HARMONIZING LIVING AND WORKING SPHERES:

An Architectural Manifestation in the Information Age

By

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A thesis submitted to the Faculty of Graduate Studies
and Research in partial fulfillment of the requirements
for the degree of Master of Architecture

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**Harmonizing Living and Working Spheres: An Architectural Manifestation in the
Information Age**

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ABSTRACT

The pervasive use of networked computers and digital tools in the interconnected globe has had profound effect on contemporary society and generated new typologies that are manifested in architecture. This thesis explores the live/work phenomenon in the context of this transition, with a focus on the loft-type space and its related design and planning issues. Furthermore, in response to changing family and individual needs, it examines whether the Eastern traditional wisdom -- Feng Shui -- could help to re-create the harmonious living and working environment. Through the comparative analysis of the Eastern and Western literatures and case studies, this thesis concludes that there is a correlation between Feng Shui principles and non-measurable attributes of residential architecture, which is demonstrated by the design exercise. It suggests integrating Feng Shui in design would be one of future directions for the creation of a more responsive architecture.

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CHAPTER 1: INTRODUCTION

1.1 Area of Inquiry

During the past decades, there have been tremendous innovations in the technological development and methods of communication; its profound effect, as acclaimed by Hans Hollein,¹ "...wrapped up into a network of new media, contemporary architectures are preparing themselves to undergo a spontaneous evolution and to generate new typologies...". These wide range and style of explorations are accompanied by drastic changes in society. Bart Lootsma² described the impact of globalization and individualization under the influence of international media network as "Second Modernity". Mark Robbins³ suggested that our boundaries spatially and politically are being "restructured" by the digital technology. The latter is echoed by Ben Van Berkel⁴: "the new architecture body encompasses diversity, conflict and change within itself, attests to qualities peculiar to our age, including the transformability and virtually boundless absorption of information." These declarations are evident in the *MOMA* (New York) exhibition of 1999, later published in book form, entitled *The Un-Private House*. In it, the examination of twenty-five recent homes reflected the transformation of the private house, in response to changing social and cultural conditions, with a special focus on a new relationship established between the public and private spheres in the contemporary residential architecture, mediated by digital technologies. Several recent residential projects (Figure 1.1) which identified and promoted "live/work" development built across Canada have captured the attention of architecture society; the *Canadian Architect*⁵ devoted a whole issue on the topic of housing in this context; the designs not only deliver the improved living conditions but also respond to the surrounding fabric.

Figure 1.1 Photos of *District lofts* project located in an intensely urban site in Toronto

The home embodies human intentions; the design and use of houses reflect certain social and cultural values and ideas. The dynamics of the changeable relationship between habitat and resident remains one of the themes to be considered in contemporary architectural experiments. How does working at home change people's activity patterns, social network, and their living and working spatial condition? How will it change the way people plan houses and communities in the future? Penny Gurstein⁶ comprehensively studied these questions in her book, *Wired to the World, Chained to the Home*. She researched both in the profiling of the Teleworker, and the transformations in the spaces of daily life. Against the idea of "technology as a benign tool" promoted by media and technology companies that living and working components could co-exist harmoniously (Figure 1.2), Gurstein demonstrated the difficulty of combining work and family life and the powerful influence that technology has in ordering spatial, temporal, work, and interpersonal relations. She identified four distinct live/work typologies ("work dominates", "live/work blended", "live/work separated" and "work shared") according to the degree of work penetration in the home sphere and put them into the planning aspects.

Figure 1.2 A compact home office solution -- "hide-away" cabinet situated in an underused corner, and behind a large growing plant used for a privacy partition

In City of Toronto New Official Plan 2002⁷, the mixed-use area is one of the targeted growth areas in the next 30 years; it will absorb most of the increase in retail, office and service employment, as well as much of the new housing development-- a potential place to accommodate more live/work dwelling types.

In the research for the design of live/work space, the loft-style space is one of the most distinct spatial characteristics being carried throughout the history. Peggy Vancy⁸, in *Loft Living*, explored the adaptability of the loft to changing needs in avant-garde design experiments. Jessica Tolliver⁹ presented the design solutions (Figure 1.3) for spatial transformation in *Loft Style* and demonstrated that attributes of its fluid layout and industrial aesthetics could be adapted in various kinds of homes and fitted into diverse settings. Concentrated on the design of multi-purpose homes, the book *Working@Home: Working and living spaces* by Aurora Cuito¹⁰ has specifically looked into the matter of how the living and working spheres could be mixed under one roof.

In space planning and design, the Oriental wisdom, called *Feng Shui* (a term referring to the art and science of life-space design) has played important role in ancient China and

continues to influence design in our present time (Figure 1.4).

Figure 1.3 The photo illustrates the airy open plan, industrial-style detailing and variety of textures being used in a loft conversion from former commercial space

The principles of how to balance the energy in places where people live and work are well expressed in the books of *Feng Shui: Harmonizing Your Inner & Outer Space* (Shen, 2001), and *The Complete Illustrated Guide to Feng Shui* (Too, 1996). The

Figure 1.4 A modern room with comfortable Yin-Yang (denotes the two opposing forces that exist within every living thing) balanced setting brings good Feng Shui to its occupants

philosophy of Eastern design in a Western context is captured in the book of *Living Design -- The Daoist Way of Building* (Mitchell and Wu, 1998), in which it suggests the West has much to learn from the Chinese tradition that includes harmony at all scales of design, integration with nature, and strong cultural and spiritual connections.

Home is the complicated intersection of human psychological aspects and physical environment. The live/work space composition is not simply an addition of room to the home, but it demands a whole new range of reconfiguration. The present standards of housing design and construction could not satisfy the diversified social environments and cater to the interest of current occupants. Gregory L. Demchak¹¹ suggested that the viable alternative to current housing must be economically competitive, technologically superior, and should offer clients more control in the design of their living environments. He described those dwelling spaces as "economical, mutable, multifunctional, reversible, detachable, compressible, extendable, and adjustable."

In response to the new dwelling conditions in the information age, this thesis explores plausible possibilities of the live/work architecture, with the focus on the creation of a harmonious living and working environment.

1.2 The Research Question

In quest of harmonious space settings, Thomas C. Mitchell and Jiangmei Wu, the authors of *Living Design*¹² suggested that the relevance and applicability of Eastern philosophical ideas to design and architecture in the West are worth exploring in creating new meaning in contemporary livable spaces. In this thesis, several questions are investigated: What are the demands of the contemporary live/work dwelling spaces? What are their spatial

attributes and relationships? What are the relevant inter-connecting principles of Eastern and Western housing designs? Among them, the most critical one is whether Feng Shui principles could still be applied in generating more harmonious living and working environments in this contemporary condition.

As the idea of live/work spaces is central to this research, concepts and characteristics pertaining to them are discussed at some length. The design exercise is limited to the discussion of a converted loft-type space. Located in a dense urban setting the loft style has emerged as a highly desirable urban dwelling space. It promoted a lifestyle for communities that share several distinct characteristics.

1.3 Method of Research

According to Ola Nylander¹³, focusing on the housing research is somewhat fortunate since there is an abundance of sources available to help conduct the study; they include published books, professional journals, web-based articles and tremendous examples in the real world. Among them, relevant topics in residential architecture and related design philosophy from literature were selected. They ranged from technology advancement to historic review of live/work, social and cultural changes, loft-style space design, the impact of the transformation on residential space affiliated with Feng Shui principles, Western design thinking, and case studies of houses. In this process, the compare and contrast method was employed to analyze the similarities and dissimilarities between the Western-Eastern cultures and design discourses so as to set out the stage for the introduction of new housing types, and find out the fundamental criteria for domestic architecture. The conceptual design model -- the prototype live/work complex in an urban

revitalized area -- describes the necessary conditions to be considered in a broader perspective and demonstrates the design solutions inspired through this research.

The vision was laid out by Demchak: "In a post-industrial society, the home should play a significant role in the social and technological trajectories of society. It should not be conceived as an untouchable historically bound icon, but rather as a means of empowering human creativity and inventiveness."¹⁴

CHAPTER 2: THE ISSUES OF LIVE/WORK INQUIRY IN HOUSING

2.1 Housing in the Information Age

*"Computing is not about computers anymore. It is about living." ¹
Being Digital, Nicholas Negroponte, 1996*

In this Age of Information, ubiquitous digital technology embodying computers and advanced information and telecommunication systems influences every aspect of human life. It not only offers numerous possibilities to improve the quality of lives, but also catalyzes new lifestyles which have never been experienced before. In this context, however, the AEC industry was left behind in terms of technological advancement. As described in the statement of MIT's *House_n* Project:

"In spite of the extraordinary new design and manufacturing tools that have changed other industries, residential construction remains fragmented, inefficient, and labor intensive - little changed since mid century." ²

Incorporated latest technologies, design methodologies, and construction processes, *House_n* Project explores the future of the home, and demonstrates that the castle of human being -- "house", the roots of habitat is undergoing inevitable changes in response to new patterns of life.

Most people understand the notion of home to be one's private domain, which is both a congenial domestic environment and a sanctuary from the public realm and the forces of nature. As computers are moving into people's daily lives, as a source of communication and knowledge, it brings more functions and complex scenarios, challenging the role of home serving as an interface between the private and public with more heterogeneity. Technology also loosens the boundaries of place (Jackson, 2002), in the circumstance of the increasing speed of globalization, the world is network-connected and instant-linked,

people are becoming more nomadic, making "homes" wherever they go. The definition of the home has to be re-defined.

The working pattern established since the industrial revolution has been reversed, the "working at home" has become a significant trend in workforce profile in both developed and less developed countries (Gurstein, 2001). Currently 65 million Americans work at home, growing by a 600,000 a year; some studies have indicated that as much as 75% of the work done in this country will be in the home by 2010 (Arden, 2002). In Canada, the fastest-growing job category of all is self-employment; some 400,000 Canadians started a business in the 1990s and 2.3 million people are now self-employed -- about 17% of all workers. Another 700,000 Canadians have an office in their homes, even though they work out of the home. By 2010, people who run home-based businesses will represent one-third of the workforce (Feather, 2000). Architecture, as a vessel of human living, production, economy and culture, will change according to the content. *"Wired to the World, Chained to the Home"*, *"The Race to Make Rooms IT Hubs"*, *"Live-Work: Not a Style, a Lifestyle"*, *"The Holistic House"*..., from professional journals to local newspapers, people speak of the future of houses fervently; they can't wait for living in tomorrow. One vision was set out in *DomestiCITY*³ (Figure 2.1) which offered a radical approach to the contemporary circumstances of domesticity. Pierre Chabard⁴ said that the idea of the house as private interior space and the absolute antithesis of the external public domain underwent gradual breakdown. The ongoing development of the televisual and electronic media rendered the house permeable to the outside world. In *"The Un-Private House,"* an exhibition organized by the Museum of Modern Art, New York in 1999, twenty-five housing projects were presented in response to the changing cultural

Figure 2.1 DomestiCITY project, designed by Dogmar Richter with Morkus Sahst, Anthony Guida, Nina Yooan and Andrew Obermeyer

conditions. It examined "the changing demographic patterns, shifting definitions of privacy in light of the proliferation of various types of media, and new concepts of work and leisure."⁵

There are several messages from the exhibition on housing in the Information Age:

- There are new domestic requirements that differ from those of the nuclear family. Nowadays, increasing numbers of couples without children, people living alone, etc. The changing structure has resulted in new spatial configuration, and people have the tendency to adopt the concept of loft-style living.
- The rapid growth of new media has been a catalyst for architectural innovations. "Today's home is a permeable structure, receiving and transmitting images, sound, text, and data."⁶ The effects of media on daily life have caused the concept of privacy to evolve in new directions. It loosens the boundary between public and private, people could be physically alone but still connected.
- Rather than being an escape from work, today's home often merges workspace with living space. Whether it is an appendage or an extension of a remote place of work, or a principal place of work, the "reintroduction of work into the private house" calls for more attention to harmonize the living and working spheres.

2.2 The Focus of Architectural Experimentation

According to Deyan Sudjic⁶, the house has been at the forefront of both architectural design and popular consciousness for more than a century. As a reflection of the essence

of architecture, the home has become one of the most valuable means by which to explore 20th century design. In that century, technological innovation, the global impact of World War II, and the uncertainty imposed by a postindustrial society and globalization are all socio-historical concepts that have been reflected in the changing face of not only the form of the individual home, but also the patterns of domestic life. What seems usual today was an incredible new direction then. It has been "acting as a kind of lightning rod, and served to distill the essence of successive waves of architectural invention."⁷ This most fundamental building type builds up private kingdoms -- safe, congenial environment, represents human dreams and desires. As a basic building block, it expresses and connects people to the surrounding neighborhood, the community, which eventually forms the true image of society and reflections on culture, and technology. For architects, the housing design becomes their test beds and manifestos responding to the ever-changing world. For Le corbusier in 1920's, it was "a machine to live in", for Terency Riley in 1990's, it has become "busy, permeable centres of work and communication". For *House_n* project (MIT), and other notable future house projects undertaken by some leading technology companies, home is human-machine interface, a residence that responses to people's changing needs.

2.3 Redefinition of Home

*"Habitat is a broad concept. In biology, it refers to all aspects of the natural environment in which some plant or animal lives. Applied to our species, it expands to include what architects like to call the 'built environment' that is, not only buildings but also the 'infrastructure' of roads, railroads, utilities, parks, etc. Yet while all these are important, the heart of 'habitat' is the image of 'home'."*⁸

Finding Home: A look at roots and possibilities for habitat, Robert Gilman, 1986

Looking at home might be parallel to looking at the world, as it reveals the human-

environment relationship. Through the definition of "home" from Merriam-Webster's Collegiate Dictionary⁹, it refers to "one's place of residence"; "the social unit formed by a family living together"; "a familiar or usual setting", "a place of origin; headquarters". "Feel at home" means you are relaxed and comfortable, in harmony with the surroundings. So the home is a kind of social setting, an inner sphere enclosed and protected by house, which has its original meaning of "shelter" or "refuge". Overall, "house" is the physical, tangible layer of living, while "home" is more metaphysical, representing the sociocultural, socioeconomic intangible aspects that are changing all the time. For most people in North America, the ideal of "home" represents a place of safety and identity for the living family. On the other hand, it may imply that "not-home," i.e. the outside world, is a place of danger, a place where people are strangers (Gilman, 1986). Such notion leads to the separation and conflict of public and private sphere as stated, "the interior is where we are; the external is elsewhere."¹⁰ Nevertheless, "it is a place which they can love, because through it, and in it, they have constructed their world".¹¹

Through the last decades, information technology has profoundly changed life by the ways of communication. Increasingly, activities such as shopping, news-browsing, banking, learning, recreation, etc., are taking place directly in the home. In response to these, the home is changing from "shelter" or "living quarters" to "headquarters of living" with multi-functional capabilities. Maggie Jackson¹² argues in *What's Happening to Home?* that the Industrial Age ideal of the private retreat is disappearing. Instead, the "home" is transformed into a busy center of work and communications. The same as Kacey Fitzpatrick¹³ mentioned in *Time* magazine, "it's command central for the modern

family in all its configurations, the place to huddle, socialize and strategize in an increasingly complex world." He added, "the families we work with are trying to find a balance between comfortable refuge, multi-functioning utilitarian facility and showplace."

"A home is not a house", Reyner Banham and Francois Dallegret¹⁴ had declared it in 1965. It was further explained in *Strategies and Tactics*:

*"...home is not household, as a social group and something to be perpetuated; home is not an abode. ...The home is a place of strategic application in the formulation of positions with regard to problems connected with the effects of globalization."*¹⁵

In *Finding Home*, Robert Gilman¹⁶ assessed the "home" by looking at three major approaches to housing that have been around for thousands of years: the isolated single family dwelling; the institutional, multi-household dwelling; and the village-neighborhood. He concluded:

"Housing around the world still falls generally into these three broad categories, but each of them has been deeply affected by the coming of industrialization. One of the biggest changes has been the separation between income-producing work and home. Another has been increased mobility, from the daily use of motorized transport to more frequent changes of residence".

Today the general reverse of such separation has been observed, which reflected in the proposal of *Hybrid Housing* (Ahrentzen, 1992) -- a residential structure accommodating both residential and business spaces and activities, where residents occupy and manage both kinds of spaces. In order to accommodate the diversity and multiplicity of spaces and forms, meet the wide variety of current lifestyles, the home will take on heterogeneous typologies, it "would remain the universal iconic referent defining a common way of living in it."¹⁷ Whatever the home definition and configuration, it will always carry important shared meanings, convey human identity and social values; moreover, it "still requires a space to become a place",¹⁸ to live lives in harmony, with

energy, time for thought and time for being.

2.4 Inter-connected World

One of the breakthrough of technology in the 20th century is the emergence of the Internet. It took thirty-eight years for telephones and seventeen years for televisions to spread to 30 percent of American households, however, in only seven years, the same percentage of homes in the U.S. have access to the Web. It changed the world from isolated spots to connected sphere, as well as the working and living patterns. The Internet's audience continues to expand rapidly which creates new communities. Distance means less and less in the digital world, redefines the "proximity" that is no longer dependent on physical measurement, but the ability to connect to a network and shared interests. This phenomenon was seen as a step toward global integration and unity of all peoples. In the introduction of *Understanding Media*, Marshall McLuhan¹⁹ wrote:

"Today, after more than a century of electric technology, we have extended our central nervous system in a global embrace, abolishing both space and time as far as our planet is concerned."

He further predicted:

*"'Time' has ceased, 'space' has vanished. We now live in a global village... a simultaneous happening."*²⁰

Nowadays in Canada seven in ten households regularly go online daily from home: that makes Canada one of the most wired nations on earth.

Starting in the mid-90's, the e-commerce cyclone spreads around the world. Information and goods are distributed across conglomerated economic structures and invisible telecom infrastructures. People are connected closer than ever imagined. As information can flow freely on the Internet, the Internet has the potential to break down the centralized power and help form a community that lives on a more integrated basis, with

more shared responsibility. It is a catalyst for social and political change that is able to generate endless possibilities for individuals.

Working from home is one of the alternatives offered by the Internet. This is also one of the Negroponte's futures. "Digital living will include less and less dependence upon being in a specific place at a specific time."²¹ It is not a rosy prediction, one-quarter of households in Canada has used the Internet for work-related business. As being pointed out in *The Un-private House*:

"At the end of the twentieth century, a new relationship between public and private is emerging-one where the private is engaged with the public through media and technology. In both theory and practice, the ascendancy of these digital technologies has become a catalyst for contemporary architectural innovation and experimentation" ²²

The example of how the media and technology transformed a house to the extreme could be seen in 2000 with the broadcasting of reality show of "Big Brother". It has shaken the American and European media audiences with most arguments discussing the division between "public life" and "private domain".²³

In recent studies by Stanford's SIQSS and Carnegie Mellon's HomeNet Project²⁴, it has been shown that increased use of the Internet leads to social isolation and depression. People who spent more time on the Internet spent less time socializing with peers, communicated less within the family and felt more lonely and depressed. However, other studies emerged contradicting these results, suggesting that the Internet actually brings people closer together by bridging geographical barriers. It is true that the Internet can bring people together virtually, but may also result in isolating them physically. The new opportunities, and the challenges to our daily living, its social, psychological effects will also stay associated with housing developments and debates.

2.5 Changing Needs of Dwelling

"Our home is a window to our soul. It represents our goals, dreams, desires, in essence, a true reflection of ourselves and our time."²⁵ Changes in individual lifestyle and social condition are manifested in dwelling layouts. Architecture then not only responds to people's physical, social and economic needs, but also stimulates their cultural and spiritual expectations.

According to Alvin Toffler²⁶, human history could be divided into three great "Waves". The First Wave was the Agricultural Society. The Second Wave was triggered by the Industrial Revolution symbolized of mass-produced model. This model promotes standardized goods, centralized power, hierarchical institutions, the division between producer and consumer. In response to these new rules, the traditional living and working pattern were undergoing change. One of the most significant factors in housing design was the separation of the living and working spaces. "The realization of privacy within the house was an evolutionary process that unfolded over centuries" (Riley, 1999). It was acclaimed to be the first time the living space became antithetical to the place of work,²⁷ furthermore, a retreat from it.

"As the Second Wave produced a mass society, the Third Wave de-massifies us, moving the entire social system to a much higher level of diversity and complexity"²⁸ in the areas of live, work, play etc. It is represented by smaller teams, flexibility and ability to change, reduction of overhead, just-in-time principles, shared characters of de-centralized, de-massified, diversified. The success of Swatch²⁹ (Figure 2.2) demonstrates the power of innovation and diversity offering unconventional looks and alternative experiences.

Figure 2.2 Swatch Skin Collection

The fragmentation of both mass institutions and Second Wave patterns of life in the Third Wave re-empowers the "home". It is suggested that:

*"The idea of us all driving off to centralized locations to work, be educated, etc, is 2nd wave. The 3rd Wave is more about working and learning where it makes most sense, or where you are most comfortable or productive. There will often be more reason to stay home than to drive off to work."*³⁰

In this context, once again the "home" becomes the focal node -- defined by its unique location -- of a general domesticity. While more and more things could be produced digitally and delivered electronically through computers and tele-communication systems, the "home" becomes the "electronic cottage" in which many functions previously confined to the office or factory can be carried out. While every individual has constantly changing needs and priorities, as opposed to standardization, particular attention should be given to building schemes that conform to contemporary life.

