of this essay, Heidegger states that 'the outset of the destining of the West'⁵⁷¹ (a destiny which manifests as our technologized revealing of the Earth, the

⁵⁶⁹*Ibid.*, footnote 14 on p. 15.

⁵⁷⁰*Ibid.*, p. 23.

⁵⁷¹*Ibid.*, p. 34.

real) occurs in Greece. Heidegger is referring here to the shift, initiated in ancient Greece, away from a presocratic understanding of being and toward a rationalist understanding of being. For Heidegger it marks the moment where Earth, the real, is first conceived as having 'permanent presence.' Heidegger confirms this reading in another text, where he explains the movement from the ancient Greek presocratic understanding (which Heidegger appears to privilege)⁵⁷² to the rationalist understanding:

In the beginning of its history, being opens itself out as emerging [physis] and unconcealment [aletheia]... From there [physis] it [being] reaches the formulation of presence and permanence in the sense of enduring [ousia].⁵⁷³

In *The Question Concerning Technology*, I believe Heidegger is arguing that enframing, a notion which plays on the concepts of framing and presencing, is an outcome of conceiving of Earth as permanently present.⁵⁷⁴ It is only with the advent of this conception of Earth that the possibility arises for limitless technological striving. To explain why this might be so, it is necessary to return to the temporal structure of care and the struggle of Earth and world in the design process.

Dwelling and care are grounded in an understanding of the world that is always already projected ahead. Design struggles to bring Earth (as that which is not already understood) into an already understood world. When Earth is transformed into the regularities and predictability of a world, there exists the possibility of care. If Earth were to be conceived as that which *cannot* be brought fully into the clearing

⁵⁷²Zimmerman argues that Heidegger eventually abandons the view that one way of revealing may be superior to others. Zimmerman, *Contesting Earth's Future*, *op. cit.*, pp. 132-33.

⁵⁷³Heidegger cited in Okrent, *Heidegger's Pragmatism*, *op. cit.*, p. 230.

⁵⁷⁴*Ibid.*, pp. 226-236.

of understanding — as that which strives in and of itself and may transform unexpectedly or jut through into world as storms, floods, rogue animals, disease, famine, and the striving of other human worlds — then the caring worlds which arise from the struggle with Earth could only ever be understood as offering ephemeral care. Their care would be limited by the ever present possibility of the uncontrollable thrustings of Earth, a limit marked by the presence of God.

If, on the other hand, Earth is understood to be *already* constituted by properties and structures — whether as Aristotelian substance, Newtonian mechanical systems, sub-atomic molecular structures, genetic codings, and so on — then, while such structures might not at any given time be fully understood, this conception of Earth nevertheless holds open the enticing prospect that the structures are available to be discovered in the future. With such an understanding of Earth it would show up as sensible to strive to disclose these already present structures and utilize them to facilitate the building of a caring world. Every aspect of Earth not already fully disclosed — the secrets of the brain, the causes of little understood disease, the hidden patterns of the weather, the laws of the cosmos, the properties of materials, the psychological motivations for human behaviour — would therefore become potential sites for disclosive effort. With this conception of Earth as *already* constituted by permanently present properties and structures, *even before* the world attempts to disclose those properties and structures, Earth has in a sense *already been revealed* as no more than a resource which stands alongside the other resources already made present in the world. Thus Heidegger is able to argue that even before the historical advent of modern industrial technology, the essence of technology has already revealed the Earth, the real, as standing reserve.⁵⁷⁵

⁵⁷⁵'Chronologically speaking, modern physical science begins in the seventeenth century. In contrast, machine-power technology develops only in the second half of the eighteenth century. But modern technology, which for chronological reckoning is the later, is, from the point of view of the essence holding sway within it, the historically earlier.' Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 22.

In this account, the occlusion of Earth's absent and self-concealing dimension has allowed Western rationalism's misreading of the Earth as constituted by presence to be self-perpetuating. The history of Western science has evidenced the disclosure of Earth as ever new and different properties, structures and systems. The view presented in this Dissertation is that these disclosive events are an outcome of the struggle between world and Earth — worked out by design — in which each resultant new scientific techno-practice discloses Earth in a new way. Because of rationalism's commitment to the conception of Earth as permanently present, however, these often incommensurable disclosures of Earth by different techno-practices have been misinterpreted as progressively 'better' or 'more comprehensive' descriptions of the pre-existing structures of Earth.⁵⁷⁶ Even design itself, which it is argued is instrumental in the continual striving to disclose Earth in all domains, including science, has been misinterpreted by the rationalist attempt to explain everything in terms of presences. As demonstrated in the previous Division, rationalist formulations of design occlude the role of absence from the design process.

The Techno-rational Enframing of Contemporary Environmentalism

On the basis of the interpretation of Heidegger's work presented in this chapter, it is argued that conceiving of Earth as constituted by structures which are permanently present, initiated, and continues to maintain, the trajectory of our Western techno-rational way of being. Conceiving of Earth as permanently present, and therefore available for disclosure, holds open the prospect of unbounded care. By disclosing the enduring structures of Earth, these may be utilized in the building of a world of total predictability, total care, total control. *Because our epoch has already projected an understanding of Earth as permanently present*, in any event where Earth thrusts

⁵⁷⁶While Kuhn would not necessarily agree with the interpretation presented here, his work nevertheless provides a critical account of the struggle to read the paradigm shifts in scientific discovery as simple and progressive increases in scientific knowledge. Kuhn, *The Structure of Scientific Revolutions*, *op. cit.*

through and discloses breakdown — whether it be as H.I.V. Aids, congestion at a traffic light, or the thinning of the ozone layer — it is likely to show up as sensible to strive to disclose the underlying structures, reasons and causes, and utilize these structures in returning the world to care. In these examples it would therefore show up as sensible to seek to discover the pathology of the H.I.V. virus, driver behaviour patterns, or the chemistry of the process of ozone depletion, and employ this knowledge in the permanent overturning of the breakdown.

In this view, it might be expected that a culture which has *not* projected a conception of Earth as 'there and available' for disclosure, is unlikely to be set on a trajectory which strives to overcome breakdown by seeking to disclose the underlying structures of Earth. In the Indian tradition, the self-concealing aspect of Earth might correspond to the primordial chaos, the void, the ocean of all possibilities, from which cosmic order is created and is destroyed in an unending cycle.⁵⁷⁷ Clearly, the projection of this understanding of Earth and its relationship to the ephemeral order of the world (the cosmos) is unlikely to sustain a trajectory where breakdowns are sought to be overcome by the disclosure of the structure of the Earth, as Earth is not conceived of having a structure. This understanding would not, however, preclude such a culture employing an understanding of the self-disclosive aspects of Earth — the seasons, the winds, the heavenly bodies, the materiality of the environment, the flora and fauna — in the building of a caring, technologically mediated world (much in the way Heidegger implies that the caring world of the Blackforest farmhouse is brought into being)⁵⁷⁸.

From the perspective of Heidegger's laying out of the temporality of care, Western rationalism reveals itself to be a totalizing, anthropocentric enterprise. Even before

⁵⁷⁷See, for example, Snodgrass, *The Symbolism of the Stupa*, *op. cit.*, pp. 28ff.

⁵⁷⁸This also appears to be the basis of Heidegger's differentiation between his positive treatment of the use of the wind to power a windmill and his negative treatment of the use of fossil and atomic power sources. Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 14.

its disclosure, the structure which is assumed to constitute Earth is taken as a resource which is available to be made part of understanding, and thereby projected ahead in order to facilitate our care. In this way, Earth is assumed to stand ready at the service of the care of human worlds. Even the reactionary discourse of environmentalism cannot escape this enframing. 'Ecosystem' and 'ecology' mark the dwelling together of all things. However, techno-rationality has already assumed ecosystems to be constituted by a complex web of structures, interrelations and interdependencies. While these structures and interdependencies may not yet have been fully disclosed, they are nevertheless assumed to be present, and therefore stand ready at the service of the care of human worlds.⁵⁷⁹

In an article entitled *The Challenge of Ecology to the Design Professions*, Lamb describes the consistency with which design interventions 'fail to produce the correct response, or that the response is unexpected or unpredictable.'⁵⁸⁰ Drawing upon examples such as the Aswan High Dam, the Snowy Mountains and Colorado Diversion Schemes, and the Trans-Amazonian Highway, Lamb demonstrates a range of unexpected consequences, often arising 'in areas not related to the original intention or location of the scheme.'⁵⁸¹ The disclosure of unintended outcomes, which in this dissertation correspond to breakdown brought about by the thrusting of Earth, leads in turn to the initiation of further design interventions directed toward correcting the unintended outcomes. This manifestation of an unrelenting cycle of breakdown and design effort to overcome breakdown, is recognized as 'technofix.'⁵⁸²

Lamb argues that unintended outcomes could be avoided if the designer began with

⁵⁷⁹For example, the theme of the 1997 conference in Seattle of the peak American science association, the AAAS, was the 'ecological services' provided by nature.

⁵⁸⁰Lamb, "The Challenge of Ecology to the Design Professions", *op. cit.*, p. 16.

⁵⁸¹*Ibid.*, p. 19.

⁵⁸²For a discussion of the relation between technofix and 'need' see Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, pp. 39ff.

an 'ecological view of things.'⁵⁸³ That is, if the designer began with a knowledge of, and worked from the perspective of, the 'operation of [the] natural processes'⁵⁸⁴ in which the design is to intercede. While Lamb's paper makes a genuine attempt to move beyond anthropocentrism, even before it is made the move is already enframed by the anthropocentrism of techno-rationality. In his examples Lamb argues that the unintended consequences of the design interventions arose because 'the *real* nature of the environment was not assessed by the schemes' designers'⁵⁸⁵ or similarly that '[t]he technological solution... did not consider the *true* ecosystem into which it was to be physically placed [my italics]'.⁵⁸⁶ This argument can be seen to be premised on a conception of Earth as constituted by presences — in this case the 'real' and 'true' pre-existing ecological processes and systems. By disclosing the processes and systems which are assumed to *already* constitute the Earth, the possibility is held open that the consequences of interventions can be *predicted and controlled*. Thus even in the well-meaning domain of environmentalism, the hubris of conceiving the possibility of 'controlling the Earth' in order to facilitate the care of human worlds can be seen to arrive with an understanding of Earth as constituted by presence — an understanding that is always already unnoticingly projected ahead of our epoch.

On the basis of the interpretation of Heidegger's work presented here, Earth, prior to its disclosure in a world, is pure possibility and cannot be conceived in terms of pre-existing presences. Earth, as possibility, is only disclosed *as* something when taken into the projects of a world. The process by which Earth is taken into the projects of a world involves a struggle between Earth and world, a struggle 'worked out' by the process of design. In this view, the disclosure of Earth can only be in terms of the projects of the world, and must therefore always be finite. Because this

⁵⁸³Lamb, "The Challenge of Ecology to the Design Professions", *op. cit.*, pp. 21-22.

⁵⁸⁴*Ibid.*, p. 16.

⁵⁸⁵*Ibid.*, p. 18

⁵⁸⁶*Idem.*

understanding denies the possibility of there being any total, or final truth of the structures, properties, systems or processes that constitute Earth, it also denies the possibility that a complete understanding of Earth might allow designers to predict the breakdowns that may arise from design interventions.

As argued in the preceding Division, design does not involve the manipulation of presences but involves instead the articulation of a background of experience — the world — which is inevitably always finite. As possibilities are projected in assembling the nestings of in-order-to's that constitute a design project (a design intervention) background understanding may disclose potential breakdowns from the perspective of other projects. No matter how participatory the design process, the background understanding brought to bear in the design process will always be perspectival and finite, and will therefore leave open the inevitable possibility that, as Rodger points out, *every* design intervention will precipitate breakdown.⁵⁸⁷

It might however be argued that science has already disclosed many of the relations which would make it possible to predict the breakdowns that may be precipitated by a design intervention. It might for example be contended that the understanding of river ecology already available at the time of the design of the Aswan High Dam could have disclosed the potential ecological problems which eventuated. While it is agreed that the relations disclosed by science may transform background understanding and thereby allow potential breakdowns that might not otherwise show up to be brought to presence in the design process, it would still nevertheless be argued that science can only disclose Earth from the perspective of particular projects. In this view, scientific understanding, and therefore the understanding that science might bring to the design process, must inevitably be finite.⁵⁸⁸ Indeed, it

⁵⁸⁷Rodger, "Architecture for Sustainable Development," *op. cit.*, pp. 4-11.

⁵⁸⁸ Which is certainly not to say that it should not therefore be introduced into the design process. Indeed, the designer's background understanding will inevitably also be constituted by interpretations of assertions arising from the domain of science.

has been argued that the mode of disclosure of Earth by science involves the same struggle between world and Earth in which design has been shown to be instrumental: possibilities deliberately projected by techno-science bring into being new projects which disclose Earth in new ways.

Because the experiments (technologically mediated projects) of science do not always arrive *in advance* of the technologically mediated 'experiments' carried out by the designing of other domains, the understanding science allows is not always available to facilitate the disclosure of potential breakdowns *during* the design process. For example, the design projects of heavy industry began their 'experiments' with chemical discharges into the atmosphere at the outset of the industrial revolution and still continue those experiments today. These projects have precipitated breakdowns in which Earth has thrust through, disclosing itself as global warming, ozone depletion, acid rain, and so on. These new industrial projects, brought into being by design, have disclosed aspects of Earth that were, quite simply, not previously present. The science which has subsequently been disclosed to explain these thrustings of Earth was not part of background understanding at the time in which these problems were set on their way. Only by bootstrapping history could we now claim that these breakdowns were predictable.⁵⁸⁹

Conclusion

The confidence of our epoch arrives with the projection of the possibility of grounds, where the final ground for all posited reasons and causes is the conception of Earth as a permanent presence. It is assumed that knowledge of these grounds — of the structures that are conceived as inhering in Earth — can be employed in overturning breakdown and bringing into being caring worlds. What is occluded

⁵⁸⁹For a discussion of the significance of bootstrapping in the discipline of history, see Nickles, T. "Good Science as Bad History: From Order of Knowing to Order of Being." In *The Social Dimensions of Science*, ed. E. McMullin. 85-129. Notre Dame: University of Notre Dame Press, 1992.

from this understanding is that Earth, as possibility, is only made present *as* something for the projects of a world. In this view, new world building by the deliberative process of design can never be grounded in a 'knowledge' of the structures of Earth, but must always be the articulation of a background understanding of the world-Earth nexus disclosed by the world building of previous designing. That is, design must always be an articulation of a finite disclosure of Earth. Understanding Earth as permanent presence has led to the misreading of the events in which new world building by design precipitates unanticipated breakdown. In such situations it is assumed that the aspects of Earth which are disclosed by the intervention of new design projects were present *prior to the design interventions*, and therefore could have been employed to predict and thus prevent breakdown. On the grounds of this assumption, each advent of breakdown initiates even more intense striving to increase knowledge of the 'real' structures of Earth. The possibility that has already been projected ahead of our epoch occludes the understanding that Earth, prior to its disclosure in a world, is not constituted by presence, and therefore also conceals the futility of its own striving.

In this account, *design* can be seen to facilitate the unending cycle of striving to overcome breakdown. By bringing into being new worlds which care from the perspective one set of projects, design precipitates breakdown for other projects. When breakdown is disclosed, design is in turn employed in striving to overturn the breakdown and return the world to care. In this way, design both *initiates* breakdown, and offers itself to *overturn* breakdown. Because of the understanding of Earth that is projected ahead of our epoch, the groundlessness of this striving is occluded and our struggle to install worlds of care therefore recognizes no limit, no 'measure.' As Heidegger's explication of the temporal structure of care reveals, only when we are able to *be-long* in a world, and that world is able to become part of a background understanding that is already projected ahead, are we then able to dwell. Design's participation in the constant striving to overturn breakdown and

install caring worlds results in a world which is continually changing, a world in which care is no longer possible, a world in which 'mortals ever search anew for the nature of dwelling, that they *must ever learn to dwell*.'⁵⁹⁰

⁵⁹⁰Heidegger, "Building, Dwelling, Thinking," *op. cit.*, p. 161.

CHAPTER 9

CONCLUSION: LETTING BE

The argument traced in this Dissertation, while building upon the work of the early and later Heidegger, often takes Heidegger's work far from its original domain. The argument therefore opens itself to criticism on at least two grounds. It may be criticised on the grounds of the credibility of Heidegger's original work. And it may be criticised on the grounds of the credibility of this Dissertation's interpretation of Heidegger's work.

If some credence is to be given to the interpretation of the Heideggerian account presented to date, then the question that must be addressed is whether there is any possibility of breaking free of its nihilistic conclusion. This concluding chapter ponders the possibility of escaping the enframing of techno-rationality in which design's participation in the unrelenting striving to bring into being caring worlds threatens the very possibility of care.

Letting Be

The work of the later Heidegger provides numerous indications of ways of being that might not be enframed by techno-rationality. In the essays discussed in the previous chapter, Heidegger speaks favourably of art as a way of creating in which the materiality, the Earthiness, of the product is not 'used up' in its functionality. He also speaks of a way of building which arises from dwelling — from a long association with a place which allows an understanding of that place to be projected ahead of building. And he speaks of poetry as the metaphor for dwelling within limits — leaving the unshieldedness as unshieldedness, not striving to continually overturn breakdown and install worlds of care. The question is, therefore, how these alternative ways of being might come to be — how we might be released from the technological way of revealing that enframes us so that we are able to

dwell without striving constantly to employ technology to overturn breakdown.

Although Heidegger argues that the 'essence' of technology — the technological revealing of the Earth as a resource — is at the heart of our inability to dwell, he is not, as might be assumed, advocating the rejection of technology:

For all of us, the arrangements, devices, and machinery of technology are to a greater or lesser extent indispensable. It would be foolish to attack technology blindly. It would be short-sighted to condemn it as the work of the devil. We depend on technical devices; they even challenge us to ever greater advances.⁵⁹¹

But somehow, Heidegger asserts, the technological way of revealing overtakes us and 'suddenly and unaware we find ourselves so firmly shackled to these technological devices that we fall into bondage to them.'⁵⁹²

In the same passage, Heidegger argues that a state of being may be possible in which we are free from this 'technological imperative':

Still we can act otherwise. We can use technological devices, and yet with proper use also keep ourselves so free of them that we may let go of them any time. We can use technical devices as they ought to be used, and also let them alone as something which does not affect our inner and real core. We can affirm the unavoidable use of technical devices, and also deny them the right to dominate us, and so to warp, confuse, and lay waste to our nature.⁵⁹³

⁵⁹¹ Heidegger, M. *Discourse on Thinking*. Translated by J. Anderson and E. Freund. New York: Harper and Row, 1966, p. 53.

⁵⁹² *Ibid.*, pp. 53-54.

⁵⁹³ Heidegger, *Discourse on Thinking*, *op. cit.*, p. 54.

Continuing his description, Heidegger alludes to how this state of being might come about:

Our relation to technology will become wonderfully simple and relaxed. We let technical devices enter our daily life, and at the same time leave them outside, that is, let them alone, as things which are nothing absolute but remain dependent on something higher. I would call this comportment toward technology which expresses "yes" and at the same time "no," by an old word, *releasement toward things*.⁵⁹⁴

By gaining 'releasement toward things' (*Die Gelassenheit zu Dingen* — also commonly translated as 'letting things be') we are able to come into a free relation with technology. The notion of 'letting be,' adopted as a catchcry by the Deep Ecology movement,⁵⁹⁵ has been interpreted by commentators in a number of different ways. Zimmerman claims that 'letting be' has at least three aspects:

First, it means not unduly interfering with things. Second, it means taking care of things, in the sense of making it possible to fulfil their potential. Third, letting be involves not just the ontical work of tending to things, but also the *ontological* work of keeping open the clearing through which things can appear. This disclosive sense of letting be lies beyond the distinction between activity and passivity, if activity means imposing one's will, and if passivity means standing around.⁵⁹⁶

The first aspect appears straight forward, though Zimmerman does not expand on what 'things' are being referred to and in what sense these things should not be

⁵⁹⁴*Idem.*

⁵⁹⁵Zimmerman, *Contesting Earth's Future*, *op. cit.*, p. 277.

⁵⁹⁶Zimmerman, *Contesting Earth's Future*, *op. cit.*, p. 132.

interfered with.

The second aspect may, however, appear somewhat problematic, especially in the light of the discussion of Earth in the preceding chapter. Zimmerman clarifies this aspect of letting be in a later discussion of the leading social ecologist, Murray Bookchin. Referring to Bookchin's valorization of preliterate societies, Zimmerman outlines Bookchin's contention that:

Preliterate societies established complementary and mutual relations with nature, for they saw that their own good lay in promoting nature's thrust toward diversity. Unlike modern societies, which regard nature as a resource to be objectified and appropriated by human labor, preliterate peoples had kinship relations with nature. Bookchin calls for reestablishing kinship relations, though at a more advanced, self-conscious level of social development. To replace the "tyranny" of subject over object, he envisions the "synchronicity" of craftsperson and material. Suggesting that authentic "producing" involves drawing out the potential in the material at hand, he shares one sense of Heidegger's notion of "letting things be."⁵⁹⁷

As discussed in the previous chapter, Heidegger holds that materiality, Earthiness, has its own potential, and strives in its own way. In the Heideggerian account, however, we do not encounter Earth's potentiality *except* as part of our world. That is to say, Earth's potentiality is not determined in advance of its encounter with world. As possibility, Earth is able to be taken in *many* ways by the many practices of many worlds. The problem which is therefore evident in the claim that 'authentic "producing" involves drawing out the potential in the material at hand' is that it might be interpreted as assuming that Earth has a 'correct' potential. Beside the

⁵⁹⁷*Ibid.*, p. 159.

question of how we might come to know the proper potential of Earth, such an interpretation tends toward the rationalist assumption of Earth as a pre-existing presence.

If 'letting be' is to be allowed the meaning of an 'authentic producing' that draws out the potential of the material, then it requires an interpretation which does not depend on the notion that Earth has a privileged or predetermined potentiality. It is argued in the preceding chapter that, while Earth itself cannot be held to have limits, when Earth is taken into a world the resultant Earth-world nexus can be seen to care only within limits. The limits within which Earth cares varies depending upon the particular technologically mediated practice within which Earth is disclosed. Thus the practice of walking barefoot will care only within certain terrain limits, while the practice of walking with shoes will care within different terrain limits. In this view, rather than an essentialist determination of the potentiality of Earth which is somehow prior to any encounter with world, the potentiality of Earth is instead interpreted as the limits of Earth's care as it is disclosed in a particular Earth-world nexus.

The claim that 'letting be' is an authentic mode of producing that draws out the potentiality of the Earth — where that potentiality is disclosed as the limits of care of an Earth-world nexus — might be seen to find support in a number of essays by the later Heidegger. As argued in the previous chapter, Heidegger differentiates between modes of producing which heed their limit ('measure'⁵⁹⁸) and modes of producing which strive to overturn every limit that is disclosed. In terms of Bookchin's notion of a craftsperson 'drawing out the potentiality of the material,' this might for example imply that someone working with hand chisels to carve out timber would work within the limits of timber disclosed by those tools. If their technologically mediated practices disclosed difficult sections of tight grain or knots,

⁵⁹⁸Heidegger, " '...Poetically Man Dwells...'," *op. cit.*, pp. 220ff.

they would work 'with' these disclosed features rather than striving to overturn these limits by, say, seeking (to develop) a power tool which obliterates the limit.

Developing modes of authentic ways of being which 'let be' would therefore require a struggle between Earth and world in which the limits disclosed by world are recognized and heeded. Such a world would not strive to overturn every limit, every breakdown, as it is disclosed, but would draw back from disclosed limits and reorganize itself in respect of the limits. Heidegger's example of the farmhouse in the Black Forest — which we imagine to be the result of a long struggle between the practices of many generations of farmers and the Earthiness of the Black Forest disclosed by those practices — is perhaps meant as a lesson in such a way of being.

