ARCHITECTURE-ON-PAPER: A STUDY ON THE SIGNIFICANCE OF IMAGINARY ARCHITECTURAL SPACE.

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"We must hold a place of honour for the myth-maker. The author who humanises (and individualises) our imaginary space."

- Matt Ratto -
(http8)

Title of study:

Architecture-on-paper: A study on the significance of imaginary architectural space.
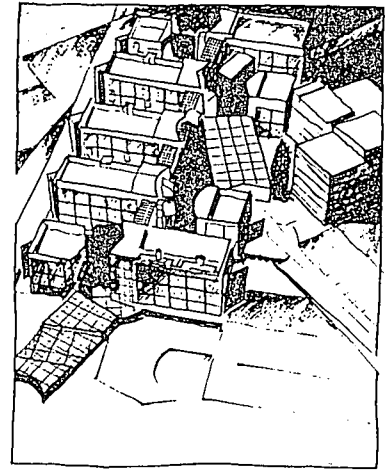
1. Research proposal

1.1 The necessity of the study:

Peter Eisenman, Bio-Centrum, Franfurt-am-Main, 1987-9. Original: Jencks 1990: 208

"The work of Zaha Hadid, like that of Tschumi, Eisenman or Libeskind, exists as much on paper as in 3D form - as such it is a commodity of the mind, a reinforcement of the notion that the new architecture is about ideas as much as visual forms." (Papadakis, A., Powell, K, 1996:7)

architecture of the mind

A vast amount of information already exists on Cyber Space and Virtual Reality. The computer and computer generated space are regarded by many as replacements for paper as a communication medium. This assumes that the documentation of information on paper was previously the most important means of presenting information.

paper as presentation medium

The writers on Cyberspace and Virtual Reality give credit to its origin: *The mathematical and geometric rules which are deployed to create the illusions of three-dimensions on a computer* found its origin on paper as practised in ancient Greece and the Renaissance's *scientific linear perspective and Cartesian co-ordinate system.* (Luton, 1997:http7)

Cyberspace's origin of representation is found on paper

The fact that the work of architects like Hadid and the above-mentioned finds expression mostly on paper supports the necessity to research the significance of imaginary architectural space today.
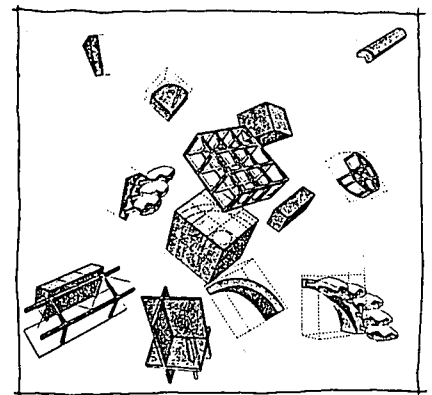

Bernard Tschumi, Exploded folie, 1984
Tschumi; 1997: 207

1.2 The purpose of the study:

Hypothesis: Imaginary architectural space as expressed on paper has a significant influence on the practice of architecture.

Architecture-on-paper provides a substantial basis for the examination of imaginary architectural space and its influence on architecture as a separate field. Stone (1976:6) states that *the complete history of architecture is... the history of both built and unbuilt.* She also sees the history of architecture as *a weaving together of the variously textured strands of both these elements.* (Sky, 1976:7)

Imaginary architectural space can best be examined by studying architecture-on-paper, since architecture-on-paper is not limited by rules that govern reality - reality seen here as the built environment. With paper as medium it is possible to examine the significance of imaginary architectural space and its influence on architecture through the ages, since architecture-on-paper has a history of its own and can be traced over centuries.

The purpose of the study is therefore to determine whether imaginary architectural space has a significant influence on the practice of architecture. Architecture-on-paper will function as source of reference.
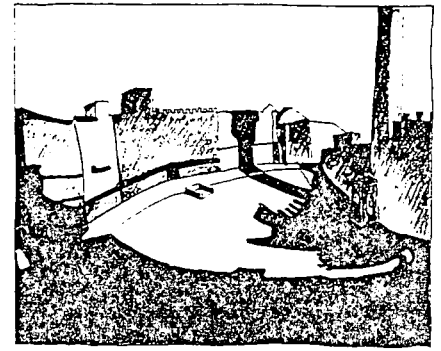
1.3 The research problem:

The dilemma concerning this field of research is already suggested in the title of the study:

Architecture-on-paper: a study on the significance of imaginary architectural space.

Architecture-on-paper:

- What needs to be determined is whether architecture-on-paper can be classified as architecture. The same process in which architecture is designed on paper also gave rise to the practice of architecture-on-paper for it's own sake as practised for example by Louis Kahn. [*Kahn's sketches, which may in many ways be seen as the beginning of the current wave of interest in drawing for its own sake as an isolated phenomenon in architecture...* (Steele, 1994:7)]

Louis Kahn, Campo, Siena, Winter 1951 – Travel Sketch
Original : Brownlee 1991: 150

- Architecture-on-paper was practised in history (i.e. Piranesi, Le Doux). The researcher wants to determine whether this practice has a process of it's own and whether this process has changed over time.

- The question must be answered as to whether architecture-on-paper has a right to exist only as means to the creation of built architecture, or whether it has the right to exist as a phenomenon on its own. (Architecture-on-paper for its own sake with its own agenda and problems to solve.)

Significance:

Kruft (1985:16) quotes Emil Kaufmann (1924) as having said the following... "*Artistic theory is itself no more than an expression of the spirit of the age, and its significance does not reside in the fact that it points the way for its own age, but in its serving subsequent generations as a monument to past ideas.*"

Significance is limited to what is viewed or regarded as important for a specific time. Significance therefore supposes a value system which is time limited, for it is intended for the age in which it is valued as important.

This study will attempt to determine the significance of imaginary architectural space by researching its manifestations through time and across the boundaries of preconceived expectations of the researcher. It may, however, be influenced by the 'time' in which the research is executed.

