/Porosity and Participation: The Architecture of the Canadian Institute of Design/

By

Bini Saha, B.Arch.

A thesis submitted to
The Faculty of Graduate Studies and Research
In partial fulfillment of the requirements for the degree of

Master of Architecture (Professional)

School of Architecture
Carleton University
Ottawa, Ontario
2004-2005

© Copyright
2005, Bini Saha

Library and
Archives Canada

Bibliothèque et
Archives Canada

Published Heritage
Branch

Direction du
Patrimoine de l'édition

395 Wellington Street
Ottawa ON K1A 0N4
Canada

395, rue Wellington
Ottawa ON K1A 0N4
Canada

0-494-06819-1

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

MR06819

Canada

Abstract

The first part of the thesis is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The second part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The third part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The fourth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The fifth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The sixth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The seventh part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The eighth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The ninth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary. The tenth part is devoted to the study of the asymptotic behaviour of the eigenvalues of the Laplacian on a domain with a fractal boundary.

Acknowledgements

I would like to thank Professor Stephen Fai for his kind support, probing questions, and exceptional guidance. I am also grateful to my family and friends for their continued motivation, patience and encouragement.

Abstract

The thesis considers the architectural implications of a new understanding of social space as porous space. This paradigm sees social space not as a homogenous, abstract and passive entity, but as heterogeneous, porous and active through democratic participation. This examination draws parallels between porosity and Canada's participatory democracy. A critical appraisal of the Bauhaus ideology, as a historical precedent and a survey of other institutes of design, as case studies elucidates the functioning, possibility and need for such an institute. This in conjunction with a discussion of Henri Lefebvre's notions of social space and George Parkin Grant's views on Canadian democracy forms a framework for the Canadian Institute of Design. The porous architecture of the Canadian Institute of Design demonstrates the possibility of creating a social and democratic environment. The Canadian Institute of Design sets the national agenda for the role of design in its social, political, cultural and creative contexts. It affirms the strategic importance of building and promoting national awareness and consciousness about design.

Table of Contents

1 INTRODUCTION	1
2 WHAT IS AN INSTITUTE OF DESIGN	9
2.1 The Bauhaus	10
2.2 The Institute of Design (ID), Illinois.....	38
2.3 Design Institute of Australia (DIA), Melbourne	42
2.4 The Institute of Design Research and Outreach (IDRO), Iowa.....	45
2.5 The Netherlands Design Institute, Amsterdam.....	47
2.6 Case Study Conclusions.....	52
3 POROSITY	54
3.1 Social Space as Porous Space	56
3.2 Porous space and Canadian democracy	60
3.3 Public Participation.....	62
3.4 An Environment Conducive to Creativity	64
3.5 Raising Standards for Quality	66
4 DESIGN IN CANADA	70
4.1 A Brief History	70
4.2 Public Participation in Canada.....	75
5 SITE AND CONTEXT.....	77
5.1 Connections and Links	77
5.2 LeBreton Flats	81
6 CANADIAN INSTITUTE OF DESIGN.....	92
6.1 Project.....	92
6.2 Program	94
6.3 Architectural Elements	102
6.4 Design Factors	106
7 CONCLUSIONS	126
Bibliography	130

Table of Illustrations

All images copyright of the author unless otherwise noted.

Figure 2.1 Itten's Preliminary Course	15
Source: http://www.bauhaus.de/english/bauhaus1919/unterricht/ Johannes Itten, <i>Design and Form; the Basic Course at the Bauhaus</i> , Trans. John Maass (New York: Reinhold Public Corporation, 1964) 62,63.	
Figure 2.2 Itten's Preliminary Course: Human Body	17
Source: Hans M. Wingler, <i>The Bauhaus: Weimar, Dessau, Berlin, Chicago</i> , trans. Wolfgang Jabs and Basil Gilbert (Cambridge, Mass: MIT Press, 1969) 281.	
Figure 2.3 Girl's School and Bauhaus Stairway	17
Source: http://www.schloss-schwerin.de/schwerin/shop/shophome.htm http://www.moma.org/collection/provenance/items/597.42.html	
Figure 2.4 Several Circles (Einige Kreise)	19
Source: http://www.guggenheimlasvegas.org/artist_work_md_7120.html	
Figure 2.5 In the Gray	19
Source: http://www.inter-art.com/en/kandinsky4.htm	
Figure 2.6 Sommerfeld House	22
Source: Michael Siebenbrodt, ed., <i>Bauhaus Weimar: Designs for the Future</i> , (Ostfildern-Ruit: Hatje Cantz, 2000) 24.	
Figure 2.7 Banister Detail	22
Source: Frank Whitford, <i>The Bauhaus Masters and students by themselves</i> (London: Conran Octopus, 1992) 107.	
Figure 2.8 Model House	24
Source: Siebenbrodt, 39.	
Figure 2.9 Bauhaus Director's office location	24
Source: http://architecture.mit.edu/~sloan2/final.html	
Figure 2.10 Bauhaus Director's office	26
Source: Siebenbrodt, 42.	
Figure 2.11 Homage to the square series	26
Source: http://spaightwoodgalleries.com/Pages/Albers.html	
Figure 2.12 Moholy Nagy's Preliminary Course	26
Source: http://www.bauhaus.de/english/bauhaus1919/unterricht_moholy.htm	
Figure 2.13 Bauhaus Kandem lights	29
Source: http://www.bauhaus.de/english/museum/sonderausstellungen.htm	
Figure 2.14 Bauhaus Furniture Prototypes	29
Source: http://www.bauhaus.de/english/museum/sonderausstellungen.htm	
Figure 2.15 Bauhaus Plan, Dessau.	36
Source: www.bauhaus-dessau.de/en/history.asp?p=bauhaus	
Figure 2.16 Bauhaus building	36

Source: http://www.bildarchiv-monheim.de/florian-monheim/moderne-architektur/moderne-architektur/bauhaus/17200.htm	
Figure 3.1 Collages exploring Porosity	68
Figure 3.2 Models exploring Porosity	69
Figure 5.1 Site Location	78
Source: http://warmuseum.ca/cwm/new/ca_sitee.html	
Figure 5.2 Site Map	78
Source: http://www.canadascapital.gc.ca/corporate/parks_heritage/development_projects/lebreton/_pdf/PKG54_e.pdf	
Figure 5.3 Capital Core area	79
Source: http://www.canadascapital.gc.ca/corporate/plan_reg/_pdf/core_draft_plan_e.pdf	
Figure 5.4 LeBreton Flats	79
Source: http://www.canadascapital.gc.ca/corporate/parks_heritage/development_projects/lebreton/site_map_updates/index_e.asp	
Figure 5.5 Bicycle and Pedestrian Pathway System	83
Source: http://www.canadascapital.gc.ca/corporate/parks_heritage/development_projects/lebreton/_pdf/building_05.pdf	
Figure 5.6 Roads, Parking and Public Transport	83
Source: http://www.canadascapital.gc.ca/corporate/parks_heritage/development_projects/lebreton/_pdf/site_map_16.pdf	
Figure 5.7 LeBreton Flats View Control Planes	90
Source: http://ottawa.ca/city_services/planningzoning/2020/op/vol_1/annex_schedules_en.shtml	
Figure 5.8 War Museum Sight Line	90
Source: http://warmuseum.ca/cwm/new/brochure_cwm_en.pdf	
Figure 5.9 Site and War Museum Photos	91
Source: http://warmuseum.ca/cwm/new/ca_conste.html	
Figure 6.1 Massing Models	93
Figure 6.2 Models	95
Figure 6.3 Exploring Porosity in Design	96
Figure 6.4 Exploring Porosity through drawings	97
Figure 6.5 Exploring Porosity through drawings: Colour	98
Figure 6.6 Sight Lines	100
Figure 6.7 Sight Lines in Plan	100
Figure 6.8 Site Model: Massing	101
Figure 6.9 Site Model: Sightlines	101
Figure 6.10 Ground Floor Plan	107
Figure 6.11 First and Second Floor: Program	108
Figure 6.12 Long Section through Design Convention Hall and Conference Hall	109
Figure 6.13 Long Section through Central Pathway	109
Figure 6.14 Transverse Sections	110
Figure 6.15 Elevations	111
Figure 6.16 Model: Ground floor level	112
Figure 6.17 North wing and South wing	112
Figure 6.18 Forecourt	114

Figure 6.19 East Entry	114
Figure 6.20 Inner Pores	115
Figure 6.21 Terraces	116
Figure 6.22 Administrative Zone: View from ramp.....	117
Figure 6.23 Administrative Zone: Waiting and office areas	117
Figure 6.24 Workshop Area: View from administrative zone	118
Figure 6.25 Workshop Area: Workshop offices on the left	118
Figure 6.26 Workshop Area: Workshop offices.....	119
Figure 6.27 Workshop Area: Inner Court.....	119
Figure 6.28 East Entry and Inner Court.....	123
Figure 6.29 North Wing: Inner Court.....	123
Figure 6.30 Exhibit Space: View towards studios.....	124
Figure 6.31 Digital Labs.....	124
Figure 6.32 Studio Space.....	125
Figure 6.33 Exhibit Space: View through pores.....	125

1 INTRODUCTION

1.1 Introduction

Design is developing from a craft and trade activity to a profession and hopefully, towards an established academic discipline. A number of observers have suggested that the last decade has witnessed the emergence of a field of study - even a discipline - of design.¹ This then, is a significant moment at which to focus on this. Countries all over the world have come to recognize the emergence of design as the key to cultural, social and economic prosperity in the 21st century. Canada has also reached a “Tipping Point” for design.² A research study carried out by the DIAC³ reveals the following facts. It shows that Canada has a critical mass of designers working in several design disciplines. Ontario has the third largest design workforce in North America.⁴

These designers have a higher level of formal education than the general workforce and they work in almost every sector of the economy including manufacturing, retail, financial services, and the cultural industries. Canada has a strong presence in design education with 66 design programs offered at Ontario universities and colleges and some additional programs in private institutions. Undergraduate programs in Canada provide a strong foundation in design theory, design process, design methods, and new technology.

¹ Richard Buchanan, “Education and Professional Practice in Design,” *Design Issues* 14 (1998) 2.

² Arlene Gould and Paola Poletto, “Design Matters: DIAC Design Industry Study,” *DIAC Report*, (2004): 45-1, <http://www.dx.org/diac/pdfs/DIACFinalReport.pdf>.

³ Toronto Economic Development formed a working group called the Design Industry Advisory committee (DIAC) in January 2001. DIAC members represent the design associations of Ontario, Toronto Economic Development, the Ontario Ministry of Economic Development and Trade (MEDT) and the Design Exchange (DX).

⁴ Meric S. Gertler and Tara Vinodrai, “Designing the Economy: A Profile of Ontario’s Design Workforce,” *DIAC Report*, (2004): 50-1, <http://www.dx.org/diac/pdfs/DesigningTheEconomy.pdf>.

It is clear that Canada is well positioned to take advantage of the current design boom. However, the study also reveals some key factors that need to be addressed. There are comparatively fewer graduate programs in design in Canada. Post-graduate design programs train design educators, provide a platform for design research, connect design to other disciplines, and help the evolution of design as a discipline. To add value to design education, a more collaborative perspective that engages design educators from all the disciplines, needs to be adopted. The design community feels that it needs a new image, an image that will celebrate the combination of skills and circumstances that make Canadian designers a valuable strategic resource for economic and social gains.⁵

The problems stated above establish the need for sophisticated design education and the desire for character and image that exhibits a distinct Canadian-ness. It generates the need to envision a Canadian Institute of Design to promote design and design education at a national level. This raises several questions that will be addressed through the course of this thesis. First and foremost: What is an institute of design and what is a national institute of design? The study stresses the need to engage the heterogeneous capabilities of Canadian designers from different sectors to promote cross-disciplinary design initiatives. What sort of an institution, environment, and spatial characteristics nurtures this approach? The need for a collaborative approach asserts the importance of design as a social activity in terms of its importance and impact on users and social environment. How can we make best use of designers' skills and creative talents to create greater social advantage? The notion of image and identity is important in creating national awareness in design. How can we define Canadian-ness in this context? To sum up: Is it possible for the Canadian Institute of Design to be a social space, to promote

⁵ DIAC Design Industry Study.

design awareness, democratic participation and exhibit a national character, all at the same time?

The thesis being put forward is that, in view of the question posed above architecture can be a catalyst for the unfolding of social space as porous space. A proposal for the Canadian Institute of Design becomes the vehicle for exploring this thesis. The primary research begins with a critical analysis of the Bauhaus ideology as a historical precedent and a survey of several other institutes of design as case studies. (Chapter 2) This is supplemented by research on Henri Lefebvre's theory of space and George Grant Parker's views on Canadian democracy, following a new understanding of social space as porous space. The role of porous space in creating environments conducive to democratic participation and creativity is examined. (Chapter 3) The site for the project is next to the National War Museum, Ottawa. An analysis of site and context and the implications of porosity at the urban level are explored in Chapter 4. Chapter 5 is a survey of design and public participation in Canada. The design of the institute tests, elaborates and concludes the ideas explored in the thesis. (Chapter 6 and Chapter 7)

1.2 What is an Institute of Design?

This chapter starts with a brief description of a typical institute of design. A detailed analysis of the Bauhaus and a survey of some other Institutes of Design scattered over a wide spectrum of geographical territory, is an attempt to familiarize the notion of such an institute. A critical analysis of the Bauhaus examines the two phases of the Bauhaus, the early 'mythic phase' (1919 – 1925) associated with poetic self-expression, and the later 'rational phase' (1925 – 1933) associated with standardized industrial production. Examples of works, such as those of Itten, Kandinsky and others that are

broadly based under the territory of 'mythic phase' are explained in terms of the manner in which they exemplify the character of 'mythic'. The mythic phase invigorates inner subjectivity to create pieces of work that are one of a kind and hence authentic. The rational phase deems each of these pieces to be ideal objects for mass production. An appropriated version of the Bauhaus pedagogical programme and a critique of the Bauhaus ideology in terms of a collaborative approach are considered as prospects to guide a new design. As a critique of the Bauhaus ideology, the Canadian institute of design is not an exploration to re-create the mythic and rational phases/spaces/architecture. As explained in Chapter 6, the institute instigates porosity to contribute to a collaborative student, profession/ industry and public engagement in the process of design. The mythic and rational can be more or less present in an institute of design but the concept of porous space addresses the need for democratic participation in a 'Canadian' Institute of Design from a contemporary perspective to improve quality and raise national awareness in design. The other institutes are selected due to their presence and national contribution to the field of design education and awareness. Some of these institutes have objectives and social agendas that resonate with the ideals of the Canadian Institute of Design.

1.3 Porosity

Chapter 3 discusses porosity as a concept. Porous space is social space that is physically, visually and spatially porous. It is porous to physical and visual movement, to ideas and to democratic participation. Porosity addresses several groups that are involved, related and affected by the design process. It entails the formation of a socially responsive environment that encourages the flow of ideas and people. Physically,

porosity is also expressed as pores and perforations in the structure that allow physical, visual and spatial continuity between spaces. Notions of social interaction, democratic participation and Canadian-ness co-exist in porous space. Chapter 3 also discusses Henri Lefebvre's ideas on social space and George Parkin Grant's notions of Canadian democracy as they relate to porous space. Porous space is not merely porous in an abstract sense. Porous space is active, operational, productive and multifaceted as it integrates notions of social interaction, democratic participation and Canadian-ness. Porous space transgresses the boundaries between public and private spaces, between work and study spaces between exhibit and workshop spaces. It creates architectural environments that accommodate the collective creative spirit of the design community. Further, porosity, democratic participation and collaborative learning contribute to an environment conducive to creativity.

1.4 Design in Canada

Chapter 4 includes a brief history of design in Canada and a survey of public participation in Canada. A concise history of design and public participation in Canada is important in order to appreciate the relevance of porous space and democratic participation in the Canadian Institute of Design. This survey helps to situate the issues of national design awareness, education, porosity and democratic participation, discussed in this thesis, in a broader framework of the history of Canadian Design. Since the Canadian Institute of design calls for collective involvement of all categories of people involved in the design community, it is also important to examine the prospects and history of collective involvement and public participation in Canada.

1.5 The Site and Context

We must take into account, the site, for the circumstances by which the institute can contribute to public awareness, democratic participation and address a national character is also constitutive of the characteristics of its surrounding context. The nature of the institution calls for national design awareness and public involvement; hence an ideal location would be a prominent, setting in the urban core, where the city meets the capital. The site for this institution is next to the War museum. To the east, the site has strong visual connections to the seat of Canadian Democracy and the core of the national capital region (Parliament Hill). Immediately to the south, will be a Commons, community and festival park with a Square for civic celebrations according to National Capital Commission plans. Chapter 5 includes a brief history of the site and discusses those features of the site that need to be addressed in the design project. These include axial visual links to the city and the capital; framed views of the peace tower and the parliament buildings; pedestrian links and cycle paths that connect the site to Le Breton flats and further down; the Commons Park; War museum; the edge facing the canal and NCC's plans for this region.

1.6 Canadian Institute of Design

This section explains how porous space and democratic participation are employed through design, program and environment. It describes the planning of the Canadian Institute of Design as a building and as it relates to its urban surroundings; as it materializes into a porous, democratic, creative environment - architecturally. The chapter discusses the areas, architectural program and key architectural elements in the building. The architecture of the Institute of design is porous in nature; porous to ideas

and democratic participation, to visual and spatial boundaries, to critical and collaborative thinking, to all members involved in the creative design process.

Porosity implies, a natural flow between spaces, punctured facades and perforations in the structure, which allow visual and physical movement back and through. Further, navigating through levels of porosity ranging from visual to actual spatial transitions, getting a sense of what's happening in the Institute such as everyday occurrences, moments and exhibits through these pores as framed views, makes it accessible and inviting to public participation. At the urban level porosity induces visual and physical links, connecting the Institute to its surroundings. Interior courts that act as functional and visual filters for LeBreton flats are reinterpreted in the institute as inner courts or pores. These interior pores and a network of pedestrian links and cycling routes gather the activity and energy of the site towards the Institute. The Institute's terraces are accessible and visually connect the war museum to the parliament buildings. The Institute also manages to establish a sense of place through its setting, architecture and character. The physical form of the building is the result of a process of complex decisions based on design factors.

1.7 Conclusions

The concluding chapter recapitulates the questions and concepts discussed earlier on in the thesis. Is it possible for the Canadian Institute of Design to be a social space, to promote design awareness, democratic participation and exhibit a national character, all at the same time? The thesis considers the architectural implications of a new understanding of social space as porous space, which is heterogeneous, porous and active through democratic participation.