In terms of the more recent discourse of 'sustainability',⁵⁹⁹ developing sustainable ways of being might also be seen in terms of a long struggle between world and Earth. The sustainable forestry practices of indigenous forest dwellers might, for example, be read as a long struggle in which the world of a people has continually adjusted itself to fit within the limits of Earth disclosed by its own practices.⁶⁰⁰ In this view, the Earth (disclosed as the particularities of the forest, its speed of regrowth, its interdependence on other species, etc.) can be seen to care for the projects of a world only within limits disclosed by its technologically mediated logging practices. Over the duration of the struggle, adjustments in logging practices may disclose the limits of those practices: if too few logs are taken, this may disclose a breakdown for the world of projects which have become dependent on the log supply; if too many logs are taken, this may disclose itself as damage to

⁵⁹⁹As discussed in Division I of this dissertation, there is now a voluminous body of work on the subject of Ecologically Sustainable Development (ESD). See, for example, the seminal text World Commission on Environment and Development. *Our Common Future*. Oxford: Oxford University Press, 1987; also see Commonwealth of Australia, *Draft National Strategy for Ecologically Sustainable Development*, *op. cit.* Fry offers a reconceptualization of ESD with the concept of DES (Developing Ecological Sustainment). See Fry, *Remakings: Ecology Design Philosophy*, *op. cit.*, pp. 26-38.

⁶⁰⁰A study of the forest dwellers of Shanu in China has estimated that it might take at least three to four hundred years for an indigenous group to 'learn' sustainable forestry management practices. See Chandler, P. "Ecological Knowledge in a Traditional Agroforest Management System among Peasants in China." Unpublished Ph. D. thesis, University of Washington, 1990.

the forest such that it is unable to supply the required number of logs, again disclosing breakdown for the world of projects which is dependent upon the log supply. In the event of breakdown, the world may either 'draw back' and adjust its projects to fit within the limits of Earth disclosed by the logging practices, or the world may strive to overcome the disclosed limits of Earth by transforming the logging practices (perhaps by taking less mature trees, moving into a new areas of forest, or by engineering the productivity of the forest). From the Heideggerian perspective, these two courses might be claimed to mark the divergence between the mode of producing which 'lets be,' and the mode of producing enframed by the technological revealing of Earth.

Returning to the three aspects of 'letting be,' the third aspect is said by Zimmerman to involve 'not just the ontical work of tending to things, but also the *ontological* work of keeping open the clearing through which things can appear.'⁶⁰¹ In accordance with the interpretation presented in this Dissertation, 'the clearing' is the already projected world of projects and practices in which things reveal themselves. Keeping open the clearing might therefore be interpreted as maintaining our worlds of projects and practices. Clearly, however, Heidegger's rhetoric must imply more than this. Our modern technological way of being is also a clearing in which things are revealed, but it is this very mode of revealing, this clearing, which is the source of Heidegger's consternation. This point troubles Zimmerman, who sees an inconsistency in Heidegger's negative evaluation the technological mode of revealing and his claim that there are no privileged modes of revealing:

...how could his [Heidegger's] yearning for an ontologically richer, posttechnological world be squared with his contention that there are no privileged epochs? Is not the technological age simply *one* way of disclosing things, and the fourfold another? If the "law of the earth"

⁶⁰¹Zimmerman, *Contesting Earth's Future*, *op. cit.*, p. 132.

conceals itself, how can we know whether our world fails to conform with it? Further, if *physis* appropriates Dasein as the site through which to gather and disclose itself, is not technological modernity, too, consistent with *physis*? Heidegger could read modernity as the most constricted mode of disclosure only by viewing Western history as decline and fall from a nobler origin. Eventually abandoning this view, he could say only that technological modernity excluded the ancient Greek disclosure of being, but ancient Greece excluded the technological disclosure. I would add that ancient Greece also excluded modernity's egalitarian commitments.⁶⁰²

While Heidegger may have conceded that there are no privileged modes of revealing, there is no doubt that he saw modern technological revealing as problematic (although he may also have agreed with Zimmerman that the ancient Greek mode of revealing was not without problems). The overwhelming problem of the modern technological mode of revealing is that in this mode, being itself is concealed. The very world of involvements of projects and practices which opens the clearing in which things presence tends to withdraw into the mere functionality of equipment. In the essay, *The Thing*, the later Heidegger uses the example of a jug to draw out the difference between 'objects' revealed by techno-rationality and 'things' which gather the world of involvements to which they belong. Borgmann follows Heidegger in taking up an aspect of this difference in his own differentiation of a 'device' from a 'focal thing.' Whereas a device, such as an air-conditioner, is no more than an unnoticed in-order-to gain warmth, a focal thing, such as a hearth, is a hard-won gathering of the world of practices of those who relax round the hearth:

A stove used to furnish more than mere warmth. It was a *focus*, a hearth, a place that gathered the work and leisure of a family and gave

⁶⁰²*Ibid.*, 132-33.

the house a centre. Its coldness marked the morning, the spreading of its warmth the beginning of the day. It assigned to the different family members tasks that defined their place in the household. The mother built the fire, the children kept the firebox filled, and the father cut the firewood. It provided for the entire family a regular and bodily engagement with the rhythm of the seasons that was woven together of the threat of cold and the solace of warmth.⁶⁰³

Borgmann shares with Heidegger an appreciation of the value of leaving some breakdowns in place and not striving to make them transparent. The father's toil in chopping the wood and the mother's labour in making the fire become positive, almost ritualistic experiences. For Heidegger, however, it is not the character of the thing which determines whether it gathers a world or whether it disappears into functionality. Heidegger's examples of 'things' that have the potential to gather a world, which include a mirror, a bridge and a plough, would indicate that an air-conditioner might equally gather a world. Rather than the nature of a thing determining how it is disclosed, for Heidegger it is the technological enframing of our epoch that flattens most things into mere objects. For techno-rational modernity the presence of the jug, for example, might be held to be grounded in the 'permanently present' sub-atomic structure of which it is constituted. Such a disclosure conceals the groundless ground of the *already projected world of involvements* which allows the jug to come to presence as a jug.

But the claim that the technological revealing of modernity occludes other ways of revealing also concerns Zimmerman. According to Zimmerman, the very possibility of Heidegger's stance in relation to technology is itself a refutation of Heidegger's stance:

⁶⁰³Borgmann, A. *Technology and the Character of Contemporary Life*. Chicago: University of Chicago Press, 1984, pp. 41-42.

Regarding Heidegger's negative evaluation of the allegedly all-embracing era of technological modernity, one may ask the following. Since Heidegger himself was born into and thus shaped by modernity's understanding of being, how could he conclude that the technological disclosure of things is constricted or inconsistent with the possibilities of things?⁶⁰⁴

In Zimmerman's view, Heidegger does not allow for the possibility that different modes of revealing may exist side by side:

Given Heidegger's claim that each epoch is governed by a principal mode of disclosure, he was not able to say that a world could be ontologically double-coded: technological, on the one hand, and fourfold-like, on the other. Problems like this make it difficult to read Heidegger as a forerunner of deep ecology.⁶⁰⁵

Zimmerman's view seems to be at odds with the evidence of Heidegger's later work. For Heidegger, the one-dimensional technological mode of revealing appears as a danger *toward which* we are heading, not a danger that has already entirely overtaken us. The conclusion to Heidegger's essay, *The Thing*, which states that 'things are also compliant and modest in number, compared with the countless objects everywhere of equal value...'⁶⁰⁶ would indicate that while technological rationalism is now the dominant mode of revealing, modest numbers of 'things' are still able to gather their worlds. Indeed, many of the central themes of Heidegger's later essays — art, poetry, alternative ways of dwelling and building, meditative thinking — can be read as attempts to disclose the marginal practices that resist

⁶⁰⁴Zimmerman, *Contesting Earth's Future*, *op. cit.*, p. 132.

⁶⁰⁵*Ibid.*, p. 133.

⁶⁰⁶Heidegger, "The Thing," *op. cit.*, p. 182.

technological enframing.

Dreyfus agrees that the Heideggerian perspective allows for the possibility of marginal ways of being existing alongside the dominant technological way of being. Indeed, Dreyfus claims that it is through the nurturing of these marginal ways of being that Heidegger sees hope for overcoming technological nihilism:

Heidegger holds that we must learn to appreciate marginal practices — what Heidegger calls the saving power of insignificant things — practices such as friendship, backpacking in the wilderness, and drinking the local wine with friends. All these practices remain marginal precisely because they resist efficiency. These practices can, of course, also be engaged in for the sake of health and greater efficiency. Indeed, the greatest danger is that even the marginal practices will be mobilized as resources. That is why we must protect these endangered practices.⁶⁰⁷

Dreyfus ponders the gestalt shift that would be required to bring such marginal practices together into a new cultural paradigm — a cultural paradigm in which the marginal practices themselves become the dominant practices. He points to an example of a new cultural paradigm that almost came into being in the 'flower power' movement of the sixties:

This new understanding almost coalesced into a cultural paradigm in the Woodstock music festival of 1969, where people actually lived for a few days in an understanding of being in which mainline contemporary concerns with order, sobriety, willful activity, and flexible, efficient

⁶⁰⁷Dreyfus, H. "Heidegger on the Connection Between Nihilism, Art, Technology and Politics." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. Cambridge: Cambridge University Press, 1993, p. 310.

control were made marginal and subservient to certain pagan practices, such as enjoyment of nature, dancing, and Dionysian ecstasy, along with neglected Christian concerns with peace, tolerance, and nonexclusive love of one's neighbour.⁶⁰⁸

Although not discussed by Dreyfus, one thread of this new cultural paradigm which is of significance to this Dissertation was the movement to redesign a way of being with a new orientation toward technology and the environment. Manifestations of this movement included the 'small is beautiful' approach,⁶⁰⁹ the push for 'appropriate' technologies,⁶¹⁰ and, in architecture, the appearance of a spate of projects modelled on the 'autonomous house.'⁶¹¹ What these approaches shared was a recognition that modern technology was becoming increasingly interdependent and increasingly beyond the control of any individual. Technological interdependence was evidenced in the globalizing of production, where raw materials might be sourced in one part of the world, manufactured in another, and marketed in yet another. Authors such as Marcuse,⁶¹² Ellul,⁶¹³ Ortega⁶¹⁴ and Winner⁶¹⁵ recognized a darker side of the increasing complexity and interdependence of technology. Rather than being a neutral tool, technology was instead seen as part of a complex interdependent system which was neither fully understandable nor fully controllable. In this view, which in many ways echoes

⁶⁰⁸*Ibid.*, p. 311.

⁶⁰⁹Schumacher, E. F. *Small is Beautiful: Economics as if People Mattered*. New York: Harper and Row, 1973. For a general discussion of the theorization of technology in response to recent global problems, including environmental problems, see Ihde, D. *Philosophy of Technology: An Introduction*. New York: Paragon House, 1993, p. 87-110.

⁶¹⁰Ihde, *Philosophy of Technology*, *op. cit.* p. 90.

⁶¹¹Vale, B. "Autonomous House." University of Cambridge, Department of Architecture Technical Research Division, 1972; later published as Vale, B. and R. *The Autonomous House*. London: Thames and Hudson, 1975; and "The Autonomous House," Film Archive held in the Audio-visual Library, Faculty of Architecture, University of Sydney, 1974.

⁶¹²Marcuse, H. *One Dimensional Man*. Boston: Beacon Books, 1968.

⁶¹³Ellul, J. *The Technological Society*. New York: Alfred A. Knopf, 1964.

⁶¹⁴Ortega y Gasset, J. "Man the technician." In *Toward a Philosophy of History*, 87-161. New York: W. W. Norton, 1941.

⁶¹⁵Winner, L. *Autonomous Technology*. Cambridge Massachusetts: MIT Press, 1977; and Winner, L. *The Whale and the Reactor*. Chicago: University of Chicago Press, 1986.

Heidegger's, the interdependent technologies of modernity were tending toward becoming an autonomous cybernetic system in which humans were no more than replaceable parts and the environment no more than a resource.

As a response to this view, there was a movement toward the design of built environments employing 'friendly,' small scale, self-contained technologies which were understandable (and therefore considered controllable) and which had a reduced impact upon the environment.⁶¹⁶ Paradigmatic of this approach was the 'autonomous house.' The endpoint of the trajectory of such autonomous building projects is a totally self-contained environment, where everything needed is produced within the environment, and all waste is disposed of within the environment.

Although the trajectory remains unrealized, the practices to which it has given rise are of interest in respect of the Heideggerian critique of techno-rational enframing. Film interviews conducted at the time of the student occupation of the autonomous house project at the University of Sydney indicate that perhaps, for the short time that the somewhat ramshackle building was in use,⁶¹⁷ the various small scale technologies that were employed showed up more in the way of Heidegger's 'things' than 'objects.' In the context of such an 'autonomous' environment, a technology such as water tank, for example, has the potential to become a 'focal thing' rather than a mere 'device.' Because a tank is the only source of water, and because of its dependence on the vagaries of the weather, each time a tap is used there is a gathering of the understanding of where the water is coming from, how the scarce rain fills the tank, how the water level in the tank drops with each use. Prolonged use of water — in a shower for example — is likely to bring this understanding to presence and therefore result in more careful use of the water.

⁶¹⁶These technologies were also integral to the push for micro-development in the 'third world.' Ihde, *Philosophy of Technology*, *op. cit.* p. 90.

⁶¹⁷"The Autonomous House," Film Archive, *op. cit.*

Thus, as a 'thing' that gathers a world of involvements, the water tank 'spares' the water. By contrast the 'unlimited' water supply offered by the automated and remote controlled systems of water delivery to city houses may withdraw into the transparency of functionality. The water is simply ready-to-hand, 'there and available' for use. Its source, its method of collection, its journey to the house, and its consumption, remain largely unnoticed.

While some of the technologies employed by the appropriate technology movement have been drawn into the dominant cultural paradigm,⁶¹⁸ the alternative ways of living which arose from this movement remain, in Dreyfus terms, marginal practices. This raises a significant question. If, as Dreyfus holds, marginal practices offer the possibility of overturning technological enframing, why are they so resistant to adoption? Why is it so difficult for an individual or a group to step outside the striving of techno-rationality and bring into being alternative ways of being that are not enframed? While the rhetoric which calls for the nurturing of marginal practices sounds admirable, I believe Heidegger's own laying out of the structure of care, and its implications for the striving in which design participates, offers a compelling account of the forces that mitigate against stepping outside the dominant paradigm.

Care and Devaluing

As argued in Division II, the interdependent nestings of the projects and practices of a world *care* for those who participate in those projects and practices. For a technologically mediated practice to care, it must be an in-order-to in the larger nesting of projects that constitutes a world. Obversely, to be cared for by a world, we must already understand that world and be able to project our understanding ahead of our involvements in that world. In an event of breakdown, and as part of

⁶¹⁸A typical range of 'alternative' technologies which are now commercially available can be found in Pedals, P. *Energy From Nature: A Complete Guide to Independent Energy Systems*. Nimbin: Rainbow Power Company Pty. Ltd., 1990.

the striving of technological modernity, design may bring into being a new technologically mediated practice which overcomes the breakdown and transforms the limit of care. This new technologically mediated practice may in turn disclose possibilities for other projects and therefore instigate yet further designing. In this way the new technologically mediated practice *gathers* a new world of projects and practices.⁶¹⁹ With this new world in place, projecting an understanding which is grounded in the old world can no longer care, as the understanding is no longer confirmed by the new world into which it is projected.

The imperative to remain within the care of a changing world is evident in every context in which new technologically mediated practices are brought into being by design. It might be imagined that the introduction of the technology of shoes, for example, may have gathered a whole new world of projects and practices. Shoes would perhaps have allowed walking and hunting on new types of terrain. Because shoes mean that feet do not require as much thematic attention, greater attention could be given to the immediate environment, in turn resulting in greater efficiency in hunting or warfare and easier escape in events of danger. Shoes may therefore have gathered a new world of practices in which hunting activities ranged across previously inaccessible terrain, or where the greater efficiencies led to shorter hunting forays and greater time for other activities. Because those not adopting the new technologically mediated practices would be unable to participate in the changed hunting, warring and social practices and would therefore be uncared for by the technologically mediated practices which now constitute that world, their very survival might be placed at risk.

⁶¹⁹The process by which technologies gather worlds is described by Boyden as the *principle of technoaddiction*: 'In human history it has frequently been the case that, when new techniques have been introduced into a society, they have not been really necessary for the satisfaction of the survival and health needs of the population. Sometimes they have been introduced simply for curiosity, and sometimes because, in one way or another, they have benefitted a particular individual or group within the society. With the passing of time, however, societies reorganise themselves around the new techniques and their populations gradually become more and more dependent on them for the satisfaction of basic needs. Eventually a state of complete dependence is reached.' Boyden, *Biohistory: The Interplay Between Human Society and the Biosphere*, *op. cit.*, p. 173.

In the same way, design interventions such as a dam and irrigation system might gather around them a new world of projects and practices. The dam and irrigation system may allow intensive all-season farming and greater productivity. Greater productivity may result in a world in which produce prices are reduced without affecting farmers' incomes. Greater productivity might also allow greater numbers of people to be supported by the same land area. In this scenario, the technologically mediated practices of those not adopting the new technologies would be tangibly devalued. While their volumes of produce remain unchanged, the new world of involvements returns lower prices per unit of produce. As population pressure grows and as relative wealth levels between those who adopt the new technologies and those who do not shifts, those dwelling in the older land-technology nexus are made vulnerable to take over by those striving to realize the land's new potential — a potential brought into being by the new technologies.

All technologies brought into being by design's striving to overcome breakdown, whether these technologies be mobile phones, high-speed photocopiers, or pop-up toasters, reveal new possibilities which gather new worlds of technologically mediated projects. In this way our caring world of interdependent projects and practices is incrementally transformed. Any attempt to step outside the current interdependent world of involvements, either by not adopting new caring technologies or by adopting technologically mediated practices which do not contribute as in-order-to's in the larger world of involvements, opens itself to be devalued. The devaluing may occur at the level of a husband/wife/partner who resists adopting 'time saving' devices, such as toasters, and thereby find themselves with insufficient time to work to earn a second income — itself a possibility opened by the world gathered around the new 'time saving' technologies. Or the devaluing may occur at the level of a nation which does not adopt current military technology and therefore leaves its resources vulnerable to forceful takeover by nations who do

participate in the striving for ever new, caring, military technologies.

As discussed, the already projected understanding of our world of involvements has been described by the tradition as 'expectations.' In terms of this account of the significance of the care offered by the world, desiring that expectations be met by the world cannot be viewed merely as an indulgence. Rather, it is a recognition that a world in which our projected understandings are not confirmed — where expectations are not met — is a world that does not care. The experience of the 'autonomous house' at the University of Sydney showed that expectations which were established in the larger world were often not able to be met by the 'autonomous' world of practices and projects. Expectations of hot, strong showers established in the larger world devalued the unreliable luke warm shower of the autonomous house. Expectations of having time to study and attend lectures devalued the time intensive tasks of growing and preparing food. Students living at the autonomous house finally reported that they were showering and eating at an adjacent, modern student facility.⁶²⁰

In late industrial modernity it would seem impossible to conceive of an alternative way of being that could readily sever itself from the striving of contemporary technological practices without being devalued by expectations created in the technologised world from which it attempts to free itself. The possibilities of modern painless dentistry or high technology medicine, which are the outcome of vast ongoing world-wide relations of involvements, are unlikely to be deliberately foregone for the sake of participating in an alternative way of being which could not meet those expectations. In this view, radically marginal ways of being are likely to be devalued by the expectations of the dominant world and may themselves become parasitic on that world. The autonomous house experiment, for example, drew upon the waste stream of the larger world in its construction and employed

⁶²⁰"The Autonomous House," Film Archive, *op. cit.*

the services of the larger world while in use, but its involvements did not contribute to the care of that larger world.

On the other hand, 'successful' environmentally oriented products of design appear to be those which are not only in some way environmentally considerate, but *also* meet the expectations created by the larger world of involvements. Thus we see the emergence of large and well appointed architect designed 'green' houses,⁶²¹ or environmentally friendly consumer products such as 'green' automatic dishwashing detergent, which, as well as having some environmental features, meet the expectations created by the current world of technological involvements. The problem is, of course, that by meeting the continually changing expectations of the larger world of involvements these design outcomes are inadvertently shackled to a world that continues to strive out of care to bring into being new worlds of technologies and practices. They are no longer, in Dreyfus' sense, 'marginal practices.'

This account discloses a double bind. If alternative techno-practices — such as the outcomes of ecologically thoughtful designing — participate as in-order-to's in the projects of the dominant world of involvements, then they remain tied to the striving which is at the heart of the environmental crisis. If, on the other hand, these alternative techno-practices attempt to sever themselves from the dominant world of involvements, then they are devalued by the continually changing expectations that are created by the dominant world and may therefore become parasitic on that world. Enframement by the striving of techno-rationality therefore appears total.

Releaselement

On the basis of this account, any attempt to achieve incremental change *from within*

⁶²¹See for example the work of the Australian architects Gareth Cole, Baverstock and Associates, and Fulton, Gilmore, Trotter, Moss. Hollo, N. *Warm House Cool House: Inspirational Designs for Low-energy Housing*. Sydney: A Choice Book, 1995.

the interdependent involvements of our modern technologically mediated projects remains bound to the striving of techno-rationality, while any attempt to *unilaterally step outside* the interdependent involvements of our modern technologically mediated projects — whether by an individual, group, or nation — is likely to be tangibly devalued by the structure of care within which we dwell. It is, I believe, for this reason that Heidegger does not speak of the possibility of a slow or incremental transformation to our technologically enframed way of being, but instead speaks somewhat dramatically of a shift of epochal proportions in which ‘the turning of the danger comes to pass suddenly.’⁶²² It is for this reason also that the transformation Heidegger speaks of is not, at first, a transformation of our technologies, but rather *a transformation of our understanding*. As Dreyfus points out:

Heidegger’s concern is the human *distress* caused by the *technological understanding of being*, rather than the *destruction* caused by *specific technologies*. Consequently, he distinguishes the current problems caused by technology — ecological destruction, nuclear danger, consumerism, and so on — from the devastation that would result should technology solve all our problems:

‘What threatens man in his very nature is... that man, by the peaceful release, transformation, storage, and channeling of the energies of physical nature, could render the human condition... tolerable for everybody and happy in all respects.’⁶²³

On Heidegger’s account, we are only able to come into a new ‘understanding of being’ if we are granted releasement (*Gelassenheit*) from our current technologically enframed understanding. The interpretation of the work of the later Heidegger provided in the previous chapter would indicate that the understanding of being

⁶²²Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 44.

⁶²³Dreyfus, “Heidegger on the Connection Between Nihilism, Art, Technology and Politics,” *op. cit.*, p. 305.

that enframes our epoch, and the understanding from which we therefore need to be granted releasement, is the conception of Earth, the real, as permanent presence. It is this conception which allows the assumption that the being of beings has a permanent ground, and that this ground is therefore discoverable. As argued, this understanding of Earth as permanent presence has led to the misreading of the events in which new world building by design precipitates unanticipated breakdown. In such situations it is assumed that the aspects of Earth which are disclosed by the intervention of new design projects were present *prior to the design interventions*, and therefore could have been employed to predict and thus prevent breakdown. On the basis of this assumption, each advent of breakdown initiates even more intense striving to increase knowledge of the 'real' structures of Earth. It is this conception of Earth which gives our world the confidence to continue to strive, and it is this conception of Earth which occludes the futility of its striving.