1.4 Information regarding research methods and procedures:

The focus of this research paper is to collect all relevant   focus of study
information regarding architecture-on-paper. To examine the
significance and influence of this study field a theoretical
perspective is taken. No practical application will be performed;
therefore the research is limited to academic records.

The procedure is to identify relevant research material and to
apply this knowledge to the specific hypothesis.

Throughout this study, illustrations generated by the author as well
as other works will be used to exemplify and embellish the text.

1.5 The value of the study:

The main value of this study lies in determining whether imaginary
architectural space as expressed on paper broadens the field of
architecture and in identifying the possible influence it may have
on the creation of architectural space.

Imaginary architectural space as it is communicated on paper
cannot be investigated separately from the medium through
which it is communicated. Therefore the use of the term
'architecture-on-paper'.

Preliminary studies also indicate that through the practice of
architecture-on-paper architecture may gain a wider sphere of
influence.

Chapter layout:

1. **Chapter one: Criteria for Architecture**

(Defining terms used in this thesis.)

1.1   A definition of architecture

1.2   Architecture-on-paper defined

1.3   What is architecture in reality?

1.4   What is a theoretical frame of reference?

1.5   Space defined

      1.5.1   What is space?

      1.5.2   What is imaginary architectural space?

2. **Chapter two: The development of architecture-on-paper**

2.1   Architecture-on-paper through history

      2.1.1   Pre-Renaissance up to Filarete

      2.1.2   The Renaissance and late Baroque

      2.1.3   The Enlightenment

      2.1.4   The Modern Movement

2.2   The situation at present

      2.2.1   Architecture-on-paper as a design tool in the process of architecture

      2.2.2   Architecture-on-paper as impulse-inspired art

      2.2.3   Architecture-on-paper as an autonomous field

      2.2.4   A future perspective

3. **Chapter three: The purpose of architecture-on-paper**

3.1   To provide a visual basis of imaginary architectural space in order to

      3.1.1   research education (basis for theoretical debate)

      3.1.2   examine meaning - creation of symbols

      3.1.3   experiment with space itself

"All the breakthroughs towards an architecture of technology have been, in a literal sense, revelations - of how to make architecture, that pure creation of the human spirit, out of concrete, or steel, or glass, or whatever. And each revelation that has comprehended or uncovered an essence - the Villa Savoye, the Farnsworth House, just as much as the Pantheon or La Sainte Chapelle - has been a truth out of which architects can make architecture.

Not all such revelations have to be buildings. They could be a paragraph from Ruskin's Stones of Venice, or Geoffrey Scott's Architecture of Humanism, or even Asimov's Caves of Steel. But for architects..the revelations are more likely to be the engraved plates in the work of Viollet-le-Duc, or the patent application drawing that revealed the essence of Le Corbusier's Maison Domino, the space-cathedral sketches of Bruno Taut or the renderings of imaginary skyscrapers by Hugh Ferris, the Fun Palace drawings of Cedric Price, the coloured collages of Archigram's Peter Cook...or Ron Herron's Walking City drawing, a long-legged revelation stalking the surface of the globe, a truth or illusion in search of a site on which to settle and become real."

- Reyner Banham - (1994:15)
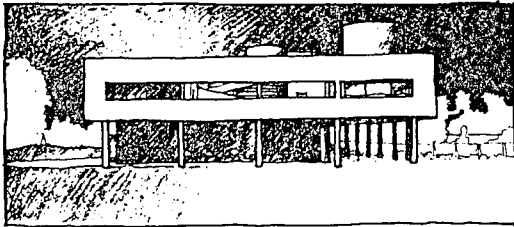
Le Corbusier, Villa Savoye, Poissy, France. 1928 - 30
Original: Sporre 1987:492.
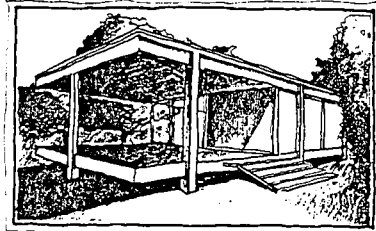
Mies van der Rohe, Farnsworth House, Illinois 1946- 1951 Original: Academy Forum, 1992: coverpage.
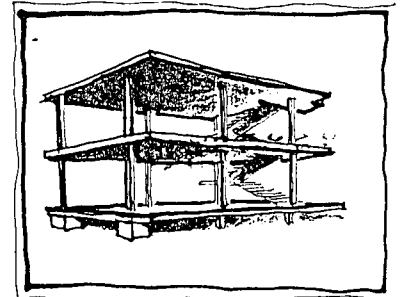
Le Corbusier, Maison Domino, 1914.
Original: Kruft 1985:183
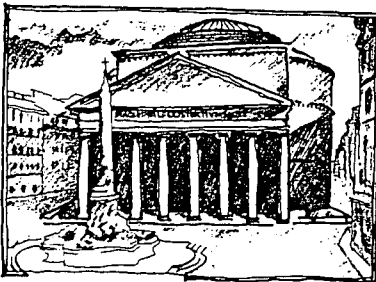
Pantheon, Rome, cAD 118-128.
Original: Copplestone 1983: 87.
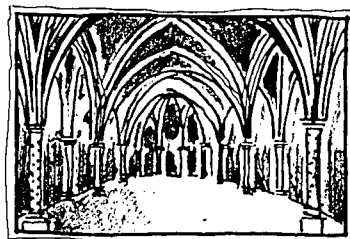
La Sainte Chapelle
Original: http://12.
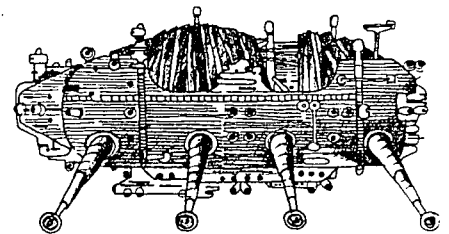
Ron Herron, Walking City, 1964
Original: Klotz 1986:24

1.   Chapter one: Criterion for Architecture

Some of the key terms used in this study have quite a wide range of interpretation or understanding.   It is therefore necessary to define the viewpoint the researcher will hold in this thesis.