The DIAC study discussed in the introduction, establishes the need for a Canadian Institute of Design. A critical appraisal of the Bauhaus and other institutes of design indicate that, an interdisciplinary, collaborative approach and a national character are desirable attributes for a proposed Canadian Institute of design. A discussion of Lefebvre and Grant's ideas on social space and Canadian democracy signifies the importance of a social, participatory, porous environment in the Canadian Institute of Design. This forms a framework for the design. Finally the porous architecture of the Canadian Institute of Design brings together many of the above conceptual threads arising out of porous space namely: social interaction, democratic participation, Canadian-ness and creativity. In the design project for the Canadian Institute of Design, a porous architecture based upon the aforementioned theory of porous space is demonstrated.

2 WHAT IS AN INSTITUTE OF DESIGN

Typically, an Institute of design is a multidisciplinary school responsible for the advancement of knowledge and education of students in the field of design. An Institute of design offers degrees, programs and courses in disciplines such as Architecture, Industrial Design, Interior Design, Graphic Design, Visual Communication, Multimedia, Exhibition and Display Design, Textile Design, Fashion Design, TV, Film and Theatre Set Design, Design Management, Jewellery Design, Furniture Design etc. Depending on the nature of the institute, auxiliary functions may include applied research, training, design consultancy services and outreach programs. Whereas an Institute of design can be part of a university, a national Institute of design is an autonomous body. A national institute of design promotes the value of design, fosters public awareness of design and sets standards for the quality of design at a national level.

The history of an Institute of design goes back to 1919 with the inception of the Bauhaus. The roots and methodological foundation of design education in many disciplines since the 1920s are found within the Bauhaus. A study of the Bauhaus as a significant historical precedent and some other contemporary institutes of design is important in the context of understanding the nature of an institute of design. An investigation of the spirit of the Bauhaus ideology, the particulars of the mythic and rational phases, the nature of the social revolution it promised and an understanding of unanimous characteristics, open up new perspectives. The purpose of analyzing the Bauhaus as a case study is not to provide a concise, comprehensive, linear history of its life, nor is it an attempt to compile two hundred years of design education and production propagated since the Bauhaus. As Wayland Bowser frames it, "Thoughtful comparison of

cause and effect in educational systems of the past will not provide the whole solution to our problem, but coupled with an equally tough-minded view of our present situation and some imagination, it offers the best approach we have.”¹

2.1 The Bauhaus

In 1919, in Germany, the Bauhaus established itself as an institution with a social agenda to reform education in art, craft and design and to create a new kind of society. The Bauhaus Movement had an important impact on the development of design and production in the twentieth century. It intensified its influence far beyond the circles of audience for whom it was originally intended. The Bauhaus design and products appear familiar even today. The Bauhaus sought to affiliate design education with social idealism and commercial reality. I intend to argue that there was a change of thought from the “mythic phase” of the Bauhaus (1919-1925) to the later, more pronounced objective and rational phase (1925-1933). As the ideals of humanity and self-expression of the mythic phase, gradually faded, it was replaced by a more exclusive concept of unity resulting from the willing submission of the personality to a restricted number of precise forms and to systematic procedures and functional methods of approach capable of being applied to all aspects of art.

2.1.1 The Mythic Phase

The term “myth” embraces certain constructions that exist in architecture, which enable us to connect to those elements of our experience that relate to humanity and self-expression i.e. things like existence, intuition, truth, value, perception... etc. This kind of myth is apparent in the early phase of the Bauhaus, and is the essence of creativity that we may find in all forms of human communication: in intellectual activities, in artistic

¹ Wayland Bowser, “Reforming Design Education,” *Journal of Architectural Education* 2 (1983): 12.

creativity, in language, in morality, and in architecture. The mythic phase is humane and poetic in expression, due to the strong bond between the artist/individual and his ideas, feelings, explorations expressed through his work. The intention is not to prove any truth through explorations in art and sculpture. The objective is a struggle to transcend realistic reproduction to achieve an interpretative design instead of a mere imitation. The use of the term 'myth' in understanding the early works of the Bauhaus is not so much an investigation of the meaning of myth, an analysis of the linguistic structures or patterns revealed, or of ancient, religious myths, rather an interrogation as to how myth exercises and connects to the human imagination structured around aspects of inner subjectivity, intuition and humane expression that engages creativity to produce authentic² pieces of work.

In attempting to define myth in the context of the Bauhaus, it is relevant to discuss other important but different notions of myth in brief. The French anthropologist Claude Lévi-Strauss argues that the meaning of myths lies not in their manifest content but rather in their underlying structure of relations, which typically works to mediate between polar extremes. In other words, the purpose of myth is to provide a logical model capable of overcoming a contradiction. Ultimately this leads Lévi-Strauss to the notion that the structure of myths is identical with that of the human mind. Thus the mytho-poetic (mythmaking) imagination, its structure and operations, is reflected in the structure and symbols of actual myths. "In his effort to understand the world, man always disposes of a surplus of meaning (which he distributes among things according to the laws of symbolic thought which it is the task of ethnologists and linguists to study). This

² Here authenticity is analogous to Walter Benjamin's concept of aura and authenticity. See Walter Benjamin, *Illuminations*, Ed. Hanna Arendt, Trans. Harry Zohn, (New York: Schocken, 1969) 251-217.

distribution of a supplementary ration . . . is absolutely necessary in order that ultimately the available signifiers and the perceived signifieds remain in that relation of complementarity which is the very condition of the exercise of symbolic thought.”³ Levi-Strauss goes on to associate what he calls the ‘floating signifier’ with poetry, myth, and aesthetic creation. Myths are metaphors containing psychological truths, written in symbolic, rather than literal language, constructed to give meaning to our world. In his essay “Myth Today,” the semiologist Roland Barthes presents his view of myth as a “second-order semiological system.” What Barthes intends by this conception of mythology is an intermingling of the signifier and signified, or form and meaning, into a “mode of signification”- myth.⁴

2.1.2 Social Context

During the early years of its foundation, the Bauhaus sought not merely to bring visual art back into closer tie with everyday life, but to make it the very instrument of social and cultural regeneration. The ideal envisioned in the early phase was that of a relationship of fine and applied arts based upon their union. These early years of the Bauhaus privileged an outpouring of artistic experimentation and cultural creativity against a background of inflation, depression, shock and the trauma of war.⁵ The picture of the Bauhaus at this point of time is predominantly accentuated with mysticism and a strong sense of patriotism and pride for the vernacular and the regional. This essential mystic character exemplifies the nature of ‘myth’. Art, that is predominant in the mythic

³ See Claude Levi-Strauss, “Introduction a l’oeuvre de Marcel Mauss,” in Marcel Mauss, *Sociologie et anthropologie* (Paris: Presses Universitaires de France, 1968), xlix.

⁴ For Barthes, “myth is a system of communication.” It is a “message,” a “mode of signification,” a “form” (Mythologies, p. 109). With a plethora of complexities and nuances, Barthes extends Saussure’s structuralism and applies it to myth.

⁵ A vivid account of the trauma and reaction to the war in relation to the Bauhaus is given by Eva Forgacs, *The Bauhaus Idea and Bauhaus Politics*, Trans. John Batki (New York: CEU Press, 1995) 21-14.

phase, does not try to prove any truth, explain its motivation, or justify its goals. Art can portray current social conditions, problems and solutions as ideas and images. Myth, like art, exists as a part of our experience and as an attempt to express our aspirations for a different kind of reality. The Bauhaus was also in search of a different kind of reality from the distress of war.

2.1.3 Itten's Preliminary Course

What made the Bauhaus teaching unique, during the mythic phase was the amount and quality of its theoretical teaching; the intellectual rigour with which it examined the essentials of visual experience and artistic creativity. Johannes Itten was the central person during the early years and influenced the first era. Itten who taught the preliminary course, encouraged the study of materials and textures by working with materials, their feel and their touch. The primary focus was on the individual student, i.e. their senses, emotions and intellect, and assisting them to learn about themselves before deciding on a specific direction. According to Itten, "Imagination and creative ability must first of all be liberated and strengthened. Once this has been achieved, technical and practical demands and finally commercial considerations may be introduced. Young people who begin with market research and practical and technical work seldom feel encouraged to search for something really new. If new ideas are to assume artistic form, physical, sensual, spiritual, and intellectual forces and abilities must all be equally available and act in concert."⁶

For the Bauhaus foundations course, students were provided with discarded materials (wire mesh, cardboard, newspapers, matchboxes, phonograph needles and razor

⁶ Johannes Itten, *Design and Form; the Basic Course at the Bauhaus*, Trans. John Maass (New York: Reinhold Public Corporation, 1964) 10.

blades) and instructed to improvise something out of these. Wood, feathers, mosses, hides had to be looked at, touched and drawn until they could be re-drawn from memory. In two of his exercises he required students to work with various textures forms, colours and tones in both two and three dimensions. The second demanded an analysis of art in terms of rhythmic lines, which were meant to capture the spirit, the expressive content of the original. Itten also developed a general theory for the course, the theory of contrast, the main theme for which was the 'clair / obscure' contrast. This was explored through various exercises, first in the form of checker-board patterns, then in abstract and finally in realistic works. Classical pictures were also studied and reproduced by students using the same theory. By dividing it up into squares, the students were induced to work through the entire area of the picture with alertness, and to make a new decision each time regarding the respective gradient of grey to be used. Some maintain that this method was influenced by Friedrich Froebel's pedagogy of 'education through play'. (Fig. 2.1)

For Itten, art was primarily a psychic means of expression, of high ethical and educational value. Itten's principles were based upon intuition and method, or subjective experience and objective recognition. "Experiencing is a faculty of the mind and spirit. If it concerns phenomena of a coarse material kind, then it is the physical faculties which produce the experience; on the other hand, if it relates to sensitive spiritual phenomena, then it is the spiritual faculties that produce the experience." Itten initiated mandatory form and colour education, essentially on the concept of creation, and in the process developing his theories on colour and the colour circle. In March 1923, Itten left the Bauhaus because Gropius no longer approved of his teaching methods, in particular of

Figure 2.1 Itten's Preliminary Course

Material studies, waste metal, tree-bark, roots, plants, and other elements mounted on plywood, by Vincent Weber, 1920/21

A piece of fur, wood, birch bark drawn from memory, by Weimar E. Elsner, L., Leudesdorff – Engstfeld, R. Schalt. 1922

the preparatory meditation exercises which sometimes proved to be detrimental to students' health.⁷ Itten's departure was one of the first symptoms of a general re-orientation of the school.

A number of artists, led by Johannes Itten, wanted to develop the Bauhaus style to that of a traditional art school with an almost monastic lifestyle. Others wished to integrate the schools works with German society and industry, by conducting exhibitions of the students' work, an idea heavily indebted to the Russian Constructivist movement.

2.1.4 Representation of the Human Body

There seems to be a difference in the manner in which the human body was perceived and represented during the mythic and rational phases. In his studies, Itten concentrated on the rhythmical coordination of the body limbs and on the body structure as a whole. The studies from Oskar Schlemmer's class, far from being realistic representations, clearly show an idealized image of man. Schlemmer extended the life drawing classes to a course in general theory on the proportions of the human body, presenting a wide concept of man including formal, biological, as well as psychological and philosophical aspects. There was an attempt to develop an image of man beyond anatomy and familiarizing students with philosophical questions. He believed that abstraction was the calling of art. As is evident from his work, his drawings were not exact, realistic representations. They were abstractions, highlighting proportions by juxtaposing subjects in order to study the human figure in relation to lines, shapes and volumes. (Fig. 2.2 - 2.3)

⁷ For an understanding of Itten's religious belief in Mazdaznan and physical exercises based on the same see Eva Forgacs, 62-46.

Figure 2.2 Itten's Preliminary Course: Human Body

Rendering of a seated old man with various objects and human study from nature, charcoal drawing, Erich Dieckmann, 1921.

Figure 2.3 Girl's School and Bauhaus Stairway

Oil on canvas, by Oskar Schlemmer, Designated as 20th c German Cubist Paintings at the Museum of Modern Art, 1930, 1932.

2.1.5 Kandinsky and Abstraction

Parallel to the preliminary courses, Wassily Kandinsky offered classes in analytical drawing and primary artistic design at the Bauhaus from 1923-1933. Interrogating object and view, Kandinsky's abstraction seems to be about the spirit of inner resonance or 'myth'. For Kandinsky, the 'inner necessity' to express his emotional perceptions led to the development of an abstract style based on the non-representational properties of colour and form.⁸ His compositions were his efforts to create a 'pure painting' that would provide a strong emotional power and the transcendence of representation by abstract imagery. From his drawings, he carefully removed the representational elements, from his compositions and transferred the subject matter conveyed by these elements to the distinctive contours of colour and form. (Fig. 2.4 - 2.5)

Returning to his studio one evening at dusk, Wassily Kandinsky was enchanted by an unexpected spectacle. He suddenly saw "an indescribably beautiful picture, pervaded by an inner glow," he wrote in his "Reminiscences" of 1913. "At first, I stopped short and then quickly approached this mysterious picture, on which I could discern only forms and colours and whose content was incomprehensible. At once, I discovered the key to the puzzle: it was a picture I had painted, standing on its side against the wall." Kandinsky was deeply affected, and attempted a re-creation of his impression of the picture; but the light was not right, and the objects in the painting obstructed his reverie. "Now I could see that objects harmed my pictures," he concluded, noting that a "terrifying abyss of all kinds of questions, a wealth of responsibilities stretched before

⁸ The work of art is a construction making use of all the potentialities of form and colour and the motive may be psychological – Kandinsky called it spiritual or 'geistig' in German.

Figure 2.4 Several Circles (Einige Kreise)
Oil on canvas, by Wassily Kandinsky, 1926.

Figure 2.5 In the Gray
Oil on canvas, by Wassily Kandinsky, 1919.

me. And most important of all: What is to replace the missing object?"⁹

In many ways, the development of art in the 20th century was a search for an answer to Kandinsky's question. "The object is surely dead," Paul Klee wrote in his diary, "The sensation of the object is of first importance."¹⁰ The critic Carl Einstein agreed, noting that art is but a constant "wrestling with optical experiments and invented space." Einstein maintained that to advance art one must transform space; and to transform space one must first "eliminate rigid objects, conventional receptacles" and in so doing, "call into question the view itself."¹¹

The German scholar Klaus Lankheit believes that for Kandinsky spirituality refers to "the subjective 'freedom' of creative man,"¹² and another German expert, Wieland Schmied, feels that Kandinsky wanted to raise "the problem of the purpose of art"¹³ by introducing the possibility of its spirituality. I think they are both correct, if incomplete in their understanding of what Kandinsky meant by the spiritual. From Lankheit and Schmied's understanding, it is clear that the crisis that led Kandinsky to create a modern spiritual art, an art that would clearly express a spiritual attitude, had two aspects. It was a crisis of creativity, that is, it involved the question as to how much subjective freedom there is in creativity, implying that if creativity is not completely free subjectively, if it is bound by objective necessity, it is not really creativity. It was also a crisis that involved the question of the purpose of art in the modern materialistic world.

⁹ Wassily Kandinsky, "Reminiscences," in *Kandinsky: Complete Writings on Art, Volume One, 1901-1921*, ed. Kenneth C. Lindsay and Peter Vargo (Boston: G. K. Hall & Co., 1982), 369-370.

¹⁰ Felix Klee, ed., *The Diaries of Paul Klee* (Los Angeles: University of California Press, 1964), 670.

¹¹ Carl Einstein, "Aphorismes Méthodiques," *Documents* (1929), 32.

¹² Wassily Kandinsky and Franz Marc, eds. *The Blaue Reiter Almanac*, New Documentary Edition ed. Klaus Lankheit, trans. Henning Falkenstein (New York: Viking, 1974) 154.

¹³ Wieland Schmied, "Points of Departure and Transformations in German Art 1905-1985," in *German Art in the 20th Century: Painting and Sculpture 1905-1985*, (London: Royal Academy of Arts and Munich: Prestel, 1985) 34.

2.1.6 Sommerfield house

Walter Gropius and Hannes Meyer designed the Sommerfield house in 1920 during the early phase of the Bauhaus. Built of wood, the reliefs represent the different sectors of Sommerfields carpentry business, and they are symbolic to the process and devices typical of carpentry work. Whitford describes the Sommerfield house as, “built entirely in wood, it is picturesque, peculiar and expressionist.” (Fig. 2.6 - 2.7) Germany lost the First World War in 1918. The shock of the war followed by ecstatic revolutionary events offered a vantage point so that an appeal to tradition and craft skills could be a moral reaction to the war. The extensive use of wood was also due to the scarcity of other construction materials at the time. In addition to Sommerfield house, none of the earliest objects from the Bauhaus that contribute to the ‘mythic phase’ take their inspiration from industrial technology. The massive, blocky shapes of Lili Graf’s wooden chest and some other objects of the time seem to resemble folk art. This attitude of the first phase could be understood considering the early Bauhaus interest in handicraft and the widespread anti-industrial and religious sentiment among German artists at the time.

The mythic and rational phases could also be understood as two competing ideologies. On the one hand, there were artists investing the individual with power to transform society, and on the other, there were artists fired by the communal ideal of collectivism.

2.1.7 The Rational Phase

During the second phase of the school’s life, quasi-scientific ideas gradually replaced romantic notions of artistic self-expression and brought about important changes in the school’s curriculum and teaching methods. The ‘rational phase’ embraced the years

Figure 2.6 Sommerfeld House

Berlin, entrance, teak wood, by Walter Gropius, Adolf Meyer, 1920.

Figure 2.7 Banister Detail

Sommerfeld House, Berlin, symbolic representation of Sommerfeld's saw mill in teak wood, Joost Schmidt, 1920-1921.

in which the tottering German economy stabilized and the nation's industry began to flourish. The reality of technical civilization, led to different requirements. Industrial potentials were to be applied to satisfactory design standards, regarding both functional and aesthetic aspects. So the Bauhaus workshops produced prototypes for mass production: from a single lamp to a complete dwelling.¹⁴

The rational phase is rooted in industry. Science or applied science in the form of technology, engineering and industrial production characterizes the role model for modernism. With absolute faith in technology, modernism cultivated an obstinate, reductive attitude towards design, as well as clichés about a clean, functional, mechanical architecture in the supposed service of freedom, social equality, order, hygiene and progress. It is this faith in industry and production that constitutes the later phase of the Bauhaus.