The understanding of the groundlessness of our world and the futility of our striving is deeply confronting to all of us embedded in western techno-rationality. Even Dreyfus appears at times uncomfortable with this understanding. In the preceding quotation, Dreyfus has edited the Heideggerian text to give the impression that Heidegger is positing that there is a possibility that technology may, one day, achieve solutions to all of our problems. That this day may come, according to Dreyfus is our greatest danger. But this is in fact not what Heidegger says. On the basis of the interpretation presented in this Division, Heidegger would deny that we could ever achieve solutions to all our problems. Rather, each solution would only ever lead to further breakdowns and further striving. The real danger for Heidegger is exactly the view inadvertently expressed by Dreyfus. In the unedited version of the Heideggerian quotation used by Dreyfus it is *not* the technological achievement of solutions to all of our problems that is the danger — the danger is instead the *view* that this is even a possibility:

What threatens man in his very nature is *the willed view* that man, by the peaceful release, transformation, storage, and channeling of the energies of physical nature, could render the human condition... tolerable for everybody and happy in all respects.⁶²⁴ [Dreyfus' deletions from the original text in italics]

On Heidegger's account, it is this 'willed view' from which our epoch must be released. But how does Heidegger envisage that such a releasement might come about? Heidegger repeatedly insists that while technology is the source of the danger, technology is also the hope for the overcoming of the danger:

*But where danger is, grows
The saving power also.*⁶²⁵

Heidegger is not implying that any particular technologies — such as environmentally responsible technologies — will save us, but that it is in technology itself that we might recognize the groundless futility of our striving. The more enframed we become and the more exaggerated this striving, the more likelihood there is that technological revealing will show itself:

Yet we can be astounded. Before what? Before this other possibility: that the frenziedness of technology may entrench itself everywhere to such an extent that someday, throughout everything technological, the essence of technology may come to presence in the coming-to-pass of truth.⁶²⁶

When we recognize that the striving in which design participates appears only to

⁶²⁴Heidegger, "What Are Poets For?" *op. cit.*, p. 116.

⁶²⁵Hölderlin cited in Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 34.

⁶²⁶Heidegger, *The Question Concerning Technology*, *op. cit.*, p. 35.

lead to more striving, we may come to see that the world *cannot* be grounded in permanent presence. By being brought into an understanding that the world is not grounded in permanent presence, we are also brought into an understanding that we can never 'know' the final ground of our world. With the abandonment of the possibility of coming to know the final ground of our world, also comes the abandonment of the possibility of being able to predict with certainty the outcomes of the design interventions that we thrust into our world. We are left instead with the certainty that striving to overcome breakdown will always bring with it further breakdown, further thrusting of Earth. It is with this understanding that we recognize our limit, our measure.

This does not mean however that such a recognition would result in the complete abandonment of technology. Rather, by understanding that the outcome of new technologies can never be predicted, and that their introduction will invariably lead to further breakdown, *we would be released from the imperative to use technology at every opportunity to overcome breakdown*. The withdrawal of the hubris of certainty would mean that breakdown might more often be left as breakdown, and where the designing of the new technologies of our world *was* ventured, that designing would be approached with a care bourne of uncertainty.

In this view, the overcoming of the danger of technological revealing is a return to Heidegger's roots in both phenomenology and hermeneutics. We are asked to see the phenomenon of technology as it *appears* in its frenzied striving, not as it is enframed by the prejudices of rationality. In accordance with the hermeneutic circle of interpretation, the new understanding of technology that arises from this meditative rather than enframed thinking is projected ahead, and the world that is encountered in the thrall of this new understanding is lit up in a new way. Rather than seeking the ground of things in presence, we are open to see that things are grounded in the groundless ground of the nexus of world and Earth. Even the

breakdowns that bring us into unshieldedness may disclose their positive aspect. The hard-won rituals of life are able to be seen as gathering worlds of involvements, rather than as something to be made transparent by technological striving.

On this interpretation, Heidegger's work may be seen as a call to open ourselves to the phenomenon of technological revealing that enframes us. In this way we might see the unrelenting cycle of breakdown in which design participates and recognise the arrogance of the conception of Earth as permanently present — 'there and available' as a resource for our care. By understanding the Earth not as presence, but as the unreifiable source of all possibilities, we are brought 'face to face with the Nothing.'⁶²⁷ It is by facing the Nothing and accepting groundlessness of the world that a new understanding will, perhaps, have *already* been unnoticingly projected ahead of the designing of a new epoch.

⁶²⁷Snodgrass, *Translating Tradition: Technology, Heidegger's 'Letting-be' and Japanese New Wave Architecture*, *op. cit.*, p. 13.

Possibilities for Further Research Arising out of this Dissertation

In accordance with one of the major theses of this dissertation, the possibilities for further investigation that may be disclosed by the dissertation will vary depending upon the context of the encounter with the work. In this view, the many projects that readers will have already noticingly or unnoticedly projected ahead of their reading of the work might be expected to reveal many different trajectories for investigation. From my own current perspective, there are a range of possibilities for further research arising out of this dissertation that I would consider valuable to pursue.

- Within the domain of architectural design, for example, it may prove fruitful to investigate the relation between historical manifestations of the desire for spatio-temporal *order* in the Architecture of both the 'East' and the 'West' and Heidegger's account of worlded humans' desire for 'care', 'dwelling', and 'always already understanding.'
- In the same domain, this dissertation might offer an opening into a further discussion of architecture's *refusal* to be 'used up' in its functionality, and therefore share the fate of modern technology as it is characterized by Heidegger.
- In its presentation of a non-foundational laying out of the design process, this dissertation should not simply be taken as a critique of much of the contemporary direction of computer automation of the design process, on the contrary, along with other critiques it may offer the possibility of alternative approaches to research into *computer aided design*.
- In presenting a non-foundational laying out of the design process in which the theory-practice divide is dissolved in favour of a non-dual notion of design as 'an articulation of background understanding,' I believe that this dissertation

may also have significant implications for *design pedagogy* that would be worthy of further investigation.

- In the domain of ecological discourse, this dissertation may invite further investigation of the implications of the way in which the devaluing process of technological 'progress' creates an ontological category (as opposed to a functional/material category) of 'waste'.
- More generally, the interpretation of Heidegger's explication of the significance of 'care' presented in this dissertation might be seen to offer a critique of the 'care free' nature of human engagement with televisual and computer environments.
- At a similarly general level, this dissertation's interpretation of Heideggerian notions of 'desire', 'care' and 'technological enframent' might contribute to the reconceptualization of human agency and causation.
- Finally, the interpretation of Heidegger's notion of Earth presented in the concluding Division of this dissertation might offer an alternative ground for conceiving 'truth' in a broad range of disciplines: for example, Earth as the groundless ground for the multiple (yet correct) interpretations of history, or Earth as the groundless ground for the shifting (yet correct) interpretations of science.

BIBLIOGRAPHY

- ABC Radio Audio Archives. "Jonathon Porritt at the Australian Museum." Sydney: ABC Radio Tapes, 1991.
- ABC Radio Audio Archives. "Radio National's The Science Show: 150th Anniversary of Anesthesia, produced by S. Carleton." Sydney: ABC Radio Tapes, 1997.
- Ackerman, J. "The History of Design and the Design of History." *VIA* 4 (1980): 12-18.
- Alexander, C. *Notes on the Synthesis of Form*. Cambridge, Massachusetts: Harvard University Press, 1964.
- _____. "From a Set of Forces to a Form." In *The Man-made Object*, ed. G. Kepes. pp. 96-107. New York: Braziller, 1966.
- _____. "A City is Not a Tree." In *Design After Modernism*, ed. J. Thackara. 67-84. London: Thames and Hudson, 1988.
- Alexander, C. et al. *A Pattern Language: towns, buildings, construction*. New York: Oxford University Press, 1977.
- Alexander, C. and B. Poyner. "The Atoms of Environmental Structure." In *Developments in Design Methodology*, ed. N. Cross. 123-134. New York: Wiley, 1984.
- Archer, B. "An Overview of the Structure of the Design Process." In *Design Methods in Architecture*, ed. G. Broadbent and A. Ward. 76-102. London: Lund Humphries, 1969.
- Archer, J. "Puzzle-making: What Architects do when no one is Looking." In *The Computability of Design*, ed. Y. Kalay. 37-52. New York: Wiley, 1987.
- Arcidi, P. "Projects: Nine Proposals on Behalf of the Environment." *Progressive Architecture* 3 (72 1991): 95-100.
- Argyros, A. "Narratives of the Future: Heidegger and Derrida on Technology." *New Orleans Review* 17 (2 1990): 53-58.
- Armstrong, D., ed. *Berkeley's Philosophical Writings*. Toronto: The Macmillan Company, 1965.
- Asimow, M. *An Introduction to Design*. Englewood Cliffs: Prentice-Hall, 1962.
- Baird, G. "Materials Selection and Energy Efficiency." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994.
- Ballinger, J., Prasad, D. and Cassell, D. *Energy Efficient Housing for New South Wales*. Sydney: Office of Energy, 1992.
- Barnhart, R. ed. *The Barnhart Dictionary of Etymology*. The H. W. Wilson Company, 1988.
- Barthes, R. *The Rustle of Language*. Oxford: Basil Blackwell, 1986.
- Bateson, G. *Steps to An Ecology of Mind: Collected Essays in Anthropology, Psychiatry, Evolution, and Epistemology*. Northvale: Jason Aronson Inc., 1987.
- Battersby, C. "The Architecture as Genius: Feminism and the Aesthetics of Exclusionism." *ALBA Scotland's Visual Arts magazine* I (3 1991).

Baudrillard, J. "The Imposition of Meaning in the Media and the Implosion of the Social in the Masses." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

Benjamin, A., ed. *Philosophy and Architecture*. London: Academy Editions, 1990.

Berger, P. and T. Luckman. *Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Harmondsworth: Penguin, 1967.

Berman, M. "The Reenchantment of the World." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

Bernstein, R. *The Restructuring of Social and Political Theory*. Oxford: Basil Blackwell, 1976.

_____. *Beyond Objectivism and Relativism*. Oxford: Basil Blackwell, 1983.

_____. *The New Constellation: The Ethical-Political Horizons of Modernity/Postmodernity*. Cambridge: Polity Press, 1991.

Best, S. "Deconstructing Space; Anne Graham's Installation for Walla Mulla Park and Jeff Gibson's Screwballs." *Transition* (42 1993).

Boden, M. *The Philosophy of Artificial Intelligence*. Oxford: Oxford University Press, 1990.

Boer, B. "Implementing Sustainability." In *Environmental Responsibility Across International Boundaries*, Second International Conference on Environmental Law: National Environmental Law Association and LawAsia, Bangkok, 1991.

Bognar, B. "A Phenomenological Approach to Architecture and its Teaching in the Design Studio." In *Dwelling, Place and Environment: Towards A Phenomenology of Person and World*, ed. D. Seamon & R. Mugerauer. Dordrecht: Martinus Nijhoff Publishers, 1985.

Bookchin, M. "Towards an Ecological Society: The Concept of Ecotechnologies and Ecocommunities." In *Toward an Ecological Society*, ed. M. Bookchin. Montreal: Black Rose Books, 1980.

_____. *Remaking Society*. Montreal: Black Rose Books, 1989.

Borgmann, A. *Technology and the Character of Contemporary Life*. Chicago: University of Chicago Press, 1984.

Bortoft, H. "Counterfeit and Authentic Wholes: Finding A Means for Dwelling in Nature." In *Dwelling, Place and Environment: Towards A Phenomenology of Person and World*, ed. D. Seamon & R. Mugerauer. Dordrecht: Martinus Nijhoff Publishers, 1985.

Boss, M. *Existential Foundations of Medicine and Psychology*. New York: Jason Aronson, 1979.

Boyden, S. *Biohistory: The Interplay Between Human Society and the Biosphere*. Vol. 8. Paris: UNESCO, 1992.

Bradford, G. "We All Live in Bhopal." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

Bratman, M. *Intention, Plans, and Practical Reason*. Cambridge: Harvard University Press, 1987.

Broadbent, G. "A Plain Man's Guide to Systematic Design Methods." *Royal Institute of British Architects Journal* 5 (May 1968).

- _____. *Design in Architecture: Architecture and the Human Sciences*. Chichester: John Wiley, 1973.
- Brown, Lester and et al. *State of the World: A World Watch Institute Report on Progress Toward a Sustainable Society*. Sydney: Allen and Unwin, 1990.
- Brown, L., H. Kane, and E. Ayres. *Vital Signs 1993: The Trends That Are Shaping Our Future*. W. W. Norton and the World Watch Institute, 1993.
- Burges, A. "Derrida, Rorty, Gadamer and Post Structuralism in Architecture." In *Gadamer Action and Reason*. Conference Proceedings, University of Sydney, 46-54, 1991.
- Burnham, D. "The Rise of the Computer State." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.
- Campbell, K. "Flaw in Universal Belief." *The Australian* (June 12 1996): 40.
- Caputo, J. *The Mystical Element in Heidegger's Thought*. New York: Fordham University Press, 1986.
- _____. *Radical Hermeneutics: Repetition, Deconstruction, and the Hermeneutical Project*. Bloomington: Indiana University Press, 1987.
- _____. *Demythologizing Heidegger*. Bloomington: Indiana University Press, 1993.
- Carr, D. *Interpreting Husserl*. Dordrecht: Martinus Nijhoff Publishers, 1987.
- Carroll, N. "Anglo-American Aesthetics and Contemporary Criticism: Intention and the Hermeneutics of Suspicion." *The Journal of Aesthetics and Art Criticism* 51 (2 1993): 245 - 252.
- Carson, R. *Silent Spring*. Harmondsworth: Penguin, 1965.
- Chakma, K. and G. Hill. "Of Other Universities: The Contested Space of the Ancient Viharas of Bangladesh." *Architectural Theory Review* 2 (1 1997).
- Chandler, P. "Ecological Knowledge in a Traditional Agroforest Management System among Peasants in China." Unpublished Ph. D. thesis, University of Washington, 1990.
- Conley, V. A. "Eco-Subjects." In *Rethinking Technologies*, ed. V. A. Conley. 77-91. Minneapolis: University of Minnesota Press, 1993.
- Cook, J. "Environmentally Benign Architecture: Beyond Passive." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994.
- Coomaraswamy, A. *Symbolism of Indian Architecture*. Jaipur: The Historical Research Documentation Centre, 1983.
- _____. *The Dance of Siva*. New Delhi: Sagar Publications, 1987.
- Commonwealth of Australia. *Draft National Strategy for Ecologically Sustainable Development*. Canberra: AGPS, 1992.
- Cooper, B. G. "Religion and Technology — Toward Dialogue." *Main Currents in Modern Thought* 26 (1 1969).
- Coyne, R. *Logic Models of Design*. London: Pitman, 1988.
- _____. "The Implications of Computer Use in Architecture Schools." *ADTRA Journal* 1 (2 1989).

_____. *The Impact of Computer Use on Design Practice*. Working Paper, University of Sydney, 1990.

_____. "Design Reasoning Without Explanations." *AI Magazine* II (4 1990)

_____. "Inconspicuous Architecture." In *Gadamer Action and Reason*. Conference Proceedings, University of Sydney, 62-70, 1991.

_____. *The Role of Metaphor in Understanding Computers in Design*. University of Sydney, Working Paper, 1992.

_____. *The Disintegrated Curriculum: Hermeneutics and the Four Modes of Professional Education*. Working Paper, University of Sydney, 1993.

_____. *Computers and Praxis: How the Theoretical is Giving Way to the Pragmatic in Computer Systems Design*. Department of Architectural and Design Science: University of Sydney, 1993.

_____. *Where in the World is Cyberspace? The Phenomenology of Computer-Mediated Communications*. Working Paper, University of Sydney, 1994.

_____. *Designing Information Technology in the Postmodern Age: From Method to Metaphor*. Cambridge, Massachusetts: The MIT Press, 1995.

Coyne, R. and A. Snodgrass. "Is Designing Mysterious? Challenging the Dual Knowledge Thesis." *Design Studies* 12 (3 1991): 124-131.

_____. *Problem Setting within Prevalent Metaphors of Design*. Working Paper, University of Sydney, 1992.

_____. *The Individual and the Group: Problems in Design*. Working Paper, University of Sydney, 1992.

_____. "Cooperation and Individualism in Design." *Environment and Planning B: Planning and Design* 20 (1993): 163-74.

_____. "Rescuing CAD from Rationalism." *Design Studies* 14 (2 1993): 100-123.

Coyne, R., A. Snodgrass, and D. Martin. *Metaphors in the Design Studio*. Working Paper, University of Sydney, 1992.

Coyne, R., M. Rosenman, A. Radford, M. Balachandran, and J. Gero. *Knowledge-Based Design Systems*. Massachusetts: Addison-Wesley, 1990.

Cross, N. *Design Process and Products: A Review of Design*. Milton Keynes: The Open University Press, 1983.

_____. *Developments in Design Methodology*. New York: Wiley, 1984.

Cumberland, J. "Intergenerational Transfers and Ecological Sustainability." In *Ecological Economics: The Science and Management of Sustainability*, ed. R. Costanza. New York: Columbia University Press, 1992.

Dallmayr, F. *The Other Heidegger*. Ithaca: Cornell University Press, 1993.

Daly, H., ed. *Economics, Ecology, Ethics: Essays Toward a Steady-State Economy*. San Francisco: W.H. Freeman, 1980.

- _____. "The Economic Growth Debate: What Some Economists Have Learned But Many Have Not." *Journal of Environmental Economics and Management* 14 (December 1987).
- Darke, J. "The Primary Generator and the Design Process." *Design Studies* 1 (1 1979): 36-44.
- Davis, M. *The Green Office: Position Paper 9: NZIA - Duroid Environmental Policy Papers (EPP'S). Second Issue.*, 1992.
- de Man, P. *Blindness and Insight*. London: Methven & Co., 1983, 142- 165.
- Deleuze, G., and F. Guattari. *What Is Philosophy?* Translated by G. Burchell and H. Tomlinson. London: Verso, 1994.
- Dennett, D. "The Interpretation of Texts, People and Other Artifacts." *Philosophy and Phenomenological Research* L (Supplement, Fall 1990).
- Derrida, J. *Consciousness Explained*. Boston: Little, Brown and Co., 1991.
- _____. *Of Grammatology*. Translated by G. Spivak. Baltimore: Johns Hopkins University Press, 1976.
- _____. *Writing and Difference*. Translated by A. Bass. Chicago: Chicago University Press, 1978.
- _____. "Bernard Tschumi: La Case Vide — La Villette 1985, Point de Folie." *AA Files* 12 (1986): 65 - 75.
- _____. *Edmund Husserl's Origin of Geometry: An Introduction*. Translated by J. Leavey, Jr. Lincoln: University of Nebraska Press, 1989.
- _____. "Jacques Derrida: In Discussion with Christopher Norris." In *Deconstruction II*, ed. A. Papadakis. 7-8. London: Academy Editions, 1989.
- _____. "A Letter to Peter Eisenman." *Assemblage* 12 (1990): 8-13.
- Descartes, R. *Discourse on Method and the Meditations*. Translated by F. Sutcliffe. Harmondsworth: Penguin, 1968.
- Dewey, J. *The Public and Its Problems*. Athens: Ohio University Press, 1991.
- Diani, M. and C. Ingraham, ed. *Restructuring Architectural Theory*. Evanston: Northwestern University Press, 1989.
- DiCenso, J. *Hermeneutics and the Disclosure of Truth: A Study of the Work of Heidegger, Gadamer and Ricoeur*. Charlottesville: University Press of Virginia, 1990.
- Dobson, A., ed. *The Green Reader*. London: Andre Deutsch, 1991.
- Drew, P. *Leaves of Iron; Glen Murcutt: Pioneer of an Australian Architectural Form*. North Ryde: The Law Book Company Limited, 1985.
- Dreyfus, H. *What Computers Can't Do: The Limits of Artificial Intelligence*. New York: Harper and Row, 1979.
- _____. "What Computers Can't Do." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.
- _____. "On the Ordering of Things: Being and Power in Heidegger and Foucault." *The Southern Journal of Philosophy* XXVIII (Supplement: Heidegger and Praxis 1989): 83-120.

_____. *Being-in-the-World: A Commentary on Heidegger's Being and Time, Division 1*. Massachusetts: The MIT Press, 1991.

_____. "Heidegger's Hermeneutic Realism." In *The Interpretive Turn: Philosophy, Science, Culture*, ed. D. Hiley, J. Bohman, and R. Shusterman. Ithaca: Cornell University Press, 1991.

_____. "Heidegger on the Connection Between Nihilism, Art, Technology and Politics." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. 289-316. Cambridge: Cambridge University Press, 1993.

Dreyfus, H. and H. Hall. *Heidegger: A Critical Reader*. Cambridge, Massachusetts: Basil Blackwell, 1992.

Dreyfus, H. and P. Rabinow. *Michel Foucault: Beyond Structuralism and Hermeneutics*. Chicago: The University of Chicago Press, 1982.

Durbin, P. and F. Rapp ed. *Philosophy and Technology*. Dordrecht: D. Reidel Publishing Company, 1983.

Eisenman, P. "Post/EI Cards: A Reply to Jacques Derrida." *Assemblage* 12 (1990): 14-17.

Eliade, M. *Myth and Reality*. Translated by W. Trask. New York: Harper and Row, 1975.

_____. *The Myth of the Eternal Return*. Translated by W. Trask. Great Britain: Arkana, 1989.

Ellul, J. *The Technological Society*. New York: Alfred A. Knopf, 1964.

Energy Division of Department of Primary Industries and Energy. *House Energy Rating System (HERS)*. Commonwealth of Australia.

Engwicht, D. *Towards an Eco-city: Calming the Traffic*. Sydney: Envirobook, 1992.

Farmer, J. *Green Shift: Towards a Green Sensibility in Architecture*. Oxford: Butterworth Architecture, 1996.

Fay, R. "Ecologically Sustainable Development and the Built Environment." *Architectural Science Review* 37 (2 June 1994): 8-9.

Feenberg, A. *Critical Theory of Technology*. New York: Oxford University Press, 1991.

Feibleman, J. *Technology and Reality*. The Hague: Martinus Nijhoff Publishers, 1982.

Feyerband, P. *Against Method: Outline of an Anarchistic Theory of Knowledge*. London: NLB Humanities Press, 1975.

Fish, S. *Doing What Comes Naturally: Change, Rhetoric, and the Practice of Theory in Literary and Legal Studies*. Durham: Duke University Press, 1989.

Flannery, T. *The Future Eaters*. Port Melbourne: Reed Books, 1994.

Flyvbjerg, B. "Aristotle, Foucault and Progressive Phronesis: Outline of an Applied Ethics for Sustainable Development." *Planning Theory*, 7-8 (1992).

Foucault, M. *Archaeology of Knowledge*. London: Tavistock Publications, 1972.