*"Life becomes more individualized, more fragmented and less secure and predictable: the Third Wave brings new problems and challenges, as well as opportunities."*³¹

William James³² identified three levels of human needs which include material

(physiological, safety), social (belongingness, esteem) and spiritual. The continual reconfiguration of the "home" to cope with our changing needs -- these practical and emotional needs, have become the focus of those architectural explorations. In this Age of Information there is no longer any dominate "majority". Society is increasingly divided into special interest groups. People need to be flexible, ready for change, always learning, developing their abilities, continuously creating their own opportunities. At the end of the 20th century, Americans relocate as often as once in every three years. Living and working will happen wherever conducive. "The pull of work accelerates the tempo of home. The push of the outside world competes with domestic priorities" (Jackson, 2002). This push and pull raised crucial question to be looked into in the transformation of the human dwelling.

2.6 Live/Work Phenomenon

"A house is a machine for living." - Le Corbusier, 1920s

"A house is a center for productive activity." -Charles Eames, 1950s

The home as a place in which people can earn their living is not a new idea. There was once the case in the 18th century houses of Spitalfields in East London, where Huguenot weavers built themselves attic workshops. It is still common throughout Asia in the form of the "shop house" where a family live and work, protecting their investment, sleeping beneath the storeroom and on top of their street-level retail outlet (Sudjic, 1999). After a somewhat slow start in the early 80's, various surveys demonstrate significant growth of the concept of live/work all over North America. Called Telework in Canada (Telecommuting in the United States), working at home as an option produces a mobile, flexible labour force which is the fastest growing sector in the job-creation. Jack Nilles³³,

who coined the word of "telecommuting" in the early 1970's, once predicted in early 90's that by the year 2020, 30 per cent of the U.S. work force will work from home some or all of the time. However, Cahners In-Stat Group³⁴ April 2002 study reveals in 2001, thirty-one million people (25% of the US workforce) telecommuted at least part of their work week.

Telecommuting is accepted by businesses of all sizes. Some nineteen million of these (over 10% of the workforce) have access to the Internet from home, enabling them to do their jobs remotely, and often to connect to corporate networks. The total number is expected to swell to forty million by 2004. EKOS³⁵ Research 2001 found 11% of Canadians work primarily from home (includes Telework, overtime or time on their business) and over 40% of Canadians work from home part of the time. The impact of Telework has made a substantial difference in their lives.

In Oct. 2001 IDC³⁶ Teleworking Forecast, it defines two kinds of Teleworking: Mobile Workers and Telecommuters. Teleworkers are a community made of workers who are either mobile workers, or telecommuters. Telecommuters, according to the Forecast, are those who spend at least one day a week working from home, and mobile workers are those who spend at least 20 percent of their working hours outside of both their home and office. Both populations are swelling across Europe. Bonn Empirica³⁷ 2002 study reveals the number of European Teleworkers at 20 million -- double of three years ago. These surveys prove beyond doubt that Telework is a phenomenon worthy of examination.

Today, most Western countries have accepted this new method of working because it enhances business competitiveness, productivity and working conditions. In fact,

Telecommuting was spurred by a wide range of concerns. As Alice Bredin³⁸ noted in *The Home Office Solution*, for employer it attracts and retains talents, increases productivity and job satisfaction; for people dissatisfied with traditional office job or seeking for the additional income, they will choose to work at home. A study conducted by the National Federation of Independent Business³⁹ indicates that two out of three new businesses are started in the home. Home-office provides an affordable and convenient solution. Advances in technology, specifically the Internet and communication system, makes the home a viable office location.

2.7 Live/Work Spatial Narrative

Neil Zimmerman⁴⁰, the author of *At Work At Home* pointed out, "whatever the work and whatever the space, successful work places share three basic features: they balance work life and home life, they're well planned and well organized, and they have a personal spirit about them that stimulates their owners to be their best work." It is noticed, some of the pressure from working at home come from the freedom it provides. Free-plan has to be not totally free, it should have certain separation or demarcation while retain the flexibility. Well-defined boundaries of work place is so important that you could always refer to other people that "you don't work from home, you work from an office in your home. And that office is just as valid as one in a big corporate centre" (Bredin, 1998).

Studies show that a majority of home-offices are blended into formerly monofunctional rooms: bedrooms, dens, dining rooms, living rooms, and kitchens. One of those future directions, as what MIT Media Lab Professor Neil Gershenfeld⁴¹ stated in his book *When Things Start to Think*, is that computers are "invisible" yet highly responsive; in

this sense, invisible means blended into everyday objects, thus in a sense unseen. At home, people will work or surf wherever they're sitting, walking, or eating. The coming technology has enormous implications for spatial behaviours of home. The next generations of computers will enable people to alternate between work and home in seconds, in every room of the house. "There will be no difference between public and private, and work and home in future", according to Kelly Heaton, an MIT researcher. If this is true, what will it bring about to the future dwelling? Does that mean the disappearance of those specifically assigned functional rooms?

Peter Suedfeld⁴², a psychology professor at the University of British Columbia who specializes in isolation studies, believes that most people actually don't get enough solitude; he cautions against the dangers inherent in too much isolation for the home-based worker. "If you work in an office, you look for serenity. If you work at home, you must seek out social and recreation time" (Bredin, 1998). It is believed that the courtyard, patio, terrace, those intermediate space connecting interior and exterior world would play a sensible role in the live/work environment.

2.8 Loft-based Topology

Loft: *a. Large, usually unpartitioned floor over a factory, warehouse, or other commercial or industrial space.*
*b. Such a floor converted into an apartment or artist's studio, and usually having the structure and installations left exposed.*⁴³

Depicted by Jessica Tolliver⁴⁴ in *Loft Style*, the lofts attracted their first residents the artists of New York City in the 1950's. In search of affordable housing, they discovered those vacant garment factories and print shops in downtown Manhattan. In its humble beginnings, the exposed and vast industrial spaces were devoid of domestic comforts,

gradually the rudiments of modern living were added, such as, water, gas and electricity. Through the decades of refinement, people all over the world have come to embrace loft-style living both in the form and function. The artists were the first to see the advantages of taking old industrial premises and converting them into studios and dwellings (Cerver, 1999). The *atelier* (Figure 2.3) is the artist's workspace par excellence, it is characterized by a large two-storey central volume, a glass front which on the whole faces north and a mezzanine floor. In fact, in 1915 Le Corbusier has already demonstrated the quality of

Figure 2.3 Photograph shows *atelier* Space of Brancusi's workshop on the original site. At the present time, a replica of the *atelier* is located in the Centro Pompidou plaza, in a pavillion designed by Renzo Piano

this topology by producing the *Domino* prototype with its standardized structural reinforced concrete frame, followed it with *Maison Citrohan* in 1920, which has double-height living space and elevated sleeping platform. Very soon it became the new style, the latest fashion in housing.

The gradual abandonment of old industrial buildings situated in city core area provides potential for "loft phenomenon". Hence, lofts are associated with revitalization of the

inner city and are closely linked to the transformation process arising from recycling of warehouses or spaces originally used for industrial purposes. Therefore, in order to retain the urban context, such conversions attempt to modify the space by accommodating new activities without changing its original expression. It is described as:

*"Inclusion shows strict respect for the existing outer shell and facades. The new programme is installed within the old walls. This is the case of most of the New York lofts and represents the original spirit of this movement. In this technique, a closed space is occupied, colonized, like nomadic tribes who set up camp on unmapped territory. The space is transformed from within."*⁴⁵

The advent of the loft was thought to be the most significant revolution and typological breakthrough in domestic space in the late 20th century.⁴⁶ It represents both the unconventional life which integrates home and work in one space and also an industrial tradition evident in the nature of the buildings themselves (Cerver, 1999). The quality of loft type space could be summarized as follows:

2.8.1 Extensive and Undivided Space

Indebted to the former industrial use, the loft has extensive, deep, blank and undivided space compared to conventional living space. This sweeping layout challenges its dwellers on how to maintain the feeling of wide-open space while addressing the necessities of modern living. Instead of creating a warren of small, single-purpose rooms, they need to analyze the patterns of different activities, configure those areas in a freer and more dynamic way. Not only to let them flow naturally, but also need to balance the openness and enclosure, the public and the private factors, and some overlapping sociable activities.

2.8.2 Flexibility and Adaptability

The informality and complexity of modern lifestyle increasingly require our homes to

provide flexibility on the distribution of space and functions. This potential "transformable" feature is attained thanks to the large span and load-bearing of former structure. As Elizabeth Wilhide described:

"Flexible space lets you work at home or have guests to stay without turning the whole household upside down. Flexible space doesn't dictate how and when you use zones within it, but supplies an elastic framework that supports the way you want to live." ⁴⁷

Figure 2.4 The photo shows the view of the glass studio mezzanine which demonstrated how the volume of the shell has been kept as whole, intact and undivided as possible

This flexible spaces evolved also in the context of the trend in large cities, such as New York or London, one or two-person families are much more common than traditional nuclear families. Smaller family units do not usually need the sort of privacy and partitioning found in a traditional home (Vance, 2000). One typical approach of this kind of design is the open-plan with core living area which forms the adaptable space, juxtaposed with small, cozy areas for sleeping and bathing. Half-height or half-width partitions are normally adopted in living area without blocking light or views. The interior walls are basically disappearing except for the bathing area and sleeping area where certain privacy takes priority. The high-ceilinged spaces often introduce galleries

and mezzanine levels (Figure 2.4), which are easy to be converted to work space, such as study, gallery, library, studio, etc.

*"With this freedom, lofts make good candidates for workplaces because they are physically separated from the living space without necessarily being visually detached."*⁴⁸

This inherent compatibility to live/work style inspires more avant-garde and experimental design solutions. In 1998, a loft in downtown Manhattan, New York was selected to demonstrate the vision of the networked home of the future.⁴⁹

2.8.3 Rich Architectural Characters

Although lofts are found in obsolete buildings, the presence of rugged industrial detail, the exposed original surface, large windows or skylight etc. provide a refreshing change of scenery from the conventional dwelling space.

Figure 2.5 This example demonstrates the contrast between the exposed and fine elements throughout the loft

"When enclosing areas with fixed or built-in space dividers, it is a good idea to experiment with unconventional materials rather than simply default to plain plastered walls. Translucent materials, such as glass block or frosted and laminated glass, allow light to filter through. Concrete can be highly effective; whether polished smooth or finished with a suede-like texture,

*its monumental quality works well with the scale and character of a loft. The shimmering surface of mosaic accentuates curved partitions, but even simply painting a divider a strong colour will make the whole effect look well-considered."*⁵⁰

Xavier Gonzalez once studied the essential spirit of the loft, from his view, the loft affords a nomadic dimension in keeping with the spirit of the end of twentieth century.⁵¹ The space is in most cases structured by floating volumes, often mobile or autonomous, without strictly defined functions. He made a comparison between the two: *the city* and *the traditional habitat*, and *the modern city* and *the loft*, and revealed:

"In the case of the former, the interior divisions give the inner spaces a predominant filled-up appearance. This quality is a federative element, where the corridor represents emptiness. In the second case, on the contrary, emptiness is broader and it articulates and organizes the collection of objects giving unity and coherence to the whole. The outer walls are the boundaries."

The first-generation lofts are located in former factories or warehouses; nowadays, the loft is becoming acceptable, alternative form of housing. The increasing diversity of the loft not only comes from the conversion, but has expanded to purpose-built loft apartments or houses and influence many kinds of non-domestic buildings. However, the loft is still strongly influenced by its artistic origins and remains closely linked to urban culture. Over the years it has become a very real social movement, a sign of identity and of belonging to a certain social class.⁵² A large percentage of those living in these spaces are painters, photographers, architects, publicists, and other kinds of creative, or design and media-oriented professionals (Cerver, 1999). In New York, for example, the loft-filled areas of *SoHo* and *TriBeCa* have become two of the city's most desirable locales, thanks to the surrounding amenities and commercial developments filled in once forlorn areas. The loft-type dwelling units with mixed-use zoning proved to be the impetus of the vibrant urban life.

2.9 Designing for Live/Work Balance

The rise of the new economy and new ways of working resulted in the rapid increase in working from home, it is evident from the *Report of Work-Life Balance in Canada, 2001*⁵³ that labour market trends and changing employment relationships indicated increased numbers of workers are choosing non-standard forms of employment and/or work arrangements (i.e. self-employment, part-time work, Telework and flexible hours). Another factor of the change in the work environment is attributed to globalization, company downsizing and restructuring, competitive pressures and technological change in the last decade. In addition, broader and fundamental changes in society and the family accentuated the issues pertaining to the live/work scenario.

While acclaiming the advantages of live/work, such as increased productivity, reduced commuting time, improved job satisfaction etc., there are increasing concerns on working at home. It may lead life out of balance. Besides daily interruptions and distractions, studies show that both mental and physical symptoms could include: stress, depression, isolation, rejection, forgetfulness, frequent fatigue, irritability, low productivity, physical complaints of aches and pains. Recently, live/work balance has become one of the important items on the agenda of many large organizations and a top priority for workers everywhere.⁵⁴ Almost two-thirds of the comments from *Voices of Canadians: Seeking Work-Life Balance*⁵⁵ is about the difficulty of achieving work-life harmony.

There is a body of research that attempted to address these concerns. The pitfalls of working at home, according to Alice Bredin⁵⁶, are a) the convenient location that can lead to overwork and increased stress, b) the distance between a home office and venues of

social interaction can cause social isolation. Limited interaction with peers and co-workers can leave them feeling discouraged and unmotivated. Proximity of a household can result in work/life imbalance, burnout, and health and emotional distress. Through the study on "information highway" and its impact on daily life and work patterns, Gurstein⁵⁷ declared the flexible, isolated work site or the mobile workplace has implications for the future of work and societal relations, and has local consequences for the reshaping of spatial forms and social dynamics. More importantly, she suggested that home-based work offers important opportunities to reorganize homes and communities, such as revitalizing single-use areas and re-planning residential communities with work content in order to create more sustainable, humane and balanced communities. There are several ways to deal with the imbalance of living and working; for examples, Lynie Arden⁵⁸ promoted "the self-organization and self-disciplines", Johnston and Smith⁵⁹ proposed "the desire for spiritual growth can help to balance the role of work in our lives", and Ann McGee-Cooper⁶⁰ suggested "energy engineering" to maximize energy and productivity.

This thesis explores some principles of well-arranged architectural design programs pertaining to live and work spheres, guided by Feng Shui.

*"Feng Shui is an ancient Chinese art and science first developed some 6,000 years ago. It's a system based on keen observation and experimentation. Feng Shui is the study of the environment, places, people, time, and how the energies of each interact. It is a practice of understanding and harnessing these forces of energy to benefit human well-being."*⁶¹

Feng Shui is a natural science which treats the environment as an integral element of the art of living.⁶² It contains a kit of powerful cultural assumptions that structures its view of reality and justify its operations.⁶³ In the era of information, digital technology processes data transmission with the speed which is difficult for humans to assimilate. Anomalies

of modern living are creating imbalance between living and working spheres. Feng Shui's principles could rectify that situation. It offers the opportunity to understand patterns of living forces and align architecture to create the most favorable living environment.

Feng Shui now appears to have found a place in the West. There has been an escalation in interest in Feng Shui today from home and business owners; they want to know how to maximize the positive energy flow in their spaces.⁶⁴ It was pointed out that:

*"...our environment makes a psychological impact on us: whatever we see, hear or smell will make an impression. ...With a new insight into our own natures and increased awareness of the effect our environment has on us, we can use Feng Shui principles to find harmonious spaces for ourselves and our families."*⁶⁵

Environments set the stage for life experiences for people who inhabit them. Feng Shui as a design system offers both creative and practical possibilities in creating harmonious living and working spaces.

CHAPTER 3: EVOLUTION OF THE LIVE/WORK IN HOUSING

*"I believe that architecture has little to do with the invention of interesting forms or with personal inclinations. True architecture is always objective and is the expression of the inner structure of our time, from which it stems."*¹

Mies van der Rohe, 1964

3.1 Live/Work Conceptual Development

Thomas Dolan, founder of the Live/Work Institute,² once explained the activity of

"live/work" in an interview:

*"... it is simply a term which means that most of one's life is centered in one place, much as farmers and villagers have done forever. As distinct from those who work outside of their homes, live/workers are not "out on the rialto," as it were, nor are they mixing and meeting at the water cooler."*³

Broadly speaking, a wide range of work styles and employment practices are differing from the traditional 9-5 full time job with a permanent contract. Hence, "working at home is as much a lifestyle choice as a business decision" (Barrett, 2002).

Nowadays, the "live/work" is reshaping workplaces and personal lives dramatically.

From the experience of "unspeakably sweet feeling of seclusion from the clamour and noise of the world" to the "permeable structure, receiving and transmitting image, sounds, text, and data".⁴ The home in opposition to work and as a refuge from the public world is being reexamined with the advent of technological, economic, and social restructuring.

According to Riley, who studied the history of the Un-Private House, that in the Middle Ages, people were living and working under one roof, the house had the public character for various activities. During the Renaissance and the later eras, there was an evolutionary process for privacy within the house. In his view, beginning in the 17th century, the rising economic fortunes of the bourgeoisie were removing the work content from the home. By early 19th century, for the first time, the living space became

antithetical to the work place; the words "retreat" and "seclusion" could represent how the living and working sphere were separated. After the Industrial Revolution, the reversing process of reintroduction of work into the private house has begun. This "live/work" movement can be attributed to existing economic conditions as well as technological advances (Gurstein, 2001). John Naisbitt (1995) declared in *Global Paradox* that "the bigger the world economy, the more powerful its smallest players". It is evident from Alvin and Heidi Toffler that in the circumstance of New Economy brought by digital revolution:

*"...their hierarchies are more flat, their products more customized. Their skill requirements have changed as muscle-work declined and mind-work increased. Alliances and complex supply webs have reduced vertical integration; markets have nichified. Firms are forced to innovate and operate at a faster pace than ever."*⁵

As we move closer to a global society, the live/work represents a major step towards working anywhere and anytime, creatively responds to the rapidly changing demands, and helps to balance busy lifestyles.

With the growing variety of tools and electronics to support work-at-home endeavors, home-based careers are more feasible, less costly, and potentially more rewarding than ever before. The increasing number of professionals choosing to work at home, the home office is quickly becoming a standard feature of the domiciles of families worldwide. In *Blurring Boundaries: Socio-Spatial Consequences of Working at Home*, Sherry Ahrentzen reported the changes in the home as a result of the intrusion of work: there are some good effects, such as flexibility, freedom, coziness, informal attire, work smarter, without interruptions, no commute etc. There are also some bad points, such as chaos at home, loneliness, exhaustion and professional jeopardy. This growing trend demands new housing design solutions, which Andrew Harrison named as how to

“accommodate the new economy”.⁶

How could we reunite work and home, without losing the balance? Here are some hints from the UK Teleworkers' Association;⁷ the new live/work space would

- *support 24 x 7 performance*
- *have speed and flexibility of operation*
- *be flexible, re-configurable and expandable/ contractible space*
- *be working in a mixture of public and private spaces*
- *be less monolithic and more fluid and transient*

3.2 Integration of Technology

*"The nature of work is such that we are blurring the boundaries. What we are seeing is, in my opinion, a move from the industrial age to the information age, from a situation where we once worked together to a new realization that, with new technology, we can work anywhere."*⁸
 Joanne Pratt, quoted in Home Sweet Office, 1993

The technical innovation is not only one of the determinations of architecture progress, but also one of the driving forces behind teleworking's popularity. It has a radical impact on the process of designing a building and transforming the spatial quality of the interior. Just like how *electricity* changed the relationship of domestic interior, it has an equally significant impact on the form of houses, and their layout inside and out (Sudjiz, 1999).

*"The traditional cellular layout of the house-one cave-like space opening into another-was no longer necessary, electric light expanded the usable area of the house after dark....it is clear that something quite decisive and radical really did overtake architecture in the early years of the twentieth century. In part, the answer is the impact of an avalanche of technical innovation."*⁹

Since the electricity modified the plan of the house, the modern plumbing brought the outhouse in, along with the electrical appliances turned kitchens into efficiency centers, the house was "transformed from items of loose furniture into part of the architecture fabric".¹⁰ In 1920's, the telephone system and the electronic radio were introduced into the house; since then, various types of communication technology, such as television,

fax machine, and most significantly, the personal computer, with its peripherals started to transform our perception of the world, and provided a framework for an information-based society. When houses "become a permeable structure, receiving and transmitting images, sounds, text, and data", they are no longer just family nests; instead, they are essential ingredients for global economy. As we have seen, the home could be "a place for growing a business, for earning a second degree and for home-shopping." And with the increasing demand of the spatial flexibility, the "spaces can be easily converted into offices, guestrooms, gyms, nurseries, or whatever best happens to suit their needs at a particular moment" (Ho and Barreneche, 2001).