2.1.8 Model house

In the first Bauhaus Exhibition in Weimar, a model house, designed by the Bauhaus was opened to the public. This was conceived as a self-contained entity and constructed on the site of the school's activities. The interior of the house was the result of efforts of various workshops. So a functional prototype of the modern home was constructed with a basic cubic form, a flat roof and renunciation of any type of ornament. (Fig. 2.8) It had all the features and functions of the modern kitchen. It was unlike the homes of that time. Although it was intended as a commercially viable alternative for

¹⁴ For George Mucho's view on the 'rational' aspect of the Bauhaus see Frank Whitford, *The Bauhaus Masters and students by themselves* (London: Conran Octopus, 1992) 217. By the late-1920s some designs entered production, ranging from Marcel Breuer's "Wassily" chair to Marianne Brandt's "Kandem" bed lamp, see Wingler, 1969, Humblet, 1980, and Forgacs, 1995.

Figure 2.8 Model House

Haus Am Horn, cavity wall construction, made of lightweight concrete panels, by George Muehe.

Figure 2.9 Bauhaus Director's office location
Dessau, designed by Walter Gropius.

housing in Germany, it became an early expression of the modern suburban American homes from the 1950s and 60s.

2.1.9 Director's Office at Bauhaus, Dessau

The Bauhaus director's office by Gropius is another product of the rational phase. The design and rational layout of different elements are derived from the logic of spatial continuity. The design is the exact definition of the matrices constituted by its key elements: i.e. the furniture, lighting, openings. These technical volumes interconnect by means of lines, chromatic planes and geometrical frameworks. A study of the axonometric view reveals the method of composition employed, which is 'rationalism as the geometrical measurement of the parts'. Gropius designed the furniture for the office which was made in the carpentry workshop, and the lamp, with its series of fluorescent tubes. The carpet was produced in the fabric workshop. In a way it appears to be a standard office space that could be anywhere except that the furniture and décor are Bauhaus designs and products. So 'rational' here is not related to the formal appearance but rather, this way of creating standard or model spaces which could be produced as prototypes anywhere irrespective of the context. (Fig. 2.9 - 2.10)

2.1.10 Joseph Albers "Homage to the Square"

Joseph Albers worked on a series of squares that he called 'Homage to the Square.' It is a disarmingly simple work. The optical effects he created, i.e. shimmering colour contrasts and the illusion of receding and advancing planes were meant to challenge the viewer's faculties of visual reception. This shift in emphasis from perception willed by the artist to reception engineered by the viewer is the philosophical root of the homage to the square series. He tried to teach the mechanics of vision and

Figure 2.10 Bauhaus Director's office
Axonometric view, Dessau, designed by Walter Gropius.

Figure 2.11 Homage to the square series
Joseph Albers.

Figure 2.12 Moholy Nagy's Preliminary Course
Balance/equilibrium study, wood, metal parts,
wire, Weimar, by Charlotte Victoria, 1924,
reconstruction 1967.

show even the uninformed viewer how to see. The homage to the square series is also distinguished by the carefully recorded inscriptions of technical details on the back of each panel. This codification of the making of the painting, along with the reductively systematic application of colours, is characteristic of the 'rational phase', when painting was stripped of the transcendental. (Fig. 2.11)

2.1.11 László Moholy-Nagy

Moholy Nagy, a rationalist, abandoned subjective approaches to art, preferring an objective view of the world. However, he saw the importance of combining artistic creativity with technology. He admired the Russian Constructivists, particularly Vladimir Tatlin who, inspired by Picasso's Cubist paintings, sculptures and particularly his collages, created 'constructions' out of junk -string, cardboard and rubbish. At the time, Constructivist ideas spread and their rejection of notions of naturalism or romanticism propagated. They were creating art that was not only abstract, but absolute - absolute geometric form. These ideas intersected with the 'New Objectivity' movement in Germany which replaced expressionism with themes of practicality, restraint and discipline. These themes dominated the new design aesthetics of the times.

Moholy-Nagy avoided mysticism and romanticism believing in the potential of abstract art to create new visual laws of pure and simple logic. His teaching emphasized the objective study of colour and form, using new techniques and materials. On replacing Itten as head of the metal workshop and the preliminary course, he discouraged artistic handcraft and concentrated on producing prototypes for mass production.¹⁵ He had difficulty convincing the students to stop producing finely hand-worked objects in

¹⁵ For Moholy Nagy's diary notes and own accounts see Whitford, 159-169.

precious metals in favour of electrical household appliances and light fittings. But he said: 'to be a user of machines is to be of the spirit of this century.'

Moholy-Nagy avoided the use of silver and other expensive metals in favour of sheet steel. Instead of silver wine jugs and coffee services, he directed the students to use nickel and chrome plating, and to produce prototypes for the lighting fixture industry. Moholy-Nagy created a new character for the workshop, linking at the same time education and industrial production. He noted that there was a conspicuous need for simple and functional objects for daily use, and he set the students to produce models for mass production, which manufacturers paid royalties to produce. Marianne Brandt designed a table lamp which is still manufactured today. (Fig. 2.12 - 2.13)

The appointment of Moholy-Nagy and former students, such as Marcel Breuer, to the teaching staff guided the Bauhaus to a straightforward and worldly approach. This meant stressing practical design, mixing craftwork and industry which would combine the learning of trade expertise with design artistry and provide the best opportunity for students in practical training for their role as industrial designers. Instead of precious materials, the students now used common materials, turning out functional light fittings rather than decorative ones.

2.1.12 Bauhaus Prototypes for Industry

The Cooperation between the Bauhaus and the Lamp Factory Kandem led to the production of a series of lamps that were both technical and formal landmarks. The Bauhaus program of direct cooperation with industry could here be successfully realized for the first time. The position of the company in the field of lighting technology, linked with its methods of development oriented towards practical use, were an ideal

KANDEM
HEIM-LEUCHTEN

KANDEM-DOPPELZYLINDER-LEUCHTE
Zwei kreisförmige und schalenförmige Doppelzylinder aus
dunkler oder hellgrüner Glasmasse. Keine Blendung, ge-
steigerte Lichtausnutzung, keine Zusatzabgemessene Flächen.

KANDEM-DECKEN-LEUCHTE
Eine mit zwei gleichmäßig leuchtende Doppelzylinder
schützt den Auge gegen Blendung. Vorwiegend kann sich
leicht ablegen. Gledigere Verhältnisse werden erreicht.

KANDEM-HAUSHALT-LEUCHTE
Die geeignetste Leuchte für kleine Räume. Die Leuchte
von M. Brandt. Sie gibt bei bestmöglicher Lichtver-
nutzung eine gleichmäßige, ausblende Beleuchtung.
Sie ist vollkommen dicht abgeschlossen. Gerade und
glatte Oberflächen sind vorhanden. Die Leuchte ist
einfach zu bedienen.

KANDEM-NACHTTISCH-LEUCHTE
Sofort und bequem. Einfach und dauerhaft. Die Leuchte
ist von M. Brandt. Sie ist für kleine Räume geeignet. Die Leuchte
ist von M. Brandt. Sie ist für kleine Räume geeignet.

KANDEM-SCHREIBTISCH-LEUCHTE
Eine geeignete Leuchte für den Schreibtisch. Die Leuchte
ist von M. Brandt. Sie ist für kleine Räume geeignet. Die Leuchte
ist von M. Brandt. Sie ist für kleine Räume geeignet.

KÖRTER & MATHIESEN A. G. LEIPZIG-LEUTZSCH
LICHTTECHNISCHE SPEZIALFABRIK

Figure 2.13 Bauhaus Kandem lights
Marianne Brandt, 1927.

RÜCKENLEHNSTUHL
mit Stoffbezug

TEETISCHE
mit Stoffbezug

LIEGE-GESTELL
mit Stoffbezug

BETT
mit Stoffbezug

KLUBSSEL
mit Stoffbezug

PREIS-LISTE
STAHLROHRWÖBEL G.D.G. - G.D.G. - G.D.G. - G.D.G.

KLUBSSEL
mit Stoffbezug

ABLEGETISCH
mit Stoffbezug

TISCH
mit Stoffbezug

SCHRANK
mit Stoffbezug

ARMLEHNSTUHL
mit Stoffbezug

Figure 2.14 Bauhaus Furniture Prototypes

combination with the Bauhaus ideas of functional product design. The lamps were developed by students of the Bauhaus together with Kandem lighting technicians. They soon made their way into apartments and offices. Within a few years more than 50,000 of these work and ceiling lamps were sold. This was proof to the Bauhaus that its designs could indeed become industrially finished mass-products and reach a correspondingly wide public. Similarly, the rational phase produced furniture that could be models for industrial production. The furniture developed followed a set of rules: it should be light and suitable for many uses, easily to be taken apart and therefore mobile. (Fig. 2.14)

2.1.13 Workshops

The Bauhaus interior workshop developed new parts and connectors and used inexpensive home-grown woods. Aesthetic criteria were subordinated to this new type of construction. This way a new type of lightweight, functional furniture emerged, aimed at developing inexpensive furniture for a wide market. The workshops were designed to enable students to become well rounded in all disciplines. It was an effective teaching method because it catered for kinesthetic as well as auditory and visual learning. The relocation of the Bauhaus to the industrial center of Dessau from the cultural hub of Weimar was intended to encourage a closer relationship between art and industrial design. Whereas in the mythic phase and early years at Weimar the emphasis was on individual work, the Bauhaus of Dessau and the rational phase became more focused on industry. From the Bauhaus came kitchen utensils, furniture, toys and other products that are so common in modern life that many people today would be surprised to discover they originated in the first quarter of the century. In the rational phase, Moholy-Nagy

took over the foundation course from Itten. He brought a constructivist and functionalist thinking to the course.

In the Bauhaus 'rational philosophy', the form of objects is a result of a detailed functional analysis of the problem. Theoretically, the form emerged from this functional analysis of purpose and materials. The designer simply brought all these factors together in a coherent way. Unlike the artist, the designer did not impose his/her personality on the problem to get to the potential solution. Is it surprising that so many different products ended up looking so similar? Yet even here, there was a practical point: simple geometric shapes allowed for easier industrial production and standardization.

2.1.14 Gropius and the Rational Phase

There is a strong parallel between the rational phase of the Bauhaus and Gropius' vision of architecture. In Walter Gropius' words, "The full consciousness of my responsibility as an architect came to me as a result of the First World War, during which my theoretical premises first took shape. The violent eruption, made every thinking man feel the necessity for an intellectual change of front. Each in his own particular sphere aspired to help in bridging the disastrous gulf between reality and idealism. It was then that the immensity of the mission of the architect of my own generation first dawned on me. This is more than just a lost war. A world has come to an end. We must seek a radical solution to our problems."¹⁶ Gropius' radical solution emerged in the form of the Bauhaus.

Gropius criticized builders in a memorandum, "Overloading and false romanticism in place of good proportions and practical simplicity have, for all purposes,

¹⁶ Gropius to James Marston Fitch in conversation. Peter Gay, *Weimar Culture: The Outsider as Insider* (London: Secker&Warburg, 1969), 9.

become the tendency of our age.” He saw a way back to “quality and style”: an organization that would apply industrial techniques to the building trade. Mass production had proved beneficial in combining the “highest quality of raw materials and labour” with “low prices”; to treat service of cultural ends. A return to handicraft, Gropius concluded, was impracticable, in fact unthinkable; the road to the future lay in the intelligent application of prefabrication and standardization.”¹⁷ While political, industrial and technological dominance gave power to warring nations, the after effects were morally weakening. A whole generation was lost to the war. The ideal of progress of humanity was hard to maintain when civilized nations had committed such barbarities. The experience of war made many question the value of the society they lived in. The reason for the massive casualties in the war was very clear: ‘technology’ in the form of massed artillery, machine guns, planes, gas shells, tanks and submarines. Women, who used to live a purely domestic life, were now working in large numbers in factories while men went out to the battlefields. Society changed. It became clear that industrial production (i.e. mass production) was the key to winning the war, not individual heroism. This war coordinated and rationalized the industrial forces of Europe and North America. The rational phase sought to alienate the objective, essential knowable truth and beauty, totality and unity that can be found; whose meaning can be known, understood, and mastered through scientific means.

2.1.15 The Bauhaus as an Institute

The Bauhaus had a tremendous influence on design and art in general. It was not just a matter of the ‘style’ of its products, but just as much, its teaching methods and

¹⁷ The memorandum is partially reprinted in Hans M. Wingler, ed., *Das Bauhaus: 1919-1933 Weimar Dessau Berlin* (Bram: Verl. Gebr. Rapidly & CO, 1962) 26-27.

program. Unlike traditional academies, some of which survived by copying historical styles and methods, teaching in the Bauhaus centered on teaching individual creativity as a means of problem solving. Another key difference from the past was the idea of the 'new'. That is, that new forms, shapes and solutions could be created to suit new problems. The origins of Bauhaus were far from the earlier methods of education in industrial art, art proper and architecture. Its program was based on the newest knowledge in pedagogy.

The idealistic basis of Bauhaus was a socially orientated program; that an artist or architect must be conscious of his social responsibility to the community and the community has to accept the artist or architect and support him or her. This ideal is equally relevant today. But above all the intention of Bauhaus was to develop creative minds for architecture and industry and teach them to produce artistically, technically and practically balanced utensils. The institute included workshops for making models of type houses and all kinds of utensils, and departments of advertising art, stage planning, photography, and typography.

As an institution, the Bauhaus was a university-level school of art and design. Building on the ideas of William Morris¹⁸ and Peter Behrens, the curriculum centered around the premise that the fusion of the fine arts with crafts and technology would yield higher quality design work for production by industry. Over the course of little more than 10 years, the work of the students and faculty at the Bauhaus elevated it to the forefront of the burgeoning modern movement. As a publicly funded institution, the school was particularly susceptible to political tides and was closed by the Nazi regime in 1932.

¹⁸ For an understanding of Morris' influence from one of his lectures in 1894 see Hans M. Wingler, *The Bauhaus: Weimar, Dessau, Berlin, Chicago*, trans. Wolfgang Jabs and Basil Gilbert (Cambridge, Mass: MIT Press, 1969) 19.

Arguably, the closing of the Bauhaus did more than any other single event to spread the ideas developed there, as former members made their way around the globe after being forced out. As a result, most modern design work and design education have roots in the Bauhaus.

2.1.16 The Bauhaus Architecture

The Bauhaus Dessau building was designed by Gropius as a model of the type of rationalism espoused by the school. Adherents to this new aesthetic attacked the emphasis on ornament prevalent in 19th century Western architecture, thus the building contains very few non-functional elements. The primary structural material is steel reinforced concrete, and window facades are designed as hanging (non-structural) walls. Dessau was one of several locations of the school, following Weimar and preceding Berlin. It is interesting to observe that the curriculum and standard prototypes produced by the Bauhaus still survives today, in a similar outlook, in most design institutions and industries.

The line between the romantic idea of resistance to industrialization through the design of hand-crafted, one-off environments, and the equally romantic idea of embracing progressive machine-age reproduction, was drawn many times in history. The Bauhaus developed mass-reproducible designs, the production and licensing of which literally funded some of its day-to-day operations. Hence the factory aesthetic of the school's Dessau building, designed by Gropius and Meyer in 1925-1926. Less obviously, however, this embrace of industrialization begins with the designer. Not only are objects designed, mass-produced, and disseminated; the designer himself or herself is designed as a product, to be manufactured and distributed. The Bauhaus produced designers and

dispersed them around the world. The vast glass walls of the Dessau building which, in Gropius' words, "dematerialize" the line between inside and outside, suggest this immanent launching outward of both students and their designs. The preoccupation of architecture with visual order and space does not lead to an understanding of the organization of contemporary society and human behaviour. "Form follows function," was a great liberation but it brought back the arbitrary necessity of form. This tragic insistence on form can be observed in the Bauhaus school, with functionalism at its peak, during its rational phase. (Fig. 2.15 - 2.16)

In spite of the historical matrix and the location of Bauhaus in Germany, a Canadian Institute of Design with the Bauhaus pedagogical program, seems viable due to its wide spread influence and pedagogical principles that are still followed today. With the closing of the Bauhaus School in 1933, the Bauhaus movement began as teachers and students migrated across Europe and North America. Various work and collaborations were undertaken in Europe where the Bauhaus influence was evident. However, it was in North America that the modernist movement in architecture took its strongest root where American firms and institutions sought many of the Bauhaus masters.

The Bauhaus was itself explicitly conceived as a "total work of art", a glorious "building" produced by a singular allusion of different disciplines, resources, and techniques. Gropius never stopped searching for what he called the "oneness of a common idea" around which artists of every kind could be gathered in a grand teamwork. The institutional space of this singular idea is even comparable to a domestic interior. The Bauhaus factory presented itself as a family, complete with daily activities of

Figure 2.15 Bauhaus Plan, Dessau.

Figure 2.16 Bauhaus building

sleeping, eating, and playing. In contrast the products of the factory or workshops were to be mass-produced in industry and cater to the masses in comparison to the intimate scale of a family.

2.1.17 Questioning 'Mythic and Rational'

Today, does a culture dominated by every form of cybernetics and digital fantasy, including the seamless articulation of the human body with intelligent machines really address humanity? One may also question, the character of the 'mythic phase' of the Bauhaus, today. Maybe it is an elapsed phenomenon, reflecting the primitive manifestation of culture, and it should be rejected. There is a danger of returning to an irrational state of thinking, the danger of losing individual freedom of thought and imagination for the sake utopian ideology.

Alberto Perez-Gomez, in "Architecture and the Crisis of Modern Science," says: "Truth - demonstrable through the laws of science - constitutes the fundamental basis upon which human decisions are made over and above 'reality,' which is always ambiguous and accessible only through the realm of 'poetics.' ... Modern man ... has forgotten his fragility and his capacity for wonder, generally assuming that all the phenomena of his world, from water or fire to perception or human behaviour have been 'explained.' ... Art can be beautiful of course, but only seldom is it understood as a profound form of knowledge."¹⁹ Enterprises such as instrumental power, scientific curiosity and utopianism, unless wedded to some polarity of existence, become endless pursuits of fine objectives, usually without any finality.

¹⁹ Alberto Perez-Gomez, *Architecture and the Crisis of Modern science* (Cambridge and London: The MIT Press, 1983) 5.

2.2 The Institute of Design (ID), Illinois

When one speaks of ID's history, Laszlo Moholy-Nagy comes into the picture. Moholy supervised the Visual Fundamentals program that was central to the Bauhaus. The Nazi government, considering the Bauhaus subversive, closed it in 1933. Four years later, Moholy-Nagy came to Chicago at the invitation of the Association of Arts and Industries, which wanted to open a design school to augment the economic and cultural life of the city. Moholy-Nagy set up his idea of 'total education' and called the school "The New Bauhaus." The Association members felt it was too experimental and just over a year later, in the fall of 1938, withdrew their support. Moholy, however, continued his pursuit. He reopened the school under a new name, the Chicago School of Design. In 1944 it acquired its present title, the Institute of Design now absorbed by the IIT.