_____. *The History of Sexuality*. Vol. I. Translated by R. Hurley. New York: Pantheon Books, 1978.

- _____. *Power/Knowledge*. ed. C. Gordon. New York: Pantheon Books, 1980.
- _____. "Questions of Method: An Interview." *I & C. Power and Desire: Diagrams of the Social* (8 Spring 1981): 3-15.
- Eco Design Foundation. *Livable Cities*, Sydney, 1992.
- Fox, A. and Murrell, R. *Green Design: A Guide to the Environmental Impact of Building Materials*. London: Architecture Design and Technology Press, 1989.
- Fox, W. "The Deep Ecology-Eco-Feminism Debate and its Parallels: A Defence of Deep Ecology's Concern with Anthropocentrism." *Environmental Ethics* 11 (1, Spring 1989).
- _____. *Towards a Transpersonal Ecology*. Boston: Shambhala, 1990.
- Frampton, K. "On Reading Heidegger." *Oppositions* 4 (1974).
- Fry, T. *Design History Australia: A Source Text in Methods and Resources*. Sydney: Hale and Iremonger and the Power Institute of Fine Arts, 1988.
- _____. "Under-standing Dis-stance: the Presence of Interpretation in Action." In *Gadamer Action and Reason*. Conference Proceedings; University of Sydney, 43-45, 1991.
- _____. "Material re-creation: eco-designing a new mainstream." *Artlink* 11 No 4 (Summer 1991/92): 18-19.
- _____, ed. *R U A TV?* Sydney: Power Publications, 1993.
- _____. *Remakings: Ecology Design Philosophy*. Sydney: Envirobook, 1994.
- _____. "Architecture on the Road to Change." *TAS: The Architecture Show TAS/53* (September/October 1994).
- _____. *Vital Design*. Unpublished, Eco-Design Foundation, Sydney.
- _____. *Design in Action and Design Reinvented*. Unpublished, Eco-Design Foundation, Sydney.
- Fynsk, C. *Heidegger: Thought and Historicity*. Ithaca: Cornell University Press, 1993.
- Gadamer, Hans-Georg. "Hermeneutics and Social Science." *Cultural Hermeneutics* 2 (1975): 307-316.
- _____. *Philosophical Hermeneutics*. Translated by D. Linge. Berkeley: University of California Press, 1976.
- _____. *Reason in the Age of Science*. Translated by F. Lawrence. Cambridge, Massachusetts: The MIT Press, 1982.
- _____. *The Relevance of the Beautiful and Other Essays*. Translated by N. Walker. ed. R. Bernasconi. Cambridge: Cambridge University Press, 1986.
- _____. *The Idea of the Good in Platonic-Aristotelian Philosophy*. Translated by P. Smith. New Haven: Yale University Press, 1986.
- _____. *Heidegger's Ways*. Translated by J. Stanley. Albany: State University of New York, 1994.
- _____. *Truth and Method*. Translated by J. Weinsheimer and D. Marshall. New York: Continuum, 1994.

- _____. "What is Truth?" In *Hermeneutics and Education*, ed. B. Wachterhauser. 25-32. Evanston: Northwestern University Press, 1994.
- Galbraith, J. *Designing Complex Organizations*. Reading, Massachusetts: Addison-Wesley, 1973.
- _____. *Organizational Design*. Reading, Massachusetts: Addison-Wesley, 1977.
- Gallagher, S. *Hermeneutics And Education*. Albany: State University of New York Press, 1992.
- Gelernter, M. *Sources of Architectural Form: A Critical History of Western design Theory*. Manchester: Manchester University Press, 1995.
- Georgescu-Roegen, N. "Energy, Matter, and Economic Valuation: Where Do We Stand?" In *Energy Economics and the Environment: Conflicting Views of an Essential Interrelationship*, ed. E. Daley and A. Umana. Boulder, Colorado: Westview Press, 1981.
- Gero, J. *Expert Systems in Computer-Aided Design*. Amsterdam: North-Holland, 1987.
- _____. *Artificial Intelligence in Design*. Southhampton: Computational Mechanics Publications, 1989.
- Giddens, A. *The Consequences of Modernity*. Stanford: Stanford University Press, 1990.
- Glass, N. *Working Emptiness: Toward a Third Reading of Emptiness in Buddhism and Post Modern Thought*. Atlanta: Scholar Press, 1995.
- Gordon, A. and D. Suzuki. *Its a Matter of Survival*. North Sydney: Allen and Unwin, 1990.
- Greenland, J. and S. Szokolay. *Passive Solar Design in Australia*. Canberra: RAIA Education Division, 1985.
- Grundmann, R. "The Ecological Challenge to Marxism." *New Left Review* (187 May/June 1991).
- Guignon, C. "History and Commitment in the Early Heidegger." In *Heidegger: A Critical Reader*, ed. H. Dreyfus and H. Hall. Oxford and Cambridge: Basil Blackwell Ltd, 1992.
- _____, ed. *The Cambridge Companion to Heidegger*. Cambridge: Cambridge University Press, 1993.
- Gusevich, M. "The Architecture of Criticism: A Question of Autonomy." In *Drawing/Building/Text*, ed. A. Kahn. New York: Princeton Architectural Press, 1991.
- Haar, M. *The Song of the Earth: Heidegger and the Grounds of the History of Being*. Translated by R. Lilly. Bloomington: Indiana University Press, 1993.
- Habermas, J. "A Review of Gadamer's Truth and Method." In *Understanding and Social Inquiry*, ed. F. Dallmayr and T. McCarthy. 335-363. Notre Dame: University of Notre Dame Press, 1977.
- Hall, A. D. Jr. *A Methodology for Systems Engineering*. New York: Van Nostrand, 1962.
- Halper, E. *Form and Reason: Essays in Metaphysics*. Albany: State University of New York Press, 1993.
- Hamilton, C. *The Mystic Economist*. Fyshwick: Willow Park Press, 1994.
- Hardin, G. "The Tragedy of the Commons." In *Managing the Commons*, ed. G. Hardin. and J. Baden. San Francisco: W. H. Freeman and Co., 1977.

Harvey, B. and J. D. Hallett. *Environment and Society: An Introductory Analysis*. London: The Macmillan Press Ltd, 1977.

Hawken, P. *The Ecology of Commerce: A Declaration of Sustainability*. New York: Harper business, 1993.

Heelan, P. *Space Perception and the Philosophy of Science*. Berkeley: University of California Press, 1983.

Hegel, G. W. F. *Selections*. Translated by S. Taubeneck. New York: Continuum, 1990.

Heidegger, M. *An Introduction to Metaphysics*. Translated by R. Mannheim. New Haven: Yale University Press, 1959.

_____. *Being and Time*. Translated by J. Macquarrie and E. Robinson. Oxford: Blackwell, 1962.

_____. *Discourse on Thinking*. Translated by J. Anderson and E. Freund. New York: Harper and Row, 1966.

_____. *What is Called Thinking?* Translated by F. Wieck and J. Gray. New York: Harper & Row, 1972.

_____. *Identity and Difference*. Translated by J. Stambaugh. New York: Harper and Row, 1969.

_____. *On the Way of Language*. Translated by P. Hertz. New York: Harper and Row, 1971.

_____. *On Time and Being*. Translated by J. Stambaugh. New York: Harper and Row, 1972.

_____. "Building, Dwelling, Thinking." In *Poetry, Language, Thought*, ed. J. Gray. 143-62. New York: Harper & Row, 1975.

_____. "The Thing." In *Poetry, Language, Thought*, ed. J. Gray. 163-186. New York: Harper & Row, 1975.

_____. *Poetry, Language, Thought*. Translated by A. Hofstadter. New York: Harper & Row, 1975.

_____. "The Origin of the Work of Art." In *Poetry, Language, Thought*, ed. J. Gray. 15-88. New York: Harper & Row, 1975.

_____. "What Are Poets For?" In *Poetry, Language, Thought*, ed. J. Gray. New York: Harper & Row, 1975.

_____. "Language." In *Poetry, Language, Thought*, ed. J. Gray. 187-210. New York: Harper & Row, 1975.

_____. "...Poetically Man Dwells..." In *Poetry, Language, Thought*, ed. J. Gray. 211-229. New York: Harper & Row, 1975.

_____. *The Question Concerning Technology and Other Essays*. Translated by W. Lovitt. New York: Harper & Row, 1977.

_____. "Basic Writings." ed. D. Krell. New York: Harper Collins, 1977.

_____. *Heraclitus Seminar*. Translated by C. Seibert. Alabama: University of Alabama Press, 1979.

_____. "Only a God Can Save Us Now." In *Heidegger: The Man and His Thought*, ed. T. Sheehan. 45-72. Chicago: Precedent, 1981.

_____. *The Basic Problems of Phenomenology*. Bloomington: Indiana University Press, 1982.

_____. *The Metaphysical Foundations of Logic*. Translated by M. Heim. Bloomington: Indiana University Press, 1984.

_____. *History of the Concept of Time*. Bloomington: Indiana University Press, 1985.

_____. *The Principle of Reason*. Translated by R. Lilly. Bloomington: Indiana University Press, 1991.

_____. *Nietzsche*. Vol. 1 and 2. Translated by J. Stambaugh, D. Krell and F. Capuzzi. ed. D. Krell. New York: Harper and Row, 1991.

Heller, A. *The Power of Shame: A Rational Perspective*. London: Routledge & Kegan Paul, 1985.

Heller, A., and F. Fehér. *The Postmodern Political Condition*. Cambridge: Polity Press, 1988.

Hill, G. "Environmental Constraints upon the Process of Project Procurement." Major Report, University of Technology, New South Wales, 1992.

_____. "Response to Draft Strategy for Ecologically Sustainable Development, and Draft National Greenhouse Response Strategy for and on behalf of the Royal Australian Institute of Architects Natural Environment and Energy Group." 1992.

Hillier, B., J. Musgrave, and P. O'Sullivan. "Knowledge and Design." *EDRA* 3 (1972): 29/3/1 - 29/3/14.

Hirsch, E. *Cultural Literacy: What Every American Needs to Know*. Boston: Houghton Mifflin, 1987.

Hoelscher, H. "Technology and Individual." *Main Currents in Modern Thought* 28 (3 1972).

Hollinger, R., ed. *Hermeneutics and Praxis*. Notre Dame: University of Notre Dame, 1985.

Hollo, N. *Warm House Cool House: Inspirational Designs for Low-energy Housing*. Sydney: A Choice Book, 1995.

Hoy, D., ed. *Foucault: A Critical Reader*. Oxford: Basil Blackwell Ltd, 1986.

Hoy, D. "Heidegger and the Hermeneutic Turn." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. 170-194. Cambridge: Cambridge University Press, 1993.

Husserl, E. *The Crisis of the European Sciences and Transcendental Phenomenology*. Translated by D. Carr. Evanston: Northwestern University Press, 1970.

Ihde, D. *Technics and Praxis: A Philosophy of Technology*. Dordrecht: Reidel, 1979.

_____. *Existential Technics*. Albany: State University of New York Press, 1983.

_____. *Technology and the Lifeworld: From Garden to Earth*. The Indiana Series in the Philosophy of Technology, Bloomington: Indiana University Press, 1990.

_____. *Instrumental Realism: The Interface Between Philosophy of Science and Philosophy of Technology*. Bloomington: Indiana University Press, 1990.

- _____. *Philosophy of Technology: An Introduction*. New York: Paragon House, 1993.
- _____. *Postphenomenology: Essays in the Postmodern Context*. Evanston: Northwestern University Press, 1993.
- Inayatullah, S. "Deconstructing and Reconstructing the Future: Predictive, Cultural and Critical Epistemologies." *Futures* (March 1990).
- IUCN, UNEP, and WWF. *Caring for the Earth: A Strategy for Sustainable Living*. Gland, 1991.
- James, W. *Pragmatism, A New Name for Some Old Ways of Thinking*. Cambridge Mass: Harvard University Press, 1978.
- Jencks, C. *The Architecture of the Jumping Universe*. London: Academy Editions, 1995.
- Jnr, L. White. "Cultural Climates and Technological Advance in the Middle Ages." *Viator* 2 (1971).
- Jochim, M. *Strategies for Survival: Cultural Behaviour in an Ecological Context*. London: Academic Press Inc, 1981.
- Johnson, M. *The Body in the Mind: The Bodily Basis of Meaning, Imagination, and Reason*. Chicago: The University of Chicago Press, 1987.
- Johnson, Paul-Alan. *The Theory of Architecture: Concepts, Themes, & Practices*. New York: Van Nostrand Reinhold, 1994.
- Johnson-Laird, P. *The Computer and the Mind: An Introduction to Cognitive Science*. London: Fontana, 1988.
- Jones, C. *Design Methods: Seeds of Human Futures*. New York: Wiley, 1970.
- _____. "A Method of Systematic Design." In *Developments in Design Methodology*, ed. N. Cross. New York: Wiley, 1984.
- Judd, B. and P. Bycroft, ed. *Evaluating Housing Standards and Performance*. Vol. IV. Housing Issues. Red Hill: RAIA National Education Division, 1990.
- Kant, I. *Critique of Pure Reason*. Translated by N. Smith. New York: Macmillan, 1968.
- Klein, E. *A Comprehensive Etymological Dictionary of the English Language: Dealing with the Origin of Words and their Sense Development thus Illustrating the History of Civilization and Culture*. Vol. Vol. I A - K. Amsterdam: Elsevier Publishing Company, 1966.
- Klemm, D. E. *Hermeneutical Inquiry*. Vol. I: The Interpretation of Texts. Atlanta: Scholars Press, 1986.
- Kockelmans, J. *Heidegger on Art and Art Works*. Dordrecht: Nijhoff, 1985.
- Kolb, D. *Postmodern Sophistications: Philosophy, Architecture and Tradition*. Chicago: University of Chicago Press, 1990.
- Krell, D. *Martin Heidegger Basic Writings: from Being and Time (1927) to the Task of Thinking (1964)*. London: Routledge & Kegan Paul, 1978.
- Kuhn, T. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press, 1970.
- Lakoff, G. and Johnson, M. *Metaphors We Live By*. Chicago: University of Chicago Press, 1980.

- Lamb, R. "The Challenge of Ecology to the Design Professions, I: Invention and Intervention." *Exedra* 3 (1 1991): 16-24.
- Lambourne, R. *Energy Embodied in Materials: Position Paper 6: NZIA - Duroid Environmental Policy Papers (EPP'S)*, Second Issue. 1992.
- Lambourne, R. *Environmental Health Hazards: Position Paper 7: NZIA - Duroid Environmental Policy Papers (EPP'S)*, Second Issue. 1992.
- _____. *Sustainable Timber Usage: Position Paper 8: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue. 1992.
- _____. *Sustainable Timber Usage: Species: Position Paper 16: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue. 1992.
- Lang, J. *Creating Architectural Theory*. New York: Van Nostrand Reinhold Company, 1987.
- Larkum, A. *Sustainable Development*. School of Biological Sciences: University of Sydney, 1993.
- Laslett, P. *John Locke: Two Treatises of Government, A Critical Edition*. London: Cambridge University Press, 1967.
- Latour, B. and S. Woolgar. *Laboratory Life: The Construction of Scientific Facts*. Princeton: Princeton University Press, 1986.
- Latour, B. *Science in Action: How to Follow Scientists and Engineers Through Society*. Milton Keynes: Open University Press, 1987.
- _____. "Clothing the Naked World." In *Dismantling Truth*, ed. H. Lawson and L. Appignanesi. 101-126. London: Weidenfeld and Nicolson, 1989.
- Lawson, B. *How Designers Think*. London: Architectural Press, 1980.
- Lawson, B., H. Partridge, and J. Gelder. *Environment Design Guide: Assessing the Environmental Impact of Building Materials*. Royal Australian Institute of Architects, 1995.
- Lawson, W. *Building Materials, Energy and the Environment: Towards Ecological Sustainability*. Canberra: RAIA, 1995.
- Lipsey, R., ed. *Coomaraswamy, 2: Selected Papers Metaphysics*. Bollingen Series LXXXIX. Princeton: Princeton University Press, 1977.
- Lloyd, G. *The Man of Reason: 'Male' and 'Female' in Western Philosophy*. London: Methuen, 1984.
- Logan, B. *The Structure of Design Problems*. Glasgow: University of Strathclyde, 1987.
- Lovelock, J. *Gaia: a New Look at the Life on Earth*. Oxford: Oxford University Press, 1979.
- Lyle, J. *Design for Human Ecosystems: Landscape, Land Use, and Natural Resources*. New York: Van Nostrand Reinhold Company, 1985.
- Lyotard, J. *The Postmodern Condition: A Report on Knowledge*. Translated by G. Bennington and B. Massumi. Manchester: Manchester University Press, 1984.
- Mackenzie, D. *Design for the Environment*. New York: Rizzoli, 1991.
- Madison, G. *The Hermeneutics of Postmodernity*. Bloomington: Indiana University Press, 1990.

_____. ed. *Working Through Derrida*. Evanston: Northwestern University Press, 1993.

Maher, M. L. "Heuristically Generating Multiple Optional Beam Designs." In *Expert Systems in Engineering, Architecture and Construction in Sydney*, edited by J. S. Gero and F. Sudweeks, Conference Proceedings, University of Sydney, 1989.

Mander, J. "Four Arguments for the Elimination of Television." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

Marcuse, H. *One Dimensional Man*. Boston: Beacon Books, 1968.

Martin, D. "Space and Place." In *Gadamer Action and Reason*. Conference Proceedings. University of Sydney, 55-61, 1991.

Marx, K. *The Poverty of Philosophy*. New York: International Publishers, 1963.

Marx, W. *Heidegger and the Tradition*. Translated by T. Kiesel and M. Greene. Evanston: Northwestern University Press, 1971.

Matthews, W., ed. *Outer Limits and Human Needs: Resource and Environmental Issues of Development Strategies*. Uppsala: The Dag Hammarskjöld Foundation, 1976.

Maturana, H. and F. Varela. *The Tree of Knowledge: The Biological Roots of Human Understanding*. Boston: Shambhala, 1988.

McLaughlin, S. "Practices and Primordial Understanding: Major Implications of Heidegger's Philosophy for Computer-aided Architectural Research." Unpublished Ph. D. thesis, University of Sydney, 1993.

McWhorter, L., ed. *Heidegger and the Earth: Essays in Environmental Philosophy*. Kirksville: The Thomas Jefferson University Press, 1992.

Meadows, D. H., D. L. Meadows, J. Randers, and W. W. Behrens III. *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. London: Pan Books, 1983.

Meadows, D. H., D. L. Meadows, and J. Randers. *Beyond the Limits: Global Collapse or an Sustainable Future*. London: Earthscan Publishers. 1992.

Megill, A., ed. *Rethinking Objectivity*. Durham: Duke University Press, 1994.

Merchant, C. "The Death of Nature." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

_____. *Radical Ecology: The Search for a Livable World*. New York: Routledge, 1992.

Milbrath, L. *Envisioning a Sustainable Society: Learning Our Way Out*. Albany: State University of New York Press, 1989.

Milton, K., ed. *Environmentalism: The View from Anthropology*. London: Routledge, 1993.

Misgeld, D. and G. Nicholson, ed. *Hans-Georg Gadamer on Education, Poetry, and History*. Albany: State University of New York, 1992.

Mitcham, C. and A. Huning, ed. *Philosophy and Technology II: Information Technology and Computers in Theory and Practice*. Dordrecht: D. Reidel Publishing Company, 1986.

Mitcham, C. *Thinking Through Technology: The Path Between Engineering and Philosophy*. Chicago: The University of Chicago, 1994.

- Mitcham, C. and R. Mackey, ed. *Philosophy and Technology: Readings in the Philosophical Problems of Technology*. New York: The Free Press, 1972.
- Mitchell, W. *The Logic of Architecture: Design, Computation, and Cognition*. Cambridge Massachusetts: MIT Press, 1990.
- Moore, G. *Emerging Method in Environmental Design and Planning*. Massachusetts: MIT Press, 1970.
- Moore, C. and A. Miller. *Green Gold: Japan, Germany, the United States, and the Race for Environmental Technology*. Boston: Beacon Press, 1994.
- Mueller-Vollmer, K., ed. *The Hermeneutics Reader: Texts of the German Tradition from the Enlightenment to the Present*. Oxford: Basil Blackwell, 1986.
- Mugerauer, R. *Interpretations on Behalf of Place: Environmental Displacements and Alternative Responses*. Albany: State University of New York Press, 1994.
- Mulhall, S. *On Being in the World: Wittgenstein and Heidegger on Seeing Aspects*. London: Routledge, 1993.
- Mumford, L. "Authoritarian and Democratic Technics." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.
- Naess, A. "The Shallow and the Deep: Long Range Ecology - A Summary." *Inquiry* 16 (Spring 1973): 95-100.
- _____. "Self-Realisation: An Ecological Approach to Being in the World." In *Thinking Like a Mountain*, ed. John Seed et al. 1988.
- _____. "Sustainable Development and Deep Ecology." In *Ethics of Environment and Development: Global Challenge, International Response*, ed. J. R. Engel and Joan Gibb Engel. London: Belhaven Press, 1990.
- _____. *Ecology, Community and Lifestyle*. Translated by D. Rothernberg. London: Cambridge University Press, 1990.
- Nagel, T. *The View from Nowhere*. Oxford: Oxford University Press, 1986.
- Nash, R. F. *The Rights of Nature: A History of Environmental Ethics*. Madison: The University of Wisconsin press, 1989.
- Nelson, S., A. Megill, and D. McClosky, ed. *Rhetoric of the Human Sciences: Language and Argument in Scholarship and Public Affairs*. Wisconsin: University of Wisconsin Press, 1987.
- Newell, A. and H. Simon. *Human Problem Solving*. Englewood Cliffs: Prentice-Hall, 1972.
- Newell, A. "Artificial Intelligence and the Concepts of Mind." In *Computer Models of Thought and Language*, ed. R. Schank and K. Colby. San Francisco: W. H. Freeman, 1973.
- New Zealand Institute of Architects. *NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- Nickles, T. "Good Science as Bad History: From Order of Knowing to Order of Being." In *The Social Dimensions of Science*, ed. E. McMullin. 85-129. Notre Dame: University of Notre Dame Press, 1992.
- Nietzsche, F. *On The Genealogy Of Morals*. New York: Vintage Books, 1969.

- Norberg-Schulz, C. "Kahn, Heidegger and the Language of Architecture." *Oppositions* 18 (1979):
- _____. "Heidegger's Thinking on Architecture." *Perspecta* 20 (1983).
- _____. *Architecture, Meaning and Place: Selected Essays*. New York: Rizzoli, 1988.
- Norgaard, R. "Environmental Economics: An Evolutionary Critique and a Plea for Pluralism." *Journal of Environmental Economics and Management* 12 (4 December 1985).
- _____. "Economics as Mechanics and the Demise of Biological Diversity." *Ecological Modelling* 38 (1987).
- Norgard, J. and B. Christensen. "Technological Options and Sustainable Energy Welfare." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. 189 - 220. London: E & FN SPON, 1994.
- Norris, C. and Benjamin, A. *What is Deconstruction?* London: Academy Editions, 1988.
- Novitz, D. "Metaphor, Derrida, and Davidson." *The Journal of Aesthetics and Art Criticism* (Fall 1985).
- Okrent, Mark. *Heidegger's Pragmatism: Understanding, Being, and the Critique of Metaphysics*. Ithaca: Cornell University Press, 1988.
- Olafson, F. *What Is A Human Being?: A Heideggerian View*. Modern European Philosophy, Cambridge: Cambridge University Press, 1995.
- Onions, C. T., et al., ed. *The Oxford Dictionary of English Etymology*. Oxford: Clarendon Press, 1966.
- Ormiston, G. and A. Schrift. *The Hermeneutic Tradition: From Ast to Ricoeur*. Albany: State University of New York Press, 1990.
- Ornstein, R. and P. Ehrlich. *New World New Mind*. New York: Doubleday, 1989.
- Ortega y Gasset, J. "Man the technician." In *Toward a Philosophy of History*, 87-161. New York: W. W. Norton, 1941.
- Owen, D. *What is Ecology?* Oxford: Oxford University Press, 1980.
- Palmer, R. *Hermeneutics: Interpretation Theory in Schleiermacher, Dilthey, Heidegger and Gadamer*. Evanston: Northwestern University Press, 1969.
- Papanek, V. *The Green Imperative: Ecology and Ethics in Design and Architecture*. Singapore: Thames and Hudson, 1995.
- Parkes, G., ed. *Heidegger and Asian Thought*. Honolulu: University of Hawaii Press, 1987.
- Partridge, H. and W. Lawson. *A Method for the Quantitative Assessment of the Ecological Sustainability of Building Materials*. Vol. 1. Proc. Solar 94, Sydney: UNSW, 1994.
- Pearce, D, E. Barbier, and A. Markandya. *Blueprint for a Green Economy*. London: Earthscan Publications, 1989.
- Pearson, D. *The Natural House Book: Creating a Healthy, Harmonious, and Ecologically Sound Home Environment*. North Ryde: Angus & Robertson, 1990.