1.1 A definition of architecture

For every architect the answer to defining architecture will be obscured by his own filters, his own goals and dreams and visions of an ideal architecture. Man's view on what architecture really is has repeatedly changed over time.   Each definition tends to highlight an aspect of architecture which played a dominant role in the person who is giving the specific definition of architecture.

In his essay 'Architecture, essai sur l'art' (c1799), cited by Tschumi (1990:16), Etienne-Louis Boullée debated the definition of architecture by challenging Vitruvius's who stated that architecture is *the art of building.* According to Boullée *this definition contains a crass error.   One must conceive in order to make.   Our forefathers only built their hut after they had conceived its image. This production of the mind, this creation of what constitutes architecture, that which we can now define as the art to produce any building and brings it to perfection.   The art of building is thus only a secondary art that seems appropriate to call the scientific part of architecture.*

According to this definition or description, Etienne-Louis Boullée saw the architectural conception of an image as the first step and the physical 'art of building' as the scientific second part of architecture.   Architecture does not exist without both processes: the first gives birth to the second, which in turn glorifies the first by becoming the physical embodiment of all aspects of the vision.

Over against this view, Johnson (1994:75) quotes Paul Frankl to have stated in 1914 that *insofar as purpose is the essence of architecture, architecture is its material manifestation.* Here the

Boullée's 'production of the mind' versus Vituvius' 'art of building'
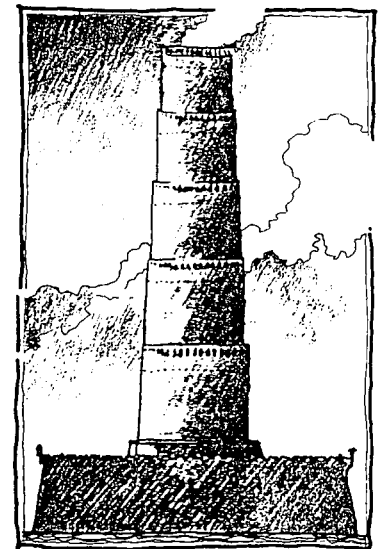
Etienne-Louis Boullée,
Lighthouse design
Original: Tod 1978: 62

Frankl's 'material manifestation'

additional concept of purpose seems to give rise to a new debate in the search for a definition of architecture: Should all architecture conform to the norm of functionality or purpose to be viewed as such, or does the possibility of satisfying a need that is not physical exist as a way of creating true architectural space? (See 3.1.2)

Le Corbusier acknowledges the fact that we have *higher intention(s) than that of simply being useful,* but still claims that *architecture is an undeniable event that arises in that instant of creation when the mind, preoccupied with assuring the firmness of a construction... finds itself raised... and tends to show the poetic powers that animate us and give us joy.* (Johnson, 1994:75)

Le Corbusier's 'the mind's poetic powers'

Silver (Jencks, 1969:281) justifies the existence of 'architecture without buildings' as follows: *"If we try to talk about architecture without buildings, we should find it no more difficult than talking about literature without typography and speech, or music without musical instruments."* The conclusion can thus be made that architecture uses buildings as music uses instruments - buildings become the medium to express space, to embody thoughts and values, etc.

Silver: architecture without buildings?

Campbell (1996:http2) expands on this thought when stating *physical architecture as the embodiment and expression of societal values in physical form (like bricks and mortar).* Campbell further gives a definition that envelopes and relates the fields of physical as well as virtual architecture (see 5.3): Architecture is defined as *the making of a place by the ordering and definition of meaningful space, as developed in response to a need of program* (Campbell, 1969:http3) Still the question remains as to whether architecture can only be justified by an exterior need?

Campbell's 'expression of societal values'

On this issue Bernard Tschumi claimed in 1974 already *that, after more than half a century of scientific pretence, of system-theories that defined it as the intersection of industrialisation, sociology, politics and ecology, architecture wonders if it can exist without having to find its meaning or its justification in some purposeful*

Tschumi on meaning and exterior need

exterior need. (Johnson 1994:75) Now, 24 years later, the debate still continues.

According to Allsopp (1977:30), *architecture is not an expression of personal emotions of the architect. It is the exercise of an artistic skill in the service of people.* Allsopp, however, does not state whether 'in the service of people' is externally or internally motivated. One may further ask the question whether the exercise of any artistic skill can be free of the expressions of architects' personal emotions.

Heath shifts the emphasis from architecture as a service to architecture as a process (which can accommodate this service). The view of architecture held by Heath (1984:1) is that *it is primarily a certain kind of activity, not a kind of building; in the currently fashionable terms, that it is a process and not a product.* He continues by saying that the history of architecture as such is characteristically more concerned with the product than with the process. Heath seeks the reason for this in the development of architectural history as a subject with its *first concern* to be *the taxonomy of styles.* He further shows the focus on the product rather than the process to have its origin in the *matter of documentation; the records of the process are often lacking or inadequate, while the product is self-recording. Nevertheless, architectural history, insofar as it has concentrated on products, has frequently encountered the question, 'What is to count as architecture?* Therefore, the focus on the building as object, that is the 'product of architecture', seems to be misleading as a definition for architecture.

If the building as object does not satisfy the definition of architecture, then one is unwittingly led to ask the question: Should architectural space be physically inhabitable to be acknowledged as architecture or may the possibility to explore 3d space with the mind be a sufficient criterion in classifying a certain imaginary space as architecture?

Allsopp's ' artistic skill in service of man'

Heath: architecture as a process

Harbison (1991:11) states that in actual fact *certain things which exist are more farfetched than many which don't. And actual buildings can be fictional, which is to say uninhabitable and thus unrealisable in certain specifiable ways.* The inhabitability of architecture seems to be debatable.

The authority of the designer is another aspect that should be questioned in the search for a definition of architecture: should the person who designs architecture be an architect?