There is no doubt that people's working practices -- where they work, the way they work, and the way they communicate at work -- are greatly affected by innovations in technology. The working situation of "24 x 7 performance, speed and flexible operation"¹¹, along with radical reconfiguration in demographics and lifestyles, demands new means of architectural expression. Sudjiz once made this statement:

*"It is only the availability and wide dissemination of technology that gives power to trigger huge change: when innovation has become so widespread as to be invisible."*¹²

It helps to reveal the intent of the provocative MIT's *House_n* Project, which devoted to the development of "Smart House" -- transforms the house into a responsive machine that can be tailored to homeowners' particular needs. Microsoft, with the same ambition, hired architects to work with programmers to design its version of future house, which homeowners can communicate with, and vice versa. Cisco System has also developed two prototype facilities in its headquarters, *the Internet Home* and *the Mobility Centre*, which showcase various types of wireless technology and internet connections for managing tasks at work and at home. A well-published example of *Lipschutz/Jones*

Apartment in New York demonstrates the presence of work in domestic domain tend to create a new kind of space, "in light of the globalization of international markets, their working hours are no longer fixed. Rather, work occurs when market activity occurs. Hence, the home office is in effect a panopticon-like trading room."¹³ Riley predicted that the integration of work and daily life would make the sharp distinction between them less definitive. It is evident from the *Mobius House*¹⁴ in the Netherlands, the clients are a husband and wife who both work at home. The spatial loop of their living and working sequences, not only blend their lives in various aspects, and also link between the different features of the surroundings, a true manifesto of the seamless integration and spatial fluidity.

The issues of technological integration raise many concerns, as described by Gurstein,

"In describing the home of the future, futurists have taken a technologically determinist analysis that obscures the role individuals and society play in the process of change. The use of telecommunications and information technologies to generate and transmit information has the potential to decentralize resources and provide flexibility and control over both work and home life. At the same time, such technologies could individualize homeworkers and isolate them from opportunities in the larger society. Many questions regarding this phenomenon need to be addressed. How do workers adapt to the new form of workplace in the home? How does home-based work affect social relations both within the household and in the larger community? How do the activities of a home change and how is this change accommodated physically when people work at home? Generally, is working at home a viable alternative to other forms of work arrangements?"¹⁵

Current residential architecture is a reflection of contemporary life; its complexities and instabilities challenge the architects to look forward and define better spatial settings to live and work.

3.3 Challenge of Private/Public Domains

The relation between private and public spaces often relates to the evolution of live-work. Home, the living quarter, has the quality of seclusion, which is based on "a discernible

separation of its inhabitants and activities from both the public realm and the other house."¹⁶ Inevitably, the work would be opposed to "the rituals and comforts that people now associated with the domestic."¹⁷ Beginning in the seventeenth century, the public content (work) gradually declined in the home. In the early nineteenth century, the "distinction between the private house and the public world had become so refined that it was thought to reflect various broader dualities as well, among them suburb and city, craft and industry, and nature and artifice" (Riley, 2000).

The presence of the public was captured notice in the early 20th century, when the electronic radio entered into the home, as Martin Heidegger¹⁸ expressed, such presence altered the distance from events and things. In fact, the increased presence of the electronic media on daily life and its potential effects are far beyond the distance; it has caused the concept of privacy to evolve in new directions. As McLuhan wrote, "the new electronic interdependence recreates the world in the image of a global village"¹⁹ that we could keep connected while being physically separated. This new link through "nodes" and networks, creates new online communities, as argued in *City of Bits*, they transcend geographic boundaries and social contexts, offer new ways of thinking about urban design, private and public space, the separation of work and home life and personal identity (Mitchell, 1996). Gurstein further declared boundaries between work/home life, workplace/home, public/private space, and male/female roles have become blurred, and those new interpretation would affect the social and physical setting of the home.

The examples of MVRDV's²⁰ two row houses in the Borneo Sporenburg -- one of the most dense developments in Amsterdam, the Netherlands, demonstrated how

architectural innovation was catalyzed by the changes in the idea of privacy.

Figure 3.1 3D model view of House No.12

House on Plot 12 (Figure 3.1) designed for a couple as their work place and home. The site is entered from a roof that slopes up from pavement level, allowing space for one car and a storage room beneath. Within the narrow base only 2.5-metres wide by 16-metres long, the architect created a semi-public "alley" that steps down from the street to the rear of the house. The completely transparent elevation facing the gap not only provides natural light but also "put the inside on display". The mixture of privacy and publicness is the topic the designers here to explore. On the other hand, the two opaque volumes enclosed extra width to accommodate a guest suite and two working studios.

House on Plot 18 (Figure 3.2) also designed as live/work space for a couple, having the smallest interior square footage, MVRDV have managed to produce a design with four levels. These levels work as one continuous room, flows upward like a vertical loft defining living, dining, and working areas with different height and degree of privacy.

Figure 3.2 3D model view of House No.18

Through the manipulation of the section, it connects with the outside at three types of *Verandah*, *French window*, and a *Roof garden*. It was conceived having more transparent façade and open to public view than that of No.12. This fluid configuration confirmed their resolution of blurring the private and the public sphere within the contemporary urban context.

Figure 3.3 The view of *Curtain Wall House* from street

The transformation of lifestyles challenges the conventional houses which no longer appropriately serve them, and redefines the meaning of domesticity with ever-increasing speed. The example of *Curtain Wall House*²¹ (Figure 3.3) in Tokyo, illustrates how life might be lived in a radical new way. According to Shigeru Ban²², while Mies van der Rohe's famous glass *Farnsworth House* brought the outside in through a glazed exterior, his *Curtain Wall House*, in the traditional Japanese fashion, takes the concept one step further. He reworked Mies's concept of the "universal space," in which cores and partitions are actually furnishings and transparent external walls created a continuous flow of interior and exterior space.

He further explained, the walls in Mies's "glass houses" were fixed glass supported by steel frames, it was only visually transparent, not physically. In his designs, the wall was always ambiguous. The outer skin of the house is comprised of two elements: transparent glass panels and fabric curtains, when both of them concealed, the interior would be opened up completely to the neighbours. This "naked" openness stunningly erodes the border between public and private, with no transition in between.

3.4 Loft Style / Life Style

In thinking of the nature of residential architecture, the evolving lifestyle is one of the themes. It offers valuable views on how to construct our home physically and psychologically. Unlike the radically transformed appearance of the houses, the evolution of ways of life takes longer time. Here are some of the major tendencies have been confirmed.

- **The increasing number of small households (one or two people) and the aging group of population**

The latest *Canada Census, 2001* reveals the average number of persons in a household is 2.6, while households of one and two persons consist of 58% of the overall numbers. It also shows people over 55 years old are 22% of the population in 2002 data. They create different needs from those of traditional family units. Echoed by Riley, that the living pattern of a family without children would have less need for acoustic and visual privacy, "...the traditional upstairs/downstairs separation of the private and the public spaces is less compelling. Instead, the loft model has been deemed to be appropriate; its flexibility and openness are in marked contrast to the structured spaces that typify the traditional family..."²³

- **An evolution on conceptions and the internal distributions of the home**

The house nowadays is becoming the centre of living, working, education, entertaining, healing etc. This multidimensional role is changing what a house looks like inside, as Bill Saporito²⁴ observed. The changes to new American homes, the compartmentalized shelter with separate rooms for preparing food, eating, entertaining and watching television has been steadily giving way to an abode made up of larger, flexible living areas. Features such as media rooms and home offices could be found in many new homes. With the living room fading, the kitchen has become the family gathering place, it blends into that large live-eat-play space often called a great room, which connects through glass doors to the outside space. The disappearance of interior walls and the desire for indoor-outdoor living, confirmed by Stephen Peake²⁵ that "[Feng Shui] the oriental philosophy of maximizing the Chi, or energy, of a building through its design is a must for Asian buyers, and it is crossing into the Western mainstream".

- **The increasing presence of new technologies**

The widespread adoption of digital technologies in home profoundly changed our perception of "inside" and "outside". Increasingly, those activities used to happen outside of homes will take place directly in the home. As MIT's *House_n* research predicted, the person-centered design will generate new technologies to satisfy the emerging and future needs of people as they live in their homes. It signals one of the significant revolutions, as Hugh Hardy²⁶ identified -- buildings are never definitive, activities do not necessarily correspond to enclosed spaces. Loft space, with its original warehouse character, is freer to serve its content, and is more ready to accommodate a new activity as adequately as any other container.

- **New types of living / working relationships**

The modern live/work concept, originated from artist's studio where they both work and live in rehabilitated industrial buildings. In the 1990's, the live/work concept was exploding the conventional definitions of workplace and home.²⁷ As mentioned previously, the dynamic contemporary life adds more functions into our dwelling space, in searching for the new type of space which has the potential to accommodate and modulate such activities, the loft type is the option. The lofts are the ultimate urban homes; spacious enough to relieve the tensions of cramped city life; reassuringly tied to the past but comfortably adapted to the present (Vancy, 2000). Instead of confined rooms housing a single function, the loft comes the benefit of wide-open, flexible spaces. It was well described in *New Loft Living*:

"At least part of the reason why lofts have been so successful is the fact that they do not impose a conventional framework on the way people live. Today, when the boundaries between living and working are not clear cut, adaptable, transformable space keeps step with the fluidity of modern lifestyles. While what most people understand to be a 'true' loft is generally a single open area on

one floor, the same flexible approach to spatial planning is beginning to infiltrate other types of residential development." (Wilhide, 2002)

According to Feng Shui theory, when you put something in your home, you are bringing that energy into your life (Lam, 1996). Loft type space configuration will add a new pattern of energy to the living environment, and influence the lifestyle as well.

In summary, the lifestyle evolution is having profound implications for domestic architecture, loft style space has the advantages, in terms of both form and function, to accommodate new types of households, living patterns, and respond to radical reconfiguration of human daily lives.

3.5 Zoning Issues Examination

Since the Industrial Revolution, the traditional city needed to be transformed under the pressure of social, economic and political changes. From the modernist point of view, the 20th century became an age of progress, the advances of engineering and technology attempted to produce a better quality of life for all. People were then convinced that a rationally planned city, using the standardized housing types would offer a healthy, humane alternative. The French architect Tony Garnier made detailed plans ("*Cite industrielle*") for a model of modern industrial city in 1904, areas were demarcated for different functions, such as living, working, relaxation, and transport. The traffic system had separate roads for vehicles and pedestrians. Green spaces took up more than half of the city area. Set in the midst of these were loose groupings of simple free-standing apartment blocks, built of industrial techniques, and affording plenty of air and light (Tietz, 1999).

These conceptual principles were reinforced and promoted by Le Corbusier, who exhibited his grand plan for the "*Ville contemporaine*" in 1922. This proposed city of three million people would be divided into functional zones: twenty-four glass towers in the centre would form the commercial district, separated from the industrial and residential districts by expansive green belts. The theme of this plan was to bring "sun, space, and green" to the city. His vision of home and city was both innovative and influential; it became the manifesto of the "Charter of Athens" and was published by the International Congresses of Modern Architecture (C.I.A.M.) in 1943. However, the separation of planned location of working places with respect to dwelling places has created excessive commuting distances; the traffic facilities were overtaxed during rush hours and excessive space of a city is devoted to parking lots. "The functionally divided city, intersected by motorways, left nowhere for civic life to grow" (Tietz, 1999).

After the Second World War, with Europe's housing problems worse than ever, Le Corbusier experimented his domestic and urban theories on the *Unité d'Habitation* in Marseilles (1952). Seventeen storeys high and designed to house 1,600 people, the Unité incorporates various apartment types, shops, clubs and meeting places, all connected by raised "streets". There was also a hotel and recreation facilities. This mixed-use building now still attracts local middle-class professionals.

In the 1970's, Rem Koolhaas²⁸ published several analyses of the metropolis of New York, in *Delirious New York*, celebrating the principle of mixed use. The skyscraper which accommodates offices and dwellings, as well as places of entertainment under the same roof -- the Rockefeller Center -- is his prototype of the city building (Tietz, 1999).

In 1977, the "Charter of Machu Pichu" was drawn up. It was the antithesis of the "Charter of Athens", and one of the things it demanded, was the integration of various parts of the city and its uses. The individualization of society at the end of the twentieth century has led us to a radical rethinking of city layout and of the relationships between buildings and open space. The emergence of live/work as an important urban building type has great potential for the creation of appropriate contemporary communities and urban landscape.

"The independent nature of homework and the unavailability of alternative employment opportunities make working at home ideal. It is time to safeguard the freedom to choose to work at home."²⁹ Ann McLaughlin, former Secretary of Labour of the U.S. said "the changing workforce demographics demand that we provide employment opportunities that allow workers the freedom to choose flexible alternatives including the ability to work in one's own home." She added, "at a time when flexibility is an operational imperative to our competitive advantage, government should enhance, not impede, workers' choices."³⁰ In response to that, local mayors and town councils, start to adopt a new general plan, and zoning laws are being adjusted accordingly.

In Canada, the strategic directions for live/work have been adopted by Vancouver City Council in 1996. The Vancouver's Zoning and Development By-law allows for live/work units, and also contains many mixed-use zones. A team of architects undertook a research of live/work opportunity in downtown Toronto (Fish, Kurtin, Nasmith, 1994). It proposed a general use designation that allows the mixing of industrial, commercial and residential uses including live/work units. Evolved from an extensive process of public involvement, the City of Toronto recently (in 2002) adopted a thirty-year plan for its

physical development. This policy plan uses a new idiom of city planning that carves a wholesome way of categorizing and organizing land uses. Instead of single-use categories, namely industrial, commercial and residential, it views land uses as functional clusters of mixed and interrelated uses, such as *Neighbourhoods*, *Apartment Neighbourhoods*, *Mixed Use Areas*, *Regeneration Areas* and *Employment Areas*.

A recent statement of “*Technopolis*” (Figure 3.4) by Kisho Kurokawa³¹, posed a challenge to the conventional zoning and presented some fresh ideas, such as Vertical Zoning and Layered City³². The project is one of the nodes in the *One-North* Development planned by Zaha Hadid.³³ It comprises an area of about 200 hectares in Central Singapore, to be developed in phases over the next 15-20 years and serve as concrete step for Singapore towards “Intelligent Island”. The purpose is to create a vibrant mix of commercial, residential and recreational environments that are conducive to success.

Responding to a contemporary desire in the dense metropolis, the design of “*Technopolis*” takes the program of vertical zoning and harmoniously distributes facilities and services by social mixing (studio, family flats, prestige penthouse suites) in semi-private spaces (inner courtyards, light shafts), open private spaces (balcony, terraces), and public spaces (patios). It is an example of green skyscraper combining the Western modern thinking with Chinese culture; it encourages the contact with nature, minimizes the use of land and activities impact on the environment, explores the sensitive path combining minimalism and complexity, ecology and technology, and architecture and nature.

Figure 3.4 The perspective view of *Technopolis*

Similar ideas could be seen in the *Solar-Oriented City 2001*³⁴ and the *Shinonome Project*³⁵ -- the Multi-faceted, Three-dimensional City in Tokyo, Japan. The concept of the Solar-Oriented City is the vertical and horizontal redistribution of functions: the southern facade is dedicated to habitation, the northern facade to amenities (libraries, museums, factories, laboratories etc.). The building is thus stratified into three vertical layers. The southern layer is designed to offer maximum sunlight in the living units; the northern layer, using thicker walls, seeks protection from the sun and fits into the shadow of the southern part. Between the two layers there is a service and circulation interface.

Kengo Kuma, the design architect intended to reinterpret the concept of Le Corbusier's *Unite d'Habitation* in Shinonome project (Figure 3.5). He tries to "inject a functional and hands-on quality of life, by means of the multi-purpose nature of the construction".

The multi-purpose aspect is conveyed in the program, which not only combines homes, SOHO offices, commercial and public amenities and facilities, but also has the flexibility in the use of the housing units. Each individual family can occupy several units, distributed on several floors or on either side of the atrium, creating inter-connected networks -- an alternative to the conventional type of "inhabiting" typical of the 20th century, for extended family modes.

Figure 3.5 The elevation and cross-sections of Shinonome project

The new idea of "extended family modes" to distribute several units on different floors owned by one family (or two generations, double-roled), on the one hand provides better separation for arranging public and private spaces, on the other hand mixed functions without clear zoning may cause ambiguous setting.

Comparatively, the configuration of "Technopolis" could be simpler in terms of architectural articulation. The intention of creating "street" instead of "building", made the Shinonome project more horizontal. Forming "random chaos of the street", the public corridors running through the whole complex, reduced the privacy and tranquil feel. Within the context of One-North development, "Technopolis" has better vantage point being fit into a big picture, merged into vibrant life. The building itself is integrated by multi-layered elements, easy to be plotted, transferred to the other place.

While the conventional being re-examined, re-configured, and re-structured, all these projects provide specific responses and creative additions to contemporary living patterns.

CHAPTER 4: EASTERN AND WESTERN PHILOSOPHY DISCOURSE ON DESIGN

4.1 Eastern Wisdom of Feng Shui

For more than 3,500 years, the Chinese have been keeping the secret of a unique part of their culture -- Feng Shui -- a dominant method applied to the design and arrangement of their living environment. It is a profoundly creative and intuitive art which is in accordance with the forces of the universe; it is also a science, "with diagnostic equipment, mathematical formulas, and specialized terminology" (Lam, 1996). As argued by Cate Bramble¹, Feng Shui uses physical and mathematical principles of Yin--Yang theory for its hypotheses, and the same methodologies like Western scientific inquiry that is, practitioners observe and record, formulate mathematical models of structures, and report findings in both technical and layman's language, so that the work can be accessed and assessed by any other sufficiently-skilled practitioner. These comply with the definition of "*a systematic and orderly arrangement of knowledge*"² which the science holds.

Feng Shui is rooted in an extraordinary sensitivity and affinity to nature. In Chinese, Feng Shui means *Wind* and *Water* -- two of the most fundamental forms of life's energy. They are the manifestation of looking at environments and their characteristics in a completely different way.

"Feng Shui is a vital and exciting component of a wisdom from ancient China" (Too, 1996). It fascinates both Eastern and Western people on how ideas about nature and attitudes towards the natural world historically been related to techniques and practices

for understanding, interacting with, and shaping that world.³ This chapter presents the essential nature of Eastern thoughts and set out the relevance of the Western science. It also demonstrates how it was applied to the creation of our built environment in both Eastern and Western worlds.

4.1.1 The Way to View the Universe

Feng Shui is based on an interpretation of the natural world which enabled the Chinese to create efficient agricultural systems, and also the study of the movement of heavenly bodies in order to determine the passage of time (Hale, 2000). Compass directions and their associations are fundamental to the practice of Feng Shui. Then the knowledge was abstracted and numbers were used in order to find the inner order of the cosmic movement. This mathematical pattern of the Universe was recorded in *Yi Jing*. The *Yi Jing*, or commonly known to Westerners as *the Book of Changes*, is the first known attempt by the Chinese to formulate a system of knowledge around the interplay of opposites (*Yin* and *Yang*). It is a deceptively simple yet complex system of understanding the patterns of change in the Universe.

Astronomical and geomantic calculations and the place of human beings within them are plotted on a *Luo Pan* -- a type of south-pointing compass surrounded by the Ba Gua. This depicts astrology information and other details for the calculation and analysis of auspicious placements, it can indicate, through the interpretation, almost every aspects of life. This vast amount of information has been reduced to a shorthand form incorporated in a "Magic Square". It symbolizes a world of constant transformation. Many formulae based on the Magic Square are used to discover whether a place is auspicious, in itself and for the people living there. The energies represented by the

Magic Square always move in a fixed pattern. These patterns are repeated over time and can indicate the fortunes of a person or building in a certain year.

4	9	2
3	5	7
8	1	6

The Magic Square: the "magic" lies in the fact that every line adds up to 15. It exists in various cultures.

The information contained in the *Luo Pan* is condensed into the Magic Square, which forms the basis of the *Ba Gua* (Figure 4.1) -- a tool widely used to investigate our living and working environments. According to *Yi Jing*, The *Ba Gua* represents the journey of life, it holds some of the images which describe the energies of the eight directions and the central position, governs fundamental life issues, such as career, knowledge, health, wealth, fame, marriage, children, and benefactors. The fate could be manipulated through balanced and harmonious arrangement of those associated components (Lagatree, 1996).

Through the contemplation and exploration of the natural universe philosophically and practically, Chinese people gradually discovered the laws of nature and identified how the natural energy around them behaves and how it affects them. It helps them to establish favourable locations for human habitation and the auspicious confluence of forces for harmonious living.

4.1.2 Perception of the World

The principles of Feng Shui, along with Oriental medicine, astrology and philosophy,

Figure 4.1 Ba Gua – An Octagon surrounded by the eight Trigrams of the *Yi Jing* and representing the eight compass directions and attributes they associated

together reflect a unified perception of the world. "Knowing the ancient beginning is the essence of the *Way*", wrote by *Lao Zi* in *Dao De Jing*, this perception of the origin of all that exists was based on the contemplation of the natural world. According to *Dao De Jing*, the beginning of everything is nothing ("*Wu Ji*"), the Chinese expressed this potential of energy by drawing a perfect circle. This is a concept has often been

mistranslated and misinterpreted -- it is not a "void", on the contrary, it is expressing at a stroke both fullness and emptiness, endless motion and full of possibility. The Daoists believe this Great Emptiness to be the fountainhead of creation. The single entity divides, forming the two primal energies of the Universe-*Yin* and *Yang*. They are represented as tadpole-like symbols called *Tai Ji* (Figure 4.2), a bulge at the top for the head and a pointed end for the tail. This shape represents the movement of universal energy or balancing motion.