- Pedals, P. *Energy From Nature: A Complete Guide to Independent Energy Systems*. Nimbin: Rainbow Power Company Pty. Ltd., 1990.
- Penning-Rowswell, E. and D. Lowenthal, ed. *Landscape Meanings and Values*. London: Allen and Unwin Ltd, 1986.
- Pepper, D. *The Roots of Modern Environmentalism*. London: Routledge, 1986.
- Pérez-Gomez, A. *Architecture and the Crisis of Modern Science*. Cambridge, Mass: The MIT Press, 1985.
- Pickering, A. *Constructing Quarks*. Chicago: University of Chicago Press, 1984.
- Pilatowicz, G. *Eco-Interiors: A Guide to Environmentally Conscious Interior Design*. New York: John Wiley & Sons, Inc., 1995.
- Plant, J., ed. *Healing the Wounds: The Promise of Ecofeminism*. Philadelphia: New Society Publishers, 1989.
- Plato. "The Philosopher King Rules." In *Plato's Complete Works*, ed. H. Drake. Patterson: Littlefield, Adams and Co., 1959.
- Plotnitsky, A. *Reconfigurations: Critical Theory and General Economy*. Gainesville: University Press of Florida, 1993.
- Plumwood, V. "Ethics and Instrumentalism: A Response to Janna Thompson." *Environmental Ethics* 13 (Fall 1991)
- _____. *Feminism and the Mastery of Nature*. London: Routledge, 1993.
- Ponting, C. *A Green History of the World*. London: Penguin Books, 1991.
- Poster, M., ed. *Jean Baudrillard: Selected Writings*. Stanford: Stanford University Press, 1988, pp. 166 - 184.
- Putnam, H. *Realism and Reason*. Cambridge: Cambridge University Press, 1983.
- Rabinow, P., ed. *The Foucault Reader: An Introduction to Foucault's Thought*. London: Penguin, 1984.
- Radford, A. and J. Gero. *Design By Optimization in Architecture, Building and Construction*. New York: Van Nostrand Reinhold, 1988.
- Rapp, F., ed. *Contributions to A Philosophy of Technology: Studies in the Structure of Thinking in the Technological Sciences*. Dordrecht: D. Reidel Publishing Company, 1974.
- Rapp, F. *Analytical Philosophy of Technology*. Translated by S. Carpenter & T. Langenburch. Dordrecht: D. Reidel Publishing Company, 1981.
- Redding, P. "Nietzschean Perspectivism and the Logic of Practical Reason." *The Philosophical Forum* XXII (1 1990).
- Relph, E. "Geographical experiences and being-in-the-world." In *Dwelling, Place and Environment: Towards a Phenomenology of Person and World*, ed. D. Seamon and R. Mugerauer. Dordrecht: Nijhoff, 1985.
- Rescher, N. *A System of Pragmatic Idealism*. Vol. I: Human Knowledge in Idealistic Perspective. Princeton: Princeton University Press, 1992.

- Ricoeur, P. *The Rule of Metaphor*. Translated by R. Czerny and K. McLaughlin. Toronto: University of Toronto Press, 1977.
- _____. "Hermeneutics and Human Sciences." ed. J. Thompson. Cambridge: Cambridge University Press, 1981.
- Robertson, G. *Sustainable Built Environments: Position Paper 2: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- _____. *Projected Climate Change: Position Paper 3: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- _____. *Atmospheric Ozone Depletion: Position Paper 4: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- _____. *UNCED - Introduction for Architects: Position Paper 11: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- _____. *Commercial Buildings - Climate Adaptating/Climate Rejecting: Position Paper 12: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- _____. *Commercial Building External Skin Options for Sustainability: Position Paper 13: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.
- Rodger, A. "Architecture for Sustainable Development." *Exedra* 1 No. 2 (Summer 1989): pp. 4-11.
- _____. "An Integrated Approach to an Energy Efficient House." *Architectural Science Review* 37 (2 June 1994): pp. 59-66.
- Rodger, A and R. Fay. "Sustainable Suburbia." *Exedra* 3 No. 1 (1991): p. 4-15.
- Rodman, J. "Ecological Sensibility." In *Ethics and the Environment*, ed. D. Scherer. Prentice Hall, 1983.
- Rogers, C., R. Taylor, A. Borgmann, S. Carpenter, P. Fandozzi, and L. Winner. "Symposium on Appropriate Technology." *Research in Philosophy & Technology* 6 (1983): 3-43.
- Rorty, R. *Philosophy and the Mirror of Nature*. Oxford: Basil Blackwell, 1980.
- _____. *Consequences of Pragmatism*. Minneapolis: University of Minnesota Press, 1982.
- _____. *Contingency, Irony and Solidarity*. Cambridge: Cambridge University Press, 1989.
- _____. *Objectivity, Relativism, and Truth: Philosophical Papers*. Vol. 1. Cambridge: Cambridge University Press, 1991.
- _____. "Feminism, Ideology, and Deconstruction: A Pragmatist View." In *Mapping Ideology*, ed. S. Zizek. New York: Verso, 1994.
- Rossi, A. *The Architecture of the City*. Cambridge: MIT Press, 1982.
- Rowe, P. *Design Thinking*. Cambridge: MIT Press, 1987.
- Royal Australian Institute of Architects Chapter - NSW. *RAIA - Final Draft Environment Policy*. Royal Australian Institute of Architects, 1991.
- Royal Australian Institute of Architects. "RAIA Environment Policy." *Architecture Australia* (September/October 1994): 83-90.

- Russow, Lilly-Marlene. "Why Do Species Matter?" *Environmental Ethics* 13 (Summer 1981).
- Ryan, C., M. Hosken, and D. Greene. "Eco Design: Design and the Response to the Greening of the International Market." *Design Studies* 1 (1992): 2-22.
- Ryle, G. *The Concept of Mind*. London: Hutchinson, 1949.
- Sallis, J., ed. *Reading Heidegger: Commemorations*. Bloomington: Indiana University Press, 1993.
- Samuels, R. and D. Prasad. *Global Warming and the Built Environment*. London: E & FN SPON, 1994.
- Samuels, R. "Environmental Accountability: Users, Buildings and Energy." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994.
- Schank, R. *Explanation Patterns: Understanding Mechanically and Creatively*. Hillsdale: Lawrence Erlbaum, 1986.
- _____. "What is AI Anyway?" In *The Foundations of Artificial Intelligence: A Source Book*, ed. D. Partridge and Y. Wilks. 3-13. Cambridge: Cambridge University Press, 1990.
- Schatzki, T. "Being, the Clearing, and Realism." In *Heidegger: A Critical Reader*, ed. H. Dreyfus and H. Hall. Oxford and Cambridge: Basil Blackwell Ltd, 1992.
- Scheibler, I. "Heidegger and the Rhetoric of Submission: Technology and Passivity." In *Rethinking Technologies*, ed. V. Conley. Minneapolis: University of Minnesota Press, 1993.
- Schön, D. *Displacement of Concepts*. London: Tavistock, 1963.
- _____. "Generative Metaphor: A Perspective on Problem setting in Social Policy." In *Metaphor and Thought*, ed. A. Ortony. 254-283. Cambridge: Cambridge University Press, 1979.
- _____. *The Reflective Practitioner: How Professionals Think in Action*. U.S.A.: Basic Books, 1983.
- _____. "Towards a Marriage of Artistry and Applied Science in the Design Studio." *Journal of Architectural Education* 42 (4 1988).
- Schrag, C. "The Transvaluation of Aesthetics and the Work of Art." In *Thinking About Being: Aspects of Heidegger's Thought*, ed. R. Shahan and J. Mohanty. Norman: University of Oklahoma Press, 1984.
- Schumacher, E. F. *Small is Beautiful: Economics as if People Mattered*. New York: Harper and Row, 1973.
- Schwartz, E. "Overskill: The Decline of Technology in Modern Civilization." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.
- Seamon, D. and R. Mugerauer, ed. *Dwelling, Place, and Environment: Towards A Phenomenology of Person and World*. Dordrecht: Martinus Nijhoff Publishers, 1985.
- Seamon, D. "Phenomenology and Environment-Behavior Research." In *Advances in Environment, Behavior, and Design*, vol. 1, ed. E. Zube and G. Moore. New York: Plenum, 1987.
- _____. ed. *Dwelling, Seeing and Designing*. Albany: State University of New York, 1993.

- Searle, J. *Intentionality: An Essay in the Philosophy of Mind*. Cambridge: Cambridge University Press, 1983.
- Sessions, G. and B. Devall. *Deep Ecology: Living as if Nature Mattered*. Salt Lake City: Peregrine Smith Books, 1985.
- Shapiro, G. and A. Sica, ed. *Hermeneutics: Questions and Prospects*. Amherst: University of Massachusetts Press, 1985.
- Silverman, H. J., ed. *Continental Philosophy IV: Gadamer and Hermeneutics*. New York: Routledge, 1991.
- Simon, H. *The Sciences of the Artificial*. Cambridge: MIT Press, 1969.
- Smithers, T., A. Conkie, J. Doheny, B. Logan, and K. Millington. "Design as Intelligent Behaviour: An AI in Design Research Programme." In *Artificial Intelligence in Design*, ed. J. Gero. 293-334. Berlin: Springer-Verlag, 1989.
- Snodgrass, A. *Architecture, Time and Eternity: Studies in the Stellar and Temporal Symbolism of Traditional Buildings*. Vol. 1 & 2. New Delhi: Aditya Prakashan, 1990.
- _____. "Hermeneutics and the Application of Design Rules." In *Gadamer Action and Reason*, Conference Proceedings, University of Sydney, 1-11, 1991.
- _____. "Asian Studies and the Fusion of Horizons." In *Gadamer Action and Reason*, Conference Proceedings, University of Sydney, 35-42, 1991.
- _____. *The Symbolism of the Stupa*. Delhi: Motilal Banarsidass, 1992.
- _____. *Translating Tradition: Technology, Heidegger's 'Letting-be' and Japanese New Wave Architecture*. Working Paper, University of Sydney.
- _____. "Angkor: Mandala, Myth and Metaphor." In *The Age of Angkor: Treasures from the National Museum of Cambodia*. Conference at The National Gallery, Canberra, 1992.
- Snodgrass, A. and R. Coyne. "Models, Metaphors and the Hermeneutics of Designing." *Design Issues* 9 (1 Fall 1992): 56-74.
- _____. "Is Designing Hermeneutical?" *Architectural Theory Review* 2 (1 1997): 1-29.
- _____. *Hermeneutics, Objectivity and Design Evaluation*. Working Paper, University of Sydney, Undated.
- Sokal, A. "A Physicist Experiments with Cultural Studies (The Conventions of Academic Discourse)." *Lingua Franca* 6 (4 May-June 1996): 62-64.
- _____. "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity." *Social Text* (Spring/Summer 1996).
- Southwick, C. *Global Ecology in Human Perspective*. New York: Oxford University Press, 1996.
- Steiner, G. *Heidegger*. London: Fontana Press, 1992.
- Stiny, G. *Pictorial and Formal Aspects of Shape Grammars*. Basel: Birkhauser Verlag, 1975.
- Stone, J. "Environment, Plague and the Problem of Charity." *24 Hours* (April 1992): 50-56.
- Szokolay, S. *Architecture and Climate Change*. Canberra: RAIA Education Division, 1992.

- Taminiaux, J. "Heidegger and the Earth." *Diacritics* 19 (1989): 3-4.
- Taylor, C. "Rationality." In *Rationality and Relativism*, ed. M. Hollis and S. Lukes. 87-105. Oxford: Basil Blackwell, 1982.
- _____. "Engaged Agency and Background in Heidegger." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. Cambridge: Cambridge University Press, 1993.
- _____. "Comparison, History, Truth." In *Philosophical Arguments*, ed. F. Reynolds and D. Tracy. 146-164. Cambridge: Harvard University Press, 1995.
- Thayer, L. "Man's Ecology, Ecology's Man." *Main Currents in Modern Thought* 27 (3 1971).
- Thayer, R. *Gray World, Green Heart: Technology, Nature and the Sustainable Landscape*. New York: John Wiley, 1994.
- Todd, N. and J. Todd. *From Eco-Cities to Living Machines: Principles of Ecological Design*. Berkeley: North Atlantic Books, 1994.
- Trainer, T. *Abandon Affluence!* London: Zed Books, 1985.
- _____. *There are Alternatives*. London Green Print, 1992.
- Trigg, R. *Rationality and Science: Can Science Explain Everything?* Oxford: Blackwell Publishers, 1993.
- UIA/AIA World Congress of Architects. *Declaration of Interdependence for a Sustainable Future*. International Union of Architects and American Institute of Architects, 1993.
- Vale, B. "Autonomous House." University of Cambridge Department of Architecture Technical Research Division, 1972.
- Vale, B. and R. *Green Architecture: Design for a Sustainable Future*. London: Thames and Hudson, 1991.
- van der Leeuw, S. and R. Torrence. *What's New?: A Closer Look at the Process of Innovation*. London: Unwin Hayman, 1989.
- van der Ploeg, S., L. Braat, and W. Lierop. "Integration of Resource Economics and Ecology." *Ecological Modelling* 38 (1987).
- van der Ryn, S. "Eco-villages: Toward Sustainable Architecture." *Progressive Architecture* 3 (72 1991): 88-90.
- Vattimo, G. *The End of Modernity: Nihilism and Hermeneutics in Postmodern Culture*. Translated by J. Snyder. Baltimore: The John Hopkins University Press, 1988.
- Vinten, G. "Environmental Auditing and the Built Environment." In *Global Warming and the Built Environment*, ed. R. Samuels and D. Prasad. London: E & FN SPON, 1994.
- Vitruvius. *Vitruvius on Architecture*. Vol. II. Translated by F. Granger. London: William Heinemann Ltd, 1956.
- _____. *The Ten Books on Architecture*. Translated by M. Morgan. New York: Dover Publications Inc., 1960.

Vodanovich, I. "Teaching Development: The Dynamics of Knowledge and Power." In *Teaching for Development, Teaching about Development: New Perspective*, ed. by P. Thomas. Conference Proceedings. Australian Development Studies Network, Canberra, 1995.

Wachterhauser, B. R., ed. *Hermeneutics and Modern Philosophy*. Albany: State University of New York, 1986.

Wark, M. "Postmodernist Jokers." *The Australian* (June 5 1996): 28.

Warnke, G. *Gadamer: Hermeneutics, Tradition and Reason*. London: Polity Press, 1987.

Watkin, D. *Morality and Architecture: The Development of a Theme in Architectural History and Theory from the Gothic Revival to Modern Movement*. Oxford: Clarendon Press, 1977.

Watkins, T. *The Resource management Act: Position Paper 5: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

_____. *Section 1 Chapter 7 Agenda 21: Position Paper 10: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

_____. *Farewell to "Shelter": Position Paper 14: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue, 1992.

_____. *NZIA Submission on Agenda 21: Position Paper 15: NZIA - Duroid Environmental Policy Papers (EPP'S)*. Second Issue. 1992.

Webber, P. and G. Hill. *Control of Building by Floor Space Ratio in the City of Sydney: Review of Methods of Measurement*. University of Sydney, 1992. Appendix to Submission to the Council of the City of Sydney

Week, D., & S. Loo. "Dialogue on Two Worlds—The Practice of Architecture Meets the Study of Hermeneutics." In *Universities as Interpretive Communities*. Conference Proceedings, University of Sydney, 11-42, 1993.

Weinsheimer, J. *Gadamer's Hermeneutics: A Reading of Truth and Method*. New Haven: Yale University Press, 1985.

Wheelright, E. "The Socio-economic Roots of the Environmental Problem." In *Radical Political Economy: Collected Essays*, ed. E. Wheelright. Sydney: A.N.Z. Book Co., 1974.

White, L. "The Historic Roots of Our Ecological Crisis." *Science* 155 (3767 March 1967).

Wigley, M. and P. Johnson. *Deconstructivist Architecture*. New York: Little Brown and Company, 1988.

Wigley, M. *The Architecture of Deconstruction: Derrida's Haunt*. Cambridge, Mass.: The MIT Press, 1993.

Winner, L. *Autonomous Technology*. Cambridge Massachusetts: MIT Press, 1977.

_____. *The Whale and the Reactor*. Chicago: University of Chicago Press, 1986.

_____. "Mythinformation." In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.

Winograd, T. "What Does It Mean to Understand Natural Language." *Cognitive Science* 4 (1980): 209-241.

- Winograd, T. and F. Flores. *Understanding Computers and Cognition: A New Foundation for Design*. New Jersey: Ablex Publishing Corporation, 1986.
- Wittgenstein, L. *Philosophical Investigations*. Oxford: Basil Blackwell, 1958.
- _____. *Tractatus Logico-Philosophicus*. Translated by D. Pears and B. McGuinness. London: Routledge and Kegan Paul, 1961.
- Wittgenstein, W. *The Blue and Brown Books*. Oxford: Basil Blackwell, 1964.
- World Commission on Environment and Development, *Our Common Future*. Oxford: Oxford University Press, 1987.
- Wright, K. "The Place of the Work of Art in the Age of Technology." *Southern Journal of Philosophy* 22 (1984): 565-583.
- _____. ed. *Festivals of Interpretation: Essays on Hans-Georg Gadamer's Work*. Albany: State University of New York Press, 1990.
- Yeang, K. *Designing With Nature: The Ecological Basis for Architectural Design*. New York: McGraw-Hill, Inc., 1995.
- Young, J. *Sustaining the Earth: the Past, Present and Future of the Green Revolution*. Kensington: New South Wales University Press, 1990.
- Zarsky, L. "The Green Market." *Australian Left Review* (124 December 1990).
- Zerzan, J. and A. Carnes, ed. *Questioning Technology: A Critical Anthology*. London: Freedom Press, 1988.
- Zerzan, J. and P. Zerzan. "Is Technology Neutral?" In *Questioning Technology: A Critical Anthology*, ed. J. Zerzan and A. Carnes. London: Freedom Press, 1988.
- Zimmerman, M. "Heidegger and Marcuse: Technology as Ideology." *Research in Philosophy & Technology* 2 (1979): 245-261.
- _____. "The Role of Spiritual Discipline in Learning to Dwell on Earth." In *Dwelling, Place and Environment: Towards A Phenomenology of Person and World*, ed. D. Seamon and R. Mugerauer. Dordrecht: Martinus Nijhoff Publishers, 1985.
- _____. *Heidegger's Confrontation with Modernity: Technology, Politics and Art*. Bloomington: Indiana University Press, 1990.
- _____. "Heidegger, Buddhism and Deep Ecology." In *The Cambridge Companion to Heidegger*, ed. C. Guignon. Cambridge: Cambridge University Press, 1993.
- _____. *Contesting Earth's Future: Radical Ecology and Postmodernity*. Berkeley: University of California Press, 1994.
- Zizek, S., ed. *Mapping Ideology*. London: Verso, 1994.

APPENDIX

IS DESIGNING HERMENEUTICAL?

ADRIAN SNODGRASS AND RICHARD COYNE

An atomistic language model is frequently used to codify what is seen as the logical sequence of steps in the design process. Following the critique of Wittgenstein, this language model, derived from Positivist theory, has been generally abandoned by philosophers of language. It is argued here that despite its apparent successes in the short term, the model embodies a fundamental misunderstanding of the nature of the design process. Drawing on recent studies of language in philosophical hermeneutics, and especially the work of Hans-Georg Gadamer, the authors argue that design activity proceeds by way of a hermeneutical circle, involving the projection of pre-understandings and a dialogical structure of question and answer. Design does not fall within the domain of natural science with a base in formal logic, but belongs rather to the domain of the human and hermeneutical sciences with a base in the processes of understanding and interpretation. Atomistic language models of design are antipathetic to hermeneutical functioning, and impede rather than assist design understanding and practice.

It is commonly supposed that design activity can be described, codified and explained in terms of an algorithmic logic model derived from language theory. The model, exemplified in the work of Stiny, Mitchell, Yoshikawa, and Coyne *et al.*, is the basis of much of the current research in design methodology and CAD.¹ Mitchell gives an elegant description of the model.² He claims that design can be described in words that make up a critical language and such word descriptions can be formalized using the notation of first-order predicate calculus. Design worlds, he says, consist of "graphic tokens which, like words, can be manipulated according to certain grammatical rules." He sees design processes "as computations in design worlds with the objective of satisfying predicates of form and function stated in a critical language."³ Mitchell specifies that there are three main parts to this model:

"First... the relationship of criticism to design may be understood as a matter of truth-functional semantics of a critical language in a design world. Second... design worlds may be specified by formal grammars. Third... the rules of such grammars encode knowledge of how to put together buildings that function adequately. Thus the relation of form to function is strongly mediated by the syntactic and semantic rules under which a designer operates."⁴

He says that, "the first step in precise formulation of a design world is to specify the primitives (kinds of elementary graphic tokens) out of which designs may be assembled."⁵

This model presupposes that the process of designing is analogous or equivalent to the process by which we use language; that the process can be described in terms of primary tokens (for example, geometric shapes) which equate words; and that these primary elements can be manipulated according to grammatical rules so as to build up coherent structures in the same manner that words can be combined in accordance with the rules of logic to form meaningful sentences. The model derives from a Positivist theory of language, which relies for its cohesion and integrity on the concept that verbal atoms (words) correspond to objects in the real world. These primary verbal tokens combine to form larger information segments such as sentences. To be meaningful, say the Positivists, these combinations of verbal tokens or word atoms must be assembled according to the rules of formal logic. If they do not conform to these rules they are meaningless and the statements they convey are false.

In the following we shall attempt to show the limitations of this view of language, a view which underpins many prevailing assumptions concerning the nature of the design process, in particular those which make appeal to logic, formal systems, and the computational paradigms of Artificial Intelligence.

Positivist Concepts of Language

The Positivist concept of an exact and determinate language made up of symbols which correspond to a unique set of atomic facts traces to Plato. He speaks of the "weakness of the *logos*,"⁶ by which he means that spoken language is treacherous, that it has a tendency to slip out of our control so that meanings disappear into the thickets of ambiguity, self-contradiction and paradox.⁷ Ordinary spoken language is unequal to the task of representing reality; it does not directly correspond to its referent. Ordinary language must be replaced by a system of signs which corresponds exactly to the structure of what is. To control our thinking we must resort to a system of signs that can be controlled, a formal language that always behaves according to the dictates of logic. For Plato, the paradigmatic expression of such a language was the language of mathematics; the ideal language for thinking is one in which words function like numbers. In this way, "the word, just like the number, becomes the mere sign of a being that is well-defined and hence pre-known."⁸ Only statements expressed in such a formal language could lay claim to certainty.

The Logical Positivists attempted to formulate a "language of science," constructed on the base of mathematical logic. Their aim was to define a precise, certain and meaningful language that is clearly demarcated from meaningless pseudo-sentences.⁹ They based their enterprise on the concept of logical atomism, the notion that words have a direct correspondence to things which are discrete, explicit and determinate; that words and what they stand for are like atoms or primary elements; and that words, as primary elements of language, can be brought together in logical sequences to form statements that are meaningful because they are certain, possessing a truth that can be tested against the rules of logic and against the things or facts they represent.

These efforts culminated in Wittgenstein's *Tractatus Logico-Philosophicus*,¹⁰ the definitive exposition

of the Positivist theory of language, in which he specified just such a precise and perfect language, one which would escape opinions, purposes, values, and intentions. All subjective notions and purposive meanings were banished from the domain of concrete experience. He maintained that "the ultimate constituents of the world are a unique set of atomic facts whose combinations are pictured or mirrored in the relations among symbols in a logically perfect language," that "the world can be described completely by knowing all these atomic propositions," and that "there is one basic use of language: to convey information. . . ." It follows that "all language which conveys information is exact and determinate."¹¹ The *Tractatus* thus defines the world in terms of a set of atomic facts which can be expressed in logically independent propositions. Everything can be expressed in the formal language of logic. "The limits of my language mean the limits of my world. Logic fills the world: the limits of the world are also its limits."¹²

Wittgenstein's Critique of Positivist Concepts of Language

With the appearance of the *Tractatus* the Positivist position seemed invincible. By the middle of this century, however, it was wholly demolished, defeated not so much by attacks from outside, but from within. Positivism self-destructed. It fell apart under the self-reflexive impact of its own criteria. The most potent of these internal assaults came from Wittgenstein himself, who turned his immense critical talents to an analysis of his own earlier thinking, dismantled the *Tractatus* and consigned to irrelevance the Positivist notion that atomic units of language correspond to realities in an objective world.