According to Heath, (1984:4) *the introduction of formal education and legal status have restricted the range of distribution and increased the proportion of architects in the 'model' category. Yet degrees, diplomas and certificates of registration are not essential to the activity of architecture; nor is the ideology or the formal social structure of professionalism.* With this Heath makes the field of architecture accessible to a wider range of designers.

The field of architecture is further stretched to accommodate computer models and the new technology when Beck (1983:11) declares architecture to be *a plastic art characterised by three-dimensional models.*

Before a conclusion can be made regarding a definition of architecture, it may be helpful to change the question to: What forms part of architecture, given the above-mentioned statements regarding architecture?

- A lot of what constitutes architecture is embodied in buildings.
- Architecture is a process which is guided by a need that need not be externally motivated. (Joy is subjective and internally motivated.)
- Architecture always has a spatial quality, whether inhabitable or not, realisable or not.
- The spatial quality of architecture can be explored mentally and sometimes physically.

For the sake of this study, the researcher will assume that architecture can be more than buildings designed by educated

architects, that it is more than the art of building and that it need not be inhabitable, though a process exists, be it only on paper.

Architecture will be taken to be space that comes into being via a design process to resolve an existing need, whether this need is externally or internally motivated.

definition of architecture

1.2 Architecture-on-paper defined

As mentioned previously, architecture-on-paper has a history of its own that can be traced over centuries. If architecture-on-paper can therefore be used as reference for imaginary architectural space through time to make conclusions on its significance in history, 'architecture-on-paper' has to be seen as a variable which has also undergone a process of development or change. (The relevance of paper as a medium to study the significance of imaginary architectural space will be addressed throughout the progress of this thesis.)

architecture-on-paper's historical qualities

Memarzia (1997:http4) defines architecture-on-paper in the following argument: *"Until the process of building a particular structure is underway or completed, the drawings and sketches which the architect has produced through the design of any spatial environment can be thought of as an abstract representation of an imagined reality. These drawings therefore can be thought of as abstract mental models."*

Memarzia: architecture-on-paper as abstract mental model

Architecture-on-paper can find its manifestation in the designed building that was never erected because the client moved to another city for instance, to the extreme design that is impossible to build because technology has still to be developed to make such a design executable in physical form. Sky and Stone (1976:1) define the term 'unbuilt' as the design that was never carried out, for whatever reason.

Sky and Stone on unbuilt architecture

Architecture-on-paper as a term does not exist. It is developed for the sake of this study because it contains more than the term 'unbuilt' in the fact that it may consist of pure fantasy on the one

architecture-on-paper as a term

hand, or on the other hand of 3d animation that make it actually 'real'.

Architecture-on-paper was at first intended to refer mainly to architecture developed on paper as a communication medium. However, as the study progressed, it became clear that architecture-on-paper can also include architecture that was generated on a computer but then guided by the laws that govern usual representation on paper. Architecture-on-paper will therefore include computer generated images, etc. It becomes a term to describe architecture-on-cave-wall, architecture-on-paper, architecture-on-computer, architecture-on-(medium), with this including other types of relevant mediums which find their main focus to express imaginary architectural space. The word becomes more than the obvious interpretation. It stretches over time to accommodate progress in its meaning. The process is what classifies the image as architecture-on-paper.

Architecture-on-paper also contains more than the term 'unbuilt' in the fact that architecture-on-paper "*could be a paragraph from Ruskin's Stones of Venice, or Geoffrey Scott's Architecture of Humanism, or even Asimov's Caves of Steel.*" For architects it could be "*a truth or illusion in search of a site on which to settle and become real.*" (Banham 1994:15)

Sky and Stone (1976:4-6) classify unbuilt architecture as follows:

a) *Simply not carried out:*
- The competition entry
- Not realisable due to circumstances e.g. cost, complexity, limitations of technology
- Development proposals
- Frustration because of politics, aesthetics, technicalities, dogmatic approaches that limit creative invention, etc.

b) *Not really intended to be built*
- Ideal city or regional planning (In search of utopia)

- prototypes
- conceptual or idea architecture
- the student project

c)   *Pending or unfinished*

For the sake of this study, architecture-on-paper will be taken to be the description/communication of designed space as found in drawings, words, and images on different presentation mediums (see chapter 5). As such architecture-on-paper contains space of which the boundaries have been determined only on a medium, whether this medium is paper, the computer or other models that communicate space. Such a space has not been embodied in reality.

definition of architecture-on-paper

1.3 What is architecture in reality?

Wade (1977) cited by Heath (1984:16) claims that *design problems are concerned with "closure of the terminal state" or deciding what it is that is to be done, and also whether it can be done. In summary, part of a design problem is finding out what the problem is.*

Wade on reality

As such architecture in reality is determined by the laws that govern reality, for example the laws of physics. Other more subjective laws that are set by culture, politics, individual expectations, etc. also govern what is acceptable for reality. Harbison (1991:161) supports this view in arguing that *perhaps one cannot separate true architectural impossibility from the social will to build.*

The process of building a designed space starts when the design gets documented to determine which material and structural solution would best do justice to the designed space. Architecture-on-paper is exposed to the realities of materials, site boundaries, budget, viability, etc.

Only after architecture-on-paper has been completed in built form does it become architecture in reality - a three-dimensional reality which can be experienced with the physical body.

Here the bricks and mortar give form to physical architecture - the buildable or real.

1.4 What is a theoretical frame of reference?

Kruft (1985:16) is of the opinion than *in order to appreciate how architects saw their task it is of great importance to understand the theoretical foundation of architecture at the time, and how this has evolved.* He further believes that *the theory of architecture always belongs to a historical context which is in part causative.*

Kruft on theory

Johnson (1994:32) defines theory broadly *as a process of discourse mediating design ideas, rather than as a stand-alone notion prior to and governing design.*

Johnson on theory

In the light of Johnson's statement, theory can be interpreted to be the line of thought that governs the design process. It need not be clear-cut before the design process actually takes place, but can be reinvented and altered according to new problems or facts that arise while the designer is busy resolving the design problem.