Figure 4.2 The symbol of *Tai Ji*

Early Western scientific observation focused primarily on the behaviour of material objects. But the Chinese tradition became acutely aware of the more intangible background of energetic influences and life forces that create the objects and beings around us (Lam, 1996). As a consequence, the Chinese contemplated the fathomless and indeterminate space out of which all phenomena emerge and became aware of the invisible, limitless potential of the Universe. Reflected in the ideology, it forms unique Chinese spatial notion.

*"Thirty spokes converge upon a single hub;
It is on the hole in the center that the use of the cart hinges.*

*We make a vessel from a lump of clay;
It is the empty space within the vessel that makes it useful.*

*We make doors and windows for a room;
But it is these empty spaces that make the room livable.*

*Thus, while the tangible has advantages, It is the intangible that makes it useful.*⁴

This essence of non-being has made it clear that the usefulness is defined not by the tangible but by the intangible. It is also referred to be a fundamental misplacement of attention in traditional Western "Object-Oriented" design (Mitchell and Wu, 1998).

About 3,000 years ago, Chinese has learned from the *Yi Jing* that when anything comes to its extreme, be it on the human or natural plane, a reversal to the other extreme takes place. This polarity of opposites is known as the theory of *Yin* and *Yang* -- the fundamental principle of Feng Shui. This idea greatly affected the Chinese people to this day, and established their perception of the world: everything is cyclical -- in a constant state of flux and change. Everything is interrelated and interconnected. It's all about balance and harmony.

4.1.3 The View of Themselves -Chi

Through the observations of what occurred in nature, and what was made manifest in their bodies and lives, the ancient Chinese accumulated knowledge and experience on the system of viewing themselves. After all, the theory of Feng Shui seeks to explain the behavior of the world in relation to the lives of individuals. It studies how the environment in which people live may affect their lives and how to use the environment to influence the quality of person's life. By observing nature's forces and monitoring their effect on human bodies, the Chinese Daoists concluded that the human being is a microcosm of the macrocosmic natural world. This means the microcosmic ("small") universe within our bodies is a reflection of the macrocosmic ("big") universe outside of our bodies. Therefore, it reveals "*Chi*" -- the nature force, running inside human body.

"Chi is a concept unknown in Western philosophy but figures repeatedly in the philosophies of the East" (Hale, 2000). The movements of *Tai Ji* encourages *Chi* to move through the body, this principle has been used in Chinese Acupuncture which needles are used to unblock its flow when stuck. Chinese herbal medicine uses the special energetic qualities of herbs to correct Chi when it becomes unbalanced. This also influenced Chinese artists, who believe every brush (Figure 4.3) is the result of trained mental processes and the correct breathing techniques, which ensure their work infused with *Chi*.

Figure 4.3 Chinese Calligraphy of *Four Letters on Ancient Poems*, written in wild cursive script by Zhang Xu, 710-750 AD

To sum up, through the Chi flow, the close relationship between the Micro and Macro is established. Parallels can be drawn between this invisible energy (*Chi*) and various forms of energy described in Western science where energy fields are investigated using various instruments. However, more than a kind of energy, a person's *Chi* also contains varying quantities of each elements. It flows in our bodies and determines our personalities,

destinies, actions, and interactions with others; when it is properly developed, it can act to balance and cultivate *Chi*.

The Daoists believed that *Chi* could be enhanced and harmonized by a healthy environment -- a good Feng Shui, and is essential to achieve physical and mental health both in human body and space. The relationships could be illustrated in Figure 4.4. It is believed that if *Chi* flows smoothly, occupants will be positive and will have an easy

Figure 4.4 The diagram of relationships among personal Chi and other dynamics

passage through life. Otherwise, if the *Chi* is stuck, there will be disharmony and problems or imbalance will occur. Mitchell and Wu also pointed out that consideration of the flow of *Chi* governed many formal aspects of Chinese architecture, from town planning, religious structures, houses, and gardens, where auspicious *Chi* could be cultivated while inauspicious *Chi* could be diminished.

4.1.4 Relationship With Nature

In the late of the twentieth century, Feng Shui -- one of the most venerable Chinese traditions -- has been accepted and captured more attention from the Western world. One

of the researches focuses on the integration with nature in traditional Chinese architecture. "Most Western scientists study the Universe, they focus on one spot or element, disregarding the interconnectedness of that which surrounds and/or encompasses it... Not only architecture but the whole of Western thinking is based on 'object-oriented' view in which too much attention is paid to the 'subject' and too little to the 'context'" (Mitchell and Wu, 1998). The "context" here refers to the relationship between the

Figure 4.5 The typical Chinese Garden is looked as works of art -- a fusion of nature

subject and all the other things, which forms "many layers of connections". These connections also exist between the ways people have thought about nature ("theory") and the ways they have actually acted toward it ("practice").⁶ Only through those connections can design be truly meaningful and healthy.

The Eastern philosophy has always favoured this big picture -- the unity of all things. They believe the cohabitation with the environment and harnessing nature's forces, will bring them a more harmonious living condition. The practice of Feng Shui was born out of China's reverence for nature. Nature was not only the subject of painting, poetry, and

porcelain, it is the central theme in traditional Chinese architecture (Figure 4.5).

Figure 4.6 Diagram of *The Nine Aspects of Feng Shui*

Relationships can be drawn in the diagram of *The Nine Aspects of Feng Shui* (Figure 4.6), it brought together the eight strands of thought and practice shown the eternal "art of finding one's place" (Lam, 1996). At the center of the matrix, stood the constant factor of the individual human being, bringing the total number of elements

involved to nine, not only include the location and movement of visible realities such as earth, water and color, but also invisible forces like magnetism, time, and change.

To summarize, the Eastern thoughts have taken into account the following aspects: inseparable link with nature; interaction with environment; balance in every aspect of human living spaces.

4.1.5 Deep Rooted in Chinese Philosophies and Cultures

*"Architecture has recorded the great ideas of the human race. Not only every religious symbol, but every human thought has its page in that vast book."*⁷
Victor Hugo

Since Feng Shui has become popular spread-out in the West from 1980's and 90's, there are several definitions in the West, such as *"Art of Placement"* (limiting it to the furniture and furnishings within a home or office), others have defined it in relation to *Chi* (the subtle energy that flows through the land and affects our environment, Hobson, 1998), some acknowledge it as *"luck engineering"* (Skinner, 2000). However, from Chinese point of view, Feng Shui is far beyond from the above definitions. In *Feng Shui - Harmonizing Your Inner and Outer Space*, Zaihong Shen examined Feng Shui through a cultural context, defined its roots with Daoism, Buddhism and Confucianism -- the dominated cultural factors in Chinese history. These influential forces throughout the development of Chinese civilization, have great impact in generations of people and the landscape.

Daoism originates from the philosopher *Lao Zi* (600 BC), and his work was recorded in the *Dao De Jing* (The Classic of the Way and Its Power). Sublimating the philosophical concept of "Dao" (the Way) as described in the *Dao De Jing*, Daoist are believed to be

most strongly associated with Feng Shui. In their view, nature is the ultimate power, human is a part of nature. One could acquire intuitive or absolute knowledge only by communing with nature and being at one with it. By considering the nature is perfectly balanced, a house or other structure could potentially cause imbalance with nature and eventually affects humankind. Certain consideration must be applied to the arrangement of the built environment.

Buddhism was introduced to China from India approximately in the 1st century A.D., becoming increasingly popular after the 4th century. Buddhism played an important role in ancient China and had unique contribution to Chinese traditional architecture. Buddhists devoted much energy to studying and perfecting Feng Shui principles; many Buddhist temples were built according to it, most of them face south and contain "layers" of space, the sequence includes a pleasure garden, an outer door, a vestibule and several inner doors with various courtyards. The different characters of Daoist and Buddhist buildings are noted below:

"Early Chinese Buddhists looking for a secluded area to practice their religion, constructed temples in what are now known as China's four major Buddhist Mountains. Isolated and quiet, these mountains are larger and showier in shape than their Daoist counterparts, and were chosen with less regard toward soil quality, plant life and animal diversity. Buddhists favored these mountains for their strong yang energy, while Daoist looked for mountains with a perfect balance of yin and yang energy."

*Other differences between Daoists and Buddhists include the kind of temples each religion favored. The Buddhists built large, eye-catching temples at or near the top of their mountains, where the energy was its strongest; the Daoists not only built temples on the sides of mountains where the energy was more balanced, they were careful to create inconspicuous structures that blended with the environment."*⁸

Confucianism, based on the teachings of Confucius (551-479 BC), was a complex system of ethics designed to cultivate moral perfection. In contrast to the Daoism,

which has the character of self-reflection, Confucianism deals with practical and earthly matters, with the primary concern in human relations, proper conduct, and social harmony. This harmony conforms to Chinese social and ethical values promoting order and hierarchy. Confucianism is reflected in traditional Chinese architecture, from residences, official buildings, temples, to palaces all of which follow these same basic principles. To better symbolize the hierarchy, most buildings abide by the symmetry. The main structure is located on the axis, and the secondary structures are positioned as two wings on either side to form the main rooms and yards. Then, through the regulation of the use of colours, shapes, roof types, scale etc., the distinction between different classes of society are marked.

In summary, the three primary religions of China -- Daoism, Buddhism and Confucianism all added their imprints on Feng Shui, and made it an integral part of native culture (Shen, 2001). The principles of Feng Shui were applied in Chinese traditional architecture, in different building types, in one way or the other.

4.2 Western Science Parallel

*"Western science has been defined as a systematic approach, a methodological approach to answering questions. Science is equated with knowledge, and it is the development of knowledge that promotes the solution of problems. The "Western" scientist knows that science is based upon the principles of repeatability and predictability"*⁹
Traditional Knowledge Is Science, George Hobson

In the quest of the beginning of Western science, David C. Lindberg¹⁰ surveyed all the most important themes in the history of ancient and medieval science. He concluded that the content and practice of science were influenced by interaction with philosophy and religion. From the Dalai Lama's view,¹¹ he believes that science and Buddhism share a

common objective: to serve humanity and create a better understanding of the world. He feels that science offers powerful tools for understanding the interconnectedness of all life, and that such understanding provides an essential rationale for ethical behavior and the protection of the environment.

Among the attempts to link together Eastern and Western thoughts, there is a view that their basic principles are not only different but mutually exclusive. The Western thought is based on the notion of rigid causality, the assumption that after repeated observations supported in experience, one observes that B consistently follows the appearance of A, and therefore, A is the cause and B the effect.¹² In this sense, human phenomena that do not fit this model are considered not "logical" or incapable of being processed.

In the East, discussion of causality is somewhat meaningless, all things are related and out of the infinite complexity of their interrelations, patterns can emerge, things can change, but there is no ultimate cause. According to Lao Zi, there is no underlying set of causes or answers, Dao is mysterious and unknowable. There is an evidence regarding the unpredictable orders from modern science:

*"The outstanding contribution of modern science has revealed that in the objective world there exists both necessity and contingency and order and chaos, and there are various interactions between necessity and contingency, order and chaos and restraint & freedom, etc., which evolve constantly. The rising researches on complicated systems or open complicated megasystems show a new research orientation and reflect a new thinking, which have revealed that the objective world is an open complicated system. Whatever is changeable, they have still their unpredictable orders, and, by complicated processes and different stages, always evolve to optimal and higher orders through self-organization and constant adaptation of each other."*¹³

Logic and reason are the fundamental principles of Western thinking. The Greeks were the first to identify philosophically that knowledge could be gained through reason and logic as opposed to mysticism (faith, revelation, dogma). The rule of reason reached its

zenith in the West in the 18th century -- the Age of Enlightenment. "For the first time in modern history," writes one philosopher, "an authentic respect for reason became the mark of an entire culture."¹⁴ However, physiologically, reason and logic compose only twelve percent of our total mind power. The adult mind comprises two contingent but different components: the *conscious* mind (12 percent) and the *subconscious* mind (88 percent) (Moran and Biktashev, 1999). To the Daoists, rational thinking and experimentation were totally inadequate methods of understanding nature's truths. True knowledge went beyond the senses, it could be experienced only in a meditative state of consciousness. There is a debate about a *Great Divide* between forms of knowledge in the Western world:

*"On one side of the divide are the Rationalists, who claim that humans can know the way things are for certain, and acquire truth, but only if they use scientific thinking and scientific methods. On the other side of the debate are Relativists. For relativism, no human, whether living in pre-modernity or modernity, can ever know anything for certain: objective knowledge is unattainable because every kind of human knowledge - scientific knowledge included - is always a cultural product, constructed by the social activity of particular people living in particular times and places."*¹⁵

Recent advances in the modern sciences, have confirmed several notions of Feng Shui principles. For examples, in 1905, Albert Einstein presented his theory of relativity in his famous $E=mc^2$ formula, which means that mass (m) can be converted energy (e), and vice versa. Also, he believed deeply in nature's innate harmony that the human being is a part of a whole -- the Universe, which is limited in time and space. "Quantum physics in particular is further changing the way which the scientific community views the world. There are no certainties at a quantum level, and the experimenter cannot help being part of the experiment. This new view of nature is one in which everything is linked, one in which man is a part of the world, not above and beyond it."¹⁶

This unified world picture is being accepted by the Western, the new scientific paradigm has been shifted to a rich totality comprising of a harmonious unity of parts, which is exactly stressed by Feng Shui. More parallels might be drawn along the path of thinking, considering and perceiving the world.

4.2.1 The Golden Ratio

Discovered a system of mathematical patterns in nature, the ancient Greeks believed the image of the world could be represented by numbers and the abstraction of mathematics magically conformed to nature's truths. The Pythagorean Mathematics of Nature was summarized by *Aristotle* as "Harmony", they believed that "all things consist of number literally physical bodies themselves are made of number, or since numbers themselves are not ultimate, the elements of numbers are the elements of everything."¹⁷

There are many mathematical aspects involved in the discipline of architecture. The Golden Ratio, or Golden Section, was first developed by the Greek. In addition to the Egyptians, they used it to design their structures and monuments. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, This is a sequence of numbers called *the Fibonacci Sequence*, named after a 13th-century mathematician. Each number in the series is the sum of the two previous numbers, dividing each number in the series by the one preceding it produces a ratio that stabilizes at 1.618034. This figure has come to be known as the *Golden Ratio*. Using the Golden Ratio, a *Golden Rectangle* and a *Golden Spiral* can be created. The Golden Ratio was understood by ancient builders such as the Egyptians, Greeks, and Mayans who believed everything in nature was determined by abstract universal laws that could be expressed mathematically (Moran and Biktashev, 1999).

Fibonacci numbers and the Golden Ratio can be found in nature and human bodies, and have influenced art, architecture, and music. For examples, we could find the Golden Ratio in Leonardo da Vinci, Georges Seurat, Paul Signac and Piet Mondrian's art work; Egypt's Great Pyramid of Giza (2600 BC), the Parthenon in Athens (400 BC), and Le Corbusier's United Nations building in New York City were constructed using the Golden Ratio; it can also be found in the intervals between the notes from the Classical Music (Moran and Biktashev, 1999).

The incorporation of Golden Ratio with architectural design is considered very aesthetic because its proportions are thought to be pleasing to the eye. There are also many types of symmetry, prevalent both in classical and modern architectural designs, because of its easiness on establishing the order of buildings. Recorded in *Ten books on architecture* (Vitruvius, 100 BC) and *The Four Books on Architecture* (Palladio, 1570), these principles of establishing the profound patterns of symphony and order have actually been applied to their living environments in the West, which employed the concept of Feng Shui that everything is inter-related, a constituent part adjoined together to create an unified and agreeable form of harmony.

4.2.2 The Greek Four Elements

Like ancient Chinese, there was also the observations and efforts of understanding the structure of Universe and what makes up it in the Western world. According to the *Empedocles*, a Greek philosopher (500 BC), all matter in the Universe is comprised of some combination of four "roots" or elements of *Earth, Air, Fire and Water*.

"These four elements arise from the working of the two properties of hotness (and its contrary coldness) and dryness (and its contrary wetness) upon an original unqualified or primitive

*matter. Fire and air are outwardly reaching elements, reaching up and out, whereas earth and water turn inward and downward. The possible combinations of these two properties of primitive matter give rise to the four elements or elemental forms."*¹⁸

Empedocles described these four elements not only as physical manifestations or material substances, but also as spiritual essences. The interaction of them is influenced by the relationship between the two great life energies of Love and Strife.¹⁹ Each of the four elements was held to exist in an ideal pure form, while the real things around people were considered impure, or mixed, forms of these four ideal elements.

Influenced by *Euclid's* pure mathematical discovery, *Plato* (4th century BC) revised the four elements theory with the proposition that there were five elements in the Universe (Figure 4.7). The fundamental elements theory, along with the Ten Pythagorean Principles acknowledging the properties of opposites, built the basis for Western thinking about nature since then. Significant parallels and distinctions could be drawn upon the Chinese five states of change or *Wu Xing*: earth, wood, metal, fire, and water which interact in any of three dynamic cycles (productive cycle, domination cycle, reductive cycle), and the essential basis of *Yin* and *Yang*. One similarity is both of theories contains the conflicting "opposites", and as Aristotle pointed out, "harmony is a blend of contraries". This represents their basic symbolic correspondences to the Universe.

Figure 4.7 Five elements -- earth, water, air, fire and quintessence are in correspondence with five regular solids

4.2.3 Culture Difference

*"Westerners write horizontally from left to right, but somebody started to write vertically from top to bottom in order to connect heaven and earth. From where will the world become one? When Western thought starts moving around, centering upon Eastern thought, the world can be one."*²⁰

Sun Myung Moon on "The Difference between Eastern and Western Culture"

Comparisons between Western and Eastern cultures have been done on a regular basis in the field of Architecture, Art history, Society and other fields. It becomes more important today in the context of globalization.

- Western Yang

*"From cultural level, the Westerners are yang-oriented. They consistently favor the masculine over feminine; reason over faith; separation over integration; and spending over saving. They like things bigger-faster-better."*²¹

These characters stemming from one of the extremes of the dichotomy: the Western Perspective, resulted in the empirical, logical and linear thinking in the traditional Western Sciences,²² and "Object-Oriented" approaches in design and architecture.²³

- Eastern Yin

Elizabeth Moran further explained that the Eastern counterparts have traditionally been more Yin-oriented. They favour philosophy and religion over science; intuitive wisdom over rational knowledge; traditions over progress; family over the individual. Developing the inner spirit has always taken precedence over materialism, technology, and the outer world. Respecting nature's beauty has been far more important than extracting something from it.

It is suggested by several scholars that the West and East could establish certain connections to achieve the wholeness -- the balance of Yin and Yang. The blended Eastern and Western philosophies will inevitably influence the ideas underpinning our

social fabric, promote more harmonious living environments. For example, Mitchell and Wu once noticed that a wisdom presenting in the Eastern tradition is missing in the Western society, through which would make the design works more meaningful and healthy. They also explored the relevance and applicability of Eastern philosophical ideas to design and architecture in the West. They concluded that Eastern philosophy -- with its emphasis on growing, not making; on process, rather than product; and on connection, instead of separation, can be instructive to the West.

Renowned Japanese architect Kisho Kurokawa advocates his idea of "co-existence" in his *"The Philosophy of Symbiosis"*:

"One important point of focus in the transformation from the age of the machine to the age of life is the conversion from standpoints of Euro-centrism and logos-centrism to the symbiosis of different cultures and to ecology." ²⁴

This symbiosis, the close relationship between nature and human beings, the environment and architecture, would be the direction in this new century, as he firmly believes.

4.2.4 Relationship With Nature

"Let Us make man in Our image, according to Our likeness; and let them rule over the fish of the sea and over the birds of the sky and over the cattle and over all the earth, and over every creeping thing that creeps on the earth." ²⁵
Genesis 1:26

It is believed that the Christian ideas of nature imprinted the obsessive themes of dominance and control in traditional Western attitudes towards nature -- Nature is here for us to use. The Western Christianity has been seen as "the most anthropocentric religion" which gives humans permission to exploit nature in a mood of indifference to the integrity of natural objects.²⁶ In 1967, Lynn White Jr.²⁷ expressed in his influential article of *The Historical Roots of our Ecologic Crisis*, that human ecology is deeply

conditioned by beliefs about nature and destiny, i.e. by religion. He urged that humans must examine and critique their attitudes towards nature. He further noted that the human damage and destruction upon the environment grows out of Western technological and scientific advances made since the Medieval period. Edwin A. Locke²⁸ also testified this process in *The greatness of Western Civilization*:

"The triumph of reason and rights made possible the full development and application of science and technology and ultimately modern industrial society. ...Scientific and technological progress followed in several interdependent steps. Men began to understand the laws of nature. They invented an endless succession of new products. And they engaged in large-scale production, that is, the creation of wealth, which in turn financed and motivated further invention and production. As a result, horse-and-buggies were replaced by automobiles, wagon tracks by steel rails, candles by electricity. At last, after millennia of struggle, man became the master of his environment."