The Institute of Design (ID) at Illinois Institute of Technology is a leader in teaching systemic, human-centered design. Together, faculty and students at ID approach design problems from many perspectives, employing analytic and synthetic design methods to identify current and future needs and to humanize the technology needed to solve those problems. Through research initiatives, ID is constantly developing new methodologies for user-centered, strategic design.²⁰

2.2.1 ID Methods

Human-centered design has branched out of traditional design, social sciences, engineering, and business. It is taught at ID through a highly effective framework of four human factors, which address the physical, cognitive, social, and cultural factors involved in people's interactions with products, systems, and organizations. The framework of

²⁰ All information regarding ID's methods have been obtained from <<http://www.id.iit.edu/profile>>

human factors supports ID's designers as they address not only the users' physical capabilities and cognitive functions, but also the cultural background and social situation of the user at the time of using the product or service. As a result, ID students learn how to modify a product for different environments, for different situations within a culture, and ultimately, for the 'market of one.'

In addition to the human factors framework, the Institute of Design uses a range of methods to help gather data, analyze and understand human behaviour and symptoms, and to develop prototypes to test human-centered designs. Following are brief descriptions of some of those methods.

2.2.2 Ethnographic Observation

Ethnographic observation is a method originally used in social science research. ID students utilize this method to understand unarticulated needs and issues that users of particular products, environments, software, and systems have in order to create innovative design solutions.

2.2.3 Video Ethnography

Video ethnography is a way to capture human behaviour in the context of the person's natural environment as a means of gaining insights about user behaviour and assess needs. Videotaping allows students to view and re-view user behaviour. The analysis of the tapes is used to present insights and implications for design solutions. Not only is videotaping essential at the beginning of the design process as needs are identified, but it is also important throughout the process as students gain an understanding of a particular user context as prototypes are developed.

2.2.4 Disposable Camera Studies

Disposable camera studies is a new method at ID that enables students to gain insights about places they cannot access, such as people's homes. Because they are so inexpensive, students can give disposable cameras to users so they can document their environments and objects in context. Because this method involves the subjectivity of the participants instead of the student doing the research, students get a glimpse of life through the users' eyes.

2.2.5 Observation with Prototypes

ID students give their prototypes to users as a means of observing typical interactions. Students use video ethnography and field notes to document their observations. The insights they gain allow them to determine what works, or doesn't, and why, so they can refine their concepts from actual experimentation.

2.2.6 New Human Factors

New human factors include methods to understand the broad terrain of human needs in a methodical way, needs people may not even know they have and hence do not express them. These processes extend far beyond the focus groups and surveys applied in traditional marketing. Employing the principles of human factors, in combination with ethnographic observation methods, can help product-development teams create value-rich products.

2.2.7 Physical Human Factors

Understanding physical human factors and capacities helps students design products, environments, and systems that fit the physiological capability of users. This area of study expanded greatly during World War II when, to build submarines, aircraft,

and tanks, the armed forces needed to understand what men could and could not tolerate. NASA research also led to important understanding about physical needs in extreme situations.

2.2.8 Cognitive Human Factors

Understanding cognitive human factors helps students take into account cognitive patterns, such as how people receive, process, and understand information. Only by knowing how people best absorb information, attach meaning, and develop memory can we present effectively. This becomes critical as we integrate increasingly complex information into product and services.

2.2.9 Social Human Factors

Understanding social human factors helps students create products, environments, and systems that enable people to work more effectively either individually or in teams. This understanding is increasingly vital to the growing use of empowered teams as the cornerstone of enterprises.

2.2.10 Cultural Human Factors

Understanding cultural human factors helps product-development teams avoid creation of products, environments, and systems that conflict with values and patterns of behaviour. Cultural influences on human perception and behaviour are often difficult to grasp, yet such understanding is essential when developing products for new markets or when creating fundamentally new products that current markets will use in entirely different ways

2.2.11 Prototyping

Prototyping produces a succession of mock-ups to sharpen on a concept. ID students use a combination of conceptual and behavioural prototypes to reach their final designs. ID students create these prototypes so people will not have to rely on verbal descriptions that often lead to a variety of interpretations.

2.3 Design Institute of Australia (DIA), Melbourne

The DIA is an Institute recognised as a dynamic body representing designers in Australia and promoting high ethical and professional standards through education, information and event management.²¹ While the DIA administers cooperative, collaborative support services to members, government and the community, the backbone of the institute following its history embedded in industrial roots is based on industrial enterprise.

2.3.1 The History of the DIA

In the 1920s and 1930s, Australian industry was far behind the developments taking place overseas. The general attitude within management and design at the time was either to copy a product from a glossy magazine or directly from the imported article. Another approach was to produce a product made under license to an offshore company, thus saving on design and development costs. It could often present a reduction in tooling costs as tooling could also be imported.²²

Frederick Ward, Frances Burke, Hera Roberts, Roy de Maistra, Michael O'Connell and others in Melbourne and Sydney who were designing quality furniture and fabrics for small scale production in the early 1930s, brought about the beginning of a

²¹ All information obtained from <<http://www.dia.org.au/>>

²² See Ron Rosenfeldt, "The History of the DIA," *LFDIA*, (1999).
<<http://www.dia.org.au/index.cfm?module=about&id=31§ion=history>>

consciousness of good design in products. With the advent of the Second World War in 1939, new processes and techniques were brought from overseas and developed alongside those created by local technicians.

Secondary industry expanded in size and range to meet the increasing demands of the war effort. New technological processes, new materials and greater demands gave an impetus to the productive capacity of the nation.

During the early post-war years, the demand for goods outstripped supply. When markets began to tighten and industry found itself faced with competition, both within Australia and without, manufacturers and distributors understood the need to improve the products they made or handled.

In 1947, the first gatherings of interested designers were held that led to the emergence of the Society of Designers for Industry (SDIA), followed later, by its development into the Industrial Design Institute of Australia.

2.3.2 The Voice of Design in Australia

The DIA is an organization working for the future of the design professions in Australia. It is the only multidisciplinary organisation of designers in Australia. It speaks out for all designers. Since 1947 the Design Institute of Australia has been actively improving community recognition and status of designers. It's a professional body for designers run by designers. Working through its State Branches and National Council the DIA promotes the value of design and designers to industry, business, government and the community. It provides a vibrant networking base on a state, national and international level. Through its international affiliations it links its members with

designers in over 40 countries. Membership benefits include representation, information, professional development, events and newsletters.

2.3.3 Areas of Design Represented

The DIA welcomes members practising in all fields of design. It has classes of membership for members from industries and businesses who associate with, trade with or service the design sector and membership classes for people from educational organisations training designers.

The DIA's Constitution lists the following disciplines:

Industrial Design, Interior Design, Interior Architecture, Graphic Design, Visual Communication, Multimedia, Exhibition and Display Design, Textile Design, Fashion Design, TV, Film and Theatre Set Design, Design Management, Design Education, Jewellery Design, Furniture Design, Interior Decoration, Architecture. The Constitution allows for the inclusion of other design disciplines not specifically listed.

2.3.4 National Charter of the DIA Mission Statement

To promote and assist the effective excellence, political influence, and co-operative spirit of the Australian design professions and enhance their relevance to Government, business and society.

Key Roles of the DIA

To support the DIA's vision, the key roles are to:

- promote excellence in the professional design industry through education and professional development;
- provide timely, relevant and targeted information and support services to members and, where appropriate, government and the community

- conduct research and formulate policies that affect present and future directions of activity
- uphold the input value of design in the national framework of business and the community
- represent the views and interests of the design profession to government, regulatory bodies, business, education, and the community
- maintain and enforce a members' code of professional and ethical conduct
- develop and maintain strategic alliances with similar organisations overseas to further the interests and roles of the Institute
- provide event management services for the promotion of design excellence in the different sectors of the industry

2.4 The Institute of Design Research and Outreach (IDRO), Iowa

The Institute for Design Research and Outreach (IDRO) at Iowa State University emphasizes on applied research, closely linked with both the instructional and outreach missions of the institution and its four departments: architecture, art and design, community and regional planning, and landscape architecture. Through IDRO, faculty and students work in adjunction with citizen groups and communities in addressing real-world problems and in exploring opportunities for new research initiatives.

Broadly defined, IDRO's overall mission is to motivate creative approaches to solving design problems. It strives to promote interdisciplinary design research, to facilitate communication with design professionals and the public and to respond to the needs of the people of Iowa in areas associated with the design disciplines. Current areas of study include community sustainability, environmental awareness and responsiveness,

implementation of the Americans with Disabilities Act (ADA), historic preservation, and the use of the Iowa Communications Network (ICN) for public education. Programs are conducted around these fields of emphasis and expertise. Projects often are carried out collaboratively.²³

2.4.1 Outreach Efforts

IDRO works with Iowa industries on projects of mutual interest. Student groups and faculty teams explore concepts for new products and new applications. When students and faculty work with business groups, local government units, citizen groups, and design professionals, they are continuing the long tradition of Iowa State University in providing Extension services through integrated outreach. Outreach efforts both respond to the needs of the state and look out for emerging needs in areas that are represented by the design disciplines. Design faculty work primarily in the area of applied research, exploring and developing solutions for design problems within specific contexts. The products of this research can range from problem-solving processes to bodies of information to pieces of equipment to physical works of art. Faculty and students have, for instance, worked in affiliation with the Iowa Energy Center and supermarket owners to design display shelves with energy-efficient, built-in lighting. Other partnerships with business and industry have worked on the applications of computer-to-window treatments and recreational vehicle designs.

2.4.2 Professional Development

IDRO's professional development programs respond to the call for integration of research, theory, and practice. Programs are conducted in cooperation with the American

²³ All information obtained from <<http://www.design.iastate.edu/>>

Institute of Architects (AIA) Iowa Chapter, the American Planning Association (APA) Iowa Chapter, and the American Society of Landscape Architects (ASLA). In addition, IDRO provides funding for professional development seminars for members of Iowa's professional design community.

2.4.3 Professional Partnerships

The research and outreach activities of the college are strengthened by the network of relationships that IDRO maintains with all levels of government, professional organizations, and other departments and agencies of Iowa State University. Joint projects are planned with the Iowa Department of Transportation (IDOT), the Iowa Department of Economic Development (IDED), the Iowa Department of Natural Resources (IDNR), the Iowa Department of Public Instruction, the Iowa Arts Council (IAC), the Iowa Energy Center (IEC), and the Iowa Transportation Center. Collaborative undertakings have involved the state chapters of professional associations as well as representatives of professional design firms.

2.5 The Netherlands Design Institute, Amsterdam

The Netherlands Design Institute, which was founded in 1993, is a think-and-do container whose mission is to increase the economic and social contribution of design. The Institute's projects bring together a variety of design specialists, users, and experts in many other disciplines. They come from universities, research institutes and companies around the world.

As an independent, non-profit foundation, the Institute receives core funding from the Dutch government and the city of Amsterdam. Further revenues come from companies investing in research; from other government ministries; and from the

European Commission. A full-time staff, led by the director, works on a regular basis with about 20 independent associates. Each year the Design Institute organises about 60 research studies, workshops, seminars and conferences - plus a number of research projects in which new product or service ideas are tested in practice.²⁴

2.5.1 The Changing Role of Design

Design - like innovation - is one of those words, which mean different things in different contexts; despite decades of discussion and contemplation, no one has yet come up with a commonly accepted definition. Although many people might perceive design to be all about appearances, design is not just about the way things look. It is also about the way things are used; how they are communicated to the world; and the way they are organized and produced.

Many of the problems facing society are multi-dimensional: unemployment, an ageing population, and the environment. But the institutions we expect to solve those problems - government, science, education, and the professions - are not multidimensional. Design therefore has an important new role to play in turning policy concepts into ideas or stories that can inspire people to act. The particular contribution of designers is to use their planning skills to turn a concept into a story, and their visualization skills to make that story visible. The process of design is highly interactive, intense, and imaginative. The process also involves designers in collective work with other disciplines.

The central process of the Institute is the identification of new issues that confront design. Potential partners are located and, with them, the Institute identifies action points.

²⁴ All information obtained from <<http://www.design-inst.nl>>

Design scenarios are then created by multi-disciplinary groups which also conceptualise new products or services. Whatever the outcome, the whole process is based on a publishing model in which ideas and results are dispersed through a variety of media and events.

2.5.2 Themes for Research

The Institute's activities are organized according to a number of themes: Design and Industry, Age and Care, Environmental Sustainability, Cities and Regions, New Skills, and, importantly, Connectivity. Continuous evaluation of developments in the new economy, and new interactions between Design and Industry, inform much of the Institute's work. The contribution of design to innovation is explored with dynamic small companies from different parts of Europe in a project called the European Design Industry Summit. Entrepreneurial flair and innovation are easier to describe than to teach; regular workshops investigate how successful companies use design to innovate. These are not abstract affairs - innovation is discussed among the managers of real companies. The institute also brings these managers into contact with young designers in our annual Young Designers and Industry event.

The design of services in relation to Age and Care is an important theme for the Institute and its partners. More than 50 percent of all European adults will soon be older than 50, and products and services are needed not just to meet their individual needs but, more importantly, to help older people look after each other. For older people there is a need for better communication, which can be more important than high-tech physical aids to their welfare. Indeed better communications can reduce the call made on welfare

services. Designing the infrastructure - and in particular, interfaces easily used by older people - is an important focus of the Institute's programme.

Pervading all the Institute's work is the theme of Environmental Sustainability. A growing number of innovative companies have embraced the concept of 'green design' - not just in a defensive sense, against a downpour of green regulations, but pro-actively, as a competitive weapon in a highly eco-sensitive market. As a result, many designers are being asked to improve the eco-efficiency of products and services by a factor of four, ten or even 20 times.

The competition between an estimated 300 (in Europe) Cities and Regions is a new but intense phenomenon. Investment, jobs, and prosperity have become so mobile that old cities are competing against new ones, and new ones are competing against each other. These cities compete through continuous investment in hard and soft aspects of their urban infrastructures: showpiece 'antenna buildings', transport and information systems, cultural buildings and infrastructures; small pieces of urban equipment. Each city wants to be different, smarter, first. The result is a rapid growth of innovation in urban design at all levels. The Institute keeps an eye on these broad trends, and undertakes pilot projects with a number of Dutch cities and provincial authorities.

As well as exploring new drivers of innovation and change, the Institute strives constantly to improve learning processes in which research, collective intelligence workshops, and communications, interact. The New Skills theme encompasses the constant evaluation of the Institute's own projects, and holds workshops on such themes as knowledge management. To share its knowledge internally and externally, and to publish results, the Institute uses face-to-face events, the Internet, the media, and its own

publications. The Institute's website and databases are both a research programme and communication medium, and can also be used as a shared workspace for project teams who may be working from different places.

2.5.3 Doors of Perception

The Institute participates in an adventure by organizing workshops in which these pioneering multidisciplinary companies meet to exchange experiences. These encounters have proven to be so rich and stimulating that the Institute will shortly launch an interaction design publishing programme in which the latest ideas, projects, research, tools and business issues will be explained and discussed for an international audience. Each year, in the Institute's celebrated annual conference and flagship public event, Doors of Perception, dealing with issues relating to the new technologies are explored. The conference attracts 800-1,000 people to Amsterdam from all over the world, and generates widespread coverage in mainstream newspapers and magazines. Doors of Perception brings together scientists, artists, business people, designers, and policy makers. Each year speakers are confronted with a theme, and asked to react. Since 1993, four Doors have been opened upon four different themes: Doors 1 asked 'what is this stuff? and what is it for?'; Doors 2 centred on the theme of 'home'; while Doors 3 explored the relationship between environmental sustainability and information technology. The event, in which two very different communities came together, became known as 'info-eco'; Doors 4 developed the 'info-eco' theme by focusing on 'speed'. In 1998, the fifth Doors of Perception conference covered the theme of 'Play', spanning learning, play, and work in the context of the changed world.

2.6 Case Study Conclusions

Within the diversities of location and context that characterize the institutes of design studied, it is possible to extract certain positive features and drawbacks. A critical reassessment of the Bauhaus pedagogy, principles and ideology, through subsequent analysis and synthesis of written and visual production of the Bauhaus masters and students reveals a closed, isolated approach to design, limiting it to the domain of the designer. During the inter-war years the Bauhaus movement attempted to knit the design process into a totalized, coherent whole. That is, designers were expected to balance all the considerations that came to bear upon the design of particular projects. In this way, design quickly evolved into a closed activity - an activity in which all but the designers themselves had little if any valid input on questions of materials, taste . . . and so on. Designers came to exist within a social bubble, consulting no one but other designers. The Bauhaus was successful in facilitating large-scale economic production by co-operating with the industry. However, a lack of initiative in integrating other groups such as the public/user groups in design activities is apparent. In this sense, the Bauhaus was not porous to ideas from outside other than its designers.

A study of more contemporary institutes of design such as the Institute of Design (ID), Illinois, the Design Institute of Australia (DIA), Melbourne, the Institute of Design Research and Outreach (IDRO), Iowa and the Netherlands Design Institute, Amsterdam elucidates the functioning, possibility and need for an institute of design. These studies reflect the institute's respective presence, agendas, objectives and contribution to the field of design education and awareness. Within this set of case studies it is apparent that these

institutes have similar agendas with subtle variations ranging from an emphasis on industrial culture to human centred design.

For the ID, the role of design education seems to be an active contribution to the development of industrial culture. An obsession with the rationalization of the design process is apparent in its methodology discussed below. ID uses this methodology in the application of design of semiotics, cybernetics, information theory and operations research which can be broadly categorized under an 'artificial intelligence' design process. ID's research initiatives are relevant in understanding users' increasingly complex lives, in order to develop innovative and humane products and business concepts. As such, the institute favours a socially oriented collaborative approach based on a scientific design-conception. The DIA is inclusive in engaging all possible, categories of design professionals with industrial and government organizations; however the institutions pursuits in engaging the user group and the public are not clear in its mandate or programs. As national institutes of design, the Design Institute of Australia and the Netherlands Design Institute promote the value of design but do not seem to exhibit a specific 'Australian' or 'Dutch' character. Another observation is that support from the government, public sector, industry and professional sectors is essential in promoting national awareness in design.