Wittgenstein negates the assertion that logical language alone is meaningful by pointing to the language of ordinary use, which manages to communicate meanings even though it blatantly fails to conform to the constraints of formal logic. The "weakness of the logos" is not so powerless that it cannot adequately convey meanings for our everyday purposes. Live language, language as it is spoken in the context of ordinary human activity, is not an exact system of invented signs. Wittgenstein expresses this in an architectural metaphor:

"Our language can be seen as an ancient city: a maze of little streets and squares, of old and new houses, of houses with additions from various periods and this surrounded by a multitude of new boroughs with straight regular streets and uniform houses."¹³

The new boroughs with straight streets and uniform houses are the formal languages of mathematics and logic; and the maze of little streets and squares is language as it is spoken in the context of the lived world.

Wittgenstein says that "the speaking of language is part of an activity, or a form of life."¹⁴ We can only understand spoken language in the context in which it is spoken. Ordinary language is wholly entwined in networks of common sense conventions; linguistic practices cannot be separated from concrete "life forms," that is, attitudes, world views and a cultural ethos.

Our ability to understand everyday speech depends on our ability to reduce the ambiguity of the individual terms by placing them within the global context of the situation in which they are used. It is not necessary to eliminate ambiguity; we do not need to take refuge in a formal language. We have a sense of the situation; we pick up clues and cues in the parts and the whole and by a filtering process involving a large degree of "ambiguity tolerance" we sift out possibilities and arrive at a sufficient sense for the purposes at hand.

Our ability to understand language,

*is a matter of our sharing routes of interest and feeling, modes of response, senses of humour and of significance and of fulfilment, of what is outrageous, of what is similar to what else, what a rebuke, what forgiveness, of when an utterance is an assertion, when an appeal, when an explanation—all the whirl of organism Wittgenstein calls 'forms of life'.¹⁵

When children learn a language they are engaged in a form of life. They share at least some of the goals and interests of their parents and other teachers, and these goals and interests and the activity they are engaged in with others in a particular situation reduce the possible references of the words that are being used. The teacher does not define words for the child; the child and the teacher understand each other and learning can take place not because the child learns rules but because the child and his teacher share a context. Wittgenstein says, "What one acquires here is not a technique; one learns correct judgments. There are also rules, but they do not form a system, and only experienced people can apply them right. Unlike calculation rules."¹⁶

Wittgenstein says that when we engage in ordinary spoken language in our daily activities we are involved in language games. We do not so much learn a language as participate in it, as we participate in playing games; and we do not so much learn a language as learn the rules of the games in which language operates. The rules of language change as the life situation, that is, the life game, changes. When as children we learn these games, we are at the same time being trained to view the world in certain socially determined ways. Language games are played according to rules that apply within a particular situation. Our activities are inseparably interwoven with language; we live in a language-constituted world; and in order to act in that world we must know how to play the language game in the particular circumstances that apply in the situation in which we find ourselves. We must know the rules of the language game that is being played at any moment; we must know the appropriate responses to whatever is said.

The rules of language are immanent within particular language games. They are indigenous to the games themselves. They cannot be disentangled from the particular situations in which they occur, so that we cannot specify common structures that apply to all language situations. They cannot be abstracted from the language games and made to constitute a transcendental grammar. There is no grammar that joins the games one to another. Language games stand as if in isolation from each other. They are hermetically sealed.

Wittgenstein has shown not only that language is part of life forms, but also that language forms life; it is constitutive of the world we experience. Language frames the world in which we live; it frames the way we see the things in the world; and therefore language cannot be an object which we can invent or create. Our relationship with language is not one of subject and object, since we are within language and part of its process.

We are so involved in the language games we play, says Wittgenstein, that we cannot stand outside them so as to describe them. Language can only be expressed in terms of rules if we step outside language, in which case we are describing what language *should* do; but as soon as we attempt to determine the rules governing what language does in fact, we are in a double bind, because we are caught up in the language game and objectivity is forever elusive. To catch language in the net of rules we need rules by which to recognize the context in which the rules apply, rules to recognize the lived situation, the intentions of the speaker, the anticipations of the listener, and other rules in an endless series. These given, we then need yet more rules to govern the application of these meta-rules, and so on to infinite regress.¹⁷

Wittgenstein says we can't describe the language games we play because we are absorbed in them. A self-reflexive paradox vitiates the Positivist model of language: any model that purports to describe language must stand outside language and regard it as an object; but this is not possible because we must use language to describe language. Plato's enterprise of constructing a perfect and precise language is doomed to failure. Such a language only *seems* more certain and true than the everyday spoken language of the market place and the dinner table. The meanings of the words 'certainty' and 'truth' are wholly dependent on the situation in which they are used in the context of a language event. We cannot look to a precise, logical language to provide ultimately true answers; at best we can seek responses that are appropriate within the context of a particular situation.

Statements made in ordinary language usage are not true or false but, as Austin says, felicitous or infelicitous, which is to say, appropriate or inappropriate within the context of the language game being played.¹⁸ A statement either fits the situation in which it appears or it does not. It is felicitous and meaningful if it fits with or is appropriate in the context of the state of play, but if it does not fit or is inappropriate it is then infelicitous and incomprehensible. When an inappropriate and incomprehensible statement intrudes into the language game, the situation seizes up and the game stops.

In summary, Wittgenstein's radical attack on the atomic model of language is based on the argument that the meanings of words do not derive from a logical calculus. Firstly, we cannot give a precise definition of a word because its meaning is forever changing according to the situation in which it is used. Meanings differ with context. The meaning of a word is precisely its use. We cannot, therefore, discern the meanings of words and sentences in isolation or in the abstract. A word is polysemic; it does not have a single meaning, and its various meanings merge, interpenetrate, are in a continual flux that eludes definition and rules. The definition of the word is blurred and continually changing; it is infinitely flexible.

Secondly, *we* define terms. We construct meanings, and the use of a term is determined by arbitrary convention. So similarly, grammars do not exist until we construct them; and we construct them according to conventions. Because of the porosity and flexibility of meaning that inheres within language we cannot specify a universal and transcendental grammar. The forms that language takes are determined by its usage: language is intimately related to particular human actions and anticipations and expectations of such actions. Rules are not imposed on the language from without and as upon an object, but inhere within a particular language game played in a particular life situation, which forms part of a socially constituted set of conventions.

Wittgenstein's description of language as a game highlights the point that the meaning of language does not depend on its fragmentary units having a one-to-one correspondence to things in an extra-linguistic world, units that combine to form logical structures. The meaning of language depends, rather, on the way it is used in a context. The bewitchment of language that Socrates deplored in the *Cratylus* cannot be avoided by replacing its ambiguities and paradoxes with precise symbols designating a reality that stands outside of language. Whatever reality "out there" might be, it is inextricably interwoven with language, and cannot be considered except in the context of language as it is spoken in ordinary discourse.

Language is not a sign system, a language of symbols; nor is it an information system.¹⁹ It is a language game, and as such it breaks out of the limits that any symbolic system necessarily implies. It is not made up of atomic tokens which represent or correspond to elements of reality in an extra-linguistic world; and it cannot be forced into the straitjacket of formal grammars without altering what it really is.

The Hermeneutical Circle

Coming to the analysis of language from an entirely different direction, hermeneutic philosophy reaches similar conclusions. Hermeneutic studies attempt to answer the question, How does understanding arise? How, for example, do we understand everyday language if, as we have seen, it does not follow the rules of logic and is shot through with ambiguities and imprecision? Philosophical hermeneutics answers that when we understand language, or anything else for that matter, it is because of the working of the hermeneutic circle.²⁰

The hermeneutical circle has to do with the circular relation of the whole and its parts in any event of interpretation. At first viewing it would seem that we cannot understand the meaning of a part of a language event until we grasp the meaning of the whole; and we cannot understand the meaning of the whole until we grasp the meaning of the parts. That is, we cannot understand the meanings of the words that make up a sentence until we can locate them in the context of the sentence as a whole; and we cannot understand the meaning of the whole sentence until we understand the meanings of the words that it comprises. By extension, the meaning of a concept depends on the context (or the horizon)²¹ within which it occurs; but this context is made up of the concepts to which it gives meaning. Any act of understanding language involves an interplay of text and context. The whole and the part give

meaning to each other; understanding is circular.

Thus we understand what someone says to us or something we read because of a reciprocal relationship between the whole and the part. These are inseparable in the process of interpretation. The meaning of the sentence as a whole reflects back and modifies the meanings of its component parts, the words. The whole can only be understood in terms of its constitutive parts and these parts in turn can only be construed in terms of the whole which they constitute.

This formulation may appear simple or even banal, but the apparent simplicity is deceptive. There is a logical contradiction concealed in the circle of interaction between whole and part: if we must understand the whole before we can understand the parts and yet the parts derive their meaning from the whole, then understanding can never begin. We cannot start with a whole that has no parts; and we cannot start with the parts until we understand the whole. This paradox does not imply that the circle is vicious, but merely that logic is inadequate to the task of understanding the working of understanding. Yet understanding occurs, so there must be some leap that enables us to understand the whole and the parts at the same time, however contrary to the rules of logic this may seem.

Looking at this from a slightly different viewpoint, logic would seem to indicate that we can only understand a sentence *after* it has been construed as a whole, so that the meanings of its constituent parts can then be understood in retrospect. Understanding of language, however, does not proceed in this retrospective manner, but at the same time as the language event takes place. We understand words as they are uttered. On a larger scale, we cannot fully understand the parts of a text except in the light of the text as a whole, but we nevertheless understand the parts as we read them and before we have completed reading the whole text. How is this possible?

"A person who is trying to understand a text," says Gadamer, "is always performing an act of projecting. He projects before himself a meaning for the text as a whole as soon as some initial meaning emerges in the text. Again, the latter emerges only because he is reading the text with particular expectations in regard to a certain meaning. The working of this fore-project, which is constantly revised in terms of what emerges as he penetrates into the meaning, is understanding what is there."²²

When reading a text or hearing a speech utterance, we have initial intimations and expectations of what the meaning of the whole will be, and interpret accordingly what we are reading or hearing at the moment. We pick up clues and cues from the parts, and from these construct an antecedent formulation of the whole, which then functions in a dialectical fashion to refine and redefine the parts. We move from partial and disjointed insights to an understanding of the whole and back to the yet-to-be-understood portions of the text. As soon as we initially discover some elements that can be understood, we sketch out the meaning of the whole text. We cast forward (or fore-cast) a preliminary project, which is progressively corrected as the process of understanding advances. Interpretation brings with it an anticipation, albeit vague and informal, of the meaning of the whole; and the light of

this anticipation plays back to illuminate the parts. This prior understanding is in turn corrected or confirmed, and gradually specified, as the details react upon it.

That is to say, we project a meaning of the whole even as we begin to read the text or hear the speaker and understand the parts accordingly. This preliminary projection is continually revised as the reader or listener penetrates deeper into the meaning of the parts. The projection, at first unclear and only existing in outline, plays back into the interpretations of the parts, requiring their revision even as the projected meaning itself is continually revised in the light of the interpretation and increasing understanding of the parts. By this process of to-and-fro reflection the understanding of the whole gradually emerges.

As Habermas puts it, the future exists as a horizon of expectations, which fuse hypothetically the fragments of previous experience into an intuitively grasped totality. We anticipate end states by reference to which events, both past and present, smoothly coalesce into "action-orienting stories."²³ This is a cycle of anticipation and revision. We anticipate the outcome of our activities and interpretation proceeds in the ambience of an anticipated outcome. The outcome permeates our present understanding.

Understanding thus involves a process of projection, but what is the nature of this projection?

Describing what he calls the "fore-structure of understanding," Heidegger says that in any interpretive event, such as understanding spoken language, a text, or the meaning of an object, before we begin consciously to interpret we have already placed the matter to be interpreted in a certain context, viewed it from a pre-given perspective, and conceived it in a certain way.²⁴

"The process that Heidegger describes is that every revision of the fore-project is capable of projecting before itself a new project of meaning, that rival projects can emerge side by side until it becomes clearer what the unity of meaning is, that interpretation begins with fore-conceptions that are replaced by more suitable ones. This constant process of new projection is the movement of understanding and interpretation."²⁵

Gadamer terms these fore-structures "prejudices," with the provocative intent of calling into question the Enlightenment's "prejudice against prejudice," which he sees as a wholly false interpretation of the nature of consciousness and as instrumental in creating an ethos of alienation. He aims to rehabilitate prejudice (pre-judging), rescuing it from its pejorative connotations. All understanding, he says, necessarily involves prejudice, fore-meanings that are not fully objectifiable. These prejudices can be either enabling or disabling, depending on the way in which they are opened up to hermeneutical understanding.

Interpretation, then, is "the working out of possibilities projected in understanding," that is, it is the working out of how something figures in the context in which it stands.

Heidegger and Gadamer both say that this anticipatory projection of meaning underlies every act of understanding. In sensing a thing we sense it *as* something. When we hear a sound we don't, except by an artificial and willed withdrawal of understanding, hear a meaningless, disembodied and abstracted sound, a mere impact upon the ear, but hear it as something carrying meaning—the cry of a baby, the screech of a tyre, the sound of a voice. When we see something, we see it not as a meaningless object to which we only later, and as a subsequent action, attach a meaning, but rather as something that we immediately, and coincident with the seeing, see as something already meaningful. The act of seeing something is an act of recognizing it, of understanding it as what it is.²⁶

The action of sensing a thing *as* something presupposes and *requires* that there is a preunderstanding of what the thing is prior to the simultaneous acts of sensing and recognizing it. In this action we understand the thing, we understand what it is, because we already understand it, and bring that prior understanding with us to the sensing and the recognizing.

“In interpretation we do not, so to speak, throw a ‘signification’ over some naked thing which is present-at-hand, we do not stick a value on it; but when something within-the-world is encountered as such, the thing in question already has an involvement which is disclosed to our understanding of the world, and this involvement is one which gets laid out by the interpretation.”²⁷

That is to say, when we interpret something as something, when we understand it as something, we do not first perceive it as an object and *then* clothe it with meaning. The interpretation is grounded in something we have in advance, a preunderstanding. We have a fore-conception. “An interpretation is never a presuppositionless apprehending of something presented to us.”²⁸ Meaning gets its structure from these preunderstandings, which render the thing intelligible. All interpretation therefore operates in the forestructures. The interpretation has already understood what is to be interpreted.

Similarly, we understand a speech utterance instantly, at the moment of hearing it. We understand it as meaningful, not after hearing it, but as we hear it. This understanding is only possible because we have a prior understanding of what the statement is saying even as it is spoken. We have, as it were, projected an understanding onto the statement in the moment of its enunciation, and in this manner understand the statement *as* something.

In our everyday, normal relationship with the world in which we live we make sense of things without having first to grasp them conceptually as objects that stand over against us. Things are simply there; they are not alien and distanced objects, but are familiar and already understood. Things are, in Heidegger's phrase, “ready-to-hand.” We perceive them “circumspectively,” that is, not as objects, but in a practical manner, either as things that have some practical use or else simply as things that are there in the situation in which we operate. We don't need to ask what things are doing there; they are familiar, at home, in their right place; they do not surprise us; we do not have to explain their presence; they do not elicit from us some special account of their meaning, because they are already, just as they are, meaningful. A hammer is of practical concern to the carpenter, but has no theoretical interest for him,

except when something goes wrong, when there is a "breakdown" in this relationship, and the hammer registers as an object or, as Heidegger puts it, it becomes "present-to-hand."

Our understanding of things in the lived world is not a matter of knowing objects but of taking them for granted. They are there, in our circumspective perception; they are already understood; our relationship to the world is already hermeneutical through and through; we understand things before they are there as objects for our direct inspection.

Not only do we throw forward our pre-understandings in every act of interpretation, says Heidegger, but the pre-understandings themselves have been "thrown" into our present situation from past experience. We are not simply "objects" in the world, objects without a history and as if isolated from the past, but are thrown into the midst of a network of understandings of practices, institutions, conventions, aims, tools, expectations, and a multitude of other factors that make us what we are.

Nor are our projections merely arbitrary productions of the subjective imagination. The projection derives from experience brought to bear on the clues scattered in the situation we are in.²⁹ Anticipations of the completed whole are not the positings of subjectivity but emerge from preunderstandings that inhere within the situation itself.³⁰

A typical positivist and empiricist criticism of the hermeneutical circle claims that the circle is vicious in that the "validation" of an interpretation can only be by appeal to other interpretations of the "parts," so that we are caught up in an endless cycle of interpretations.³¹ In this view there must be some criterion or method that stands apart from the circle of interpretations, something to which we can refer to assess the truth or falsity of our interpretations. In answer to this it can be said that we do not choose to enter the circle of interpretation. We are already in it, in all our thinking and actions, including the act of establishing scientific criteria of validation. As much as it may scandalize empiricists and positivists, the criteria by which we assess interpretations are nothing more or less than other interpretations. If the adequacy, or felicity, of our interpretation is not apparent to others, then the best we can do is refer them to other interpretations that support and expand our own. This again is the functioning of the hermeneutical circle: we establish an interpretation by appealing to other interpretations as a grounding for our own, which operation is an inter-referencing of whole and part. If this does not lead to unassailable certainty, then neither do any other events of understanding, including those that take place within the domain of rigorous scientific method. This lack of final and absolute certainty is the inescapable epistemological predicament that is built into the human condition. It is a condition of our own finitude.³²

Meaning is not fixed and firm, but is historical; it changes with time and as the situation changes. Understanding is in perpetual flux. Meaning is not an immutable object that stands over against us but is an everchanging part of an ever-changing situation. It is not an object, but neither is it subjective. It is not something we think first and then throw over onto an external object. It is known from within and can only be so known: we cannot get around in front of meaning, any more than we can get around

in front of language. We are embedded in meaning structures, and so cannot view them as objects that can be tested by the criteria of logic. Meaning exists prior to any separation of subject and object. In the interpretive act the Cartesian subject-object dichotomy dissolves.

How, then, can we assess the validity of interpretations? A projected interpretation only approximates what the whole might be and is highly fallible. It may well be a wholly inappropriate anticipation. Given that we cannot resolve conflicts between interpretations by an appeal to empirical evidence or to formal logic, since these presuppose a taken-for-granted understanding of what type of evidence and what type of argument can be allowed to enter into the discourse, by what token can we say that a projected interpretation is not merely arbitrary?

"The only thing that characterizes the arbitrariness of inappropriate fore-meanings is that they come to nothing in the working-out. But understanding achieves its full potentiality only when the fore-meanings it uses are not arbitrary."³³

The interpreter must not rely on the fore-meanings at once available to him, but must,

"examine explicitly the origin and validity of the fore-meanings present within him... This fundamental requirement must be seen as the radicalization of a procedure that in fact we exercise whenever we understand anything."³⁴

We assess the validity of interpretations by entering into a "dialectic of guessing and validation."³⁵ The projection must be perceived to be open to error and must be constantly recast, which is to say, reinterpreted. This is achieved by way of a dialogic exchange of question and answer, now to be examined as having direct relevance to the dynamics of the process of designing.

The Dialogical Basis of Understanding

Gadamer gives a series of metaphors to elucidate the nature of the hermeneutical event.³⁶ One metaphor likens understanding to the dialectical process of question and answer that takes place in serious conversation. It is pertinent here because it relates to themes to be developed in the following and also because it gives a picture of the functioning of language that is wholly opposed to the atomic language model. Gadamer cites authentic conversation or dialogue as the quintessential hermeneutic event.

Gadamer describes a dialogue as,

"a process of two people understanding each other. Thus it is characteristic of every true conversation that each opens himself to the other person, truly accepts his point of view as worthy of consideration and gets inside the other to such an extent that he understands not a particular individual, but what he says. The thing that has to be grasped is the objective rightness or otherwise of his opinion, so that they can agree with each other on the subject."³⁷

By dialogue he does not mean idle chatter, but genuine conversation, which he characterizes as follows:

"A fundamental conversation is never one that we want to conduct. Rather, it is generally more correct to say that we fall into conversation, or even that we become involved in it. The way in which one word follows another, with the conversation taking its own turnings and reaching its own conclusion, may well be conducted in some way, but the people conversing are far less the leaders of it than the led. Understanding or its failure is like a process which happens to us."³⁸

True dialogue is the opposite of argument. Both sides are immersed in the discussion. They are both concerned to enlarge their understanding of a subject. As in the exemplar of all dialogue, Socratic dialectic, it is a process of interrogation and appropriation. It involves a recognition and assimilation of the unfamiliar. In authentic dialogue the positions of both partners are transformed. A genuine dialogue is a give and take whereby the participants arrive at a new understanding.

To think of the dialogue as an encounter between a subject (I) and an other (thou) is to misread a subject-object dichotomy into a situation where it does not apply. In genuine dialogue the participants are caught up in the give and take, in such an involved way that they lose themselves in the conversation. The conversation has an internal buoyancy, the to-and-fro movement of a wholly absorbing game.³⁹ Gadamer makes the equation of the dynamics of dialogue and game-playing explicit when he says,

"Now I understand that the basic constitution of the game, to be filled with its spirit—the spirit of buoyancy, freedom and the joy of success—and to fulfill him who is playing, is structurally related to the constitution of the dialogue in which language is a reality. When one enters into a dialogue with another person and then is carried further by the dialogue, it is no longer the will of the individual person, holding itself back or exposing itself, that is determinative. Rather, the law of the subject matter is at issue in the dialogue and elicits statement and counterstatement and in the end plays them into each other."⁴⁰

The question-answer structure is a form of the hermeneutical circle since the question posits a preliminary way of seeing. The hermeneutical experience is dialogical. The reader enters into a dialogue with a text, commences a to-and-fro give and take that proceeds until understanding is reached. The dialogue enables the text to reveal itself and enables a new understanding.

Dialectic and the method of the natural sciences proceed in entirely different ways. In method the inquirer controls and manipulates; in dialectic the subject matter of the discussion poses questions to which the inquirer responds. The subject matter interrogates the inquirer. The dialectical process is entered into so that the subject matter can reveal itself. Gadamer says that experience has its dialectical fulfillment "not in knowing but in an openness for experience, which is itself set in free play by experience."⁴¹

In the paradigmatic hermeneutical event, the interpretation of a text, there is a reciprocity of questioning: the interpreter asks a question of the text, and at the same time the text addresses a

question to the interpreter. Further, to understand the text is to understand the question asked by the text. This is the question-answer structure of all true dialogue, a structure which is radically fundamental in every hermeneutic act. Gadamer claims that, like the hermeneutical circle, the structure of questioning inheres in all experience. He says,

"It is obvious that in all experience the structure of questioning is presupposed. Experience is not to be had without questioning. The realization that some matter is other than one had first thought presupposes the process of passing through questioning. The openness which lies in the nature of experience is, logically seen, as openness to thus or thus. It has the structure of a question."⁴²

The hermeneutical experience begins when the interpreter is sufficiently open to allow the text to question him or her. By this process the horizon of the interpreter is fused with the horizon of the text.⁴³ The text "unhinges" our prejudices and suggests its own. What is essential in any true dialogue is an openness to what the other is saying, so as to test our own understandings and preunderstandings.

Genuine conversationalists must be open to the questioning of the other, but this openness is not the "open-mindedness" of the *tabula rasa*. We ask questions which have a particular orientation, directed by our preunderstandings.⁴⁴ A question is always directional or intentional in character.