Although this may seem like a flimsy interpretation of Johnson's idea about theory, Kruft (1985:19) states that *as long as an architect operates within the norms of his day, the individual architect has no need to advance theories of his own, any more than a theorist is under a compulsion to put his theories to the practical test himself.*

Theory is thus trapped within the time span in which a certain space is designed. The designer is influenced by the age he lives in, whether it is a conscious or sub-conscious activity.

Fish continues on this line of thought and remarks that deconstruction and any other theoretical pronouncement *announces a rationale for practices already in force, it provides a banner under which those who are already doing what it names can march; it provides a visible target for those who have long thought that things are going from bad to worse.* (Johnson, 1994:33)

A theoretical frame of reference is that line of thought/ideas that governs the design process. As such it is inspired by the spirit of the age in which it is formulated, for it resolves the design in a way that tends to be typical of the age in which it is designed.

definition: a theoretical frame of reference

The architect's interpretation and his own understanding of how to resolve the problem at hand creates the theoretical frame of reference that makes his design understandable. This frame of reference can be seen as a library of ideas that can be argued as to why certain design decisions were made. (See also 3.2)

1.5 Space defined

1.5.1 What is space?

According to Christiaan Norberg-Schulz, (1971:9) man's interest in space stems from *a need to grasp vital relations in his environment, to bring meaning and order in a world of events and actions.* Norberg-Schulz defines man's main aim when ordering his world as the search for *a dynamic equilibrium between himself and his environment. All objects in his surroundings are distributed accordingly to such relations as inside and outside; far away and close by; separate and united; and continuous and discontinuous. Space, therefore, is not a particular category of orientation, but an aspect of any orientation.*

Norberg-Schulz on space: an aspect of orientation

He also focuses on man's experience of his environment and states clearly that this process of spatial perception is a complex

one *where many variables are involved... Perception mediates a world which could also very well be described as 'events in a four-dimensional space time'.* (Norberg-Schulz 1971:10)

Norberg-Schulz uses the physical environment to describe space and how man perceives this environment to understand "space" as an architectural term. According to his understanding of space, it is that area where-in man can order and regulate his life. The matter that separates space and makes it discontinuous or outside and inside can thus be viewed as non-space.

When Kennith Frampton (1983:60) becomes poetic about 'occupied' space, the question can be asked as to whether space needs to be inhabited to have meaning?: *Space is the necessary given of architecture as it is normally conceived and interpreted, whereas Movement is that pre-conceived scenario of human occupation: the sensual choreography of the body, as it is experienced from within or witnessed from without, the pirouette of the dance and the vortex of the mob.*

Kennith Frampton on space as uninhabitable

Till moves the emphasis from existing space and space perception to created space and its origin. For Till (1996:9) *space is first conceived of as a property of the mind and then realised as physical matter. It is in this move from the metaphysical concept to the physical reality that a confusion arises between concept and reality because the word 'space' has to cover a whole variety of conditions.* He also states that *in its final 'form', architectural space is objectified, subject to qualification and measurement.* With this Till shows that there is a process in space-making - space has a wider arena than the real.

Till on the creation of space

Interesting to note is Till's reference to space as something that can be realised in physical matter, for it is that which surrounds space which is truly the physical matter, and not space itself.

Space, therefore, is understood to be that element of architecture where boundaries are determined by the physical elements of

definition of space

architecture. These physical elements of architecture can, in simplistic terms, be referred to as the floor, roof and walls.

1.5.2 What is imaginary architectural space?

Johnson (1994:75) answers this question with a quotation of Khan's who stated boldly in 1964 that *architecture really does not exist. Only a work of architecture exists. Architecture does exist in the mind. A man who does a work of architecture does it as an offering to the spirit of architecture... a spirit, which knows no style, knows no technique, no method. It just waits for that which presents it. There is architecture, and it is the embodiment of the unmeasurable.*

When Khan argues that architecture exists already in the mind, he gives architecture a new realm in which architecture can be any space one can dream or imagine.

Harbison (1991:7) shows that *buildings often have a virtual or imaginary component, not that they are liable to vanish like thoughts, but they are more precarious than they ordinarily appear, because preoccupied with meaning something.*

To both Khan and Harbison architecture can exist in thoughts, and thoughts (meaning) can exist in architecture. Imaginary architectural space is therefore very interwoven with architectural space and vice versa.

For the sake of this study, imaginary architectural space will be taken as space that only exists, or that is still retained in the mind - the phase before it becomes architecture-on-paper, which is expressed on some kind of medium.

definition of imaginary architectural space

2. Chapter two: The development of architecture-on-paper

"One of the functions of history is to help us to live in a larger sense, in wide dimensions."

- Siegfried Giedion -

(1954:8)

Giedion gives the history of architecture immense importance when stating its ability to enlarge our lives. This is made true for architecture-on-paper as well when Sky and Stone incorporate architecture-on-paper in the complete history of architecture:

"There is a long process... before an architectural idea becomes a built reality... Certainly, unbuilt architecture can be as influential in history as that which has been built...The complete history of architecture is therefore the history of both built and unbuilt..." (Sky, 1976:7)

architecture-on-paper as documented history

Giedion (1954:7) also pleads for historians to learn to view history (past and present) objectively: *To plan we must know what has gone on in the past and feel what is coming in the future. This is not an invitation to prophecy but a demand for a universal outlook upon the world.*

history to be viewed objectively

A universal view implies that historians (or people who look at history) should be able to come to the same conclusion no matter from what culture they themselves are.