3 POROSITY

The question stated in the Introduction chapter is thus: Is it possible for the Canadian Institute of Design to be a social space, to promote design awareness, democratic participation and exhibit a national character, all at the same time? This suggests the need for the Canadian Institute of design to be a venue where many groups participate and several perspectives meet. The groups that participate together - users, students, design professionals, employees, production engineers, industrialists and government officials – constitute the design community because they are involved, related and affected by the design process and its products. The architectural implications for this denotes a system of social spaces that is porous to the flow of ideas and opinion. It connotes intermingling, dialogue and participation.

Porous space is social space that is physically, visually and spatially porous.¹ It allows the permeation and mediation of ideas. It allows visual and spatial transitions. Porosity is characterized by pores and perforations in the structure. Porous space is social space because it is inclusive in commemorating the authority of all members of a design community to convey their own ideas as planners and decision makers. Porous space allows democratic participation because it is permeable and accessible to all the participants of a collaborative, creative design process. In this sense, porosity also reflects Canada's participatory, strong democracy. Notions of social interaction, democratic participation and Canadian-ness co-exist in porous space.

¹ Porous is generally associated with being absorbent, having holes, penetrable, permeable, pervious etc.
<<http://thesaurus.reference.com>>

‘Social space’ is a component of a plethora of terminological systems, used in the social disciplines, architecture, environment and behaviour studies etc. to name a few. In each case it has specific meanings and overtones, but it is also consistent in its relation to people, groups and societies and their interaction. The use of ‘social space’ here, is akin to the one defined by Henri Lefebvre. “The form of social space is encounter, assembly, simultaneity - of everything in space, everything produced either by nature or society, either through their co-operation or through their conflicts: living beings, things, objects, works, signs, symbols... It is hyper-complex: embracing individual entities and peculiarities, relatively fixed points, movements, and flows and waves - interpenetration, superimposition, conflict.”²

Lefebvre suggests that until recently the view of space was based on the division Descartes established between *res cogitans* and *res extensia*.³ Based on Euclidean geometry, space was formulated on the basis of extension, and thought of in terms of co-ordinates, lines and planes. As early as 1939, Lefebvre has described geometric space as abstractive.⁴ He criticized the illusion of space as transparent, neutral, passive, empty, abstract, and objectively “real,” as perpetuated by Euclidean geometry and Kantian ideals of an a priori realm of consciousness.⁵ Instead, he defines space as active, operational, instrumental: “the role of space, as knowledge and action, in the existing mode of production.”⁶ He describes how social space is productive and performative. “Social space per se is at once work and product...Social space is what permits fresh actions to

² Henri Lefebvre, *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Blackwell, 1994) 101.

³ René Descartes, “Meditationes de Prima Philosophia,” in *Œuvres Philosophiques: Tome II*, 1638-1642, (Paris: Garnier Frères, 1967)

⁴ Henri Lefebvre, *Dialectical Materialism* (London: Jonathan Cape, 1968) 122, 133.

⁵ Lefebvre also castigates the Bauhaus tradition for producing a “worldwide, homogeneous and monotonous architecture of the state, whether capitalist or socialist”, and he is equally critical of Siegfried Giedeon for promoting a purely abstract, geometrical concept of space.

⁶ Lefebvre, *The Production of Space*, 11.

occur, while suggesting others and prohibiting yet others... Social space implies a great diversity of knowledge.”⁷ Lefebvre’s description of social space underlines a paradigm shift in understanding space.⁸ It is based on the idea that space is “not a passive surface,” it is active; it is not abstract, homogeneous and isotropic, but operational, productive and performative.

Lefebvre’s theoretical foundation is the idea that space is more than a container for objects. In fact, Lefebvre points out that imagining space to be a container generates illusions of transparency and reality that provide only an elemental understanding of space. The illusion of transparency casts a view of space as innocent and open. There is nothing inherently complicated or hidden within space that is viewed through this illusion. The illusion of reality, which Lefebvre also calls the “illusion of natural simplicity,” fosters the idea that things in a particular space are of more substance than the space itself. These two illusions combine to keep us from comprehending the far-reaching nature of space. Lefebvre understands space to be multifaceted, produced and maintained by the relations that govern the interactions of the society that exists within the space. This definition of space as a social product looks past the illusions to discover the multitude of ways in which such space might be configured.

3.1 Social Space as Porous Space

Lefebvre’s characteristics of social space resonate with those of porous space. In drawing parallels between the two; porous space is an architectural manifestation of social space. Both social space and porous space acknowledge the relevance of space to

⁷ Lefebvre, *The Production of Space*, 73.

⁸ Lefebvre’s work is considered to be a critique of modernist capitalism. He shows how the Cartesian, empirical view of space epitomized by Modernism has led to an impoverished understanding of the environment.

the complex workings of society, and the mutually constitutive relationship between the two. Lefebvre views space as a social product. He argues that rather than space being a priori, a vacuum waiting to be filled, it is produced through social action. In other words, social space is produced and reproduced by the relationships that exist within the space itself. It follows from this that “every society produces a space, its own space”. Elaborating on Lefebvre, we can say that sub-societal groups that interact within the design community manufacture spaces that are unique to the groups. The union of these ‘group spaces’ becomes the space for the society. Membership in the groups is fluid and not mutually exclusive, causing the group spaces to overlay one another as necessary. Lefebvre describes this action as “interpenetrating” or “superimposing” one layer of space upon or into another.⁹ Similarly, porous space is produced by the relationships between the participating members of the design community. Porosity enables the inhabitants of the institute of design to move, participate, learn, and contribute without breaking the continuity, inter-connectedness and links between porous spaces. Social space and porous space weave together the network of associations of the physical and social fabric.

For Lefebvre (social) space is not a passive, abstract, homogeneous and isotropic container of objects, but active, operational, productive and performative. Likewise porous space is not merely porous in an abstract sense. It is porous to ideas, to physical, visual and spatial links, to democratic participation, interaction and dialogue. Porous space is active, operational, productive and multifaceted as it integrates notions of social interaction, democratic participation and Canadian-ness.

⁹ Lefebvre, *The Production of Space*, 86.

According to Lefebvre, “(Social) space is not a thing among other things, nor a product among other products: rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and simultaneity their (relative) order and/or (relative) disorder. It is the outcome of a sequence and set of operations, and thus cannot be reduced to the rank of simple object...”¹⁰ In porous space, participation and interaction outlines situations in which thinking (through participation) involves the flow of thoughts and their arrest as well. Plausibly, a flow of creative ideas can arise from the ‘tension’ of coexistence and simultaneity achieved by means of visual and physical mediation through porous space.

“What happens in space lends a miraculous quality to thought, which becomes incarnate by means of a design. The design serves as a mediator - itself of great fidelity - between mental activity (invention) and a social activity (realization); and it is deployed in space.”¹¹ Porous space implies a socially responsive environment where social interaction leads to creative ideas and their manifestation in design. To describe such an environment laden with creative thought and productivity; Walter Benjamin in *Illuminations* states a situation, “Where thinking suddenly stops in a configuration pregnant with tension...”¹²

In ‘The Space of Architects,’ Lefebvre seeks to understand the nature of designed space in terms of its social organization and impact, in relation to the intentions of those who create it. Lefebvre argues that one can conceive of a “primacy of ... semi-public,

¹⁰ Lefebvre, *The Production of Space*, 73.

¹¹ Lefebvre, *The Production of Space*, 27-28.

¹² Walter Benjamin, “*Illuminations*,” Introduction by H. Arendt, trans. H. Zohn (New York: Schocken, 1969) 265.

semi-private spaces”.¹³ This would lead to a diversification of space, and the importance placed on functional division would disappear; functional division being the means by which the present system maintains control over its component parts (people). This, Lefebvre suggests would mean, “Places would be fixed, semi-fixed, movable or vacant” with regard to their function. This implies a level of flexibility whereby functional division is dispersed. Following the assumption that all human relationships may be spatial, in other words that all social relationships manifest themselves in space, one could argue that porous space can simultaneously be private and public in manifestation. One can even argue that porous space is social space which enables and demands daily negotiations of the boundaries between private and public. Enclosed space constitutes a boundary vis-à-vis Nature, people or various kinds of activities. Enclosures modulate spatial relationships; some could be intentional, others reflect hopes, expectations and tensions in the light of social interaction. Relations are reinforced or weakened by the characteristics of enclosure and environment. (Fig. 3.1 - 3.2)

Porous space also conveys a shift in focus from ‘things to experiences’. ‘Phenomenology of engagement’ is at the root of interactivity; this results in a shift of design values from, objects to experiences, from performances to appropriateness, from procedure to process, and from intent to behaviour. Placement, visual and spatial links, lighting, auditory climate all affect the degree to which a space is perceived as something shared, the degree to which it indicates social cohesion or perhaps no more than shared space.

¹³ See Henri Lefebvre, “The Space of Architects,” in *The Production of Space*, trans. Donald Nicholson-Smith (Oxford: Blackwell, 1994).

3.2 Porous space and Canadian democracy

Porous space demands the production and deployment of a heterogeneous discourse, one that allows democratic participation and makes use of multiple modes of address. Porosity as an inclusive social concept emphasizes the empowerment of all members of a design community to directly govern their own ideas as independent planners and decision makers. It reflects the needs of changing societies where the heterogeneity of multiple voices categorizing professionals, private enterprises, government officials, students and the public user group participate to be an integral member of the design community.

There is a strong parallel between democratic participation in porous space and Canada's participatory and deliberative strong democracy. As George Parkin Grant explains, "The essential principle around which Canada has been established is embodied in the age-old struggle in human society as to how free each individual can be and yet live in an ordered society where that freedom is not so abused that it infringes on the freedom of others. Where does freedom for one person to do what he likes mean lack of freedom for other people? This conflict, so continuous in human life, can be expressed in many ways: the relation of the one to the many, of freedom to authority, of liberty to order...Our democracy must consciously stimulate the equality of participation in mind, in ways that it has never dreamed of in the past. When leisure is open to all, then education must be open to all. To overcome the impersonality of the mass society, new relationships in work and leisure must be developed and lived out; indeed, new relationships at every level of existence ..."¹⁴

¹⁴ See George Parkin Grant, *The George Grant Reader*, ed. W. Christian & S. Grant, (Toronto: University of Toronto Press, 1986) 58-49.

Discussions confined within schools of design, industry offices and some professional firms can be lively. Both goals and objects of criticism are described and analyzed with a high degree of seriousness and accuracy, often in pictures, words, charts etc. But when a project is presented formally, the initial drawings and details are deleted, along with whatever doubts and criticisms may have been voiced. For fear that the overall principles may seem too simple, hasty or mere products of chance they are elaborated and embellished with the 'buzz' words of the day (this may not be a standard case). Any words of homage to the work of others are suppressed; no one wishes to seem lacking in originality. As a result of this process of self-censorship no cross-pollination or interchange takes place. This limits further elaboration or refinement and creativity.

In relation to the design community, a researcher's knowledge, the expertise of architects, engineers, industrialists, the ideas of user groups etc. and the experience of professionals can cross-pollinate through democratic participation. Collaborative design can contribute to teamwork, a sense of community and an individual's ability to exert influence, so that the process of design acquires a democratic perspective. "I think it is interesting and convincing to combine high-level cultural research and practical experience within the same space. There lies within this an enormous potential, because the level of cultural discussion can be high without falling into the exotic or into a discourse disconnected from practice which unfortunately takes place all too often."¹⁵ Proponents of collaborative learning claim that the active exchange of ideas within groups not only amplifies interest among the participants but also advances critical thinking. In terms of education, shared learning gives students an opportunity to engage in discussion, take responsibility for their own learning, and thus become critical

¹⁵ Kenneth Frampton, "Education" (One day Conference on Education, Berlage Institute, 11 May 1993).

thinkers.¹⁶ This process is beneficial for all groups involved in the design process. As an example, architects are skilled at leading public participation and to shape projects that reflect the best of what communities hope to become. While architects learn from citizens about their needs, priorities, and ideas for a range of uses; the public learns about the design process and are able to build civic ownership in a project they help shape. The municipal government gains public awareness and appreciation for projects that will be valued and well-used. Similarly professional, industry and government groups benefit from the process.

3.3 Public Participation

Porous space encourages casual movement, chance encounters and meetings, to promote public participation in creative learning. In relation to the design community, this provides an insight into the system and imbibes a sense of being part of the design process. The success of any public initiative depends largely on community support. A well thought out approach to public involvement can have positive effects on both the reception and success of these projects. Involving the public in every step of a project is a valuable action, often underestimated by earnest design and industry professionals, city leaders, eager developers as they focus on a vision for their community. Well-defined explanations of the issues allow the public to make intelligent, informed choices. A coordinated effort of public involvement is the best way to build the consensus necessary to give voice to informed supporters, leading toward a positive outcome.

Public involvement needs to take place from the beginning of a project and then progress through the various stages of the process. The design community's approach to

¹⁶ S. Totten, T. Sills, A. Digby & Russ, *Cooperative learning: A guide to research* (New York: Garland, 1991).

creating a successful Public Involvement plan would be to communicate, listen and respond. The Institute would listen, through the medium of public meetings, to the people who are affected by the project. Enabling the public to express their opinions encourages them to become stakeholders in the success of the project. Public Information open houses are more successful than public presentations since people can have their questions answered personally. These events focus on individual interactions, and allow issues to be addressed and ideas to be directed in more productive ways.

The effort to create consensus can inspire higher levels of design that capture the imagination of group participants and bring them together around a common vision. Synthesis does not mean compromise. It means rallying a group around a concept that encompasses the potential of a project in a manner that will produce an extraordinary result. Communities are effective partners if design professionals are willing to rise to the occasion by listening well, communicating effectively, thinking quickly and maintaining patience and resolve. Working with a community involves a balance between freedom and responsibility, between opportunity and constraint. Public response to concepts and consensus can be formed more easily around values and precepts than around details.

Community-oriented design projects bring unique demands but they also present special opportunities for exceptional design. These projects involve working hand-in-hand with groups to help them envision the mission of their institutions. The job is at once enormously rewarding and remarkably trying. The process engages many people and lots of different agendas. It tests the ability of the designer to fulfill many roles simultaneously and requires the skills of a facilitator, psychologist, artist and technician. In fact, the complex issues that community groups bring to the table are the source of

content for meaningful design. The process of dealing with the community forces the designer to confront the real substance of cultural projects and provides the opportunity to synthesize conflicting needs and aspirations.

It is true that a group conscience can be created around a set of abstract design parameters. People inexperienced in the theory or language of design can comprehend the most complex and subtle of ideas - if these ideas are presented clearly and established in response to the true nature of the community, the program and the context. The Design group needs to establish a common set of goals at the outset of the project and keep these goals in front of the public group as, together, they make better decisions about the project. Evaluated on their own merits, collaborative design decisions are often hard to make. Evaluated in relation to the big picture for the project, there is a rationale for making these decisions.

3.4 An Environment Conducive to Creativity

Creativity is clearly an important factor for the design community. "Creativity includes the generation of ideas, alternatives, and possibilities."¹⁷ Creativity provides the intellectual resources for design – ideas, concepts, insights, and discovery – that eventually become new and innovative theories, approaches, tools, products, and services. Creative, knowledgeable work is today, and in the foreseeable future, the critical resource for public, commercial, industrial and institutional enterprises in Canada, not raw material, machines or money. "For firms in all sectors, whether they are in the arts, services, traditional manufacturing, or high-tech, competitive success depends increasingly on their ability to tap into and unleash the creative ideas of their workforce.

¹⁷ Gerald F. Smith, "Idea-Generation Techniques: A Formulary of Active Ingredients," *Journal of Creative Behavior* 32 (1998): 133-107.

Design constitutes one of the most important manifestations of the creative process.”¹⁸ Porous space activates creative and innovative forces that arise from the free flow of communications and interactions among diverse members of the design community.¹⁹

Creative power and inventiveness are stimulated by several phenomena. One extreme is unfortunate circumstances; when confronted by difficulties we are forced to seek a solution. The other possibility is social stimuli and insight into new fields of knowledge. Research on creativity has shown that spatial factors influence communications and the nature of interactions in social environments.²⁰ The overall pattern of space in building interiors affects patterns of “useful” interactions between members.²¹ Spatial patterns affect movement patterns, and movement patterns influence how frequently people come in contact with one another. Further, the permeability of boundaries and the degree of openness in porous space affect the potential for contact that precedes many interactions. A degree of enclosure, on the other hand, aids privacy, mutual disclosure, and development of trust, which in turn all aid the free sharing of information and creativity.

Porous space allows social encounters...plentiful opportunities for unplanned meetings between people and knowledge in new unexpected combinations. Unplanned meetings require informal meeting places, and a favourable climate for communication. Porous space provides environments and enclosures for actual human communication,

¹⁸ Meric S. Gertler and Tara Vinodrai, “Designing the Economy: A Profile of Ontario’s Design Workforce,” *DIAC Report*, (2004): 50-1, <http://www.dx.org/diac/pdfs/DesigningTheEconomy.pdf>.

¹⁹ Habermas has argued that human social interaction, communication, and language, work and labour form the basis for human creativity. See Jürgen Habermas, *Moral Consciousness and Communicative Action*, (Cambridge: MIT Press, 1991).

²⁰ A. Penn, J. Desyllas, and J. Vaughan, “The Space of Innovation: Interaction and Communication in the Work Environment,” *Environmental and Planning B: Planning and Design* 26 (1999): 218-193.

²¹ Bill Hillier, and Alan Penn, “Visible Colleges: Structure and Randomness in the Place of Discovery,” *Science in Context* 4 (1991): 49-23.

which telephones, mass media and other means of communication cannot replace. In a manner of classifying, there are private spaces, semi-private, public and semi-public spaces. Each space provides different conditions for human communication, and thereby different possibilities for creative encounters. Public and semi public spaces are of special importance for spontaneous, unexpected and creative meetings. So, besides difference and heterogeneity, the organization and formation of a system of porous spaces influence creativity. The designed creative climate must however be accentuated with new social codes as well as methods for working and managing work which encourage creativity.

3.5 Raising Standards for Quality

“The objective of architectural training must ultimately be to nurture the growth of the students own sense of what constitutes quality, so that they may become aware of who they are, where they stand, what they have to say and which formal means are the most appropriate in their specific cases. To design means to think...Our time, characterized by instability, rapid change, pressure and stress, asks for a continuous revision of tasks, forces us to look for new formulations of that task in terms of spatial mechanisms and paradigms.”²²

To ensure good quality products through a creative design process, it is important that a fully funded, multi-disciplinary design team is in place very early in a project venture. Experience has shown that time spent in the early stages of a project - time spent gaining a thorough understanding of the character, context, viability and suitability of product to be designed - has paid off in the later stages of the development process. It is also essential that all members working in the development program for this background

²² Herman Hertzberger, “Do architects have any idea of what they draw?” *Berlage Cahiers* 1 (1992).

research and analysis gets an understanding and involvement in the larger part of the creative process as whole. The design team must be tailored for each project and should include the full range of skills and specialist expertise needed to carry out the project. Collaboration brings added value to the design team, especially when involved in stages. As such the design process should promote productivity and quality (in design).