To say that a text questions us is to say that it speaks to us in the manner of a partner in a conversation. Is this a valid analogy? Gadamer acknowledges that the encounter with the text is not the same as the encounter between two people engaged in a conversation, in that the interpreter projectively supplies the meanings of the text. The text obviously does not in any literal sense speak and ask questions, and cannot even be said to speak for the author; but the concept of the text asking questions has validity in that in the act of its interpretation there is a communication, a fusion of horizons, in a common sphere of meaning. The disclosure of new understandings of a subject matter that is common to the text and the interpreter makes the hermeneutic situation the equivalent of the transmission of meanings that takes place in a dialogue conducted by two people. The dialogue with the text is like a living conversation "in that it is the common object that unites the partners, the text and the interpreter."⁴⁵ In the same way that a creative discourse is not originated or imagined by the interpreter but has its own impetus, takes its own course, and leads the participants, so the interpreter does not guide the conversation with a text but is rather guided through the subject matter.⁴⁶

Inquiry by way of question and answer characterizes the human and hermeneutic sciences. It is their distinctive mark just as the use of rigorous method is the distinctive mark of the natural sciences. The dialogic inquiry by means of question and answer is not a method: "There is no method of learning to question, of saying what is questionable."⁴⁷ Genuine questions are not something we think up nor something we do. On the contrary, they occur to us, they happen, they arise of their own accord.

There is no method of making up questions, but they can nevertheless be prevented from arising. They only occur to us if we allow them to arise and if the conditions are conducive to their appearance and

acceptance. The conditions are conducive when the interpreter is given over to the dialogue, as happens when we are engrossed in a stimulating conversation. In this situation I do not choose my words with care; I do not plan what I am about to say, but speak spontaneously. I hear my own words as I utter them and at the same time as my listener hears them, and they can be as disclosive to me as they are to the other. The conversation transcends the separation of subject and object. I interpret the other speaker's questions and objections in ways unintended when uttered. The conversation has a life of its own, leading the speakers into areas that are new to them, and going beyond their initial intentions and interests. We are caught up in conversation; questions arise effortlessly from the conversation itself, generated by its internal dynamics.⁴⁸ We sustain conversations; we do not create them, even if they draw upon our total interpretive skills and experience.

The Universality of the Hermeneutic Circle

Hermeneutical philosophy claims that the hermeneutical process outlined in the preceding is primordial and universal. It operates not only in the understanding of language and texts, but in every act of understanding. Processes of understanding are radically fundamental to all human perception, thought and action. The hermeneutical process is more basic than and prior to the use of logic, formal languages and scientific method, and therefore forms the foundation for all rationality.

The hermeneutical circle applies to one's whole life, which is an ongoing process of interpreting experiences.⁴⁹ Our interpretation of experiences modifies our perception of the past and our anticipations of the future; and our understanding of the past and the future forms the context in which we interpret experiences. Understanding and experience are in constant interaction. Our self-understanding affects our understanding of all other things. All understanding is self-understanding.

In this sense hermeneutics is fundamental to our mode of being. Understanding is not one of our activities in the world, but is basic to everything we do and are. "Understanding is the original character of the being of human life itself."⁵⁰ The hermeneutical structure acts in every kind of experience-gathering and in every mode of cognitive acquisition, including the acquisition of language. It operates in all exposition and in all learning. The hermeneutic circle that operates in the understanding of a text is a particular instance of a general state of affairs.

The operation of the hermeneutical circle is not the employment of a method. It is not something we can choose to use or not, in the manner of a tool. It is, rather, embedded in all thought and in all action. To elucidate the workings of this structure is not to formulate a new-found procedure as an alternative to others; it is not to propose a non-mathematically based model in contrast to models based on the paradigms of mathematics and formal language. It is, rather, simply to indicate what is operating in every act of understanding, operating at such a basic and radical level that it cannot be dispensed with, cannot be rejected or accepted. To speak of choosing it as a method is as meaningless as to speak of the acceptance or rejection of language.

Designing and the Hermeneutical Circle

After this long excursion, it is time to return and apply these findings to the design process. Even a cursory examination of the protocol studies of Donald Schön indicates that the design process he describes works according to the dynamics of the hermeneutical circle, proceeding by way of a dialogic exchange with the design situation.⁵¹

Schön speaks of design as "reflection-in-action," which is "a reflective conversation with the situation." "The principle is that you work simultaneously from the unit and from the total and then go in cycles—back and forth, back and forth..." We "begin with a discipline, even if it is arbitrary," which, in hermeneutical terms, is the projection of a preunderstanding. This projected discipline, says Schön, is a "what if," to be adopted in order to discover its consequences, and can always "be broken open later." The designer thus begins the design task by shaping the situation in accordance with an initial appreciation. The situation then "talks back" and the designer responds to the situation's back talk by reflecting-in-action on the construction of the problem, the strategies of action, or the model of the phenomena. The process then develops in a circle—"back and forth, back and forth." Each move draws out the implications of earlier moves, seen as having consequences that are described and evaluated in terms drawn from one or more design domains, and having implications binding on later moves, creating new problems to be described and solved. In this way the designer spins out "a web of moves, consequences, implications, appreciations and further moves."⁵²

What Schön describes here is a clear and straightforward account of the working of the hermeneutical circle. The designer proceeds by way of a continuing inter-referencing of a projected whole and the particulars that make up the design situation.

In the design process we project the meaning of the whole and work out the implications of this projection by referring it back to the parts.⁵³ There is a prescient anticipation of the whole, which is then explicated in the individual parts. The design is continually re-determined by an anticipatory movement of the pre-understanding. The designer has an anticipation of the whole which guides his or her understanding of the particularities. Understanding arises by a process of constant revisions.

Bernstein's description of the hermeneutical circle as a "continuous dialectical tacking between local detail and global structures... a sort of intellectual perpetual motion" applies equally well to the design process.⁵⁴ The design process turns local detail and global structures into explications of each other.

The design process can be compared with the interpretation of a text. Design is an interpretative activity, one of understanding a design situation rather than of solving a problem.⁵⁵ Designers come to the design situation with a pre-understanding of what the designed artefact will be. Even as they begin to examine the 'text' of the design situation—the parameters that 'define' it—they have a pre-understanding, a vague projection of the completed product. As they proceed with their interpretation and as their understanding increases by way of an interpretation of the parts, the projected whole is modified, refined, and clarified. This process is fluid, repetitive and continuous. It furnishes a

kaleidoscope of ever-changing reflections, revisions, false starts and back-tracking, leading eventually to a clarification of the projection.⁵⁶

We project a provisional image of a future fulfillment from our present situation of understanding, into which we have been thrown by our past design experience. There is a mutual influencing and interaction of past, present and future understandings. Our present understanding of the artefact projects forward to adumbrate the artefact in its future completion, and this provisional projection then throws back to refashion our present understanding, which in turn throws back to refashion our understanding of our past experience... and so the cycle continues.

In the design process we often do not fully know what the goal is until we have reached it.⁵⁷ Nevertheless, the obscurity of the goal does not block our design activity. Even though initially we don't know precisely what we are striving to achieve, we have some sort of vague preconception. The particulars of the situation give us clues to the unknown.⁵⁸ Our ability to arrive at a design goal depends on our ability to anticipate a hidden potentiality.

Again, even when the designer approaches a particular design task with a sense of its unintelligibility, a single factor in the design situation, perhaps some characteristic of the site or some specific requirement of the client, can illuminate and orient the task, drawing what was without coherence into a preliminary projection of a meaningful whole. The single factor suggests an image of the whole.⁵⁹ With this projection, albeit vague, the hermeneutical circle has been entered and can proceed in its back-and-forth way.

The efficacy of the process depends on keeping it moving. It also depends on an openness that allows for the intrusion of rival projections. Every projection contains the potentiality of itself projecting a new design. Alternate projections can develop side by side until they coalesce or one drops out of the contest.

Designing is grounded in understanding and is nothing other than the explication of what has already been understood. This does not mean, however, that the design is predetermined, or that the process must take a preordained sequence of logical steps, nor that there is a preestablished result—the answer—and prescribed methodological steps to that result. The explication of what is already understood only unfolds when the process is fluid and retroactive. The projected task completion must be allowed to reflect back into the design situation and affect the interpretation of particulars.

The hermeneutic act of designing follows a dialectical structure of question and answer.⁶⁰ The designer projects an anticipated completion of the work, and then enters into a dialogue with it, questioning its validity in the light of the particular factors that make up the design situation. The designer then allows the design situation to ask questions in its turn. The answers given by the situation and the questions it raises evoke further answers and questions, and the design proceeds by a back-and-forth, to-and-fro movement of query and response.⁶¹

If the design process is a dialogical cycle of question and answer, who or what does the design situation question? It questions all the prejudgments, preunderstandings, values and attitudes which the designer brings to the design situation, preconceptions which are taken for granted since they are for the greater part unconscious.⁶² The question is referred back to the designer's own fore-structures.

When designing, designers are continually being questioned. They can facilitate that process by laying themselves open to the questions, leaving themselves vulnerable, at risk, by taking the questions as probings of their prejudgments; or they can proceed in a one-sided manner, asking questions of the situation, but protecting their preestablished biases by not allowing themselves to be questioned in return. In the former case there is a revelatory disclosure of unconscious mind sets, and this disclosure renders the design process not only a dis-covery (an uncovering) of the artefact as it reveals itself in the process of discourse (in the manner in which insights reveal themselves to participants in a conversation), but it is also self-revelatory, a process of self-discovery or of edification.⁶³

The process of design is thus a disclosure, in two senses. Firstly, it is a disclosing of the artefact that is being designed; and secondly, and simultaneously, it is an unfolding of self-understanding, since it reveals one's preunderstandings. It uncovers the preconceptions that are constitutive of the design outcome, and at the same time brings to light the prejudices that are constitutive of what we are. The design process is an edification in two senses: it builds up the artefact and edifies the designer.

Is the analogy between designing and dialogue valid? In dialogue we speak with another person. In designing we enter into a discourse with a design situation and with our own design projections. In what sense can these be said to speak or ask questions?

We can engage in dialogue with things as well as people.⁶⁴ The project and the design situation are self-representing and act as texts, which the designer engages in dialogue. The designer enters into a dialogue with his or her own project and with the design situation as with unfamiliar and alien texts, allowing them to question preunderstandings.

In the design situation the designer speaks for the situation, channeling the questions it asks to him or herself.⁶⁵ One partner in the hermeneutical conversation, namely the design situation, like the text in its interpretation, is expressed only through the other partner, the designer-interpreter. In this the design situation is continually changing as the conversation proceeds. The situation does not answer and question the interpreter as some static thing. The situation changes as the interpreter's understanding of it changes, and this understanding is conditioned by the designer's prejudgments and preunderstandings. This rules out the notion of any "objective" analysis of the constitutive factors in a design situation. Not only do we select those "objects" in accordance with our interpretive preconceptions, but they are what we understand them to be at this moment. They have no abiding presence.

In the manner of a spirited conversation, which carries the speakers along and in which they

are wholly involved, the design situation carries the designer in its flow. Good conversation absorbs the speakers; so likewise the action of designing, when it is proceeding as it should, absorbs the designer. Designers are truly designing when they are so absorbed in the task that they are not aware that they are designing, nor that the design situation is an object outside themselves.

There is no end point in the hermeneutical circle; and neither is there a starting point. We do not come into a design situation without presuppositions. There is a minimal preknowledge necessary for understanding, without which the designer cannot begin to design. Descartes' ideal of a prejudiceless transparency of mind is unattainable. Not only does every part of the design presuppose the others, but we bring presuppositions regarding the whole situation and its parts by way of our experience, both our general life-experience and our more specific experience as designers. The most raw of design students, wholly untrained in design, has nevertheless been exposed from birth to the products of the design process. He or she comes to the design situation with this experience preforming suppositions concerning the nature of the product. It is fruitless to attempt to wipe the mind clean, to regain a *tabula rasa*, so that the student will come to the design task with an "open mind." There is no such thing as an open mind if this means a mind without prejudice, but the mind can be open to the questions raised by the design situation, open to the questions that threaten inappropriate presuppositions. To say that we bring prejudicial presuppositions to a task is not to say that those presuppositions cannot be made explicit nor that they cannot be challenged and changed or abandoned. This is precisely the nature of the hermeneutical process of question and answer when it is operating in an open and unrestrained manner. The presuppositions of the designer, projected as an anticipation of wholeness, are in a perpetual state of interrogation, review, revision or rejection. If the design educator acknowledges the ineradicable existence of presuppositions, recognizing them as stemming from the experience that underpins all understanding and as the base from which the design image is projected, then he or she, rather than attempting to eradicate prejudices in students, will introduce them to a design dialectic, in which those presuppositions and preunderstandings are continually under question and are revised, expanded or rejected as responses to those questions.

We believe that this, rather than any model based on logical sequences of operations, is the fitting and appropriate foundation of a design education.

Dialogical versus Logical Design

We have, then, two opposed concepts of language as metaphors for the design process. On the one hand there is the model of formalized language, the language of primary units that are combined according to the rules of logic to form meaningful structures; and on the other hand there is the metaphor of the language of conversation and dialogue, which is the language of interpretation.⁶⁶

The two notions of language are mutually exclusive. The language of hermeneutics and dialogue is wholly antithetical to formal language. Habermas asserts that the unequivocal character of formalized languages is purchased at the cost of any possibility of dialogue. Formal calculi, he says, have a

monadological structure, a structure that excludes conversation; they permit implications, but not communications; they replace dialogue with a mere exchange of information.⁶⁷ Bruns has shown that we only understand something when it is open to questioning. We cannot understand what is taken as settled and fixed. To be understood it must be restored to the questioning that gives it its sense.⁶⁸ Gadamer says that, "the logic of the human sciences . . . is the logic of the question,"⁶⁹ which means that it is dialogical rather than propositional. Propositional language shuts off questioning; it stops the interrogative flow; it expunges the ambiguities that open up new questions. In determinate, formalized language experience comes to a stand, assumes a fixed state, and expresses itself in assertions; but every assertion is the answer to a question. It is the task of the human (that is to say, hermeneutical) sciences to recall the questions that scientific propositions have forgotten, and to recall the process of conversation whence the proposition arose before it solidified into stasis. When a statement is considered definitive, it closes off any further questioning, for it is the definitive answer to whatever question was asked. No further question need be asked. In opposition to the propositional affirmations of the natural sciences, the human sciences affirm "the primacy of process over state and of question over statement."⁷⁰

Whereas formal language is a language at the disposal of the user, the language of authentic dialogue does not belong to the speakers, but rather possesses and guides them. Its function is not instrumental, but disclosive; it reveals understanding from within itself, and thereby serves as a medium that transmits understanding between the speakers. We do not use language in a conversation as a set of pre-given atomic meanings accompanied by a set of rules for their combination. On the contrary, as we have seen, the meaning of words depends on the situation in which they are used, and the logic of language is not the logician's logic but a logic of question and answer. The language used in conversation cannot be reduced to logically formalizable rule-grammars.

If, as we have proposed, the design process is one of question and answer, then we can begin to see the dangers inherent in the use of models of formal language to describe and control it. Formal language by its very structure excludes and precludes the operation of a dialogical exchange. The formal language model presupposes a separation of subject and object, and thereby conceals the dialectical nature of understanding. It obviates the engrossed involvement in which the subject and the object merge, an involvement which is the mark of genuine dialogue and the mark of genuine design activity. The formal model purchases finality at the price of holding open possibilities. In dialogue finality is forever suspended; the presuppositions of the participants are under continual review.

The dialogical and logical approaches to designing are irreconcilable. Designing, being a hermeneutical enterprise, does not employ inductive logic. It does not build generalizations from particulars in a linear and incremental manner, but predicts a generalization, the whole, and then works back and forth between that projected generalization and the particulars. In contrast to the deductive-nomological and inductive methods of explanation, which proceed by way of conclusions logically drawn from premises, the design process has no premises or conclusions. The whole and the parts of the interpretive situation are used neither deductively nor inductively, but as entities which confer

understanding, as speakers in a dialogical oscillation between interpretation and assessment. It starts with no categorically definite question, problem, *explanandum* or conclusion; nor, equally, does it start from premises. The project—the perfected whole which is aimed for—only becomes more definite and determinate as the particularities of the situation become clearer; and these, in turn, are only understood with greater clarity as the whole is disclosed. In retrospect, both the “conclusion” and the “premises” are seen to have been incoherent at the beginning of the interpretive process.⁷¹

Designing is primarily an interpretative activity. It is an activity that pertains to understanding a design situation rather than to having a knowledge of formulae, theorems and algorithms. Designing is a hermeneutical rather than an epistemological event. In the hermeneutical event application is interwoven with and wholly inseparable from interpretation and understanding; in the epistemological event, knowledge and its application are separate and sequential: knowledge is prior to its application. The answers to the questions arising in the situation are known in advance. They do not vary according to peculiar exigencies or contingencies.⁷² In the epistemological schema, theory precedes practice. In the hermeneutical event theory cannot be divorced from practice. The theory, such as it is, only comes into consciousness, is only clarified, disclosed, in the process of its application. Theory and practice coalesce in the act of interpretation; general principles are revealed as what they are, are revealed to be what they are, come to be understood in their being, in the unfolding of their application in the event.⁷³

The non-logical nature of the design process is shown in that, as was said previously, a single factor in the design situation can trigger the whole design process. Something in a part evokes a preconception of the whole. Explanations of such “leaps” cannot be encompassed by logic; but they are comfortably accommodated within the hermeneutic horizon, and without resort to notions of intuition, creativity, and the other processes supposedly hidden beyond scrutiny in the “black box” of subjectivity. Such leaps in the design process can be explicitly understood in terms of the situation in which they occur, their relation to the parts and whole within a field of interactions.⁷⁴

The hermeneutical nature of the design event has nothing to do with methodological analysis or hypothesis forming. A question in a dialogical situation projects a preliminary and provisional way of seeing. The question has its own horizon of expectations, which are subject to change according to the answer. Analysis and methodical questioning, by contrast, operate within a structure of inflexible presuppositions, which are not in turn called into question. The answer to the question is always expected to lie within the framework of the structure. The testing of a hypothesis is not a dialogical questioning, in which the answer in turn asks questions of the questioner, that is, in which the dialogue of question and answer breaks out of the framework of the methodological structure. In true dialogue the other's arguments are seen as a way of questioning oneself, and thus of transforming one's own understanding.⁷⁵ In logical discourse, by contrast, such a self-questioning is not possible.

This differentiates the hermeneutic projection from the scientific hypothesis. It would be an error to suppose that hermeneutic projections are simply hypotheses, or that the hermeneutical design

process described in the preceding is nothing other than the hypothesis-testing model of designing. The hermeneutical circle is wholly different to the process of verification or falsification of a hypothesis. The hypothesis, as conceived in Positivist methodology, formulates a specific anticipation, which is accepted in total or rejected outright on the evidence of testing procedures; experience answers the hypothesis with a simple yes or no, but in no way alters its content. The state of affairs proposed in the hypothesis is existent or non-existent. The hermeneutical anticipation, by contrast, feeds back into the particularities of the situation. The anticipation is either "fulfilled" or "disappointed"; if fulfilled it enriches the particularities, which then play back to enrich the anticipations; and if disappointed it likewise places the particularities in a new light, opening up new expectations and triggering further projections. In either case, whether the projection is fulfilled or disappointed, the horizon is enlarged.⁷⁶ The horizon change due to a disappointment of expectation is unlike the falsification of a hypothesis by way of a method. We have said that the disappointment of a projected expectation enlarges the expectation horizon. This enlargement is the discovery of something that has existed in the situation all along; it is implied in the old, discredited expectation. Unlike an hypothesis, which is discrete and strictly defined, every expectation horizon contains other horizons potentially within itself, alternate horizons which are revealed when the original expectation collapses. Gadamer posits that the disappointment of an anticipation is really a reversal of consciousness, a self-confrontation, which not only reveals our delusive opinions, but also the ways in which we have unconsciously been proceeding, thus bringing about a restructuring of understanding.

Logic-based models are powerless to comprehend (in both senses) the "irrational," contradictory and confused nature of much of the designer's activities. These aspects of the design process are wholly outside the limits of logic-based models. The same design behaviour "makes sense," however, when we approach it from the viewpoint not of logical knowledge but of understanding. We can make sense of design activities when we understand why the designer uses them, even when they are not logical, and this understanding arises when we locate design activities within the field of the design situation and the meanings that situation has for the designer. Making sense of the meanings of design actions and a design situation can only proceed by way of reference to the circle of interpretation. Design actions and design situations make up a "text" that can be read. This "reading," however, can only be explained not by reference to some external criterion, but to other readings that have reference to a projected whole. No argument based solely on logic is relevant in this never-ending play of interpretive readings.

All questions are prejudicial since they isolate out one thing rather than another to be answered; but whereas the limitations of a scientific model closes the view to new developments, the question, precisely because it is limited, *opens up* views. As Gadamer says,

"The openness of the question is not boundless. It is limited by the horizon of the question. A question which lacks this is, so to speak, floating. It becomes a question only when the fluid indeterminacy of the direction in which it is pointing is overcome by a specific alternative being presented. In other words, the question has to be asked. The asking of it implies openness, but

also limitation. It implies the explicit establishing of presuppositions, in terms of which can be seen what still remains open."⁷⁷

Whereas the use of logical methods is intended to arrive at a "solution" of a design "problem," a design process that proceeds by way of question and answer can have no final end. The answers given to a question open up further questions for those who are open and receptive to questioning. There is no "correct" answer that can be arrived at in the manner in which a correct answer can be arrived at by following a prescribed sequence of mathematical or logical steps. In the design process the answer to a question only opens up further questions, in a never-ending series. The end of the process is always imposed from outside the process, not from any finality that is found in the process itself. Whatever the nature of the external constraints that force an end to the ongoing process, every designer knows that any design could always be taken further.

The design process is an uncovering of *tacit* understanding,⁷⁸ and this hidden understanding is not something fixed, crystalline, frozen. It is processual, fluid, in incessant flux. It cannot, therefore, be brought to the surface in the manner of an archaeological find—some lifeless object—dredged up from the depths of the mind. Understanding is always in process, and this process is unending. It has no endpoint; it can never reach finality or completion. We never reach a point where it can be said, "Disclosure is complete," because new understandings are ever possible. Interpretation is never at an end. An interpretation evokes new interpretations. Understanding plays back to elicit new responses from the past; and plays forward to elicit new responses from the future. The design event is an inexhaustibly prolific and productive matrix, because it is a matrix that is ever reforming itself in conformity with its product.

• • • • •

The general philosophical critique of the atomistic language model gains a new significance in the light of hermeneutic insights into the nature of the design process. At the level of ordinary speech and action meaning plays a basic and necessary role in all human behaviour. Every situation has meaning. If things and situations have meanings they do so within a network of other meanings. In the same way that a word only has meaning in a context and in relation to other words used within a situation, so things only have meaning in relation to other things and other meanings in the field of meanings that the situation comprises. We cannot derive meaning from a single, isolated, unrelated thing.

Likewise the elements, the single, atomic "tokens" that are combined according to grammatical rules, have no meaning to the degree that they are isolated from a context; and, conversely, they are meaningful to the degree that they are embedded in a rich play and counter-play of other "elements," each carrying its own meaning, a meaning which, in the manner of a word in spoken language, can only be understood in relation to a context. As with concepts in a semantic field, where the introduction of new concepts alters the boundaries of other concepts, meanings are founded in relationships and contrasts.

A formal language—a rule-bound and artificial language made up of primary tokens—no more gives a true account of the language of design than it does of ordinary spoken language. The language of design, like normal spoken language, does not proceed according to rules, nor do we learn it by way of rules. The design world no more consists of a set of atomic facts whose relationship can be expressed in logical propositions than does the world at large. We do not experience either of these worlds as a set of objective facts. 'Facts' interrelate with and interpenetrate other 'facts'; they cannot be considered in isolation, nor are they separable. We have always already interpreted 'facts' in the context of human needs, expectations, preoccupations, preconceptions, intimations. As soon as we make a 'fact' explicit, isolate it and rip it from context, we have lost its richness of meaning. To give a single and precise meaning to the 'fact' is its emasculation. As are words in language, every fact, whether in a design world or in the world as a whole, is polysemic.