Although Giedion refers to a 'universal view', he also says that *history is not simply the repository of changing attitudes and interpretations. To turn backwards to a past age is not just to inspect it, to find a pattern which will be the same for all corners. The backward look transforms its object; every spectator at every period - at every moment indeed - inevitably transforms the past according to his own nature. History cannot be touched without changing it.* (Giedion, 1954:5)

The architectural historian will always be confronted with terms and ideas that can be interpreted very differently in different times. The term 'utopia' is an example of ideas that are forever changing - being the search for the complete, perfect world and solutions. This ever-changing idea of what the ideal solution is, has the consequence that the architectural critic cannot give a report of history (in the written word) without being determined by the forces that influence whether something is dominant within his/her time frame of reference and existence. Architectural history is therefore personalised by the writer when being evaluated by his or her own subjective system.

The conclusion can be drawn that significance is also filtered by a value system which cannot be handled by the researcher without giving a certain time restricted quality to it. Therefore the significance cannot be determined as an absolute. Indications of the researcher's ideas of what this significance is will be given. This study does not focus on the establishment of certain exact values. Its aim is to research different possibilities.

Every architectural language has its own peculiar rhetoric which the historian and critic must define. Imaginary architectural space and architecture-on-paper can be viewed as different kinds of architectural language.

2.1 Architecture-on-paper through history.

15

The focus of studying the history of architecture-on-paper is, for the sake of this study, not to give a sequential reproduction of architecture-on-paper as it occurred through the ages. The purpose of studying architecture-on-paper through history is to research its occurrence at different times and to seek some significance in its occurrence at that or later stages.

Architecture-on-paper's appearance changed through history. The researcher has identified the following periods in which its occurrence led to significant new ideas and generated new thoughts. These periods are classified as follows:

a changing focus through history

2.1.1 Pre-Renaissance up to Filarete

2.1.2 The Renaissance and late Baroque

2.1.3 The Enlightenment

2.1.4 The Modern Movement

2.2 The situation at present

2.3 A future perspective

2.1.1 Pre-Renaissance up to Filarete

The period that is referred to as pre-history did make an attempt to represent its environment in two dimensions, but this representation was limited to rituals and symbolic acts, like hunting or performing a dance. These were mainly found in caves. *Any interpretations of these drawings are purely speculative, but there exist clues that these drawings must have had magical meaning for their creators.* (Harcourt, 1991:30)

pre-history
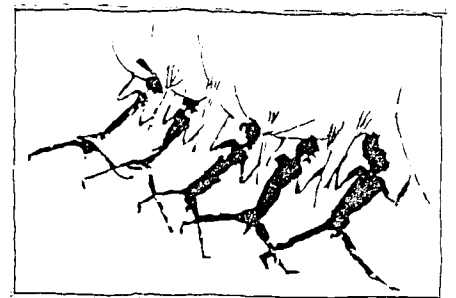
Marching Warriors (ritual dance?) Castellón, Spain. c. 7000 – 4000 B.C. Original: De la Croix, 1991 : 37.

Painting for the Greeks was mostly limited to vase painting. Images that were portrayed were also filled with meaning and had a mythical character. The main theme of the myths was portrayed as the struggle between intellect and emotion. The Greeks were fascinated by the interaction between these two seemingly opposites and used myths to give some kind of understanding to this phenomenon. *The struggle between intellect and emotion is*

the Greek era

one of the most significant undercurrents in human existence. (Sporre, 1989:93)

The Greeks thus communicated their interpretation of human activity and the values that pre-occupied their vision of the world.

During the Roman era two-dimensional art was still pre-occupied with meaning. *This tendency became part of the Roman wall decoration with all its wealth of significant content as well as in its form.* (Sporre, 1989:130)

Red Figure type Vase of around 500 BC
Original: Copplestone 1983: 69.

Architecture was hardly ever the main theme of a wall painting, though some exceptions do exist, like *the Cubiculum, from a villa at Boxereale.* (Sporre, 1989:132). Perspective had not yet been discovered and representations of buildings were two-dimensional. Things that were built on the same level were drawn on the same level (straight line). The way artists thought was still limited to a plane with no tools to create planar representations that could create a three-dimensional illusion.

Cubiculum , from a Villa at Boscoreale , c. 50 B.C.
Sporre, 1987 : 132

In the writings of the Greek physician Galen, the first ideas on the existence of perspectives can be found documented. Rheingold (1991:64) describes its occurrence as follows: *The art and science of stereoscopy is an ancient one. In the second century A.D., the Greek physician Galen described the first theory of left-eye perspective. This was the beginning of thinking beyond a planar, two-dimensional representation of what we see. For thousands of years after Galen, only a few isolated specialists looked into the binocular aspects of depth perception.*

the Greek physician Galen

Galen was the first person who realised that depth perception may be representable on a plane. However, no material could be found that showed any attempt by him to actually objectify this knowledge.

Vitruvius was not the first to write on architecture, but all earlier writings on the subject have been lost. His systematic approach towards proportions of all elements of architecture is found in

Vitruvius

Vitruvius's Ten Books of Architecture. These books are claimed to have been written in the period 33 to 14 BC. (Kruft, 1985:21)

Kruft (1985:43) sees the next writer on architectural theory who deserves to be mentioned as Leone Battista Alberti - born in the year 1404. *In his treatise* (Alberti) *started with the idea that a building is a 'kind of 'body', consisting of lines and materials, in which the lines are produced by the mind, the material obtained from nature.*

It is the first time in history that the mind is actually mentioned as a generator of form (in this case by means of lines). Here Alberti separated architectural design clearly from the actual construction.

Tod (1978:36) emphasises the influence of Alberti, and his architecture-on-paper of the time, when stating that Alberti was to influence the thoughts and ideas of architects and city designers *throughout the Renaissance* by means of his Ideal City as found in his Ten Books on Architecture.

As an architectural writer, Alberti was followed by his pupil, the Florentine architect Filarete, who, according to Kruft (1985:54), *focused on architecture as a living organism... Filarete, as prestige architect, eats at table with the Duke, who respects his architectural ideas and causes them to be translated into a* (fictitious) *reality.*

Filarete echoes Alberti's idea that a building is a kind of body, but takes it further by focusing on architecture as a living organism. To Filarete architecture is filled with meaning and is generated by ideas which are then translated into a reality. Here, around 1400 AD, the actual verbalisation of architectural space (still imaginary because undocumented) can be found recorded.