This attitude towards nature would regard the life of "in harmony with nature" as primitive, instead, provide a justification for exploitation of nature. It was thought as the root of contemporary environmental crisis. In order to have a sustainable habitat, the image of home and the relation to the nature must be reassessed.

With the recent interest in Eastern philosophy, there has been a gradual shift away from Reductionism -- where things are understood by breaking them down and looking at their component parts, towards a more holistic view.²⁹ Recent advances in sciences are also beginning to raise new ideas about the structure of reality, and many have parallels with Eastern thoughts. A unified world picture is emerging that no longer reduces nature to a series of isolated components, on the contrary, it enables us to define the interconnected and interrelated world vision.

The new design trend of "Green Design" has been noted with the emerging thinking similar to Eastern thoughts, "they extended the Buddhist belief in the garden as a

microcosm of a larger universe and as an embodiment of inside/outside."³⁰ Notions such as, *"insist on rights of humanity and nature to co-exist", " recognize interdependence between human and natural world"*³¹ have been recorded in "The Hannover Principles". It suggests the path of progress in a healthy, supportive, diverse and sustainable condition.

4.3 At Work in the East and West

Being a vital component of ancient Chinese society, Feng Shui has survived for centuries. Today, it is a way of life in many parts of Asia, Hong Kong, Taiwan, Singapore, and Malaysia etc.. Many modern multinational corporate headquarters in Asia share a guiding principle for the siting and design of their buildings and the same pursuit of the most harmonious and auspicious place to live and to work. Since 1980's, China has adopted "open door" policy to the outside world, businessmen from Hong Kong and other parts of Asia have moved their operations into China, therefore the practice of Feng Shui are reawakened in that country. After being long suppressed by the Communist government, Feng Shui, along with many other Chinese traditions -- is once again embraced.

Through the Chinese migration to various parts of the world, Feng Shui knowledge has slowly crossed the waters to the West. Wherever they have settled, their cultural and traditional beliefs are kept alive. They continue to arrange the direction of their homes, and the rooms within them, according to Feng Shui principles. More and more, Feng Shui has captured the Western imagination as a tool for design and well-being. Based on principles from design, ecology, architecture, and common sense, Feng Shui applies not only to the layout of a building but to the arrangement of furniture within a room, to the best design

of offices and public spaces -- in short, to any arrangement of man's environment (Rossbach, 2000). The West people also came to understand the goal of Feng Shui is maximum harmony with the natural order, which will bring prosperity, health and happiness.

4.3.1 At Work in the East

4.3.1.1 Chinese Courtyard House

The traditional Chinese courtyard-style house (Figure 4.8) was originated during the *Han* Dynasty (200 BC). The *Han* period was one of the most peaceful, prosperous and culturally rich in Chinese history, and the stability achieved during that time allowed the development of advanced housing forms.

Figure 4.8 Aerial view of the Chinese courtyard-style house

It is basically a quadrangle residence, composed of room units arranged around a central

courtyard. It is considered to be the epitome of the Chinese principles of axuality, balance and symmetry, and many of features bear the influence of Feng Shui beliefs, therefore, it embodies Chinese long-treasured values about the relationship between humans and their surrounding environment.

The house is usually oriented to the south, the auspicious direction, to be shielded from the cold in the winter and to receive cool breezes from south east in the summer. The glaring effect from west and east sun will also be eliminated. The layout of the plan reflects the social structure and family hierarchy, it also has layered spaces with different levels of privacy. For example, family elders lived in quarters at the rear of the compound, usually the most private part of the home, servants' quarters were usually found close to the door, near the washroom and the kitchen. The gate of the inner quarter,

Figure 4.9 View of main entrance -- *Chui Hua Men*

called *ChuiHua Men* (Figure 4.9), is an important symbol marking the social and economic status of its owner, hence, the size, type, and even color of the gate varies according to such status. While the outside walls are enclosed, the inner courtyard remains open for light, fresh air and rainwater. Courtyards are ideal places for gardens, and also served as children's playground and family gathering places.

4.3.1.2 Chinese Garden

In Chinese dwelling, the garden is the near environment of house and is very important for the integration with Feng Shui. Unlike the Western counterpart using disciplined lines and groupings of plants, the aesthetic goals of Chinese garden are to enjoy its apparent "irregularity". The Chinese garden is an artistic recreation of nature, one of the principles of garden design is "copying from nature". Most gardens try to incorporate aspects of rusticity and spontaneity inherent in nature, the quality often referred to the other art forms, such as Chinese painting, sculpture and poetry that the balance, harmony, proportion and variety are considered essential.

*"The principles of Feng Shui and Chinese garden design are closely allied. They involve philosophy, religion, literature, aesthetics, art, architecture and life sciences."*³²

The Feng Shui in Garden design is evident that each garden should have at least a small hill, some moving or still water, some stones or stone-garden according to the siting doctrine of "red phoenix in front, the black turtle as background, the green dragon left and the white tiger right" (Too, 1996). In order to maximize the flow of auspicious Chi, and harmonize the Yin and Yang energies in the garden, the spatial relationships must be well managed. According to Feng Shui, undulating paths prevent bad spirits, who can only travel in straight lines, from progressing forward, on the other hand, crooked pathways are also intended to create more vantage points for better appreciation.

*"In gardens, space must be organized in such a way that the entire garden cannot be seen at a single glance. While walking through a garden one must be able to experience changing views, with highlights and places for collecting one's thoughts. There must be contrasts and repetitions, variations and harmony."*³³

These spatial characters could be found in *Wang Shi Garden* (Figure 4.10) -- one of the smallest (at little more than one acre) yet considered one of the best designed and most elegant of the private gardens still extant.

Figure 4.10 Bird-eye view of *Wang Shi Garden*, Suzhou, China

In Garden design, views to be emphasized are framed by different architectural elements (Figure 4.11), this creates the continuity of a series of view points. The four principle elements of a Chinese garden -- *Rock, Water, Building, and Plant* -- are arranged as per their Yin/Yang properties and their symbolic meanings. The garden should also have a distinct look in each different season of the year in order to have year-round enjoyment.

Figure 4.11 The view is framed by a special-shaped opening with which the inside and outside could be connected

It is suggested the design concept of Chinese garden was to provide a "spiritual utopia" where people feel closer to nature, closer to one's own heart, closer to the ancient, so that they would be able to contemplate and resonate with nature. This rhythm, to Chinese, is the highest of all conceivable values, the quintessence of truth, beauty, and goodness of the highest levels of existence.³⁴

4.3.1.3 The City of Hong Kong

It is well known that good Feng Shui practice have helped to make Hong Kong one of the most prosperous business centers in the world. In terms of its geographic form, the Hong Kong island is a place where the mix of mountains, plain and sea forms a dragon's lair -- a place where the earth's benevolent forces can concentrate.³⁵ Acknowledging this feature in the landscape and orientations is central to the matter of Feng Shui. In this city of "*Oriental Pearl*", Feng Shui is not only applied to analyze and enhance urban and interior spaces, but also includes more mundane matters in their domain, such as auspicious dates for ceremonies, instructions on personal matters. It is believed that all factors can affect health, harmony and prosperity. Therefore, consulting a Feng Shui expert before buying a new home, relocating an office, or rearranging floor layouts is very much taken for granted by local people.

Few buildings in Hong Kong are built without consulting a Feng Shui master; Western companies in Hong Kong may also adopt Feng Shui strategies to foster harmony in the workplace and promote good health and prosperity. Here are two well-known examples:

- Hongkong and Shanghai Bank (HSBC) Headquarters

A prime modern application of Feng Shui is this HSBC Tower, the architect Sir Norman

Figure 4.12 The vast ground floor area was left open for the accumulation of auspicious energy

Foster admits Feng Shui plays a crucial role in his design process, from site plan, elevation, floor plans, to construction process. The Feng Shui expert suggested the whole ground floor should be left open (Figure 4.12), and with the presence of an empty space in front of the main entrance, offers auspicious business luck, because good-luck Chi has a chance to settle and gather potency before entering the building.

Figure 4.13 Main façade of HSBC Tower

The expert also suggested that the main supports on the front and back of the building should be inverted to look like an M instead of a W (Figure 4.13), the two escalators going up into the building be angled toward the street, rather than be perpendicular to it in order to avoid the negative energy. From the symbolic interpretation of the Feng Shui master, the facade shows up as spiders spinning webs, which is somewhat akin to someone who is forever busy making money. The protrusion on the top of structure resembles the head of a man, from a certain angle, it looks like the man is peering into a pair of telescopes -- searching the horizon with foresight for a better future.

- **Bank of China Building**

The 70-storey *Bank of China* building in Hong Kong designed by I.M.Pei, is also a prominent example for the application of Feng Shui in design. The building is auspiciously oriented on a slope facing Hong Kong Harbor with dominate view, however, the site was too exposed to several active roadways that surrounded it. In the analysis of the siting for this building,

*"The architect thought to create a positive environment protected from urban influences. Situated amid strands of bamboo and quince which mask traffic disturbances, the auspicious and restorative influence of water was incorporated in a sequence of tranquil pools and active waterfalls around the building. ... the sloped glass walls both distort the reflections and ward off the impact of nearby buildings."*³⁶

The principal design feature of this building is its prismatic facade, featuring large crosses and angles formed by structural steelwork (Figure 4.14). Many felt that the building had bad Feng Shui, and that its many angles would cause poison arrow problems for other buildings in the vicinity. Lillian Too explained how the bad Feng Shui was counterbalanced by the protective Chi flows along the arms of the roads that encircle and embrace the building:

Figure 4.14 Perspective view of Bank of China Building

*"Several others, however, using sophisticated methods and calculations based on the building's position and its "natal chart," maintain that the building enjoys very auspicious Feng Shui. The building is located in an area of busy traffic flow, and several flyovers on Cotton Tree Drive and Garden Road cross the front and back of the building. In Feng Shui terms, roads and flyovers are like rivers. If the curves of a flyover bend towards a building, they are likened to a blade or a scythe cutting into the building and bringing inauspicious Chi. In this case, however, the curves embrace the building, and resemble a river meandering slowly around it. Why? Because traffic lights on the roads slow down the traffic, thereby ensuring that Chi approaching the building does not dissipate. The flyovers, therefore, represent a benevolent configuration, bringing good fortune to the building."*³⁷

4.3.2 At Work in the West

From the interpretation of Western literature, it suggested principles of Feng Shui are also practiced in the West for a long time, either through their sound native judgement, or through the same pursuit of close relation to the nature.

The Fallingwater (Figure 4.15) -- the work of Frank Lloyd Wright, has been quoted complying with Feng Shui principles that the placement of man in relation to nature ideally accomplished the traditional Daoist objectives of meeting wind with water.

Figure 4.15 Perspective view of *The Fallingwater*

According to Master Xu,³⁸ Wright showed his innate understanding of Daoist principles—living in balance with nature. In fact, Wright deeply believed that "the closer man associated himself with nature, the greater his personal, spiritual and even physical well-being grew and expanded as a direct result of that association."³⁹

On the other hand, modern living also did not conflict with the idea of living close to nature, Richard Neutra's Singleton residence (Los Angeles, 1959, Figure 4.16) demonstrated the desire of living harmony with the surrounding landscape. His trademark

Figure 4.16 View of *Singleton residence* from inner courtyard

of plate glass walls and ceilings which turn into deep overhangs have the effect of connecting the indoors with the outdoors. This sleek modern style undisputedly influenced post-war architecture. It is suggested that “in an intelligent, logical and sensitive manner, traditional principles could be adapted to present-day circumstances” (Too, 1996).

- **Buckingham Palace, UK** (Figure 4.17)

One of the famous examples quoted in Feng Shui books is the Regal Buckingham Palace in London. “It faces a long, straight road and stands at the end of a road called The Mall. The Mall is a classic poison arrow and the Feng Shui of the royal residents cannot escape being adversely affected. However, its harmful effects are somewhat dissipated when the negative Chi flows around the circular roundabout. A barrier that deflects the negative Chi would provide even greater protection against the poison arrow. To the rear, the stately gardens offer a calm expanse undisturbed by pathways and surrounded by distant trees” (Lam, 1996).

Figure 4.17 Aerial view of Regal Buckingham Palace

- Royal Crescent in Bath, UK (Figure 4.18)

“One of the most important features of auspicious landscape Feng Shui is to have a ‘bright hall’ or empty, unencumbered land in front of the main door, it could bring luck for the residents of dwellings facing it.” In this case, “houses with front doors that overlook a park enjoy good Feng Shui because Chi has a chance to accumulate in the open space before entering the home. The houses here are all approximately the same size and shape, encouraging Chi to flow smoothly among them” (Too, 1996).

Figure 4.18 Royal Crescent in Bath, UK

- La Pyramide, Louvre, France (Figure 4.19)

The superb *fire* structure designed by I.M.Pei, drawing down intense energy from the Heavens and makes this site a great attraction for visitors. “This represents excellent Feng Shui as it looks like a crystal object, symbolizing the earth, and is thus excellently placed in the centre of the museum. It also brings Yang sunlight into the Yin museum” (Too, 1996), perfectly balanced with the water structure of the Louvre.

The Eastern tradition opens a window to the West on the distinct interpretation on many aspects of life because of their different perspective. Architecture was produced to reflect

Figure 4.19 *La Pyramide* in Louvre, France

theses diverse beliefs and a variety of concerns. As Mitchell and Wu pointed out that Feng Shui applications in the West now are restricted to the scope of "the art of placement" rather than having it govern the design themselves. In the next chapter, efforts are made through the comparative analysis of Feng Shui principles and the Western design philosophies in order to argue that spirits of Feng Shui actually exist and prevail in those design thinkings.

CHAPTER 5: COMPARATIVE ANALYSIS OF EASTERN AND WESTERN HOUSING DESIGN

5.1 The Quest of Quality of Home

From Le Corbusier's *Villa Savoye* (1929) to Ludwig Mies van der Rohe's *Farnsworth House* (1945-50), from Charles and Ray Eames *Case Study House* (1949) to Rem Koolhaas's *Maison a Bordeaux* (1998), the house plays a vital role in the formation and development of our physical environment, and also a true mirror to our social and living conditions. What kinds of qualities does the home consist of? What makes home a livable and meaningful space for its occupants? What are the underlying principles governing this domain which are not yet known? These profoundly important questions are the pursuits for the scholars both in the East and West.

From the view of Feng Shui, the principles are simply laid out, easy to understand, even with the room-by-room guide, as seen in *Feng Shui-Arranging your home to change your life* (Lagatree, 1996), however, it needs interpretation from experts, and associates with many factors which one solution could not be applied universally. Architecturally speaking, how those principles could be translated into the jargons which are more understandable by the Western people would be a task for this chapter.

The theoretical interpretation of the quality of the home could be seen in several books, from which the parallels to the Feng Shui could be drawn. Firstly, the quest of the quality of home, or the architecture at large, is unspeakable. In *The Timeless Way of Building*, Christopher Alexander proclaimed, to seek the timeless way people must first know the quality without a name:

*"...there is a central quality which is the root criterion of life and spirit in a man, a town, a building, or a wilderness. This quality is objective and precise, but it cannot be named."*¹

He mentioned many times of these unnamed attributes that govern the design and make it timeless. It is a kind of principle that he described as "one fundamental invariant feature" which is responsible for the success. He further explained:

*"And it turns out that, invariant, behind all processes which allow us to make buildings live, there is a single common process. This single process is operational and precise. It is not merely a vague idea, or a class of processes which we can understand: it is concrete enough and specific enough, so that it functions practically. It gives us the power to make towns and buildings live, as concretely as a match gives us the power to make a flame. It is a method or a discipline, which teaches us precisely what we have to do to make our buildings live."*²

He discussed a process to have a more responsive system that could perform what it "ought to be" only according to what it is. He argued that the "oneness" is the fundamental quality for anything, it embodies everything, and everything that matters stems from it.

In the first chapter of *Dao De Jing* -- "the embodiment of Dao", it says:

*"Even the finest teaching is not the Dao itself.
Even the finest name is insufficient to define it.
Without words, the Dao can be experienced,*

.....

*Both knowledge and experience are real,
but reality has many forms,
which seem to cause complexity.*

*By using the means appropriate,
we extend ourselves beyond
the barriers of such complexity,
and so experience the Dao."*³

From the Daoist's vision, the poetic and sensory qualities of space are not meant to be known, but we are encouraged to experience them. Through the experience, the intimate connection with the existential will be established. In the attempt to define the timeless way, Alexander chose several words came to his mind, such as "alive, whole,

comfortable, free, exact, egoless, eternal...", however, each of them only represents one aspect of the way, either it is too broad, too vague, or too large in scope, he concluded his failure because of "the quality is too particular, and words too broad". Instead of words, he chose certain patterns of events that keep on happening in place to represent the quality the place inherits. These patterns of events are always interlocked with certain geometric patterns in the space, on the geometric level, the certain physical elements repeat endlessly, combined in an almost endless variety of combinations. The breakthrough of his observation is:

*"Beyond its elements each building is defined by certain patterns of relationships among the elements...And each urban region, too, is defined by certain patterns of relationships among its elements....This relationships are not extra, but necessary to the elements."*⁴

This principle is permeated in Chinese architecture of its complementarity, represented by the relationship of Yin and Yang (Mitchell and Wu, 1998). This idea has been captured by Louis Kahn that some small unimportant spaces were contributing to the strength of the larger spaces, which they were serving them. The hierarchy of different spaces, mutually supporting each other, brings the coherence of the space. Mitchell and Wu argued this type of complementarity is fundamental to the Chinese architecture.

In the research about qualities and characteristics of residential architecture, Ola Nylander looks for qualities and attributes that could not be quantified or captured in statistics, he believes that there must be more to rely on than personal taste, individual aesthetic conceptions and design approaches. He first reviewed several scholars' descriptions of what makes a home, such as Ellen Key's "rooms with amusement and delight...sense of mystery amidst the everyday.",⁵ Norberg-Schultz's "poetic relationship to reality",⁶ Bachelard's "hidden magnitude".⁷ He argues that the architecture of the home

is the product of an integration of complementary measurable and non-measurable aspects. While the measurable attributes denote practical, functional qualities of home which could be physically delineated, the non-measurable attributes of qualitative, aesthetic and symbolic aspects are important for our perception of the home. To evaluate the relevance of various concepts and theories to our perception of the architecture of the home, he identified seven groups of significant attributes, which he called them "fields of attributes" that are distinguishable complex of details and characteristics in housing design. The fields of attributes he identified are:

- *Material and detailing*
- *Axiality*
- *Enclosure*
- *Movement*
- *Spatial figure*
- *Daylight*
- *Organization of spaces*

By comparing his groups of attributes with Feng Shui principles and the relevance of Alexander's "*Pattern Language*", the similarities and dissimilarities of Western and Eastern philosophy and design notions could be revealed.

Through the observation of the many parallels between *Feng Shui* and *Pattern Language*, Todd Samusson⁸ raised the question of whether the *Pattern Language* principle comes out of the *Feng Shui* tradition. He assumed that *Feng Shui* is similar to Chinese acupuncture, while sounding very spiritual and esoteric to modern Westerners, both evolved out of trial and error observation, and all about energy flow. It is suggested that *Pattern language* is similar to them as it comes from observation and analysis of the flow (patterns) of people's lives, then applied in design. For example, in *A Pattern Language*, Alexander introduced the pattern 27 "*Men and Women*", in the background of

the changing condition in 1970's. Similar to the interrelationship of Yin and Yang, he noted, "Since no aspect of life is purely masculine or purely feminine, a world in which the separation of the sexes is extreme, distorts reality, and perpetuates and solidifies the distortions." He suggested that the characters of men(yang) and women (yin) should be co-exist in land use and building design in order to realize their mutually influence on the environment. "Make certain that each piece of the environment -- each building, open space, neighborhood, and work community -- is made with a blend of both men's and women's instincts. Keep this balance of masculine and feminine in mind for every project at every scale, from the kitchen to the steel mill."⁹

In a book review, Mulberry Grove¹⁰ also mentioned:

*"Since Feng Shui embodies the principles of good design discovered in examining the principles of Nature, we needn't rely on Chinese sources alone. We have found good Feng Shui principles richly woven into all the work of Christopher Alexander, author of **A Pattern Language** and **The Timeless Way of Building**. These books not only offer the natural principles of good architectural design but, expunge the exoticism that has been inevitably attached to Chinese sources and lay Feng Shui before us as the language all our human bodies speak."*

After fully digested and universalized, these books are full of a common sense and the philosophy of design could be applied in (in a Daoist sense, invisibly) just about anything. The definition of Feng Shui from John Mitchell¹¹ probably express the true intents behind the concept of Feng Shui, "the art of perceiving the subtle energies that animate nature and the landscape, and the science of reconciling the best interests of the living earth and those of all its inhabitants." In *Feng Shui: Its Application in Contemporary Architecture*, Teh Tien Yong¹² viewed Feng Shui as an arm of the Chinese philosophy, which implants man as one of the components of the natural cycle of events into the landscape. He further described the Practitioners of Feng Shui became friends of the environment through their harmonious composition of Chinese landscape,

hence, highly identifiable. This echoes with Norberg-Schulz's remark of "... dwelling above all presuppose identification with the environment. And in this context, 'identification' means to become 'friends' with the environment."¹³

5.2 Intangible Attributes Comparison

5.2.1 Material and Detailing

*"The choice of materials and design of the details are key elements in our perception of the home. The concepts of appropriation, care and authenticity are the cornerstones of our perception of materials and detailing."*¹⁴
The Architecture of the Home, Ola Nylander, 2002

From the Feng Shui's point of view, the connection of inhabitants and the home in this regard was established through the five elements that consist of the world. Gill Hale¹⁵ in *The Essential Book of Feng Shui* points out that the materials with which we surround ourselves affect us on both physical and psychological levels through their energy.