Research has confirmed that good quality design adds value by increasing the economic viability of development and by delivering social and environmental benefits. Occupants and owners benefit from better performance, loyalty, health and satisfaction and from the increased prestige that well-designed developments command with guests and clients. Designers benefit because good design is crucially dependent on their input. Investors and funding agents benefit through favourable returns on their investments and through satisfying occupant demand. Developers benefit by attracting investors and pre-lets more easily and hence from better 'company image.' If they retain a stake in their developments for long enough, they also benefit from good returns on their investments. Everyday users and society as a whole benefit from the economic advantages of successful regeneration, including new and retained jobs, and also through access to a better quality environment and an enhanced range of amenities and facilities. Public authorities benefit by meeting their obligation to deliver a well-designed, economically and socially viable environment and often by ripple effects to adjoining areas.

Figure 3.1 Collages exploring Porosity

Figure 3.2 Models exploring Porosity

4 DESIGN IN CANADA

4.1 A Brief History

A concise history of design and public participation in Canada is important in order to appreciate the relevance of porous space and democratic participation in the Canadian Institute of Design. This survey¹ helps to situate the issues of national design awareness, education, porosity and democratic participation, discussed in this thesis, in a broader framework of the history of Canadian Design. With the advent of modernism, in the early 1900's, some modernist pioneers brought their European training to Canada, while others studied with transplanted Europeans at institutions like Harvard University and Chicago's Institute of Design. In Canada, basic characteristics of modern design such as functional arrangement of forms, technological innovation, and a manufacturing-based construction industry became apparent. Many Skyscrapers such as the Electric Chambers (1913) in Winnipeg and the Birks Building (1912-1913) in Vancouver were based on the ideas of Chicago School architects.² These buildings were designed with underlying steel framework through narrow piers between windows on the exterior. Use of modern materials such as steel and concrete is evident in the Québec Bridge (1900-1917) and huge grain elevators. Use of modern pre fabricated parts is noticeable in banks built with prefabricated parts in several western prairie towns in Canada. Mail-order houses supplied building parts for houses and commercial buildings in all parts of Canada, especially in the rapidly developing west.

¹ For architectural attributes discussed in the survey see Kelly Crossman, "Canadian Architecture," Microsoft Encarta Online Encyclopedia (2005) <<http://encarta.msn.com>>.

² See Harold Kalman, *A History of Canadian Architecture*, (Toronto and New York: Oxford University Press, 1994).

Features of modern design such as simple, reductive quality and lack of ornamentation appear in the work of Toronto architect Eden Smith. Smith's Saint Thomas's Church (1896) in Toronto resembles a Gothic parish church, built of brick, stone, and polished wood, devoid of ornamentation. Another of his projects, the Studio Building (1913) in Toronto takes on industrial aesthetics with large, factory-type windows punctured into brick walls. Taught by American architect, Frank Lloyd Wright, Francis Sullivan, designed houses in Ottawa such as the E. P. Connors House (1914-1915) that reflects Wright's influence. Samuel Maclure designed houses, such as the Biggerstaff-Wilson House (1905-1906) in Victoria. The house was incorporated into rough landscapes and built with natural materials.

Art deco, a sleek, geometrical style, influenced skyscrapers in Canada as elsewhere in Europe and America.³ The Aldred Building (1929-1931) in Montréal by E. I. Barrott and the Marine Building (1929-1930) in Vancouver by McCarter and Nairne exhibit Art deco influence. Another example is the Toronto Stock Exchange (1936-1937) by George and Moorhouse with S. H. Maw that has a flat facade holding a series of tall, slender windows. In Montréal, architect Ernest Cormier's designed his house (1930) in the art deco style.⁴

Since the 1930's craft revival, many artisans have played a role in Canadian design. Choosing to standardize their process of production, either by hand or with the help of tools, craft makers made hundreds, sometimes thousands, of pieces. However, these designers privileged artistic expression over mass production. Within Canadian

³ See William Bernstein & Ruth Cawker, *Contemporary Canadian Architecture: The Mainstream and Beyond* (Fitzhenry & Whiteside, and London: Academy Editions, 1982). This book includes important projects from the post-Expo '67 era in Canadian architecture.

⁴ See Peter Morley Ennals and Deryck William Holdsworth, *Homeplace: The Making of the Canadian Dwelling over Three Centuries*, (Toronto: University of Toronto Press, 1998).

industry, a separate trend arose, that of the, 'studio manufacturer,' a designer who established a fabrication studio to offer small-scale production. As such, Canada has had a long legacy in studio manufacturing and a reputation for creating limited production designs with panache. The Belgian monk Dom Paul Bellot, who came to Canada in the mid-1930s designed the dome and the massive concrete vaults of Saint Joseph's Oratory (1937) in Montréal merging old forms and new engineering techniques. His design for this building for Roman Catholic worship takes on a modern interpretation of Romanesque and Gothic architecture.

During 1930s the streamlined aspect of industrial design, is evident in the design of commercial buildings and movie theatres such as the Varscona Theatre in Edmonton, Alberta by Rule, Wynn and Rule. Bank interiors designed by Beaux-Arts architect John Lyle such as his Bank of Nova Scotia (1929) in Calgary, takes on a simple, modern version of classical architecture. Seaplane hangers (1928) in Montréal, with thin concrete shells in the exterior, and the Supreme Court of Canada (1938-1946) in Ottawa displays architect, Cormier's skills in dealing with high-tech structures as well as traditional materials. Cormier's Université de Montréal (1924-1950) is a symmetrical building with right-angled wings around a central tower.

World War II (1939-1945) curtailed most building activity in Canada not related to the war effort. After the war, a new design consciousness emerged in Canada. Both the media and the public recognized good design as a necessary and positive development, and the profession was legitimized via professional associations and educational initiatives. Designers took on a myriad of roles that crossed disciplines like design, engineering, production, and even marketing, engaging in unprecedented collaborations.

The designer's exploration of the materials while balancing the diverse conditions set by artistic, technical and economic concerns resulted in innovative designs, a process that continues to this day. After the war, leading designers turned to functionalism and the International Style. The International Style is noticeable in the Vancouver Vocational Institute (1948-1949) by Sharp & Thompson, Berwick, Pratt; the Elizabeth Dafoe Library (1950) in Winnipeg by Green, Blankstein and Russell; and the National Printing Bureau's plant (1949-1957) in Hull by Cormier.

By the sixties, sophisticated, design-training programs were established in Canada, allowing a generation of designers to study at home.⁵ Around 1953, the persistent quality of mainstream modernism led some Canadian architects, to opt for a regionally based architecture that reflected local conditions and use of local materials. The B. C. Electric Building (1955-1957) in Vancouver by Thompson, Berwick and Pratt and the works of Ron Thom reflect a regionalist sensibility, sensitive to the building's site. Thom's buildings for Trent University in Peterborough, Ontario, take into consideration the topography of the land. Arthur Erickson's Museum of Anthropology (1973-1976) in Vancouver incorporates post-and-beam forms of west coast Kwakiutl villages.

The Montréal International Exposition in 1967 (Expo '67), included a huge geodesic dome of interconnected metal parts that formed the American pavilion designed by American R. Buckminster Fuller. A prefabricated housing project of concrete modules, known as Habitat 67 was designed by Israeli-born Moshe Safdie. A tentlike German pavilion covered in fabric; and other large-scale exhibition structures. Montréal

⁵ See Rachel Gotlieb and Cora Golden, *Design in Canada: Fifty Years from Teakettles to Task Chairs* (Toronto: Alfred A. Knopf Canada and The Design Exchange, 2001).

itself was shaped for Expo '67 with the construction of a subway system with several station outlets and large downtown complexes linked underground.

By 1970 architects in Canada and elsewhere had begun to search for options moving away from modernism. The eighties are often referred to as the Designer Decade. During these flourishing times, postmodernism established itself as the dominant expression for design discourse. The American architects Robert Venturi and Denise Scott Brown argued that rational problem solving failed to incorporate meaning and metaphor in design. In an exhibition in 1988, the MOMA established deconstructivism⁶ as a movement, presenting the architecture of Frank Gehry, Daniel Libeskind and others. The impact of deconstructivism was minimal in Canada. Examples include CBC Broadcast Centre in Toronto, by Philip Johnson and John Burgee and Raymond Moriyama's Bata shoe museum, to a lesser degree. Robert Venturi's architecture accommodates historical references, ornament, and popular culture. Venturi's approach, more commonly led to the insurgence of postmodernism.⁷

As an awareness of the need to protect historic neighbourhoods developed, new approaches emerged in design. A. J. Diamond and Donald Schmitt Architects of Toronto designed user-friendly spaces using brick and stone, such as the Earth Sciences Centre (1989) at the University of Toronto. Jones and Kirkland designed a modernized version of a Greek temple facade in Mississauga City Hall (1982) in suburban Toronto. In Montréal, architects Peter Rose and Phyllis Lambert, in association with Erol Argun, designed the Canadian Centre for Architecture (1985-1989), a museum and study centre,

⁶ Deconstructivism in architecture draws its philosophical bases from the literary movement 'Deconstruction' developed in part by the French post-structuralist philosopher Jacques Derrida.

⁷ Robert Venturi, *Complexity and Contradiction in Architecture* (New York: Museum of Modern Art, 2002).

built of local materials and enclosed around a historic monument, the Shaughnessy House of 1874.

Recently design in Canada expresses the search for a certain degree of ‘Canadian-ness,’ receptive to urban conditions.⁸ East coast architect Brian McKay Lyons designs reflect the common sheds, barns, and dwellings prevalent in Nova Scotia. With the insurgence of an era of pluralism and homogeneity, designers have embraced local traditions and materials with a ‘critical’ understanding of the ‘vernacular’ or region, to develop new forms and imagery. Patkau Architects incorporated these ideas in their Seabird Island Band School (1990-1991) in Agassiz, British Columbia. The architects’ design with complex and unusual spaces and shapes that respond to human needs, paid homage to the animal-lore tradition of the island community.⁹ Saucier & Perotte designed an archive and viewing space for film and video, the Cinéma theque Québécoise (1997), in Montréal, in which the spectator encounters images in motion at every turn. Teeple Architects Inc. of Toronto made use a wide palette of textures: stone, wood, steel and incorporated elements of light, water, and landscape in their design for the York University Welcome Centre (2000).

4.2 Public Participation in Canada

In view of the Canadian Institute of Design’s policy of collaborative approach and democratic participation, a study of trends in public participation in Canada is important. A survey of the current status and trends in public participation across Canada indicates

⁸ According to Roger L. Martin, Dean of Rotman School of Management, University of Toronto, “It is imperative that Canadian firms and governments turn their backs on a culture of replication and instead embrace innovation, uniqueness and differentiation.” Arlene Gould and Paola Poletto, “Design Matters: DIAC Design Industry Study,” *DIAC Report*, (2004): 20, <http://www.dx.org/diac/pdfs/DIACFinalReport.pdf>.

⁹ “Seabird Island School: Patkau Architects Inc.,” *The Governor General’s Awards for Architecture 1992*, The Royal Architectural Institute of Canada (1992): 63-58.

that the field, while it is at various levels in different provinces, sectors and industries, is becoming more accepted as an essential part of policy, program and project development.¹⁰ Public participation in Canada can be traced back to the late 1920s and early 1930s when impoverished farmers and fishermen in rural Nova Scotia educated themselves about community economic development.

After World War II boom-time development, the discovery of the environment by the public and the advent of participatory democracy led to a significant expansion of public involvement, on major projects. In the '70s, public participation was embraced first by the transportation and electric power industries and in planning and managing airports by Transport Canada. Later it was adopted in waste management in selecting landfill sites. Next the mining, gas and oil industries saw the light, with most applications in Alberta and British Columbia. In the '80s, the forest industry also took up public participation. Early reliance on formal hearings and public meetings at the end of a planning process led to a wider range of interactive techniques used earlier in the planning and decision-making sequence. Now, in the '90s, more managers and decision-makers recognize the interaction of economic, environmental and social factors. The number and nature of groups wanting access to public-issues planning and decision-making is exploding. If public participation practitioners become involved in this new opportunity to take part in major decisions, they may also secure the future of the field and their place in it as Canada commences a new period of participatory democracy.¹¹

¹⁰ See "Exploring Canadian Values," Canadian Policy Research Network, Ottawa, 1995.

¹¹ Also see Desmond M. Connor, "A Generic Design for Public Involvement Programs," in *Constructive Citizen Participation: A Resource Book*, 5th ed. (Victoria: Development Press, 1994).

5 SITE AND CONTEXT

The proposed site for the project (Canadian Institute of design) is to the east of the National War Museum. The site located in the heart of downtown Ottawa on LeBreton Flats, will allow the Canadian Institute of design to be a central part of the new vision for Canada's Capital. Located adjacent to many of the National Capital's other tourist attractions, the zone will play a vital role in attracting a great number of tourists and visitors to the Capital region area. The National Capital Commission foresees LeBreton Flats as "the site of nationally important institutions - cultural and governmental - and as a dynamic community where people can live, work and play just minutes from the Parliament Buildings."¹ NCC's vision for a dynamic community and the Canadian Institute of design's need for democratic participation follows that the design should take into consideration its relationship with surrounding buildings around the site. The design also needs to consolidate the relationship between the institute and streets, squares, parks and the canal by creating pedestrian links, cycling tracks and vehicular access that form a network connecting the neighbourhood. Consequently, a study of the site and surrounding context is important in generating porosity and democratic participation at the urban level. (Fig. 5.1, 5.2)

5.1 Connections and Links

The site has two faces: one tied to the city as a collective, the other, nationalistic. Immediately south of the Canadian Institute of Design and the Canadian War Museum will be the Public Commons, a community and festival park with a Parade Square for

¹ National Capital Commission,
<http://www.canadascapital.gc.ca/corporate/plan_reg/tomorrows_plans/lebreton_flats_e.asp>

Figure 5.1 Site Location

Figure 5.2 Site Map

The numbered areas are undergoing construction as per NCC plans.

Figure 5.3 Capital Core area

The proximity of the site to important federal political, cultural and administrative institutions; this area creates a special sense of place and identity for Canada's Capital. It serves as the main stage for communicating Canadian culture and history, and hosting national events, ceremonies and celebrations.

Figure 5.4 LeBreton Flats

NCC proposal for LeBreton Flats

civic congregation and celebration. Further south will be high-density residential and commercial developments as per National Capital Commission plans. To the east, the site has strong visual links to the city and the seat of Canadian democracy, the Parliamentary Precinct with our national landmark, the Peace Tower. To the west are the upstream reach of the Ottawa River and a picturesque panorama of sunsets. To the north are views of the Albert and Amelia Islands, Chaudières Falls, the Domtar industrial site, and beyond to Gatineau and Quebec. (Fig. 5.3 - 5.6)

Close to the Institute, is the National War Museum, designed by the architectural team of Moriyama & Teshima Architects of Toronto and Griffiths Rankin Cook of Ottawa. Dedicated to the education, preservation and remembrance of Canada's military history, the museum emphasizes the role that military events have played in history. The theme of the architectural design is regeneration. In the words of the lead architect, Raymond Moriyama, "Nature may be ravished by human act of war, but inevitably it hybridizes, regenerates and prevails. This museum is a tribute to our military past and a salute to the freedom and democracy that has resulted from the sacrifices of the men and women who have served this country."² The War museum lies on an extension of the Confederation Boulevard and connected by it to the National War Memorial.

The roof of the war museum is a pedestrian walkway, allowing visitors to experience some of the Museum's multiple layers of meaning. The view towards Canada's Peace Tower on Parliament Hill is framed by the roof's twin copper peaks and is of primary importance to the architecture's 'line of sight.' The Canadian institute of design addresses this line of sight by opening up framed views of the Peace tower and the Parliamentary Precinct. These framed views are visible from the terrace of War museum

² Information obtained from <http://warmuseum.ca/cwm/new/ca_arche.html>

through the Institute of Design aligned along the line of sight. The Peace Tower and Parliamentary Precinct can also be viewed from accessible terraces in the Institute of Design. The wall and roof of the Institute extends at angles to emphasize the view corridor linking the museum to the Peace Tower and beyond. By creating visual links the Institute forms a connection with its surroundings. (Fig. 5.7- 5.9)

The National Capital Commission is planning a Riverside Promenade along the water's edge as a flexible outdoor space for walking, roller-blading and cycling. The future development of LeBreton Flats will strengthen these qualities. The Institute of Design has strong pedestrian links and cycling routes that connect to the Public Commons, Le Breton Flats and the water edge. These pedestrian links move around the Institute to address porosity and public accessibility. The institute has a main circulation ramp or pathway at its core that axially refers to the national capital core to the east and the city to the south.

5.2 LeBreton Flats

LeBreton Flats is a valuable expanse of undeveloped land in the National Capital core. It is a riverside space of some 65 hectares situated just west of Ottawa's downtown. LeBreton Flats is named after John LeBreton, a native of the Channel Islands and a Captain in the British army. He is said to have canoed on the Rideau River, then travelled by horseback from Kingston to Brockville, Ontario, where he met a prominent lawyer and judge, Levius P. Sherwood. Together, they purchased lot 40, the site now known as LeBreton Flats.

5.2.1 Options for LeBreton Flats

LeBreton Flats has seen several grand visions, thanks to urban planners from three levels of government. But what if the NCC, the region and the city had not spent all those years struggling over jurisdiction and writing up the future of LeBreton Flats in fancy reports? Phil Jenkins, writer and musician, figures he knows the answer. Left on its own, he says, LeBreton Flats might have become Ottawa's artist colony - like Gas town in Vancouver, or Toronto's Cabbage town. "It could have become a place where the artist tribe got together in cafes and bars to argue among themselves."³

'An Acre of Time' by Phil Jenkins, is about the history of an acre of land near the Ottawa River i.e. Le Breton Flats, from the first settlements to present-day bureaucracy. Describing the history of Le Breton, Jenkins' story looks at a community, as an evolving entity; a coming together of place and people over time, and the process by which man alters the place he inhabits. "I've come here to unearth a story, a rolling tale of lava and glaciers, of tropical seas and waterfalls, of whales and white-tailed deer, of Indians and pioneers, millionaires and paupers, firestorms and bulldozers, railways and lumber mills, facts and gossip. It's the story, the biography, of the field beneath my feet."⁴

According to Phil Jenkins, "And if a poet from Somalia or Sarejevo came here, that's where he would have gone to live." At one time, LeBreton Flats was an industrial area. "It was the place in Ottawa where things were made," he says, "similar to Sheffield Road in the city's east end today. That meant an abundance of lofts that could have been converted into artists' studios with plenty of space and cheap rents. Think of the atmosphere in such a place. Imagine a neighbourhood in which intellectual ferment was

³ Gator Dawg, "A Civic Gadfly Looks at What LeBreton Might Have Been," *Ottawa Citizen*, June 16, 2004, Arts section.