When Filarete drew a section through the house of Vice and Virtue he introduced a new way of communicating a building and space was created in the mind.
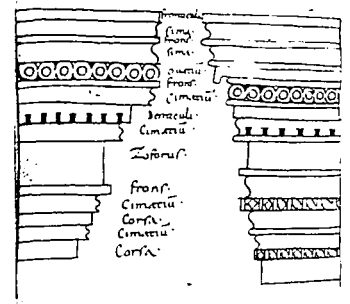
Vitruvius, codex, ninth or tenth century, Kruft 1985: plate 1

Alberti
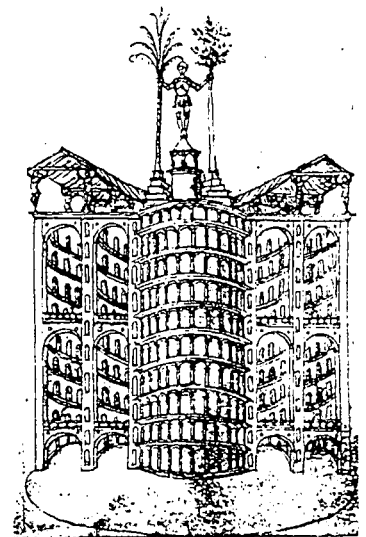
Filarete, Section of House of Vice and Virtue. Kruft, 1985: plate 14

Filarete

Filarete's section through the house of Vice and Virtue already communicates a kind of perspective representation technique. The laws of perspective drawing had not yet been established, or were not fully understood by the artist. It seems as if he relied only on his own mental picture to communicate the way the building would appear when viewed.

Tod (1978:37) shows Filarete to be employed by Francesco Sforza to design an ideal city, called 'Sforzinda'. According to Kruft (1985:54) we find in these drawings and plans of Filarete's 'Sforzinda' *the first thoroughly planned and illustrated 'ideal town' of the Renaissance. His drawings are not merely 'illustrations', but the direct product of the architect's invention, thus acquiring autonomy over text. The importance of drawings in Filarete's work opens up a new possibility for later architectural theory, that of the text becoming quite secondary to illustrations...*

Filarete, Plan of Sforzinda. Kruft, 1985: plate 12

Filarete bridged the gap between text and drawing. With this drawing became with this the primary symbol-system to communicate architectural ideas at the time. The architect was now better equipped to communicate space and had more than just a concept of what the space should look like.

2.1.2 The Renaissance and late Baroque

The Renaissance saw the invention of the perspective drawing - one that may be viewed in artistic terms to be one of the most important, even when considering artistic invention up to today. It was an invention whose influence was felt through five centuries of artistic creation.

the perspective drawing

According to Giedion (1954:31) the perspective drawing came as *an extremely new invention, but seldom has a new invention been so much in harmony with a basic feeling of an epoch. From the time of its discovery no hesitation can be observed in its application; it was used at once with complete confidence and sureness.*

Now this may seem odd, since an invention tends to be new, that is, unknown. A possible explanation for the confidence with which perspective was used, may be the fact that perspective was about the way objects were seen, without reference to their absolute shapes or reflections.

In doing so, the perspective was a *violent break with the medieval conception of space, and with the flat, floating arrangements which were its artistic expression. With the invention of perspective the modern notion of individualism found its artistic counterpart. Every element in an artistic presentation is related to the unique point of view of the individual spectator.* (Giedion, 1954:31)

Although Brunelleschi is credited by some with having discovered the laws of scientific linear perspective (e.g.1997:http7), Giedion sees *perspective not as the discovery of any one person; it was the expression of the whole era... The significant thing is the mixture of art and science.* (1954:31)

perspective drawings as art and science

The fifteenth century marked not only the important identity of method in these two spheres, but a complete union of artist and scientist in the same person. In the person of Brunelleschi (1377 - 1446) for one, these two qualities were found in close relationship.

Speaking from his perspective in 1941, Giedion asks the question: *Do we realise, in comparing our own period with this one, what it means to find a man uniting the capacities needed for executing both the most audacious engineering works and the finest sculpture? Yet such a union of talents is to be seen in nearly all the great artists of the Renaissance. Leonardo da Vinci represents a type not an exception. And the tradition that the scientist and the creative artist are combined in the same person persists throughout the seventeenth and eighteenth centuries.* (1954:32). This viewpoint of Giedion is best understood when looking at the work of Masaccio,

The painter, Masaccio (1401 - 1428) *was the youngest of the Renaissance masters, and the most advanced.* Living at the same time as Brunelleschi (architect) and Donatello (sculptor), *the painter was the first to attain to the new vision of his time.* (Giedion, 1954:32)

Masaccio

Masaccio's "fresco of the Trinity" (Giedion, 1954:33) *in Santa Maria Novella in Florence was executed when he was about 25 years old. Painted during the twenties of the "quattrocento" it was rediscovered in the late nineteenth century and exists today in a badly damaged condition. The Trinity Fresco has long been famous for its naturalistic portraits of the founders of the church which contains it. It is the first example of an endless series of paintings of this type. But it is of much more significance to us that the whole composition is encircled by a majestic barrel vault. The vault may be seen in perspective in all its grandeur. This fresco... represents what seems to be the first successful expression, in architectonic terms, of the Renaissance feeling that underlay the development of perspective. It reveals a surprising use of the newly discovered elements in combination with absolutely circumscribed tectonic surroundings.*

Masaccio, The Trinity. 1428. Original: Copplestone 1983: 178

Giedion speculates on the possibility that Masaccio had been taught perspective drawing by Brunelleschi and also mentions the fact that it has been argued that Brunelleschi himself was responsible for the execution of the perspective of the Trinity fresco. Whoever it might have been, the *barrel vault is not a part incidental to the whole composition; it is not simply a background. Instead it dominates the entire picture.* (Ibid.)