The five elements are classified as fire, earth, metal, water, and wood, each with their own distinct energy that either harmonizes or opposes other elements. These interactions decide the balance of *Chi* in nature, buildings, and even within ourselves (Shen, 2001). Nylander acknowledged that the symbolic value of materials and details is influenced by our collective memory -- our common history and cultural background. The West has come to find that "certain materials can be perceived as pregnant with associations and feelings", and he further noticed "the materials of the home contain historical and symbolic signs that we can relate to or interpret". Those interpretations would depend on the nature of the materials. He used three concepts, *appropriation*, *care* and *authenticity*, to express the perception of materials and detailing.

Appropriation is the process by which a person makes a house into a home, the familiarity of materials influence this relation.

The perception of *care* is intimately connected with the identification of the home. It could be conveyed through the "signs of craftsmanship and richness of architectural detailing".

Authenticity is considered that materials do not hide their nature or imitate other materials, this genuine sense of their substance would help to enhance the comprehensible relationship between men and surrounding environment.

Feng Shui uses three elemental cycles of productive, destructive, reductive to express the different situation of human-environmental relations. It is pointed out that understanding these cyclical relationships is invaluable for creating a harmony of energies within a home (Too, 1996). According to *The Feng Shui Workbook*, the elements are reflected in shapes, forms, textures, colours, directions, health and patterns of change, the elemental qualities of materials which affect the *Chi* of the part of the home in which they are used (Wu Xing, 1998). For example, hard, reflective surfaces have a *Yang* energy and *Chi* moves across them quickly, while soft materials and those with depth of colour or texture are *Yin* and tend to slow *Chi* movement down.

The meanings of elements and their associated colours are as follows:

WOOD can be shaped and formed and is associated with relaxation. Colour: green.

FIRE has burning and ascending qualities and is associated with enlightenment. Colour: red.

EARTH has productive and creative qualities and is associated with care and attention. Colour: yellow.

METAL has malleable qualities and is associated with energy. Colour: white.

WATER has qualities of soaking and descending and is associated with peace and quiet. Colour: black.

A balanced use of materials in terms of shape, form, texture and colour enhances the

Feng Shui of a room and creates a sense of harmony.

5.2.2 Axiality

"Directional axes can visually emphasize important elements, dramatize circulation patterns and daylighting conditions" ¹⁶

The Architecture of the Home, Ola Nylander, 2002

Axiality and symmetry are significant characteristics both in Western and Eastern architecture. Nylander gave some examples from ancient Egyptians, Roman Empire to the Renaissance period to prove they were two of the most prominent classical features both in the ceremonial architecture and middle-class homes. The symmetry and strong emphasis on a central axis are very powerful weapons in the architect's armoury (Raeburn, 1988).

Figure 5.1 The photos illustrate the modern interpretation of traditional Chinese house, the entrance has a small front porch with a setback gate. This setback is required to be able to retain the beneficial *Chi* that flowing through, also a "transition space" where domain being established. The front porch has few steps and a pair of stone animal sculptures which have symbolic meaning of protection. Inside the house, along the line of axis, certain art forms, such as painting or statue would be placed to create a focal point or represent the desire for fortune and luck

As Nylander observed, the axial composition in the home can have both physical and

symbolic aspects, so that it could dominate both surroundings and inhabitants. In most cases of Chinese architecture, the buildings or spaces are organized around directional axes, to be integrated in its surroundings. This axuality is established starting from the entrance and carried throughout to the interior (Figure 5.1). As the different functional spaces are arranged in relationship to this axis, such symmetric layout often results in the completeness of the shape in building forms. In Feng Shui theory, something that complete is an indication of satisfaction and happiness, it provides more positive readings than irregular designs. The symmetry creates an overall impression of balance and proportion that relates harmoniously to the environment around it.

5.2.3 Enclosure

*"The impression of openness or enclosure is of great importance to our perception of residential architecture. Openings in outside walls establish the character of the relationship between inner private space and the public space outside."*¹⁷

The Architecture of the Home, Ola Nylander, 2002

Nylander pointed out that the perception of open and closed has different values for an individual over time. Some people prefer the security and safety symbolized by the closed space, some prefer the freedom and expansion brought by the open space. The same idea was described in *A Pattern Language*:

"Some people want to live where the action is. Other want more isolation. This corresponds to a basic human personality dimension, which could be called the 'extrovert-introvert' dimension, or the 'community loving-privacy loving dimension.'" ¹⁸

In housing design, Alexander suggested that each cluster of houses, and each neighbourhood should have three kinds of houses (1-*nearest to the action*, 2-*almost completely isolated*, and 3-*half-way between*), in about equal numbers, to satisfy the particular desires from different kinds of people.

Nylander also observed the clear division between Classical and Modern in terms of spatial enclosure versus openness. He used the example of Villa Savoye (Figure 5.2) to illustrate how the static quality of classicism is replaced by a dynamic vision of the symbiosis between inside and out.

Figure 5.2 View of first floor, Villa Savoye, Le Corbusier, 1928-1931

Alexander also studied the enclosure in Pattern 193 *"Half-open wall"*:

*"Rooms which are too closed prevent the natural flow of social occasions, and the natural process of transition from one social moment to another. And rooms which are too open will not support the differentiation of events which social life requires."*¹⁹

He believes that the subtle conflict between exposure and enclosure naturally requires a balance, this could be achieved by partly opening up the walls or keeping them half-open. This kind of space also most easily supports both differentiation of activities and the transition between different activities than a solid enclosed partition. He concludes that the right balance will always lie between these extremes: no one room entirely enclosed; and no space totally connected to another. The combinative use of columns, half-open walls, porches, indoor windows, sliding doors, low sills, french doors, sitting walls, and so on, would help to hit the right balance.

Obviously, the size of opening, as Nylander pointed out, is a decisive factor in the perception of a space as open or closed. He proposed the notion of "architectural space is an invisible, imaginary room distinguishable from the visible concrete room." Fredrik Wulz also identified that "A space is an invisible volume of air... The visible makes up the form of a work. The invisible makes up its value."²⁰ There is a striking similarity which could be found in *DAO DE JING*, Chapter 11:

*"...We make doors and windows for a room;
But it is these empty spaces that make the room livable.*

*Thus, while the tangible has advantages,
It is the intangible that makes it useful."*²¹

This is one of the most essential points of Feng Shui reflected in Chinese architecture, once "almost wholly absent from Western design thinking" (Mitchell and Wu, 1998). This intangible quality was defined as "non-being", or "the space in between". The recognition of this intangible space was manifested in Chinese traditional dwellings and Gardens. Jiangmei Wu demonstrated in *Living Design*, "the house was thought to be a place of retreat, featuring complete privacy from the outside world. Families enjoyed the sun in secluded verandas and courtyards, where they experienced the harmonious rhythm and pulse of the Universe". Apparently, the matter of enclosure is valued greatly in both Eastern and Western world.

5.2.4 Movement

Upon the study of *movement*, Nylander claimed the variety of possible movements and circulation patterns through the home could increase the wealth of our experiences. He described the rhythm of those movements that relate to the size, shape, lighting conditions of a room, and time as well. The significance of movement was also addressed

in *A Pattern Language*. For example, in pattern 131 "*The Flow through Rooms*", It was suggested the way that rooms connect to one another plays the largest role in governing the character of indoor space:

*"This pattern describes the most fundamental way of linking rooms to one another. The movement between rooms is as important as the rooms themselves; and its arrangement has as much effect on social interaction in the rooms, as the interiors of the rooms."*²²

The movement is also essential in Feng Shui, as "the home corresponds to a superimposed image of a human body" (Post, 1998). The path of movement is associated with the flow of *Chi* which is vital system influences both our subconscious perception of the home and its physical structure. In every home, the arrangement of rooms and furniture is carefully designed according to the auspicious orientations defined by *Ba Gua* which serves as a map to match various components of the life forces. The similar interpretation is drawn by Nylander that the architectural movement is not only bound by the laws of physics, but also influenced by symbolism and personal experience.

In modern architecture, the spatial continuity and broad opening are made possible thanks to the new means of construction and technology. Written in *New Loft Living*, the fluidity and pace of modern society means that traditional domestic planning, where specific activities are assigned separate rooms, no longer feels comfortable or appropriate" (Wilhide, 2002). She suggested the loft-type space would offer the freedom to accommodate the diversity of modern lifestyle. This dynamic new type of space challenges the traditional notion of movement with two notable characters, firstly, the vertical movement becomes more dominate than before, it delivers new spatial expression and typology. Nylander acknowledged certain architectural elements tend to stimulate movement, for example, the stairway (Figure 5.3) can encourage various kinds

of movements.

Figure 5.3 The stairway in this loft space plays a dominate role in defining the space

Secondly, it has more generous circulation pattern, often without the use of corridors and passageways, the movement is created by a string of interconnecting rooms with doors or partitions between them. Such generosity of passing in a wide and ample loop around the house allows the full play of each person's instincts and intuitions (Alexander, 1977).

In any case, the design of space introduces the movement, which is crucial to the establishment of the relationship between dweller and the environment.

5.2.5 Spatial Figure

The spatial figure in Nylander's definition refers to the size and shape of a room in plan and section, he argues, it is broader and different from spatial proportion or spatial form.

The proportion has been described by *Marcus Vitruvius* in *The Ten Books of Architecture*:

*"Proportion is that agreeable harmony between the several parts of a building, which is the result of a just and regular agreement of them with each other; the height to the width, this to the length, and each of these to the whole."*²³

Andrea Palladio, in *The Four Books of Architecture*, suggested seven sets of the most beautiful and harmonious proportions to be used in the construction of rooms, which reflect musical consonance. He further studied the height of rooms with three types of mathematically connected proportion. They both agreed good proportions should come from nature where the sonorous order and harmony associated.

The Chinese Feng Shui theory shares the similar aesthetic principles with these Western ideas. In traditional Chinese architecture, the buildings were planned horizontally, a skillful consideration was given to the exterior façade, from foundation, platform, height, and width; the size of pillars and slope of roof are also carefully positioned. The symmetric layout helps to achieve the balance in homes. The emphasis on the sense of completeness results in the rectangular or square shape of buildings. Each room is considered odd numbers (3,5,7,9..., associated with Yang) of bays, a bigger room would have two bays instead of one or narrow extension to enhance the balance. In *A Pattern Language*, pattern 191 "*the Shape of Indoor Space*", Alexander pointed out that every space, which is "recognizable and walled enough to be distinct, must have walls which are roughly straight, except when the walls are thick enough to be concave in both directions. He suggested the right angles between 80 and 100 degrees make most sense because that other obtuse angles do not pack well at corners where several rooms meet, this pattern constrains the shape of ceilings too. He concluded that the majority of spaces in a building must be polygons, in plan, with roughly straight walls and obtuse-angled corners. He later made this comments that "no

building ever feels right to the people in it unless the physical spaces (defined by columns, walls, and ceilings) are congruent with the social spaces (defined by activities and human groups)."²⁴ It conveys the importance of the spatial figure in the residential architecture and other building forms as well.

5.2.6 Daylight

"No space, architecturally, is a space unless it has natural light".
Louis I. Kahn

The fundamental importance of daylight is acknowledged in both East and West. It is described that "lights are among the most powerful Feng Shui tools, because vision is fundamental to sensory experience" (Post, 1998). The use and manipulation of light is acknowledged the most important matter in Western architecture. The control of light enables the architect to model the space itself rather than the surrounding walls (Raeburn, 1988). John Lobell²⁵ acclaimed in *Between Silence and Light*:

"...Light is really the source of all being.... all material in nature, the mountains and the streams and the air and we, are made of Light which has been spent, and this crumpled mass called material casts a shadow, and the shadow belongs to Light."

The daylight associates with our sensitive biological clocks, working in tune with this natural rhythms will definitely improve our physiological and emotional functioning. In Feng Shui, the Yin-Yang or Tai Ji symbol reflects the daily and annual cycles of the Sun: the white Yang side representing daytime and the dark Yin side night-time. The light is also able to attract beneficial *Chi* to a room. To make the best use of the natural light, the first thing is to choose the right orientation. Although most of the traditional Chinese houses are facing the South where has more energy and more light, the rooms arranged inside the house won't necessarily all face the same direction, but depending on

their functions and occupants, will have different preferred orientations, such as: study room would be excellent in north position which is associated with academic work and learning ability, wisdom would be furthered there; east is favorite position for family room, it is associated with wood element that represents family life; living room is appropriate in north-west, north, north-east and south directions. The number and size of windows will also be adjusted to maintain the balance of Yin-Yang, the sunny and shady areas in the house.

Several patterns in *A Pattern Language* also addressed the similar issues. For examples, in pattern 105 "*South Facing Outdoors*", Alexander suggested that this pattern governs the fundamental placing of the building and the open space around it with respect to sun. In pattern 128 "*Indoor Sunlight*", he proposed to place the most important rooms along the south edge of the building, and spread the building out along the east-west axis so that the proper rooms are exposed to the south-east and the south-west sun. In pattern 238 "*Filtered Light*", he discussed the regulation of light in order to reduce the contrast and harshness. He even associated the daylight with the colours in pattern 250 "*Warm Colours*", he described the warmth of colors in a room makes a great deal of difference between comfort and discomfort, and the fascination does not come from the color of the things, the surfaces, but the color of the light.

Through the survey of the historical development of daylight in the home, Nylander noted technical improvements in the production of glass during the 19th century steadily increased the size of windows used in homes. Modern architecture and building have deliberately explored the virtues of various types of windows and openings to play with

the different levels of daylight. The spiritual and mystical characters of lighting are usually used to define the centre of a building or become a focal point (Figure 5.4) in a space. The research on the non-measurable attributes of daylight, reveals the character of a space is not determined by the quantity of these factors, but their relationships to one another and to the space. It is concluded that the qualitative treatment of daylight, i.e. the design and detailing of windows as well as the space they are placed will prevail.

Figure 5.4 Being one of the oldest types, the top-lighting is applied to buildings of all times

5.2.7 Organization of Spaces

The organization of room, according to Nylander, is the arrangement of the home's private interior space and of its public exterior space, and the relationship between these two. He studied the houses from 19th century to the present. There are two notable features which could be discussed, firstly, the organization within the home, which is

changing from the differentiated, well defined rooms and axial path to a radial circulation pattern of rooms surrounding the relatively neutral hall. Secondly, the sense of territory between inside and outside becomes ambiguous. He argued the good relationship between the home and its surroundings is essential to a meaningful home life. And the combination of the rooms inside and the design of space outside could provide an important support to the unity -- an interior is in harmony with its exterior.

The Chinese believes the plan of house could impact the safety and life outcomes of residents. Therefore, in traditional Chinese houses, rooms are arranged around a central axis. The entire house is in representation of the earth, each room in the house is located to reflect its meaning in Chinese Feng Shui. Steven Post explained the *centre line* and *central line* in *The Modern Book of Feng Shui*: the centre line refers to the line from front to back along the mid line, it is normally call the axis, connecting *Heaven* and *Earth*, rooms put on this axis would have dominate status, thus, the kitchen or bathroom should not be in the central place of the home. The central point refers to the division between the front half and back half of a house. The master bedroom and bedrooms should be behind the central line to be in more commanding position. It also has the advantage of providing distance from the noisy street and adding more protection. The axis and central line established the inner order and the degree of privacy bound to the home. In Feng Shui theory, the domestic life is associated with the *Yin* force, thus the numbers used symbolically are mostly even ones. In a typical plan of a Chinese house, there was an even number of rooms. Within a room, there was usually an even number of pieces of furniture too. Square tables, hexagonal tables, and octagonal tables were popular. There was an even number of cabinets placed in spaces, within which there was an even

number of drawers (Mitchell and Wu, 1998).

In Chinese traditional dwelling, the boundary of inside and outside is clearly defined by the walls around the house, however, the garden is placed inside the house; the connection to the nature becomes more intimate, as nature was taken as part of the dwelling. This sense of whole and balanced world enhanced the "process of appropriation" (Nylander, 2002), and it is the physical changes, above all, create the psychological perception of the architecture of the home.

CHAPTER 6: CASE STUDIES

*"Each house ...represents a high point. ...They are grandly sited or grandly executed, sometimes both, and they each invite examination into the relationship not just between architecture and nature but between man and nature."*¹

Introduction of Twentieth-Century Houses, Beth Dunlop and Denis Hector, 1999

These three houses are chosen to be analyzed within the framework discussed in the previous part because their powerful legacy greatly influenced the generations of followers. These influences would not result in the identical form, but the spirit of the building, in terms of addressing the concerns with nature. These houses were built around 1930's to 1950's, the splendid time of Modern Architecture, also the time that the public presence gradually appeared into the domestic sphere. In the *Fallingwater*, while the "media in its early incarnations" (Riley, 2000), it took the form of study and gallery, which located in the top floor with adjacent terrace. It is similar to the study room arranged in Chinese dwelling -- a place secluded yet with great view. In *Villa Mairea*, Alvar Aalto demonstrated his idea of a dwelling: a combination of different functions for meals, sleep, work and play. Besides its tranquil domestic look, it contains a series of work places. The library taking a quarter of the living room, provided a private study and public business meeting room. The studio of the Hostess, sitting above the living room, connected to the winter garden. The offices and staff rooms are arranged on the opposite side to the living space, around the kitchen and dinning areas. In *the Eames House*, half of the residence was devoted to the studio space, a courtyard served as a transition space in between the separated living and working quarters.

All these three houses reflected the course of live-work in their specific times, and demonstrated the attributes of qualities in architecture of homes.

6.1 Fallingwater, Frank Lloyd Wright

Bear Run, Pennsylvania 1935

Background:

Fallingwater, one of the greatest works of Frank L. Wright, has been seen as one of the Feng Shui buildings. The house was described as a place that "brings the landscape into focus, into presence, to be experienced as part of human life."² Being one of the only architects engaging fundamental ancient principles in the creation of space, Wright once mentioned that the Fallingwater was a great blessing to be experienced here on earth. It is "the coordination, sympathetic expression of the great principle of repose where forest and stream and rock and all the elements of structure are combined..."³

Upon recalling his design, he wrote in *The Future of Architecture*, "We start with the ground ... In any and every case the character of the site is the beginning of the building that aspires to architecture ... All must begin there where they stand."⁴ In his book *In the Cause of Architecture*, he said, "in the stony bonework of the earth, the principles that shaped stone as it lies, or as it rises and remains to be sculpted by winds and tide -there sleep forms enough for all the ages, for all of man."⁵ In 1937, Those Daoist principles were further summarized by Wright in his acclamation of architecture as "great living creative spirit which from generation to generation, from age to age, proceeds, persists, creates, according to the nature of man, and his circumstances."⁶ This important aspect of man and the landscape was deeply rooted in Wright, therefore generated exceptional qualities of this house that are appropriate to time, place and man.

Materials and Detailing

In this building, the material is the dominate factor of the perception of the house and

how it relates to the surroundings. It used both natural material -- stone, brick, wood and newer materials, concrete, steel, metal and glass; therefore, was referred to a wonderful "tool box" for the architects of the 20th century. The noted cantilever feature of those floating terraces only made possible by the newly developed reinforced concrete at that time. In his book *Frank Lloyd Wright*, Bruce B. Pfeiffer described Wright's style in use of materials:

*"He advised the application of a mono-material rather than the conglomerate fashionable at the time,... if there is a combination of materials, it was kept consistent throughout the elevation of the building, all in an attempt to achieve repose and simplicity."*⁷

Figure 6.1 View from South-West of Fallingwater, it shows the contrast and interconnection between the smooth surface of floating terraces and exposed stone-textured wall elements

In the exterior, there are two powerful elements, the dark natural rock and the lighter-coloured reinforced concrete (Figure 6.1). The former element builds up the vertical part of the building; the random stone patterns are repeated along the vertical walls. The latter one consists of a series of horizontal terraces and roof planes which cantilevering

both along and across the stream. The relationship of the use of material to the nature was compared:

*"This opposition between vertical/mass/earth and horizontal/floating/sky reflects the natural condition found in the trees, their roots and trunks anchored to the earth and their limbs and leaves cantilevering out into thin air."*⁸

This use of material is consistent when space merged into the interior, the walls are exposed with the same texture of outside. The floors are finished with flagstone, the color and texture appears striking similar to the water when the light comes in. This flooring continues out onto the terraces through the glass door, blending the inside and outside. This attempt is further enhanced by the treatment of the edge of the windows (Figure 6.2), as read by Robert McCarter, "the manner of delicate, light, ephemeral glass pushing into the rough, heavy, rustic stone wall represents the juxtaposition of opposite formal, structural, material and experiential aspects of architecture."⁹

Figure 6.2 The glass of the windows is set directly into the stone wall without framing at the edge, this detail summarized Wright's intention of bringing the outside in and inside out

Axiality

In order to emphasize the natural siting and flow of the space, the design adopted shifted axes and diagonal relations of spaces (Figure 6.3). The sequence of the shifted axes started from the bridge, in order to enter the building, you have to cross the bridge, turn

Figure 6.3 View from across stream (left), ground floor plan (right)

left and walk a distance to find the deep-recessed door. This process was described as "an uphill journey into a private territory"¹⁰, even though the entrance level is only six inches higher than the bridge. Through a small foyer, you are at the steps of the corner of the living room, where the diagonal view leading to the living room and the terrace beyond. The axis could be randomly change whether you would descend or ascend through the stairs, because the openness towards the south, the nature seems the only axis the design focuses on.