Herein lies the basis for the hermeneutic critique of the atomistic notion of language and design with which this article commenced. We cannot understand the meanings of isolated elements such as words in a sentence or design tokens in a design situation unless we have a prior knowledge of the whole context within which the elements occur; we cannot substitute a stepwise, algorithmic procedure for practice involving interpretation, since our choice of elements is dictated by our understanding of the practice. The practice is not "legitimized" by a "rational reconstruction" out of the elements. We cannot avoid the circle of understanding; we cannot grasp the parts, the steps, of a process such as designing unless we know beforehand how the whole thing works, and we cannot get this holistic grasp until we understand the parts.⁷⁹

To view the word or the design element as an atomic unit is to view it as an object, which presupposes a subject. But the word only has meaning in the context of interpretation, and interpretation, as Heidegger and Gadamer have insisted, involves a fusion of the subject and the object. The act of interpretation dissolves the subject-object dichotomy. We do not stand back and apart from words as we use them in a situation. We are involved with words and with the situation. We do not possess words nor use them in the manner of tools, things to be used and manipulated, but we *are* the words we use. Language possesses us. We do not stand over against language, but are embedded in it.

So also, in the design process, we do not stand over against the entities that make up the design situation and manipulate them to form larger entities. If there is any sense at all in speaking about design "elements," there can be none in speaking about their manipulation. We do not control the various elements that enter into the design event. Quite on the contrary, they have meaning and relevance in that situation to the degree that we are caught up in the process, to the extent that those entities reveal themselves, indicate possibilities, and lead us in a process of disclosure.

To regard design tokens as objects to be manipulated and controlled is to accept the instrumental view of language, which sees language as a tool, as something external to the subject, something to be used. Such a view immobilizes the spontaneous play of dialogical exchange that is the hallmark of the design process; it prevents the disclosive function of language, in which language reveals new understandings

from and of itself. It blocks the free flow of interpretation.

The atomistic language model casts potentialities of understanding in pre-established molds. It formulates possibilities of understanding *in advance* and once and for all. It pre-defines the limits of the process and thereby contains its free movement and blocks the disclosive function of dialogical language. Whereas hermeneutical designing proceeds within a network of shifting relationships, formal logic fixes this state of flux in static formulae. The fluidity of design is captured, as if by a camera, in algorithmic "stills."

Codified knowledge brings pre-known and pre-scribed answers to the design situation. Knowing the answers in advance, questions are redundant. Knowing excludes questioning. Those who know need not listen; they have the game sewn up. Pre-scribed decisions keep the situation silent.

The atomistic model renders the hermeneutical circle vicious. It pre-establishes projected meanings so that only what has been previously selected as knowable can become known, thus blocking the acquisition of new knowledge or understanding. The algorithmic formula encapsulates a knowledge of what has gone before. What has gone before becomes the prescription for what is to follow. A petrification of the past becomes the paradigm for present action. Presuppositions are necessarily brought to every interpretive event; but whereas the presuppositions of method have frozen understanding in advance, the hermeneutical circle allows for an ongoing progression of understandings.

The atomistic language model, furthermore, is an exercise in exclusion. The model narrowly defines design in terms of its own preoccupations. It deals with only a tiny portion of what goes on in a design situation and excludes all else. To define design as the manipulation of formal elements is to exclude the greater part of design, the part relating to its physical and human context. What the model defines is not the design process as such but, at best, one of its ancillary activities. To answer that the manipulation of tokens is merely an exemplary process that could be extended by analogy to cover every aspect of designing is to enter into an infinite regress like the one Wittgenstein describes, in which the results derived by the manipulation of fragmentary aspects of the design situation must then be combined by meta-rules of manipulation to form wholes which in turn need a new set of rules... and so on, endlessly. Hermeneutics would add that the parts to be combined can only be understood in terms of an anticipated, projected whole.

The term "exclusive" has two senses: excluding the other, and uniqueness. The atomic language model of design is exclusive in both senses. It excludes whatever is not contained within its definition of design; and it can be taken by the unwary to be *the* design process. This is to regard the use of a design grammar as design itself, as if we were to regard grammar as the operative principle in writing or speaking.

An algorithm, whether or not it makes explicit use of linguistic models, selects out the commonalities of different design situations. It works in the domain of universals, of what is shared by every member of a class. Such is the nature of scientific laws. But in the realm of design, as in the human sciences, it

is precisely the distinctive, the particular, the unique, the unrepeated and the unrepeatable, the idiosyncratic, that is important. Difference, not sameness, is the proper focus of study. It is not what this design situation has in common with all other design situations, or what this sequence of design operations shares with all others that is important, but what marks it out as special, individual, distinctive—as it is in our dealings with people.

In Conclusion

In conclusion, if, as has been argued here, the design process belongs to the domain of social actions and interactions, is firmly embedded in a human situation, and is a focal nexus within a network of intersubjective relationships, then it is more appropriately studied in terms of hermeneutic structures than of the natural sciences. It is to be understood not in terms of a language of precise logic which manipulates atomic tokens in an exact sign system, as in computational models of design,⁸ but rather in terms of the language of everyday conversation, which is the language of social interaction. It belongs to the domain of dialogic question and answer. Designing is hermeneutical.

¹ See George Stiny, "Introduction to Shape and Shape Grammars," *Environment and Planning B*, 7 (1980): 342-351; William J. Mitchell, *The Logic of Architecture: Design, Computation, and Cognition*, Cambridge, Massachusetts, MIT Press, 1990; H. Yoshikawa, "General Design Theory and a CAD System," in T. Sata and E. Warman (eds), *Man-Machine Communications in CAD/CAM*, Amsterdam, North-Holland, 1981; R.D. Coyne, M.A. Rosenman, A.D. Radford, M. Balachandran and G.S. Gero, *Knowledge-Based Design Systems*, Reading, Massachusetts, Addison Wesley, 1990; and Richard Coyne, *Logic Models of Design*, London, Pitman, 1988. Aart Bijl (*Computer Discipline and Design Practice: Shaping Our Future*, Edinburgh University Press, Edinburgh, 1989) expresses unease and ambivalence, prevalent within the CAD research community, about all-embracing computational models of design. The computer scientists and linguists, Terry Winograd and Fernando Flores (*Understanding Computers and Cognition*, Reading, Massachusetts, Addison-Wesley, 1987) give a stimulating critique of the algorithmic logic model.

² Mitchell, *Logic of Architecture*.

³ Mitchell, *Logic of Architecture*, pp. ix-x.

⁴ Mitchell, *Logic of Architecture*, p. x.

⁵ Mitchell, *Logic of Architecture*, p. 39.

⁶ Plato, *Seventh Letter* 342 E 4.

⁷ Plato, *Cratylus*, *passim*. Cf. Gerald L. Bruns, "On the Weakness of Language in the Human Sciences," in John S. Nelson, Allan Megill and Donald A. McCloskey (eds), *The Rhetoric of the Human Sciences—Language and Argument in Scholarship and Public Affairs*, Madison, Wisconsin, University of Wisconsin Press, 1987, pp. 239-262.

⁸ Hans-Georg Gadamer, *Truth and Method*, London, Sheed and Ward, 1975, p. 373.

⁹ Jack Mendelson, "The Habermas-Gadamer Debate," *New German Critique* 18 (1979): 44-73, p. 49.

¹⁰ Ludwig Wittgenstein, *Tractatus Logico-Philosophicus*, trans. D.F. Pears and B.F. McGuinness, London, Routledge and Kegan Paul, 1961.

¹¹ The quotes are taken from Barry Gross, *Analytic Philosophy*, New York, Pegasus, 1970, p. 143, where he lists the basic assumptions of Wittgenstein's *Tractatus*. Cf. P. Christopher Smith, "Gadamer's Hermeneutics and Ordinary Language Philosophy," *Thomist* 43 (1979): 296-321, p. 300.

¹² Wittgenstein, *Tractatus*, § 5.6.

¹³ Ludwig Wittgenstein, *Philosophical Investigations*, trans. G.E.M. Anscombe, New York, Macmillan, 1958,

§ 18.

- ¹⁴ Wittgenstein, *Philosophical Investigations*, § 23.
- ¹⁵ Stanley Cavell, *Must We Mean What We Say?* New York, Charles Scribner's Sons, 1969, p. 52.
- ¹⁶ Wittgenstein, *Philosophical Investigations*, p. 227.
- ¹⁷ Hubert L. Dreyfus, *What Computers Can't Do. The Limits of Artificial Intelligence*. New York, Harper and Row, 1979, p. 203.
- ¹⁸ J.L. Austin, *How to Do Things with Words*, Cambridge, Mass. Harvard University Press, 1962, p. 145.
- ¹⁹ Language is not a sign system as described in Structuralism or by Chomsky. This is a theme that we intend to develop elsewhere, especially as it relates to these systems as providing a theoretical base for Post-Modernist architecture.
- ²⁰ The following analysis of hermeneutics derives mainly from Martin Heidegger and Hans-Georg Gadamer. See Martin Heidegger, *Being and Time*, trans. John Macquarrie and Edward Robinson, London, Basil Blackwell, 1962; Gadamer, *Truth and Method*; Gadamer, *Reason in the Age of Science*, trans. Frederick G. Lawrence, Cambridge, Mass., MIT Press, 1981; Gadamer, *Philosophical Hermeneutics*, trans. and ed. David E. Linge, Berkeley, University of California Press, 1976; Gadamer, "The Problem of Historical Consciousness," *Graduate Faculty Philosophical Journal* 5, 1 (1975), repr. in Paul Rabinow and William M. Sullivan (eds) *Interpretive Social Science—A Second Look*, Berkeley, University of California Press, 1979 pp. 82-140; Gadamer, "Hermeneutics and Social Science," *Cultural Hermeneutics* 2 (1975): 307-16; and Gadamer, "The Universality of the Hermeneutical Problem," in Gayle Ormiston and Alan D. Schrift (eds) *The Hermeneutic Tradition: From Ast to Ricoeur*, Albany, State University of New York Press, 1990 pp. 147-158. A large literature has appeared in recent years commenting on and expanding the findings of these two philosophers. See the bibliography in Ormiston and Schrift. We have also relied heavily on Georgia Warnke, *Gadamer, Hermeneutics, Tradition and Reason*, London, Polity Press, 1987.; Joel C. Weinsheimer, *Gadamer's Hermeneutics: A Reading of Truth and Method*, New Haven and London, Yale University Press, 1985; Richard E. Palmer, *Hermeneutics—Interpretation Theory in Schleiermacher, Dilthey, Heidegger and Gadamer*, Evanston, Northwestern University Press, 1969; Dieter Misgeld, "On Gadamer's Hermeneutics," *Philosophy of the Social Sciences* 9, 2 (1979): 221-39; David E. Linge, "Editor's Introduction," in Gadamer, *Philosophical Hermeneutics*, pp. i - lviii; Roy J. Howard, *Three Faces of Hermeneutics. An Introduction to Current Theories of Understanding*, Berkeley, University of California Press, 1982; James S. Hans, "Hermeneutics, Play, Deconstruction," *Philosophy Today* 24 (1980): 297-316; Hans, "Hans-Georg Gadamer and Hermeneutic Phenomenology," *Philosophy Today* 22 (1978): 3-19; Klaus Dockhorn, "Hans-Georg Gadamer's *Truth and Method*," *Philosophy and Rhetoric* 13, 3 (1980): 160-80.
- ²¹ Gadamer (*Truth and Method*, p. 269) defines "horizon" as follows: "Every finite present has its limitations. We define the concept of 'situation' by saying that it represents a standpoint that limits the possibility of vision. Hence an essential part of the concept of situation is the concept of 'horizon.' The horizon is the range of vision that includes everything that can be seen from a particular vantage point." When we use the terms "horizon" and design "situation" in the following, we are using them in the sense in which Gadamer here defines them.
- ²² Gadamer, *Truth and Method*, p. 236.
- ²³ Jürgen Habermas, "A Review of Gadamer's *Truth and Method*," in Fred R. Dallmayr and Thomas A. McCarthy (eds) *Understanding and Social Inquiry*, Notre Dame and London, University of Notre Dame Press, 1977, pp. 335-363, [p. 350].
- ²⁴ Heidegger, *Being and Time*, ¶ 31-33 (pp. 182-203.) Heidegger terms these three fore-structures "fore-having" (*Vorbabe*), "fore-sight" or "fore-seeing" (*Vorsicht*), and "fore-conception" or "fore-hypothesis" (*Vorgriff*). *Vorbabe* includes all the culturally acquired skills and practices we employ in acts of interpretation; these cultural practices are constitutive of our being, and thus determine what we find intelligible. *Vorsicht* includes all the resources of a common descriptive language, the vocabulary or conceptual scheme we bring to the act of interpretation, and which determines what we count as real and what are relevant aspects of what we interpret. *Vorgriff* is a hypothesis we have concerning the thing being interpreted; it is the "conceptual

reservoir" that we hold in advance and bring to the interpretive act. See Heidegger, *Being and Time*, p. 193; Warnke, *Gadamer, Hermeneutics, Tradition and Reason*, pp. 77 ff.; Patrick A. Heelan, *Space-Perception and the Philosophy of Science*, Berkeley, University of California Press, 1983, pp. 220 ff.; Heelan, "Perception as a Hermeneutical Act," *Review of Metaphysics* 37 (1983): 61-75, pp. 69 ff.; Winograd and Flores, *Understanding Computers*, pp. 75 ff; Ormiston and Schrift, *Hermeneutic Tradition*, pp. 15 ff.

²⁵ Gadamer, *Truth and Method*, p. 236.

²⁶ This concept of understanding as metaphoric comes from Heidegger (*Being and Time*, *op. cit.*, ¶ 33, pp. 195-203 and cf. p. 410). Heelan, *Space-Perception* . . . , *passim*, develops the Heideggerian concepts as they relate to perception.

²⁷ Heidegger, *Being and Time*, pp. 190-1.

²⁸ Heidegger, *Being and Time*, pp. 191-2.

²⁹ The nature of experience involves notions of skill, tacit understanding and what Gadamer calls "effective-historical consciousness."

³⁰ These preunderstandings derive in large part from the tradition—both cultural and professional—in which the practitioner operates. See Günther Buck, "The Structure of Hermeneutic Experience and the Problem of Tradition," *New Literary History* 10, 1 (Autumn 1978): 31-47.

³¹ Studies in this dissenting mode include E.D. Hirsch Jr., *Validity in Interpretation*, New Haven, Connecticut, Yale University Press, 1967; Charles Altieri, "The Hermeneutics of Literary Indeterminacy: A Dissent from the New Orthodoxy," *New Literary History* 10, 1 (1978): 71-100; Anthony Savile, "Historicity and the Hermeneutic Circle," *New Literary History* 10, 1 (1978): 49-70; Peter Szondi, "Introduction to Literary Hermeneutics," *New Literary History* 10, 1 (1978): 17-30.

³² To label this as "relativism" is merely to pander to untenable Positivist notions of "objectivity." See Charles Taylor, "Interpretation and the Sciences of Man," *Review of Metaphysics* 25 (1971): 3-34 (repr. in Dallmayr and McCarthy, 1977, pp. 101-30; and in Rabinow and Sullivan, *Understanding and Social Inquiry*, pp. 33-81]. Cf. Richard J. Bernstein, *Beyond Objectivism and Relativism*, Oxford, Basil Blackwell, 1983, pp. 133 f., and *passim*.

³³ Gadamer, *Truth and Method*, p. 237.

³⁴ Gadamer, *Truth and Method*, p. 237.

³⁵ The phrase is from Paul Ricoeur, "Ethics and Culture—Habermas and Gadamer in Dialogue," *Philosophy Today* 17 (1973): 153-65. Cf. Rabinow and Sullivan, *Interpretive Social Science*, p. 15.

³⁶ Gadamer's *Truth and Method* could be described as a series of such metaphors.

³⁷ Gadamer, *Truth and Method*, p. 347.

³⁸ Gadamer, *Truth and Method*, p. 345.

³⁹ Play is another of the metaphors that Gadamer uses to provide insights into the nature of the workings of the hermeneutical enterprise.

⁴⁰ Gadamer, *Philosophical Hermeneutics*, p. 66.

⁴¹ Gadamer, *Philosophical Hermeneutics*, p. 338.

⁴² Gadamer, *Philosophical Hermeneutics*, p. 344. Cf. Ted Peter, "The Nature and Role of Presupposition: An Inquiry into Contemporary Hermeneutics," *International Philosophical Review* 19, 2 (1974): 209-222, p. 217.

⁴³ The notion of the fusion of horizons is fundamental to Gadamer's philosophy of hermeneutics. See Jan Edward Garrett, "Hans-Georg Gadamer on 'Fusion of Horizons'," *Man and World* 7 (1978): 392-400.

⁴⁴ Cf. Peter, "The Nature and Role of Presupposition . . .," *passim*.

⁴⁵ Gadamer, *Truth and Method*, p. 349.

⁴⁶ Cf. John Hogan, "Gadamer and the Hermeneutical Experience," *Philosophy Today* 20 (1976): 3-12.

⁴⁷ Gadamer, *Truth and Method*, p. 329.

- ⁴⁸ Cf. Alisdair MacIntyre, "Contexts and Interpretation. Reflections on Hans-Georg Gadamer's *Truth and Method*," *Boston University Journal* 24, 1 (1978): 41.
- ⁴⁹ The application of the hermeneutical circle to life experience (*Erlebnis*) is a pivotal concept in the philosophy of Dilthey. Cf. Warnke, *Gadamer, Hermeneutics, Tradition and Reason*, pp. 26 ff.
- ⁵⁰ Gadamer, *Truth and Method*, p. 230.
- ⁵¹ Donald A. Schön, *The Reflective Practitioner—How Professionals Think in Action*, New York, Basic Books, 1983. Schön's studies are a sound base for research into the hermeneutical nature of the design process. Cf. Peter G. Rowe, *Design Thinking*, Cambridge, Mass., MIT Press, 1987.
- ⁵² Schön, *Reflective Practitioner*, pp. 78 ff.
- ⁵³ The associations are reflected in etymologies. We speak of the design "project," which word literally means a "throwing before." "Project" is used to translate Heidegger's *Entwurf*, which means "throwing something off or away from one," with a stronger sense of "throwing" than does the English equivalent. In its common usage, however, *Entwurf* means "designing" or "sketching" some intended "project." It is also used in the sense of "projection" as when we say that a geometer "projects" a circle onto a plane surface. See Ormiston and Schrifft, *The Hermeneutic Tradition*, p. 130 (fn. 6).
- ⁵⁴ The phrase comes from Bernstein, *Beyond Objectivism* . . . , p. 95, where he is speaking of the hermeneutical process in general.
- ⁵⁵ We consider the term "project" to be more appropriate to describe the design task and its goal than is the word "problem," which carries over connotations from mathematics and the physical sciences. To speak of the Gothic masons, for example, as having the "problem" of designing Chartres is faintly ludicrous. To speak of "problems" is already on the way to handing over design to fundamentalist scientism. On the other hand, the etymology of the word "problem" itself carries associations with "project." It comes from the Greek *problema*, -matos, from *pro-ballō*, "to throw before," that is, "fore-throwing."
- ⁵⁶ This is obviously merely an outline of what is a complex procedure. The design develops both verbally and by way of images; and there is an involvement of the body as well as the mind. It is intended elsewhere to develop the ideas sketched here.
- ⁵⁷ This is one of the characteristics of the "wicked problems" that at one time exercised design methodologists.
- ⁵⁸ Cf. Michael Polanyi, *Personal Knowledge*, Chicago, Illinois, University of Chicago Press, 1958, pp. 126 ff. Aspects of Polanyi's thinking, working from an epistemological base, show remarkable parallels with hermeneutics.
- ⁵⁹ Cf. Jane Darke, "The Primary Generator of the Design Process," *Design Studies* 1, 1 (1979): 36-44.
- ⁶⁰ We are here in the realm of metaphor, where the literal or true/false statement is alien. The metaphor of dialogue, the back-and-forth of question and answer, is a metaphor for a process that might or might not be conscious, and might or might not be verbal. For the designer, the visualization of forms in the imagination can be as evocative as any question articulated verbally.
- ⁶¹ The dialogue is multi-faceted, with a multitude of questioners and answerers. The conditions of the site, the brief, and all the other factors have their questions and their answers. It is not intended here to go into specifics.
- ⁶² The "unconscious" here is not to be confused with the unconscious of psychoanalysis. Unlike the contents of the psychoanalytical unconscious, what is brought into the open in the hermeneutical process has not been repressed. The disclosure is not brought about by the removal of some sort of blockage, but is, rather, the revealing of the nature of the thing, which is the resultant nexus of an historic process.
- ⁶³ The concept of edification (*Bildung*), involving associations with cultivation and education, is basic to the thinking of Gadamer. Richard Rorty (*Philosophy and the Mirror of Nature*. Oxford, Basil Blackwell, 1980) borrows the idea, and makes it central to his concepts concerning the function of philosophy.
- ⁶⁴ Bruno Latour develops the concepts of things as speakers in a dialogue. See his "Clothing the Naked World," in Hilary Lawson Lisa Appignanesi (eds) *Dismantling Truth*, London, Weidenfeld and Nicolson, 1989, pp. 101-126 [p. 121 ff.].
- ⁶⁵ A tutor in the design studio performs the same translating function.

- ⁶⁶ Models are forms of metaphors; but metaphors are not necessarily models. Metaphor is the general term for a structure that includes models. Models as defined by science have limitations that are not binding on other types of metaphor. See Adrian Snodgrass, "Models, Metaphors and the Hermeneutics of Designing," *Design Issues* 9, 1 (1992): 56-74.
- ⁶⁷ Jürgen Habermas, "A Review of Gadamer's *Truth and Method*," in Dallmayr and McCarthy, *Understanding and Social Inquiry*, pp. 335-363 [p. 341].
- ⁶⁸ Bruns, "On the Weakness of Language in the Human Sciences," pp. 252 ff.
- ⁶⁹ Gadamer, *Truth and Method*, *op. cit.*, p. 333.
- ⁷⁰ Cf. Weinsheimer, *Gadamer's Hermeneutics*, p. 206.
- ⁷¹ Cf. Heelan, *Space-Perception* . . . , pp. 265 f. The implications for abduction still remain to be demonstrated.
- ⁷² In the same way that a primary tenet of Functionalist architecture was that buildings should have the same style everywhere, whatever the local conditions. Hence the "International" Style.
- ⁷³ This leads into some of Gadamer's most valuable insights: the identity of understanding, interpretation and application; the working of *phronesis*; the identity of theory and practice; the operation of ethics in practice; etc. It would take us too far afield to develop these considerations here.
- ⁷⁴ See Snodgrass, "Models, Metaphors and the Hermeneutics of Designing."
- ⁷⁵ Cf. Palmer, *Hermeneutics*, pp. 233 ff.
- ⁷⁶ This theme is developed by Günther Buck, "The Structure of Hermeneutic Experience and the Problem of Tradition," *New Literary History* 10, 1 (Autumn 1978): 31-47 [pp. 35 ff.].
- ⁷⁷ Gadamer, *Truth and Method*, p. 327.
- ⁷⁸ We use the term "tacit understanding" rather than Polanyi's term "tacit knowledge" because understanding and knowledge, as noted above, are to be distinguished. The concept of "tacit knowledge" leads into a web of epistemological pre-assumptions that are irrelevant in this context.
- ⁷⁹ Rorty, *Philosophy and the Mirror of Nature*, p. 319.
- ⁸⁰ Winograd and Flores, *Understanding Computers*, discuss the appropriate use of computers within a hermeneutical context. They describe a particular approach to computer system design which facilitates human dialogue and interaction.

X

UNIVERSITY OF SYDNEY LIBRARY



0000000604794977

20 OCT 1997

ALL BOOK BINDERY

91 RYEDALE ROAD
WEST RYDE 2114

PHONE: 3807 6026