⁴ Phil Jenkins, *An Acre of Time: The Enduring value of Place*, (Toronto: MacFarlane Walter & Ross, 1997).

Figure 5.5 Bicycle and Pedestrian Pathway System

Figure 5.6 Roads, Parking and Public Transport

on the menu of every cafe and hangout, where wild-eyed painters and student intellectuals talked politics and revolution over cheap wine.”

Of course, that’s not how things turned out. LeBreton Flats had grown shabby and down-at-heel when the NCC expropriated it in 1962. (For context, that was the year the Trans-Canada Highway opened, and when Marshall McLuhan published *The Gutenberg Galaxy*.) The Flats was the split lip on Ottawa’s countenance, an embarrassment to a capital city. Now, the new Canadian War Museum is taking shape on the site. And the first phase of the NCC’s plan for the 65-acre Flats redevelopment for a dense, mixed community, encircled by green spaces and linked to public transit, is making slow, irregular progress. Jenkins also envisioned LeBreton as a venue for tribal gatherings of all kinds. “When the Pope came to town, they put him there.⁵ And trade union protesters formed up there for the policy march against the Mulroney government. In some sense, I think LeBreton Flats was trying to tell us what it wanted to be. You need a place where a city can go and think collectively, where subjective, emotional things take place.” Jenkins saw the redevelopment of LeBreton Flats as a chance to “ceremonially link up Upper and Lower Canada,” by reclaiming Chaudiere Falls.

People living near LeBreton Flats put plenty of questions about the future of their neighbourhood to officials from the National Capital Commission. Empty for decades, LeBreton Flats is a clean slate, and the NCC is eager to start filling it in. The War Museum is completing construction, the roads through the flats are getting changed, and the site is in the process of being decontaminated. The NCC envisions stacked townhouses and apartment buildings ranging from four to twelve storeys, 2,500 square

⁵ In September, 1984, thousands gathered at LeBreton Flats to see Pope John Paul. Geoff Matthews, “Pope’s visit ‘the greatest event of our lives’,” *Ottawa Sun online*, 3 April 2005, <<http://www.canoe.ca/NewsStand/OttawaSun/News/2005/04/03/980629-sun.html>>

metres of retail space, wide sidewalks, and plenty of courtyards and green spaces. According to NCC plans, Phase 1 would contain 800 units in all, a quarter of which must be reserved for affordable housing.

5.2.2 Historical Perspective

LeBreton Flats lies close to the scenic Ottawa River. For thousands of years, the River was known as the “Kitchissippi” (The Great River) by the first inhabitants of the area, the Algonkian Nation. Besides providing them with the necessities of life, the river also served as an important trade route for the many peoples that lived along its banks. In 1610, the great French explorer Samuel de Champlain sailed down this river, also establishing the area as an important route for the growing fur trade in Europe. Soon, the British followed, and for two centuries the main economy of the entire region survived well on fur trade. In the early 1800s, the area became a lumber boomtown. With The War of 1812, Colonel John By began work building a canal that would connect the Ottawa River with the Rideau River to carry military supplies close to the American border. Most of those who worked on the Canal stayed, living on the south side of the river in what is now known as LeBreton Flats.

The Flats may be considered one of Canada’s oldest industrial and residential neighbourhoods. In 1900, a huge fire erupted in the community that was visible from as far away as Kingston, Ontario. The fire, swelled by high winds and the wood construction typical of that period, consumed the entire area and reduced it to ash and rubble. A community of tradesmen, merchants and their families survived and shared the Flats with industries such as sawmills and rail yards. The oils and chemicals associated with industry that existed there, combined with the remains of the Great Fire had

contaminated the soil. Later on, when it was decided that the area would become a new dynamic community in the heart of the Nation's capital, the presence of these contaminants led the NCC to call for decontamination of LeBreton Flats area before any development could proceed.

5.2.3 Recent History

The National Capital Commission acquired the land in 1962 for the construction of new government buildings. The roadways remained under municipal and regional ownership, and three-way negotiations about the future of LeBreton Flats caused some delay in planning. In 1989, a partnership was forged between the NCC, the former Regional Municipality of Ottawa-Carleton and the City of Ottawa to come up with a concept plan for LeBreton Flats. Throughout, the location continues to prove its value as a site for occasional congregations, festivals and public events.

“The central goal of the plan is to create a vibrant mixed-use community, which would be linked to the downtown core. The Flats and adjacent areas would then be connected to the cultural, institutional and natural resources within the National Capital Region. The following characteristics formed the foundation of the plan to make the community:

- Alive (drawing people back to the centre)
- Functional (serviceable systems of roads and sewers)
- Connected to the rest of the National Capital Region (recreational and commuter routes, pathways and public transportation)
- Meaningful (with national institutions on beautiful riverside sites)
- Green (environmentally sound and linked to the regional network of green spaces)

Decontamination began several years ago at one of the most affected areas: the site of the former Ottawa Paint Works (corner of Booth and Wellington streets). The technique used was biodegradation (the use of solvent-eating bacteria).”⁶. In 2002, the NCC adopted more rigorous federal and provincial standards to go about the clean up of the site and ensure that the environment would be protected during the remediation process. Significant progress has also been made in the construction of infrastructure, with the complete replacement of the infrastructure of Booth Street in 2004 and work underway on other roads, a storm water management facility and a bridge at the west end of LeBreton Flats.

5.2.4 Context

One of the important undertakings of the new vision for LeBreton Flats is to retrieve for Canadians the picturesque waterfront sites in the nation’s Capital region by developing the riverside as accessible pedestrian pathways and cycle routes. The NCC also plans to rejuvenate the Flats by ensuring a balanced mix of residential, commercial and institutional developments. The Canadian Institute of Design extends and links on to these surroundings through pathways, cycle routes and riverside paths. On- and off-street pedestrian and bicycle routes, coupled with convenient access to the Transit way, will make the Institute a lively part of the new community, an area where people can comfortably live, work, play and commute. It will also link the downtown core and the city and be accessible from adjacent areas. LeBreton Flats will become an extension of the core of the capital, while retaining its charm as a welcoming and dynamic community. Pedestrian comfort and convenience will be key, with green space, pathways and national symbols as a magnificent background.

⁶ All information obtained from NCC website <<http://www.canadascapital.gc.ca/>>

The design of the Institute engages its surroundings actively through visual and physical links. The importance of designing a building that engages and relates to its surroundings is reflected in Kenneth Frampton's lecture, "Habitat Revisited: From Land Form to Corporeal Space."⁷ In this lecture, Frampton set the concepts of 'landform' and 'corporeal space.' Landforms, Frampton explained, are "interventions conceived from the outset as a new topography, thereby reprofiling the sense of ground through the superimposition of interstitial form." This idea is neatly condensed in the German idea of *teppichhäuser*, which Frampton explained to mean, "a woven fabric that is virtually inseparable from the configuration of the ground." For Frampton, corporeal space accommodates the ergonomic and emotional needs of the subject, and stems from a design process that elevates consideration of human needs over formal expression. Frampton's discussion is centered on the "tactile and corporeal interior that is capable of responding both ergonomically and poetically to the constantly changing needs of the human subject." In conclusion to his lecture, Frampton reiterated the two basic thrusts of his talk. "The point is obvious: this question of how the body is accommodated in the living space is something to which we should pay greater attention. Buildings should be anchored into the site, rendered topographically, and not just as free standing objects."

The Canadian Institute of Design situated on the northern edge of LeBreton Flats, the new Canadian War Museum and the adjacent park known as The Common, will draw Canadians back to the shores and waterway, where the history of the Capital began. The Common, bordered by trees, will serve as both a festival plaza and a place where people

⁷ Kenneth Frampton's lecture "Habitat Revisited: From Land Form to Corporeal Space" was the keynote address of the Architectural League's 2002-2003 lecture series, "Habitation." Frampton argued that settlement must be integrated with landscape, and that interiors must be designed to respond "both ergonomically and poetically" to the needs of the human body.

can gather to relax and enjoy the views of the Ottawa River and Parliament Hill and tour around the museum and the Institute of Design. NCC planners have sketched a broad span of open space with a design load of 20,000 to 40,000 people in the very heart of the development.

Narrower streets, wider landscaped sidewalks, weather protection along frontages and seating for pedestrians will be key features of the new community. Connections to the Aqueduct, the river, islands to the north, nearby communities and the central core will make it simple and convenient to walk, cycle or take public transit within the immediate zone. The new structures to be built will also incorporate a colour palette that will complement and preserve the integrity of existing stone heritage buildings characterized by their soft greyish tones. All new commercial/residential development will respect human scale, and focus street-level activity. Variety in housing (i.e., types, sizes and prices) will create a unique, socially diverse neighbourhood that will evolve into an active and vital community.⁸

⁸ Available from
<http://www.canadascapital.gc.ca/corporate/plan_reg/tomorrows_plans/lebreton_flats_e.asp>

Figure 5.7 LeBreton Flats View Control Planes
City of Ottawa Official Plan

Figure 5.8 War Museum Sight Line
This sight line addresses the view to the Peace tower.

Figure 5.9 Site and War Museum Photos

6 CANADIAN INSTITUTE OF DESIGN

6.1 Project

The Canadian Institute of Design is a collaborative, integrated learning facility. Its agenda is to be a social space, to promote design awareness, democratic participation and exhibit a national character at the same time. It is an independent body and receives its core funding from government and public sectors. The Institute celebrates the democratic, collective potential of staff, students, public, and delegates from the profession, industry and Government, in promoting the quality of design in Canada. The design is based on a concept of porosity. The architecture of the Institute of design is porous in nature; porous to ideas and democratic participation, to visual and spatial boundaries, to critical and collaborative thinking, to all members involved in the creative design process. (Fig. 6.1 - 6.5)

Porosity implies, a natural flow between spaces, punctured facades and perforations in the structure which allow visual and physical movement back and through. Further, navigating through levels of porosity ranging from visual to actual spatial transitions, getting a sense of what's happening in the Institute such as everyday occurrences, moments and exhibits through these pores as framed views, makes it open and inviting to public participation. At the urban level porosity induces visual and physical links, connecting the Institute to its surroundings. Interior courts that act as functional and visual filters for Le Breton flats are reinterpreted in the institute as interior courts or pores. These interior pores and a network of pedestrian links and cycling routes gather the activity and energy of the site towards the Institute. The Institute's terraces are

Figure 6.1 Massing Models

accessible and visually connect the war museum to the parliament buildings. The carefully scaled building form of the Institute respects the scale of the war museum and surrounding buildings. The fluid and porous expression provides an inviting ambience, an appropriate national projection for the Institute that values creativity and innovation in design, whilst welcoming and embracing the community. (Fig. 6.6 - 6.9)

6.2 Program

The Canadian Institute of design includes architecture, interior, industrial, fine arts, textile and graphic design departments. The first level comprises of the administrative and workshop zones in the south wing and studios, laboratories and exhibit areas in the north wing. The second level has workshop areas in the south wing and studios, library and faculty offices in the north wing. The north and south wings are connected by a central circulation bridge or pathway at the first level. At the second level, huge spans of open terraces connect the north and south wings as well as connects the building to its surrounding by creating visual links. The building extends on to the site through an exterior workshop space, landscaped forecourt, pedestrian pathways etc. The third level is a café located in the north wing.

The administrative zone includes reception and waiting areas, administrative offices, offices for visiting faculty and delegates from the profession, industry, and government etc. (such as CCA, RAIC, CMHC, NCC etc.) to be rent out or provided on a temporary basis and a lowered conference hall for collaborative meetings. The workshop zone includes column free spans of workshop areas, workshop offices, storage space and extends on to an exterior, open workshop space for large scale on site undertakings. The south wing includes reception offices, studios, lecture halls, a lowered design convention

Figure 6.2 Models
Midterm: Program and space

Figure 6.3 Exploring Porosity in Design
Midterm: Porous space

Figure 6.4 Exploring Porosity through drawings

Figure 6.5 Exploring Porosity through drawings: Colour

hall, digital laboratory, classrooms, locker and storage facilities and exhibit spaces on the first level. The design convention hall is an open multifunctional space surrounded by studios and student activity, for diverse events. The exhibit spaces located close to the canal form a design experience gallery in displaying thematic settings. These spaces are geared towards contributing and promoting design awareness. Delegates from the profession, government or industry who fund critical awareness events or co-operate with the students and user groups to launch joint-venture projects could also use these exhibit spaces. The south wing has a design library along with faculty offices and classrooms on the second level. The south wing is easily accessible from parking areas in the semi basement level.

The Institute provides parking spaces at the semi basement level in the north wing. The north wing of the building is raised high from the ground plane in order to capture framed views of the canal to the north of the building and to accommodate parking below. The northeast of the site permits vehicular entry for semi basement parking; leaving the north edge facing the canal, traffic free. It is important to keep the north edge traffic free in consideration of the NCC plans. The southeast corner of the site is modified into a landscaped network of pedestrian paths and open workshop space. This forms a backdrop to create a generous square and arrival space for the main entry. (Fig. 6.10 - 6.11)

Figure 6.6 Sight Lines

Porosity at an urban level is achieved through sight lines. These sight lines dissect the Institute at angles to create framed views that visually link surrounding buildings. The Institute's terraces are intercepted by the form of the building, projected at angles, to offer unobstructed views along sight lines.

Figure 6.7 Sight Lines in Plan

Figure 6.8 Site Model: Massing

Figure 6.9 Site Model: Sightlines

Sightlines move across the war museum and Institute's terraces towards the Parliament buildings.

6.3 Architectural Elements

6.3.1 Forecourt

The southeast part of the site harbours the forecourt and connected open space, defined and characterized through the form of the Institute's structure. This open space is a combination of hard paved areas, lawn and soft landscaped patches that connect to the site to its surroundings. This large paved area creates a forecourt to the ceremonial main entry or the southeast entry. It is the site for events and welcoming ceremonies, and provides for the erection of temporary marquees. It will also provide significant amenity to the students and staff offering landscaped areas as well as 'spill' spaces. Importantly this landscaped open space creates an appropriate continuum as well as interface that connect the building to its surroundings at ground level.

The forecourt provides an area for recreation and seating as well as continuing the landscaped character of the Public Commons, war museum and Le Breton into the Institute precinct. The paved areas of the open spaces and forecourt will be finished in paving units whose size and finish are varied to create an appropriate 'break-up' and scaling of the surface. As parts of the building extend on to the landscape of the forecourt there is a layering of the fabric subtly integrating into the ground. The workshop areas in the institute extend into the landscape to form open areas for large-scale on site work. It is designed for use as a common outdoor space for collaborative work that can be viewed from interior workshops and terraces above. Pedestrian pathways in the forecourt and around the building link the institute to the surrounding context, the commons park, the museum and the residential blocks.

6.3.2 Central Pathway

The Institute has a central pathway, conceived as circulation ramps that connects all parts of the institute and provides three points of access from outside. The main, ceremonial, southeast entry to the Institute addresses the Forecourt and landscaped areas with two other secondary points of access facing Wellington street to the east and Booth street to the west. The central pathway is axially oriented to the east towards the parliament buildings and the national capital core, as well as to the south towards the city. Pedestrian pathways emerging from the Public Commons, Le Breton flats and surrounding areas meet at the Institute's points of entry and merge with the central pathway to form a continuum allowing the porous nature of the Institute to reaches out and engage with its surroundings. The central pathway breaks up into inner courts or pores. This pathway forms a raised platform at its centre that visually connects all parts of the first level.

The central pathway is an important space within the Institute, creating a sense of arrival and orientation while providing a clear circulation path that connects the building's north and south wings. The central pathway is enclosed in a glass exterior with closely spaced horizontal louvers creating a strong sense of entry and access. It draws in natural light to the building from the south and east corners. The roof of the central pathway is a combination of open, accessible terraces. This roof is separated from the second level north and south wings of the superstructure and helps resolve the intersection of the two angular geometries that form lines of sight or visual links. The floor of the central pathway is designed as an extension of the landscaped forecourt, with a continuity of paved finish.

6.3.3 Inner Pores

As an expression of porosity, the Institute has several inner pores or courts in the form of open to sky, cut outs in the building. An inner court in the south wing serves the administrative and workshop zones in providing a common hub and access to natural light. Two inner courts characterize the north wing connecting the studio and laboratory spaces, providing access to semi basement parking. The building also contains cut-outs or pores in the floor and ceiling as well as in its structure and partitions. These pores visually and physically connect all levels and are carefully scaled to create interconnected volumes. The pore above the design convention hall in the north wing is created through the positioning of the overhead bridges and large glazed railings that open the vista from deep within the building right to the café on the third level. Bringing light and air into the block of the building, the inner courts or pores remain compatible with the height and bulk of the surrounding neighbourhood.

These spaces also create semi-outdoor congregation spots. The design convention hall is made up of a series of steps or seating areas that create an informal internal ‘amphitheatre’ at the heart of the studio spaces. The generous character of the stepped areas, the presence of natural light from top and a direct view of the exhibit areas create a visual continuity through various subtle levels. Finishes around the inner courts continue with large glazed panels with occasional vertical and horizontal opaque elements to create varied levels of porosity. Other pores include vertical circulation areas such as elevator shafts and stairways. Porosity expressed through walls of studios and offices allow all spaces to be supervised from multiple vantage points. The density, the surprises, the juxtaposition of interior and exterior, and the blurring of the private and public,

through inner pores contribute to the experience of porous space. Porosity of individual structures reinforces their contribution to the reading of the design process as a whole, and the relationships among them create the social and physical fabric of the Institute.

6.3.4 Social Hubs

Within the Institute, are located, several shared, social, communal spaces and informal meeting areas, not enclosed by boundaries. These spaces or social hubs are present in the administrative, workshop, studio and laboratory zones. As an instance, these spaces are present around vertical circulation areas to encourage social interaction and the exchange of ideas through chance encounters. The central pathway provides access to all the primary teaching facilities as well as accommodating study and informal meeting areas for the students, which also form social hubs. Due to the large numbers of people circulating and interacting in these spaces, the presence of natural light and visual relief are very important and hence addressed by porosity. This has been achieved through the use of partially glazed and opaque areas; where openness is desirable the design takes on a more porous turn and where a certain amount of enclosure is required, the design is less porous in using reflective and translucent glazing along with opaque elements. While reflective glazing does not reveal the enclosed space, the surface reflects natural light and images of the surrounding areas. The design convention hall, the conference area, workshop area, exhibit area, studio spaces, in fact most spaces within the institute are socially oriented spaces with specific functions, but the social hubs are communal spaces with no other specific utilitarian function other than congregation, social interaction and dialogue.