Enclosure

Normally, the enclosure works for the separation of the private space from the public world outside, in this case, this notion was reversed by looking for the openness to the site rather than closing itself off.

To enhance the integration of the building with its natural site, especially on the south-facing side, the enclosure was minimized, only the horizontal mullions were saved. The partitions of the interior were somehow opened as much as possible to encourage the flow between the spaces (Figure 6.4).

Figure 6.4 Photos of enclosure. Entry to Guest house (top left), glass "hatch" over the stream (top right), third floor gallery (bottom left), view from kitchen to projected terrace (bottom right)

This approach is what Wright called *unfolding* architecture as distinguished from *enfolding* architecture.¹¹

Movement

There are two kinds of movements in this building, the horizontal one and vertical one. Because of the introduction of the terraces at each levels, the horizontal movement, especially the one leading to the outside becomes more dominate. The layout of interior designed by Wright was to put the furniture around the wall perimeter (Figure 6.5), therefore limited the circulation only happened in the centre of the rooms, which was opposite to the traditional Oriental arrangement. However, there is a vertical movement which shouldn't be ignored, the stairway down to the stream, if you want to get real close to the water, this movement might be the most exciting one.

Figure 6.5 View of living room, showing water-like flagstone floors and smooth light ceiling, resulted in flowing and floating feel of light and space (left), stairs suspended above the stream suggesting vertical movement (right)

Spatial Figure

The spatial figure of the building corresponds to the design intention and room functions. Wright thought the extended horizontal line is the true earth-line of human life, and the indication of freedom. Therefore, the horizontal floating planes become the dominate exterior feature, in fact, flow into the interior as well. The plan consists of a series of rectangular rooms with various sizes, in light of the intention to acquire the parallel feel

Figure 6.6 Section looking east. 1. Dining room 2. Living room 3. Master bedroom 4. Master bedroom terrace 5. Gallery 6. Gallery terrace

to the earth, the section becomes more important to establish the connection to the nature (Figure 6.6). It is observed, at the level of the small foyer, our eye-level is almost exactly at the centre of the space between floor and ceiling, the two horizontal planes are perfectly balanced, which completely define the space.¹² The living room floor to ceiling height is only seven feet one inch, besides the two stone columns, the living room seems to open out in all directions.

Figure 6.7 The corner of living room. It shows the dimensions of the interior are not measured only from inside, but the extent of the terrace and canopy beyond

As Donald Hoffmann¹³ pointed out "the lower ceiling plane near the brighter walls of

glass at the perimeter would give a certain velocity to the outward flow of space, toward broad horizontal vistas." The height of ceiling does have the effect to change our perception of the room and direct the attention to the outside (Figure 6.7).

Daylight

In order to have appropriate orientation to the sun, the building was built to the north side of the stream, therefore, the sun plays the significant effects around the three elevations. The shadows, colours and textures are changing around the clock, both inside and outside (Figure 6.8).

Figure 6.8 The pictures show a sequence of the change of lighting effect along with the movement and enclosure from the entrance to the living room

Organization of Spaces

There is an underlying order of the plan which has five equally-spaced bays starting from the entry side (Figure 6.9). It is defined by a series of parallel walls and piers. However, this symmetric distribution of spaces was purposely concealed by removing the pier in the living room, and treat the fifth bay -- kitchen differently. Through the refinement, the walls were limited, and those open corners became a powerful feature that further reduced the feel of the symmetry.

The relationship between the interior and exterior could be seen that the front portion of

the plan established the intimate relation to the nature, the rear portion of solid walls with less opening strongly connected to the ground (Figure 6.9).

Figure 6.9 Ground floor plan, 1. Entry loggia 2. Dining room 3. Living room 4. Kitchen 5. Servants' quarters 6. Waterfall terrace 7. East living room terrace 8. Plunge pool 9. Hatch-stairway to stream 10. Bridge

This dynamic relationship between building and nature was commented by Wright in *The Natural House*:

*"...it is in the nature of any organic building to grow from its site, come out of the ground into the light - the ground itself held always as a component basic part of the building itself."*¹⁴

This provides the essential way to understand his architecture.

6.2 Villa Mairea, Alvar Aalto

Noormarkku 1937-39

Background:

In the context of aftermath of the first world war, architects were in the focus of mass-housing, there was an attempt to "get at the scientific conditions for the standard dwelling in society"¹⁵ with the help of the industrialized mass-production. Among the technocratic proponents of Modernism, Aalto argued that the emphasis of architecture's inner nature, along with the attention to the human side of design could achieve architectural harmony and successfully controlled building techniques as well.

The Villa Mairea was designed for Harry and Maire Gullichsen -- the businessman and artist couple, their intention was:

*"the new villa was to be used as a summer house, a form of retreat to nature traditional in Finland, also was intended to express the aspirations of the new generation and of the their vision of 'the good life' which they believed industrialization would eventually make available to the majority in the newly-independent social democratic state."*¹⁶

The Villa was served as a kind of experimental laboratory, by which Aalto realized his advocacy of nature as a model for architectural standardization and organic life. He also attempted to incorporate the work contents in the forms of studio and office into the living realm while achieving the overall harmony.

Materials and Detailing

As Richard Weston¹⁷ observed that none of Aalto's later buildings could present as rich a collage as the Villa Mairea, this collage enabled him to adopt a richly varied palette of materials, combining "traditional" and "modern". From the wood, rustic stone, brick, to glass, tile, granite, and metal, those disparate and seemingly incompatible materials

reflected designer's intention on the experiments of "vernacular and modern, natural and man-made" (Figure 6.10).

Figure 6.10 View of timber boarded studio and balcony. In the exterior of this building, the textured natural form of studio is contrasted by smooth white stucco, two different timber boards were used, along with the flourish plantings, reinforced Aalto's "naturalization" of the architecture

The rich texture and detailing are not only shown on the exterior of the building, but also absorbed into the interior, created a sensuous feeling for the occupants. Two types of flooring (tile and wood) were used to separate the areas of ante-space and main living room. The tree-like poles (Figure 6.11) which screened the stair reassemble the "forest setting" outside, also as an allusions to nature in order to make a harmonious impression.

Figure 6.11 The main staircase is screened by circular timber poles

Through the composition of the materials and detailing of the villa, it demonstrated how the idea of resonating with the nature could result in a welcoming and livable space.

Axiality

It has some innovative ideas in terms of spatial axiality through the coherence in the spatial organization. Enter the main entrance (Figure 6.19), there is a small top-lit lobby, which leads to an entrance hall, which is on axis with the dining room, and on another axis perpendicular to the main living room. However, this axiality is weakened by the diagonal relationships (Figure 6.12) of private library/study and the winter garden, as well as the asymmetry of a screen of wooden poles and the corner fireplace.

Figure 6.12 The living room is entered up a small flight of steps and the eye is drawn diagonally across to the fireplace

By purposely not emphasizing the axiality, Alato created an impression of space which is neither uniform nor unambiguously coherent.¹⁸ In contrast to the other modernists, Aalto made many efforts here to avoid what he called "artificial architectural rhythms in the building; to subvert any clear geometric reading of the structural and spatial organization. Hence, it would come as something of a surprise to discover that the whole plan is in fact

regulated by a series of squares.¹⁹

Enclosure

In this Villa, Aalto used several ways of enclosure, which ranged from solid, part-glazed, full-height glazed, and incorporated roof-light to establish various degrees of openness to the outside. This character was also reflected in the interior partitions (Figure 6.13), therefore, creating an impression of light penetration and spatial continuity throughout the building.

Figure 6.13 Interior of first floor studio (left), view from the living room towards the winter garden (right)

Movement

One of the characters regarding architectural movement discussed by Nylander is:

*"...architecture is a precondition for experiencing architecture as a whole. Architecture invites movement, through space. Expectantly, we step forward and take possession of the architecture, of the building. We anticipate a continuation."*²⁰

One of the continuations in this villa, was the "tree-like" setting (Figure 6.14). It subtly transited from outdoors to indoors, from nature to domesticity, and by this sequence, an naturalized space was created throughout.

Spatial Figure

Although the whole plan is basically a series of squares, the only place we can find the conventional proportion is the dinning room (Figure 6.15) which has sensible underlying order. The room itself is a double-square in plan, also the centre of a triple-squared service block.

*"This formality is entirely appropriate to the activity of dining and entertaining and can be interpreted, as Klaus Herdeg has argued, as an architectural embodiment of the social traditions of the bourgeois family."*²¹

Figure 6.14 Screened thin-timbers adjacent to the main door (top left), main entrance (top right), tree-like poles screen the stair and separate the ante-space to the dinning room (centre left), timber construction of sauna (centre right), view towards the main staircase and entrance (bottom left), outdoor terrace (bottom right)

Weston further contemplated the arrangement of this setting, he wrote, Harry Gullichsen, as head of the household, occupied the head of the table facing towards the entrance,

Figure 6.15 The dining room in plan is a double-square which implies a formal discipline

where he could dominate the axis to the entrance hall and diagonally look into the entire living room. Mrs. Gullichsen would occupy the seat at the opposite end of the table, conveniently close to the servery and kitchen. The different views of them, as described:

*"she can contemplate her husband silhouetted against the dining room's asymmetrical fireplace, while through the window she can see the sauna, the pool, the garden court, and the pine forest - things natural or traditional. Most of these views the father would only see reflected in an artifice: the living room windows."*²²

Figure 6.16 The corner of the living room framed by the library and garden room merged with trees outside

Because of Aalto's desire to break the "artificial rhythms" established by a regular grid, the spatial composition of most part of the house demonstrated an informal and soothing atmosphere (Figure 6.16) which contributes to the quality of "organic life".

Daylight

A wealth of daylight is an intriguing aspect of the Aalto's design (Figure 6.17). Most windows facing south and the inner courtyard are full-height, from floor to ceiling to capture the sunshine and natural views. On the south-side windows, the external teak-slatted blinds are used to modulate the light.

Figure 6.17 The use of undulate glazed screen around the library implies the openness and moveable feature, while creating the effect of broken sunlight of the forest edge when the sun slants through the main staircase

Unlike other modernists who deliberately use large window to minimize the interference of indoors and outdoors, he used the full-height small-pane windows for winter garden, not only suggested a relationship to the outside but also deliver a sense of enclosure. It is confirmed from Thomas Markus²³ who concluded small-pane windows make for more interesting views, because the small and narrow windows afford different views from different positions in the room, while the view tends to be the same through large windows or horizontal ones.

Organization of Spaces

There are two kind of functions -- live and work in this architectural program, the overall L-shaped plan (Figure 6.19) was adopted to distinguish between the living and working quarters. The left wing accommodates of living room, bedrooms and an integral studio, the right wing consists of office, service area and guest rooms. The children's bedrooms and playroom are in between. The courtyard/garden is variously enclosed by combinations of walls, fences, trellises and the wooden sauna, as Ranulph Glanville²⁴ contended, it allows the completeness of the form at any stage and buildings can be extended to fill up the perimeter.

Figure 6.18 The winter garden used for flower arranging was designed with small-panes windows

The idea of rendering interior space as a kind of "outside inside" was a favorite theme of Finnish architecture in early 20th century, particular the characteristic "forest space".

Weston pointed out that this conception of "forest space" provides a key to the understanding of Aalto's intentions in the Villa Mairea:

*"Walking around the living room, one experiences neither the containment of traditional interiors, nor the open 'flowing space' of modern architecture, but something very much akin to the feeling of wandering through a forest in which spaces seem to form and re-form around you."*²⁵

Figure 6.19 Ground floor plan, 1. Swimming pool, 2. Sauna, 3. Winter garden, 4. Living room, 5. Library, 6. Dinning room, 7. Entrance hall, 8. Main entrance, 9. Staff rooms, 10. Office, 11, kitchen, 12. Office

Envisaged by Aalto that this poetic "forest space" is a democratic, nonhierarchical organization in which the individual was the moving centre of it. This "human side" was

evident throughout the building. Internationally acclaimed as the "humanizer" and "naturalizer", he believed that "great ideas arise from the small details of life", with a deep love of his native landscape, and the concern for the needs of human, his legacy for the 21st century could hardly be more pertinent.²⁶

6.3 The Eames House, Charles and Ray Eames

Pacific Palisades, California, 1949

Background:

The Eames house, officially known as *Case Study No.8*, was a radical experiment for "Post-war Living" which reflected the changes in the way people live and think about their environment, as well as their response to the newly developed technologies. The Case Study House Program, established in 1945 by the avant-garde *Arts & Architecture* magazine, sponsored the design and construction of a series of modern residences as prototype housing of prefabrication, mass-production. As described by Eames Demetrios²⁷, although the case study houses were designed for particular clients, however, they were trying to solve them in a way as universal as possible, moreover, they were not creating new dogmas, thus the program offered a strong, healthy push in a their ideological direction.

Being introduced in *Arts & Architecture* in December 1945, "this house -- in its free relation to the ground, the trees and the sea -- with constant proximity to the whole vast order of nature acts as re-orientor and shock absorber."²⁷ Demetrios, the grandson of Eames' family, reported his comfortable living experience in this house. Although the massing of this house is simple, however, he argued that "honest use of materials, it feels more comfortable in nature than many so-called organic shapes. Utter respect for the

natural world finds no conflict with the geometrically aligned grid."²⁸

This house was designed under the "hypothetical" clients of a working couple with no children living at home, needing space for living and for working. It is also served as a design laboratory to accommodate "work and play" and act as a "background for a life in work".²⁹

Materials and Detailing

As the intention of the program, the house used prefabricated, standardized parts and industrial materials, such as concrete, glass, steel, insulation board on plywood, translucent laminated board etc. (Figure 6.20) They were selected from trade catalogues and intended to serve as a model for do-it-yourself modern design. It was also Eames's objective to study the aesthetic contrast of those elements, between old and new, rich and humble, foreign and familiar, mass-produced and hand-crafted, in the context of personalized modern architecture.

Eames believed that inorganic materials could be complementary to the surroundings, as he mentioned, "the texture of the ceiling, the metal joists, the repetition of the standard sash, the change of glazing from transparent to translucent ... all add to the architectural relationship of house to nature."³⁰

The simple-lined factory windows and X-trusses provided the texture of the exterior, primary colour panels were arranged like Mondrian's painting. The features, such as, the exposure of structure, the use of certifiably modern materials and the absence of ornament reinforced the dogmas of honesty, clarity and unity.³¹ Among the overall industrial look, there is a noticeable detail of the effects of the *Reflections*: windows that reflect the trees

around the houses, adding a subtle texture on the hard-lined surface (Figure 6.21), through which the nature is connected and superimposed into the life within.

Figure 6.20 The corrugated metal decking conveying the sense of elegance

Figure 6.21 A reflection detail caught on the surface of limited palette of materials – steel and glass

Axiality

The pathway connects the living and working portions of the building, there is also a paralleled sightline that runs through those two spaces, standing in either space, the activity and movement of the other can be observed (Figure 6.22).

This clear axis as seen from the plan, starts from the main entrance at north east side, crosses from the service room and connects to the kitchen through the courtyard. Then the sightline arrives at the door of the living room, the four full-height glass doors at the both end of the boxes defined this axis (Figure 6.27). However, opposite to the Chinese design formula, there is no focal point along this line, thus the importance of axiality here is given way to the pursuit of visual clearance.

Figure 6.22 Photos of axiality, steel ladder stairway leading to mezzanine level (left), the courtyard between living and working portions (top right), personalized living space (bottom right)

Enclosure

Because of the site condition, the retaining wall blocks the whole west side of the building, therefore, the house can only open to the other three directions. According to the study of James Steele³², great care was taken in the placement of the solid and glazed panels, the position and size of the openings were calculated to allow light and view at the certain time of day. Therefore, it created various degrees of the openness, enclosure, along with the changing effects of shadow and reflection. For example, in living room, it opens in both south and east directions with Mondrian-styled glass panels, with no obstruction in the view of the outside, meanwhile the solid panel was added on the east side, along with the Gauzy curtains help to moderate the sunlight in this area (Figure 6.23).

Figure 6.23 Photos of enclosure, bedroom (top left), view of living room (right), bedroom hallway (bottom left), studio window with mullion configuration (bottom centre)

In second floor sleeping area, sliding translucent screen and solid plywood board are used for privacy, while maintaining the options between openness and enclosure. In the studio portion, the lower part of the wall was closed off to provide more useable wall area, the wall beside the pathway is glazed to interact with outside.

Movement

There are two kinds of movements in the house. The first horizontal movement along the axis beside the pathway is prominent in the perception of the building and the relations between the two segments. The secondary movement, is the vertical one in its loft type space (Figure 6.24), through the emphasis of this movement, the boundary of the spaces are blurred.

Figure 6.24 Constricted entrance leading to lofty open areas (left), the plywood and steel spiral stair (right). The upflowing steel spiral stair, along with the skylight, creates the contrast to the previous movement, and through it, another kind of spatial continuity and fluid is revealed

Spatial Figure

The building has clear order as a result of using the prefabricated system. The "living" portion of the house has eight bays (about 2.3 meters each), with one of them used as a shaded overhang. The central court has four bays, and the studio has five. They are clearly seen from the east elevation, the mullions and panels are divided accordingly. The two-storey-high spaces located at the end of both boxes, are approximate squares in shape and volume. They are somehow in contrast with the restrained one storey rectangular rooms. The overall proportion of service area to studio is 2:3 in work segment, the same as that of living room to the service core in living segment. However, the void (double-height space) and solid (one-storey room divisions) relation between them are flipped in its composition. Argued by Steele, "by grouping the services in both the house and the studio at the court's edge in this way, a contrapuntal, positive and negative rhythm of spaces is set up, connected by narrow passages."³³

Daylight

The importance of the connection with nature is manifested as light, air and view, which are allowed to penetrate into the various interior spaces (Figure 6.25). The living and working portions all face south and open to the view towards the pacific ocean, the east side opens to the meadow and the line of trees used as privacy screen right in front of it. As they are receiving the sunlight all day long, these direct light, screened light, shadow, reflection of the surroundings (Figure 6.26), the mix of the several lighting effects confirmed their great attention on the light. Steele studied how the positioning of windows interplay with the light as the sun moved in its daily path:

"This language of fenestration, in which the windows appear to be used like apertures, carefully positioned in either conjunction or opposition to others on each side of both major volumes, is a singular attribute that slowly reveals itself, and is easily overlooked in the visual excitement caused by the materials that are used. It was this kind of interplay, caused

by control over natural light through the finetuning of openings that are juxtaposed and calibrated with the mechanical precision of an F-stop, ..."³⁴

Figure 6.25 Natural lighting in living room (left), top-lit stair (right)

Figure 6.26 Light penetration (left) and reflection (right)

Organization of Spaces

Spatial composition is the central theme for the modern architecture. In this building, it applied the conventional *Tripartite* composition, which originated from Andrea Palladio

in 16th century -- in that villa, the building is symmetrical with the main entry and principle hall in the centre and subordinate rooms on either side. From the study of Hideaki Haraguchi,³⁵ the centre and boundaries are considered to be important spaces. However, this centrality was taken by the void space -- courtyard in this house, which served as a transition space between live and work spheres (Figure 6.27). It was argued by Steele, that these various parts are arranged to provide similar kinds of experiences, in staccato sequence. The work portion faces the main entrance, the live portion was hidden behind with the pathway beside could also connect to the entrance way directly. Its service and utility cores were placed inwards towards the central court in both living and studio segments, allowing the two storeys loft space towards outwards. This generates another opposite to the Oriental treatment of courtyard, the yard is not created to be looked upon, rather a space to be contrapuntal. If we read this within the context of the

Figure 6.27 Ground floor and second floor plans

site, it becomes reasonable as our view is intended to be directed to the central meadow and the ocean beyond, the oneness with nature is reinforced by looking at the big picture.

CHAPTER 7: A DESIGN EXERCISE OF LIVE/WORK ENVIRONMENT

This chapter explores the design of live/work type residential space in a typical setting of downtown Toronto, it also relates to the converted spaces from industrial heritage. It concentrates on the design of multi-purpose homes which accommodate two completely distinct domestic and professional requirements simultaneously.

The idea of live and work at the same site can be traced back to the beginning of the 20th century, as introduced in *Working and Living Spaces W@H*, Aurora Cuito described the advantage for those "painters and sculptors (that) practiced their art in the same location where they ate, rested, and slept, and so were able to return to their work whenever a flash of inspiration came to them." This description captured two important aspects of live/work environment: place and productivity. There are other reasons, such as elimination of travel time, flexible schedule, more time to professional dedication, etc. However, to conform the work content, there must have some dedicated work spaces, and these spaces should have the quality to enhance the performance and efficiency, for the design-driven professions, it has to motivate and inspire the creativity in accordance with their needs and desires. Among the typologies of those live/work settings, lofts provide a freer, and less segregated living and working situations, and also have the adaptability for the changing organization of the space.

Loft living represents one of the major trends in urban redevelopment in the last thirty years. The conversion of warehouses and factories into middle-class residences offers an exciting alternative to urban apartments and a way for individuals to express their personal views through the places in which they live.¹

7.1 The Background

The downtown Toronto live/work opportunities have been studied as early as in 1994; Fish, Kurtin and Nasmith² proposed changes to the Ontario Building Code and the Official Plan of the City of Toronto pertaining to land use designation to allow the mixing of industrial, commercial and residential uses including live/work units. At that time, the significance of "telecommuting" has been captured by government at several levels; there were also other changes in society, such as income, household size, lifestyle, and type of employment need to be responded.

The shift from manufacture industry to knowledge-based economy in downtown area has resulted in a very different business/residential, work/live communities. These urban lifestyle communities close to Toronto's downtown core attracted considerable new business development and certain groups of people since 1996. The report of *Regeneration in the Kings: Directions and Emerging Trends*³ highlighted a number of important findings about changing characters of the King-Parliament and King-Spadina districts. Some of the indicators of those changes and characters include the following:

- There has been a substantial amount of development activity in both areas since 1996. Eighty-six development projects are either built, under construction or being planned.
- Residential development has been a focus of activity with 7,040 housing units built or in the pipeline.
- Over 321,000 square metres of commercial space has been created or is being planned, often within former industrial buildings.
- Conversion and retention of heritage buildings have occurred, 16 development projects include the conservation of heritage buildings.
- Area residents tend to be younger adults, without children, who for the most part work downtown.

- Many of the jobs generated are professional jobs in media, business services and computer services.
- Transit usage by residents is high, the pedestrian environment is particularly important as 60 per cent of work trips are to downtown locations and 39 per cent of residents walk to work, 38 per cent of residents do not own a car.

The planning policies developed in 1996 along with favourable economic conditions, stimulated substantial reinvestment in these districts, thus helping to transform and revitalize them. However, success has not come without challenges; improvements are needed to the parks and open spaces throughout the most of the downtown areas as well as community service. High quality new development, with high architectural standards, needs to be encouraged. The lively spirit that propelled the lofts movement has reached beyond commercial neighborhoods and can easily be seen in the planning and construction of new houses and apartments and the renovation of existing ones.⁴

Similarly, in the east area of downtown Toronto, there is also a significant demand on the housing development for the New Economy, which was described vividly as "from Sweatshops to Photoshops"⁵ in *The Carlaw/Dundas Neighbourhood Improvement Plan, 2000*. In the Carlaw neighbourhood, instead of blue-collar worker, the buildings now house photographers, designers, artists, artisans and entrepreneurs. Traced back to the beginning of the 20th century, the Carlaw was the home of industry with growing manufacturing plants and employment. This attracted diverse people for the job opportunities and made the area one of the most multicultural communities in this city.

7.2 The Site

The site is located in the east of Toronto, known as part of Riverdale community. It falls within a block bounded on the north by Dickens Street, on the south by Dundas Street

East, on the west by Logan Avenue, and on the east by a former rail spur known as 1142 Dundas Street East. The interesting transition of converting the existing industrial buildings to residential use has been studied in 1998, and was envisioned in Official Plan that the retention or conversion of such buildings were encouraged. This area is filled with growing small businesses and multicultural communities, the context plan (Figure 7.1) shows several live/work conversions have been proposed around this site. It reflects the changing landscape of the job market in this area, that from former assembly line workers, to photographers, designers, artists, artisans and entrepreneurs. This shift stimulated by the New Economy has resulted in a different spatial organization as described:

*"While artists were the first to take advantage of lofts to integrate their studios and living places, photographers, fashion designers, architects, lawyers, accountants, and writers have quickly followed suit. Some have chosen to divide the lofts structurally in order to create a separation between the professional and private areas; others prefer to maintain an open expanse and circulation. Many are also able to use part of the loft space as a showroom or gallery."*⁶

The formal and preordained living patterns have been brought into question; it was suggested new living spaces should be able to easily accommodate home offices or work spaces and can remain open or be divided depending on the needs of the residents.

The new zoning and live/work uses of the Carlaw Improvement Plan responded to the significant demand for the small light industrial spaces located in downtown area, it acknowledged the diverse economy where people can live in close proximity to their work place would help to form new urban centres. For example, many existing businesses in the Carlaw neighbourhood cater to the needs of the studio district, furniture makers and other small manufacturing studios often include a retail component which somehow helps to liven up the street frontage. However, due to the atmosphere of the

Figure 7.1 The live/work projects have been undertaken or currently being review are shown on the context plan

former industrial land, the streetscape contrasts sharply with that of more traditional residential areas. Streets are often lined with trucks and there is an absence of trees, parks, and playgrounds.

Those issues have been identified, and incorporated into the development principles, which are summarized as:

- Maintain existing mixed use industrial and residential character
- Reuse existing buildings and preserve the heritage/historical structure
- Improve parks, open space and green streetscapes; enhance neighbourhood feel
- Promote at-grade retail uses along street level
- Reinforce existing identity of the district as hub for photography, film, and artisans.

Therefore, the proposed building would be "able to respond to the spirit of the past and

the needs of the present, and fuse them seamlessly", as well as enrich the historic legacy in the neighbourhood.

7.3 The Proposal

This design (Figure 7.2) responds to several site and neighbouring conditions. Firstly, through recycling of the industrial building, not only it shows a respect for the past urban fabric, but also attempts to transform the old structure to a new meaningful community resource, offering open and common spaces for the activities that help to strengthen the neighbourhood. Secondly, because the existing two storeys are converted to various

Figure 7.2 Aerial view of building in the context of neighbourhood

commonly shared spaces, the living quarter (or hybrid live/work environment) is moved above them by making full use of the industrial structure. This provides different levels

of relationships between private and public spaces. Thirdly, the Feng Shui principles are incorporated into field attributes of qualities with a focus on orientation, space organization, and enclosure etc. It helps to generate more responsive living environment.

- **Orientation**

The zoning of this "all-sided" loft building (Figure 7.3) was arranged according to orientation aspects of Feng Shui:

EAST, as the direction of the rising Sun, is associated with growth, strength and unexpected energy; in the traditional Chinese pictogram, it refers to market place, where prosperity and harmony are generated. The element for East is wood, and its color association is green. Therefore, the gallery (exhibition space) which serves as a showcase for those artists was placed at the east, facing the public park -- the large open wood element will generate positive energy and flow into the building through the main entrance.

Figure 7.3 Ground floor plan

SOUTH, is thought to be most auspicious direction and associated with fire element, which will bring the success, recognition and fame. It is a good direction to set up a

business, therefore, the retail and office components are placed in this portion of building. Along the Dundas Street, this placement will enliven the street frontage.

WEST, the direction of setting Sun is associated with harvest and satisfaction, and with metal element. The energy upon south-west sector encourages strong relationships and emotional security, normally, it is the best place for family dinning room. In this complex, the cafeteria content is placed at this portion where people could have casual eating experience which enhance the acquaintance and connection among the neighbours.

NORTH, associated water element, represents the industrial Chi that linked to career and business aspects of life. As the tranquil energy resides, it is a good direction for study, meditation and production rooms. On the north side and north-west corner, the recreation amenity space and workshop/showrooms spaces are placed.

- **Organization of Space**

The overall spatial arrangement considered factors of how to create harmonious living and working spheres. People can choose their live/work options according to their needs, for example, they could live upstairs, and work downstairs, or customize their options in the units above the second floor; or they could rent a retail or office space in the floor 1 or 2, and separate their living quarters from working yet keep in vicinity.

Axiality (Figures 7.3 and 7.4) was considered as some interactions of sightlines, more importantly, served as the paths connecting various zones. The curvilinear shapes and extra wide hallways along the axes establish the sense of "streets"; all activities will take place and be organized along this "navigation spine". The "navigation spine", with

clearly glazed opening at each end, the design will enable people to move through the environment well and orient themselves easily. Along the gentle curvilinear pathway, several skylights introduce the nodes where the entrances to each zones are placed. Those junctions also will help to encourage informal meeting, chatting, and other socializing activities.

The contrast of smooth and rough materials could be seen throughout the building, conforming with the co-existence of Yin and Yang attributes. The color system, associated with its respective directions, could balance the energy flow inside and outside of the building. The existing brick material and color are maintained on the second floor, but walls of the first floor are replaced by smooth glass to enhance the coherence and connection between inside and outside.

Figure 7.4 Second floor plan

- **Enclosure**

Besides the opening towards east side where the park is placed, the building is relatively self-contained. People will be encouraged to customize those open flexible spaces to fit their changing demands. There are no fixed walls, most of partitions are moveable, along with the use of transparent or translucent materials to increase the fluidity of the space, to create sense of continuity rather than enclosure. Even along the enclosed walls, there are gaps purposely left open to reveal inside. By the play of various degrees of enclosure, the design creates new relationship between privacy and publicity. On top of the two-storey base, two rows of live/work units are arranged around the central landscaped courtyard (Figure 7.5) which is enclosed on the north and south sides, but open towards east where auspicious energy is generated. Five umbrella's elements are placed at the west side, not only offer outdoors spaces for gathering and resting, but also help to hinder the Chi pass through the courtyard too fast, the gentle-curved pathway will also attract and retain the positive Chi.

Figure 7.5 Typical floor plan

- **Relation with Nature**

In designing a space for dual-purpose of live/work, it is important to incorporate transitional areas. Various green open spaces (courtyards) or half-enclosed terraces, patios or glazed balconies are used not only to provide separation of live/work contents, but also shared elements of “in-betweens” (Figures 7.6 and 7.7). Spaces that bring the nature forces inside would help to reduce the conflict and stress from working at home.

Figure 7.6 View from East

Figure 7.7 View from West

All units have south-facing terraces and could be laid out freely with their favourite directions. The architecture here is not to determine the way people occupy the building, but allow them to use and configure spaces the way they inhabit.

Figure 7.8 View from the Top

With various possibilities, the vibrant and connected live/work communities could be established in contemporary society.

CHAPTER 8: CONCLUSION

This thesis studied relevant issues pertaining to live/work phenomenon, and addressed several concerns of establishing a harmonious environment in our contemporary spatial setting. Through a comparative analysis of theories from Eastern and Western worlds, it has revealed that Feng Shui principles, which were widely used in traditional Chinese architecture, have certain connections to Western traditional philosophical thinking.

Modern architecture in the West attempted to map the pattern of human habitation onto the design of living spaces. However, due to different cultural and social conditions, there are some distinctions between manifestations of architecture in the East and West. The design exercise provides an understanding of the application of Feng Shui principles that could be incorporated into the live/work design environment in the West. The new live/work spatial setting calls for more attention from designers in order to create more conducive micro environment and also advocate to formation of the community at large.

The emerging trends in Western design, as introduced by Mitchell and Wu, are outlined in three primary concerns: a) ecological responsiveness; b) the quest for higher meaning; and c) consideration of the use and experience of design. From this point of view, John C. Jones wrote about the "good design":

*"The new competence which the situation now requires is, I believe, not that of deciding the shape of a product or system but the shape of a new context or process in which everyone, not just designers or experts, is enabled to see what is needed of him or her if the form of industrial life is to get better, for everyone, and not worse. To arrive at this is not to continue to design but to do something at a different scale from that, the scale of the whole problem, the scale of decentral action, thought, and imagination."*¹

The conclusion drawn is that good design could be implemented by use of a more holistic and integrated approach, like that found in the East. Architecture, could be argued, is

about the transformation of the "Non-being" into the "Being". The essence of Feng Shui is that through the positive energy flow, our psychological experience could interact with the physical surrounding, and attain harmony.

Tremendous possibilities and promising directions can be triggered by the holistic approach. Addressing the use and experience of holistic design could have many associations with Feng Shui; this has attracted attention from several Western scholars. In 1978, Bernard Tschumi² has entertained the idea of adopting human movement as the conceptual basis for the design program which served as cues for purposes and arrangements to support those activities. Edwin Schlossberg³ used the term of "creating conversation" to address the same concern in his design. In 2000, Rem Koolhaas⁴ manifested his idea in IIT McCormick Tribune Campus Center (Figure 8.1) that the modern city is a thing of vibrancy, narrative and endless connections and possibilities. The web of straight or diagonal lines cutting through the building derived from the free movement of students; it organized the different zones and encouraged the interaction and facilitated the events that take place within this complex.

Figure 8.1 Floor plan and interior view of IIT campus project

Those lines, like the metaphor of the Internet, represent the infinite paths and sources, as

well as the uncertainty in the information age. It resonates the legacy of Feng Shui that favours relationship over forms, context over segments. This extraordinary experience could also be found in a residential housing project by Steven Holl⁵ in MIT (Figure 8.2), where the perception of the building was considered central to the concept of the design; hence, moving inside the building, people are enabled to have the possibility of grasping the ultimate meaning that holds together the various parts of the whole.

Figure 8.2 Lobby view of Simmons Hall Residence

After all, the fundamental objective of architecture is still to make a place, something more than a space that could encourage human interactions and promote events to take place; it should enhance the human association with the setting, as Mitchell and Wu pointed out "where the pattern and process of everyday life are seamlessly supported"⁶. Those approaches, which shared the same principles with Daoists -- the nature of evolution, growth, and complexity -- could help to create a responsive and harmonious world.

POSTSCRIPT

Pursuing harmony and balance in human living environments has been the fundamental goal of Feng Shui in architectural design and urban planning applications in the recent past. Its principles are becoming more meaningful today in contemporary projects in increasingly complex social and cultural conditions. Architectural space has always had intangible dimension which not only represented our past and present, but also addressed human concerns for the future. Those intangible physical and spatial attributes embodied in traditional values have made powerful contributions to human understanding of life on earth. Attempts to reference traditional typologies will inform modern designers to establish interrelationships between the new building, the dwellers, and the natural environment to create transcendence in design in contemporary condition.

There is a concern on the use of Feng Shui principles in a modern city context where the traditional physical environment with its rich symbolism and ancient references no longer exists. There is also a noticeable difference between a design in a historic city setting and a design in a modern city context, where those conflicting forms and functions of the modern and the traditional reveal distinct scenarios. They pose great challenges for the designers to respond to those specific contextual requirements.

Feng Shui principles would take on three considerations pertaining to context, container and content issues in the contemporary condition. Context refers to the circumstances in which the building will be situated. It is the essential precondition to ensure harmony in the living environment. The analysis of those tangible and intangible factors could place humankind in tune with the natural forces. Container is the built form itself, and content

here alludes to the use and activities inside and around the buildings.

Nowadays, due to the human alienation in physical settings, it is sometimes difficult to establish appropriate building relationship with its surround. Moreover, the circumstances in which the use of the buildings are evolving, depending upon advances in society, they could impede the buildings to achieve their desired harmony. In light of these constraining factors, the design of the buildings might become self-referential, internalizing its Feng Shui condition. It might supercede external form and geometry considerations and relate to human action and people's relationship with the internal physical setting. Whether the building could isolate itself from the surround in order to attain its autonomy is worth further analysis. However, it is important that the internalization would necessarily complement and enhance the natural virtues of the site. It will bring in a favorable experience and have great potential to become a part of tomorrow's heritage. It will adapt to changing situations.

Utilizing Feng Shui principles in the layout of buildings will enhance human perception of their spatial behaviour. Proper use of geometry, sensible orientation, ease of movement, flow-through intersections, smooth edges of built form, correlation of the inside and outside – all will enrich human experience. It is echoed by Mitchell and Wu that architectural designs should allow this evolution to take place as smoothly as possible. By understanding the rationale behind Feng Shui principles, designers would be able to generate various alternative solutions for any particular circumstance. The wholesome way of creating a responsive architecture -- buildings which respond to their context and end-users -- could establish many layers of connections so as to make the micro-

environment more meaningful and livable.

William J. Mitchell pointed out that architecture now is no longer simply the play of masses in light, it embraces the play of digital information in space.¹ The emerging digital technologies, such as interactive media, smart technology, virtual reality etc., will add new dimensions to human built environment. In this scenario how could people connect to virtual reality and virtual perception -- simultaneously? How could virtual reality and virtual perception relate to each other? How could virtual reality be used in generating meaningful human responsiveness? The consequences of this evolution were expressed by Bart Lootsma that nowadays everything has become an adaptive process in the world:²

*"... a building is never just one thing and is always caught up in a constantly changing, complex web of relationships and stories. That is what makes architecture so fascinating. This process of change doesn't even stop when building is realized, but continues forever."*³

Greg Lynn proposed that architecture will be malleable, fluid and supple, to accommodate and integrate all these conflicting forces in a new whole.⁴ Therefore, successful Feng Shui integration in design requires a multi-dimensional approach which will include constant interpretation of the ancient classic in accommodating modern day perspectives. It would remain a primary task for architects to accomplish.

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GLOSSARY

BA GUA

An octagon surrounded by the eight trigrams of *Yi Jing* and representing the eight compass directions. With one arrangement of trigrams it has a mirror or *Yin-Yang* symbol in its center and is used as a symbol of protection. It is also used to determine a person's most auspicious and inauspicious directions and locations.

BUDDHISM

A religion founded in Northern India in the 6th century BC by Siddhartha Gautama, who became known as the Buddha (Enlightened One). While there are many different types of Buddhism, Zen Buddhism is the type prevalent in China.

CHI

Chi is the name used in Feng Shui that represents an electromagnetic force that flows through the entire universe and within each individual human being. This energy has a great influence on human lives. That can have positive or negative affects depending on the flow.

CONFUCIUS

Known as Kong Chiu -- the Chinese philosopher and teacher who lived during the 500-600s BC. Confucius emphasized the importance of proper behavior, sympathetic attitude and ancestor worship -- all tenets that remain important in China. Feng shui is not closely associated with Confucianism.

DAO

It means "The Way" -- a philosophical concept of unity of opposites that describes the true nature and harmonious governing principles of man and the universe.

DAOISM

Both a philosophy and a religion. As a philosophy, it preaches transcendence of the mundane through identifying with Dao and the laws of nature; as a popular religion, it integrates Chinese custom and wisdom, and through Feng Shui to help devotees achieve a worldly success, happiness, and comfort.

DOMINATION CYCLE

The domination cycle is a chaotic cycle of imbalance which weakens and even depletes chi. Sometimes referred to as the destruction cycle, the Chinese believe that this causes environmental imbalances (such as Global Warming) and human illness (such as weakened immune systems).

FENG SHUI

Literally translated as "wind and water" (pronounced Fung Shway), Feng shui is a term referring to the art and science of life-space. This ancient Chinese practice is used to balance the energy in those places where people live and work.

FIVE ELEMENTS

Also called the five phases, the five elements are fire, earth, metal, water, and wood. Each element has a specific type of energy. When combined in various combinations, these elements can harmonize or oppose each other.

LAO ZI

Also called Lao Tzu or Li Erh, Lao Zi was a philosopher who lived in the late 500s BC. He recorded his insights in what became known as the Dao De Jing (also called the Tao Te Ching) and is credited with developing Daoism.

LUO PAN

A Chinese south-pointing compass used to determine the flow of Chi for determining the orientation of buildings, rooms, and furniture.

PRODUCTIVE CYCLE

Known also as the birth cycle, the productive cycle is a positive, productive cycle in which each of the elements -- fire, earth, metal, water, wood -- helps create the element that follows it. The balanced progression of the productive cycle represents harmony and creation.

REDUCTIVE CYCLE

The reductive cycle is a healing cycle used to remedy the chaos created by the domination cycle of the 5 elements. A practical application of the reductive cycle would be a person has too much of one element, say water; adding wood to help absorb the water's effect.

THE EIGHT TRIGRAMS

The set of trigrams used to make up the Ba Gua. A trigram is a symbol that features a combination of three broken or unbroken lines. The unbroken line represents *Yang*, while the broken line represents *Yin*.

YI JING

The ancient Chinese book was written during Zhou Dynasty (1125-255 BC), known in the West as *The Book of Changes*.

YIN-AND-YANG THEORY

The Daoist concept that unites all opposites. According to Feng Shui, Chi is divided into *Yin* and *Yang*. Two opposite forces that are absolutely integral to each other.

Yin -- Receptive energy reflecting the more passive, still, reflective energy aspects

Yang -- Creative energy reflecting the more active, moving, warmer aspects

The symbol as a whole represents a perfect balance in the universe. Instinctively human beings are constantly working to create a sense of balance in their lives and that is how Feng Shui works with the availability of these energies.

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APPENDIX

1. Existing Site Conditions

View from North-East corner

View from South-East corner

View from South-West corner

View from North-West corner

View from North-East corner

2. Neighbourhood Characters:

Live/Work Loft Spaces

Live/Work Loft Spaces

Studio Spaces

Studio Spaces

Mixed-Use Pattern

Mixed-Use Pattern

Industrial Heritage

Industrial Heritage

Transitional Area

Transitional Area

Terraces

Terraces

Building Edge

Building Edge

Streetscape

Streetscape

Material and Detailing

Material and Detailing

Open space

Open space

Pedestrian Pathway

Pedestrian Pathway

Residential Living Environment

Residential Living Environment