6.3.5 Terraces

The orientation of the National War Museum is characterized by its axial reference to the Peace Tower. The design of the Institute draws direct reference from this and works on strengthening this connection. The central pathway is topped by open terraces on the second level, which allow this axis or line of sight to potentially extend across the institute. These lines of sight dissect the Institute at angles to create framed views that visually link surrounding buildings. The Institute's terraces are intercepted by the form of the building, projected at angles, to offer unobstructed views along sight lines. The vitality of events in second level studios and workshops can spill out onto the terraces. Terraces around the inner courts allow visual connection to the lower floors and to the workshop space below. The terrace on the third level towards the east could be used as an outer extension of the café in summer. The cloistered intimacy of the terraces, provides a space of contemplation for the creative designer, and articulates and emphasizes the architectural motifs of the building itself. The terrace above the central pathway also draws together the north and south wings of the building and integrates its circulation patterns. (Fig. 6.12 - 6.15)

6.4 Design Factors

6.4.1 Intent

The Canadian institute of design is about generating an intimate, democratic feeling of having the right to participate and move around freely, to interact and to contribute. Creative learning environments are extraordinary environments; they are exciting

Figure 6.10 Ground Floor Plan

Figure 6.11 First and Second Floor: Program

Figure 6.12 Long Section through Design Convention Hall and Conference Hall

Figure 6.13 Long Section through Central Pathway

Figure 6.14 Transverse Sections

Section through Design convention hall

Section through Central pathway

Section through Workshops

Figure 6.15 Elevations
East and south

Figure 6.16 Model: Ground floor level

Figure 6.17 North wing and South wing

creative laboratories. As such they must be fine works of architecture and have a highly developed intimacy with the human creative process far beyond the requirements of the traditional enclosed classrooms, studios and workspaces. The institute's environment is designed to connote work to the observer; work with a decided difference. When one walks into these environments, one is immediately flooded with the message that this is for creative collective work. It is an environment with variety for stimulation and immediate access to the tools the users need to do their work effectively. It is an environment to create, store, reflect, retrieve, and recreate knowledge and design. It is a unitary message that comes on all levels: visceral, intellectual, spatial and visual.

(Fig. 6.16 - 6.17)

In nature, there is variety, but traditional environments eliminate that variety and strive for uniformity. Environments that inspire creativity accommodate the human need for variety, for safety and for adventure in alternate spaces of prospect. This sort of environment is created by levels of porosity; the interaction of light, sound, materials through pores and in the way users move within the spaces.

Porosity is not so much a design aesthetic, though this is present and is consciously constructed, as it is a way of working expressed through design: fluid, active and participatory. Porous space accommodates spaces and sub-spaces that read through each other, have a unique character and provide many places for creative outbursts to happen.

The entire environment must look and feel like its permeable. Within this myriad of sub environments, spaces and activities can take place. Spaces must divide for

Figure 6.18 Forecourt

Figure 6.19 East Entry

Figure 6.20 Inner Pores

Figure 6.21 Terraces

Figure 6.20 Administrative Zone: View from ramp

Figure 6.21 Administrative Zone: Waiting and office areas

Figure 6.24 Workshop Area: View from administrative zone

Figure 6.25 Workshop Area: Workshop offices on the left

Figure 6.26 Workshop Area: Workshop offices

Figure 6.27 Workshop Area: Inner Court

protection of different groups and functions, and yet flow together. One must be able to develop a sense of the other areas, pick up the energy from them and logically move to different work areas as the work demands. Spaces can be tied by materials and light quality and continuity elements: the ramps as main circulation paths, the porous wall system weaving throughout the entire plan, the interior social hubs, the exterior landscaped workshops and roof terraces that relate to the war museum and the capital axially. The institute must strengthen its identity to create national awareness about design and still be a part of the larger context of its environment. The institute must convey a sense of uniqueness, a sense of relaxed order and excitement and explicit focus on creative productivity, yet maintain a visual interest level.

6.4.2 A Sense of Place

Familiar local scenes, the steady movement of sculling shells on the canal, or the familiar sight of cyclists, framed views of the war museum and the parliament buildings, pedestrian connections to the commons park and the surroundings, establishes a sense of place for the Canadian Institute of Design. A sense of place gives vital context to a project; while working, a person should know where they are. Architecture establishes this context, this sense of place. The environment must supply a variety of references that establish time and place in a concrete way such as the movement of natural light and a view of pedestrians filtered through porous space in the institute of design.

In the eighties, Alexander Tzonis, Liane Lefaivre (1981) and Kenneth Frampton (1985) created the term “critical regionalism” to describe a contemporary architecture which could neither be branded as internationalism nor as a folkloric or historical concept of region and architecture. The architecture of critical regionalism makes reference to the

site, the “genius loci” on a more abstract level. Rather than dealing extensively with the region itself and a particular regional style, Frampton’s concept of regionalism mainly focuses on the relationship of a building to its site and location in a sociological context. On a discussion of critical regionalism in an article written for the Yale University architectural journal *Perspecta* Frampton states, “Its salient cultural precept is ‘place’ creation; the general model to be employed in all future development is the ‘enclave’ that is to say the bounded fragment against which the ceaseless inundation of a placeless, alienating consumerism will find itself momentarily checked.”¹

6.4.3 Form

Porosity is not an instrumental dictator of the physical form of the Institute, but the essence of a collective creative environment. The appropriateness of a form depends on the degree to which it fits design decisions. The process is more important than the idea. In the case of the institute’s design process, architecture is not based on a tradition in which you have an idea that is always associated with form so that the form and idea are more important than the matter. As a designer, one can impose the form or idea on matter. The idea precedes the matter. For the Institute, the design process generates a form or idea through the manipulation of matter; matter in the broadest sense of the term - not only in the sense of material.

A circulation pattern such as the main ramp in the institute, or the way people group together for a certain activity, or the way people view the surrounding architecture such as the Peace tower and war museum from the institute have influenced the design of the institute. The north wing of the building is raised to allow semi basement parking and

¹ Kenneth Frampton, “Prospects for a Critical Regionalism,” *Perspecta* 20, *Yale Architectural Journal* (1983): 162.

frame views of the canal. The main entry and exit points are accessed through the central pathway. From the parking area at the semi basement level, one can move up into the studio spaces and exhibit areas; digital labs, the faculty offices and cafe are further up. As one walks through the central ramp and experiences the building, the path breaks into inner courts and further breaks into pores in the structure that create framed views of different spaces in the building. The interior and exterior workshops are visually linked and face each other. The terraces open up at angles to address sight lines. The building extends onto its surroundings. These factors have influenced design decisions and together with a complexity of issues such as those of circulation, function and resonance, contribute to the form. The process becomes what forms the project rather than the final effect that one decides at the outset of the process. (Fig. 6.18 - 6.33)

Figure 6.28 East Entry and Inner Court

Figure 6.29 North Wing: Inner Court

Figure 6.30 Exhibit Space: View towards studios

Figure 6.31 Digital Labs

Figure 6.32 Studio Space

Studios surrounding the design convention hall.

Figure 6.33 Exhibit Space: View through pores

Navigating through levels of porosity ranging from visual to actual spatial transitions, getting a sense of what's happening in the Institute such as everyday occurrences, moments and exhibits through pores as framed views, makes it accessible and inviting to public participation.

7 CONCLUSIONS

In conclusion it is appropriate to recapitulate the questions and concepts discussed earlier on in the thesis. Is it possible for the Canadian Institute of Design to be a social space, to promote design awareness, democratic participation and exhibit a national character, all at the same time? The thesis considers the architectural implications of a new understanding of social space as porous space. This paradigm sees social space not as a homogenous, abstract and passive entity, but as heterogeneous, porous and active through democratic participation. The DIAC study discussed in the introduction, establishes the need for a Canadian Institute of Design. Case studies of the Bauhaus and other institutes of design explain the nature of an institute of design. A discussion of Henri Lefebvre's notions of social space and George Parkin Grant's views on Canadian democracy forms a framework for the Canadian Institute of Design. Finally the design project i.e. the porous architecture of the Canadian Institute of Design answers the questions posed and demonstrates the concepts discussed.

A critical reassessment of the Bauhaus ideology reveals a closed, isolated approach to design, limiting it to the domain of the designer. The Bauhaus was successful in facilitating large-scale economic production by co-operating with the industry. However, a lack of initiative in integrating other groups such as the public/user groups in design activities is apparent. In this sense, the Bauhaus was not porous to ideas from outside other than its designers. A study of more contemporary institutes of design reflects the institute's respective presence, agendas, objectives and contribution to the field of design education and awareness. Within this set of case studies it is apparent that these institutes have similar agendas with subtle variations ranging from an emphasis on

industrial culture to human centred design. As national institutes of design, the Design Institute of Australia and the Netherlands Design Institute promote the value of design but do not seem to exhibit a specific 'Australian' or 'Dutch' character. Another observation is that support from the government, public sector, industry and professional sectors is essential in promoting national awareness in design. More precisely, an interdisciplinary, collaborative approach and a national character are desirable attributes for a proposed Canadian Institute of design.

A discussion of Henri Lefebvre's theoretic stance on social space conveys the importance of the sociable and porous nature of an Institute of Design as fundamental precepts. A discussion of social space helps, both to think about what a porous environment can be like and to clarify the designer's role in creating such an environment. The thesis draws on the idea that social space is not a passive, abstract, homogeneous and isotropic container of objects. It is active, operational, productive and performative. Likewise porous space is not merely porous in an abstract sense. It is porous to ideas, to physical, visual and spatial links, to democratic participation, interaction and dialogue. Porous space is multifaceted as it integrates notions of social interaction, democratic participation and Canadian-ness. Porous space demands daily negotiations of the boundaries between private and public. Porous space allows boundaries between design professionals, private and government bodies, students, potential clients and the public sector to overlap and intersect. A discussion of George Grant's views emphasizes the importance of Canada's participatory and deliberative strong democracy. As an inclusive social concept, porosity emphasizes the empowerment of all members of a design community to contribute their own ideas. This approach,

where the heterogeneity of multiple voices categorizing professionals, private enterprises, government officials, students and the public user group meet, echoes a particular 'Canadian-ness' in its democratic appeal.

To imbibe these factors into the hypothetical design project, the Canadian Institute of design; a porous architecture demonstrates the aforementioned theory of porous space. The institute's design is characterized by pores, inner courts, a fluid circulation pattern that creates visual, spatial and physical links, which extend subtly to the exterior landscape. Design decisions such as multiple movement paths stemming from the main entry, the subtle integration, but not compromise, of casually unfolding public and semi-public/private sequences, the blending of indoor and outdoor sequences, and the ability of the spaces to accommodate various collaborating and working functions favours an inviting, inclusive atmosphere. As one moves around, there are constantly changing corporeal situations that respond to gestures of collective participation. There is a blurring of the distinction between spaces that provide an array of ways for the subject to integrate and experience enclosure and exposure.

The design addresses porosity at an intrinsic as well as urban level. Cut outs or pores through floor slabs link activities on different floors. Cut outs or pores through floor slabs and partitions connect activities across different floors and levels. There is also the public interface between the institute of design and the urban fabric that the design must reference and integrate with the city and existing context. Through the institute's terraces that frame and form visual links between the war museum, the capital and the city, the design becomes a part of the city, neither mimicking nor ignoring the existing context.

The thesis also suggests porosity to be a powerful symbol of the enduring social relationships that define the contemporary city and are critical to its success. The porous and social spaces thus created are 'places of agreement, contradiction and invention,' the city and the capital's common ground, where differences are celebrated but also blurred in order to be a part of the larger creative process. These are the places of shared experience, where diversity coexists with community, where participation and interaction are open to all. Thus, the Canadian Institute of Design is a social construct, which provides a place for the sharing of symbolic and pragmatic dialogue, and then becomes the expression of human social interaction. Porosity establishes the grounds for the interplay of similarity and difference, proximity and distance and architecture comes into existence. Even a 'subjective' experience of architecture would always be a shared experience, inasmuch as it demands a context to enable its actuality.

The key ideas that emerge from this thesis are the importance of democratic participation and collaborative thinking in a porous environment such as the Canadian Institute of Design. The design and architecture of the Institute brings together many of the above conceptual threads arising out of porous space namely: social interaction, democratic participation, Canadian-ness and creativity. These ideas are intertwined because design is a matter of choice; it has social implications; it's the artful use of freedom and constraints for maximizing the potential to create value with the designed environment. The Canadian Institute of Design sets the national agenda for the role of design in its social, political, cultural and creative contexts. It affirms the strategic importance of building and promoting national awareness and consciousness about design.

Bibliography

- Benjamin, Walter. *Illuminations*. Ed. Hanna Arendt, Trans. Harry Zohn. New York: Schocken, 1969.
- Bernstein, William & Ruth Cawker. *Contemporary Canadian Architecture: The Mainstream and Beyond*. Fitzhenry & Whiteside, and London: Academy Editions, 1982.
- Bowser, Wayland. "Reforming Design Education." *Journal of Architectural Education* 2 (1983): 12-1.
- Buchanan, Richard. "Education and Professional Practice in Design." *Design Issues* 14 (1998) 2.
- Connor, Desmond.M. "A Generic Design for Public Involvement Programs." in *Constructive Citizen Participation: A Resource Book*, 5th ed. Victoria: Development Press, 1994.
- Dearstyne, Howard. *Inside the Bauhaus*. New York: Rizzoli, 1986.
- Ennals, Peter Morley and Deryck William Holdsworth. *Homeplace: The Making of the Canadian Dwelling over Three Centuries*, (Toronto: University of Toronto Press, 1998).
- F. Smith, Gerald. "Idea-Generation Techniques: A Formulary of Active Ingredients." *Journal of Creative Behavior* 32 (1998): 133-107.
- Forgács, Éva. *The Bauhaus Idea and Bauhaus Politics*. Trans. John Batki. New York: CEU Press, 1995.
- Frampton, Kenneth. "Prospects for a Critical Regionalism." *Perspecta* 20. *Yale Architectural Journal* (1983): 162-148.
- Franciscono, Marcel. *Walter Gropius and the Creation of the Bauhaus in Weimar: the Ideals and Artistic Theories of its Founding Years*. Urbana: University of Illinois Press, 1971.
- Gay, Peter. *Weimar Culture: The Outsider as Insider*. London: Secker&Warburg, 1969.
- Gertler, S., Meric and Tara Vinodrai. "Designing the Economy: A Profile of Ontario's Design Workforce." *DIAC Report*. (2004): 50-1.
<<http://www.dx.org/diac/pdfs/DesigningTheEconomy.pdf>>

- Gotlieb, Rachel and Cora Golden. *Design in Canada: Fifty Years from Teakettles to Task Chairs* Toronto: Alfred A. Knopf Canada and The Design Exchange, 2001.
- Gould, Arlene, and Paola Poletto. "Design Matters: DIAC Design Industry Study." *DIAC Report*. (2004): 45-1. <<http://www.dx.org/diac/pdfs/DIACFinalReport.pdf>>
- Habermas, Jürgen. *Moral Consciousness and Communicative Action*. Cambridge: MIT Press, 1991.
- Herdeg, Klaus. *The Decorated Diagram: Harvard Architecture and the Failure of the Bauhaus Legacy*. Cambridge: MIT Press, 1983.
- Hertzberger, Herman. "Do architects have any idea of what they draw?" *Berlage Cahiers* 1 (1992): 15-8.
- Hillier, Bill and Alan Penn. "Visible Colleges: Structure and Randomness in the Place of Discovery." *Science in Context* 4 (1991): 49-23.
- Hochman, Elaine S. *Bauhaus: Crucible of Modernism*. New York: Fromm International, 1997.
- Isaacs, Reginald R. *Gropius: An Illustrated Biography of the Creator of the Bauhaus*. Boston: Little Brown, 1991.
- Itten, Johannes. *Design and Form; the Basic Course at the Bauhaus*. Trans. John Maass. New York: Reinhold Public Corporation, 1964.
- Jenkins, Phil. *An Acre of Time: The Enduring value of Place*. Toronto: MacFarlane Walter & Ross, 1997.
- Kalman, Harold. *A History of Canadian Architecture*. Toronto and New York: Oxford University Press, 1994.
- Kandinsky, Wassily. *Kandinsky: Complete Writings on Art, Volume One, 1901-1921*. ed. Kenneth C. Lindsay and Peter Vargo. Boston: G. K. Hall & Co., 1982.
- Kandinsky, Wassily and Franz Marc. eds. *The Blaue Reiter Almanac*. New Documentary Edition ed. Klaus Lankheit. trans. Henning Falkenstein. New York: Viking, 1974.
- Klee, Felix ed. *The Diaries of Paul Klee*. Los Angeles: University of California Press, 1964.
- Lefebvre, Henri. *The Production of Space*. Oxford: Blackwell, 1994.
- . *Dialectical Materialism*. London: Jonathan Cape, 1968.

---. *Key Writings*. Trans. Stuart Elden, Elizabeth Lebas and Eleanore Kofman. New York: Continuum, 2003.

Parkin Grant, George. *The George Grant Reader*. ed. W. Christian & S. Grant. Toronto: University of Toronto Press, 1986.

Penn, Alan, J. Desyllas, and J. Vaughan. "The Space of Innovation: Interaction and Communication in the Work Environment." *Environmental and Planning B: Planning and Design* 26 (1999): 218-193.

Perez-Gomez, Alberto. *Architecture and the Crisis of Modern science*. Cambridge and London: The MIT Press, 1983.

Schmied, Wieland. *German Art in the 20th Century: Painting and Sculpture 1905-1985*. London: Royal Academy of Arts and Munich: Prestel, 1985.

Totten, S., T. Sills, A. Digby, & Russ. *Cooperative learning: A guide to research*. New York: Garland, 1991.

Venturi, Robert. *Complexity and Contradiction in Architecture*. New York: Museum of Modern Art, 2002.

Whitford, Frank. *The Bauhaus Masters and students by themselves*. London: Conran Octopus, 1992.

Wingler, Hans. M. *The Bauhaus: Weimar, Dessau, Berlin, Chicago*. trans. Wolfgang Jabs and Basil Gilbert. Cambridge, Mass: MIT Press, 1969.