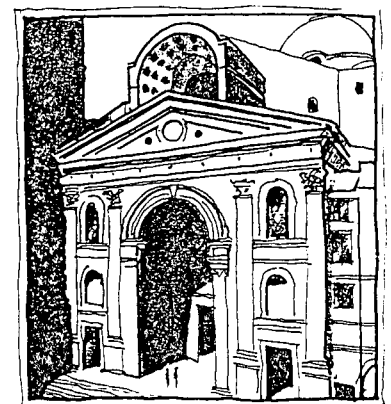Alberti, S Andrea, Mantua 1470 - '72 Original: Copplestone, 1983: 181

Masaccio was so fascinated by new technology, that it inspired him to paint the fresco of the Trinity. He expressed the newest technology in its newest artistic (scientific) form.

The focus now shifts from technology to focus mainly on how the perspective is drawn and its visual impact as found in Serlio's drawings.

Sebastiano Serlio (born 1475) trained originally as a painter under his own father and started his career as a perspective painter. (Kruft, 1985:73) He later distinguished himself as an architect with a *tendency towards a holistic conception of architecture* and Serlio showed the first beginnings of *a relativist view on history.* (Kruft, 1985:76)

Serlio, Book IV of L'architettura: The five orders, 1537. Kruft, 1985: plate 36.

Like the architectural philosophers of the time, Serlio also wrote about architecture, which writings are to be found in his architectural treatise published in his Books of *L'architettura*. Kruft finds in the preface of Serlio's Book 11 his *very telling proclamation of the connection between painting, perspective and architecture:* 'The architect', [Serlio says] '*has an absolute need of perspective', and he points out that the most important architects of our century, in which good architecture has begin to flower, began as painters.* (1985:77)

As examples of these, Serlio mentions masters like *Bramante, Raphael, Peruzzi, Girolamo Gengs, Guilio Romano and himself. One can detect here in Serlio a pictorial approach to architecture, which is more concerned with effect than with the conformity to unseen rules.* (Ibid.) With this pictorial approach Kruft reckons Serlio's treatise to be *one of the most influential of all publications on architecture.* (Kruft, 1985:73)

effect of perspective as focus for architecture-on-paper

In the fifteenth century codification was found in different 'Books on architecture' by different writers - this time is marked by written and illustrated rules and ideas on architectural solutions for different types of buildings. These illustrated ideas and possible solutions of imaginary problems, can be seen as the architecture-on-paper of this century. The same problems occur that are so present in today's architecture-on-paper: that of *the aim and purpose, namely that the visual impact is much more important and takes precedence over functional considerations and even over the relationship between interior and exterior. Serlio is concerned with architecture not as it is, but how it looks.* (Kruft,1985:78).

Andrea Palladio, Title Page of his Books of Architecture, 1570. Kruft, 1985: plate 46.

Rheingold (1991:64) shifts the emphasis from the perspective drawing as drawing in itself to the perceiver of the perspective, focusing on the way people 'read' drawings. *The most interesting aspects of anamorphic art and perspective drawing are those that tell us something about the relation between representation and perception. A researcher at Harvard... puts it this way: 'Pictures inform by packaging information in light in essentially the same form that real objects and scenes package it, and the perceiver unwraps the package in essentially the same way.'* The emphasis is still on reality, but its visual perception is the main focus.

the perceiver as focus for architecture-on-paper

The development of architecture-on-paper during the Renaissance was thus centred around the perspective drawing. The way that the artist, engineer and architect immediately practised this new invention showed that perspective was an expression of the age: a whole era which awaited the new visual communication.

perspective central in Renaissance architecture-on-paper

The significance of the perspective in the way it was drawn did not change much. The most significant change was rather what (the information) the artist or architect was trying to communicate.

Dimitiu shows a significant shift that takes place in the purpose of the perspective from the Renaissance to the Baroque eras: presentation on paper now gains the additional quality of possible reality: a reality that need not be, but is only communicated for the possibilities it may hold.

from Renaissance to Baroque

The shift from the Renaissance to the Baroque is detectable in presentation. *Between Renaissance and Baroque perspective there is a discreet but significant change of attitude with respect to presentation. The Baroque perspective consciously codifies reality instead of explicating it... The tension between the Renaissance invention or perspective as a tool for proposing a future not yet with us, and the Baroque repackaging of the present by codifying it so that it can pass for a possible future, finds parallels in contemporary architecture.* (Dimitiu,1991:28)

Renaissance reality and the way a person represented it dominated two-dimensional representation, together with technology. As the artist and architect gained confidence with this new form of visual communication, they started to interpret reality and codify it to represent a possible future. With this mind-shift, a new era was born.

2.1.3 The Enlightenment

One way of viewing the development of architecture from the Renaissance to the eighteenth century is in terms of the exploitation of the increased power of conception which these new types of model gave to the designer; a development which reaches its limit in the stage of Bibiena and the fantastic architecture of Piranesi, where invention is not limited by the cost of construction. (Heath, 1984:9)

It was as if the perspective and its powerful representational possibilities for spaces that may never be realised only struck architects during the eighteenth century.

For the first time in history it happened that the great architecture of an era, architecture that was representational of the spirit of an age, was mostly expressed only on paper. Copplestone also finds this great architecture in the work of Piranesi and his colleagues:

The sense of the power and weight of stone and the drama of huge, simple buildings is characteristic of Neo-classicism, finding expression in the work and the unrealisable projects of Claude-Nicholas Ledoux (1736 - 1806), Etienne-Louis Boullée (1728 - 1799) and Sir John Soane (1753 - 1857). Giovanni Piranesi (1720 - 1778), although trained as an architect, built little; the idealism - some would say megalomania - of Neo-classicism architects was frequently bigger than practicality of purposes. (Copplestone, 1983:272)

Sporre (1987:334) also notes that the pendulum swung back from *exquisite refinement and artifice to intellectual seriousness. The*

power of conception
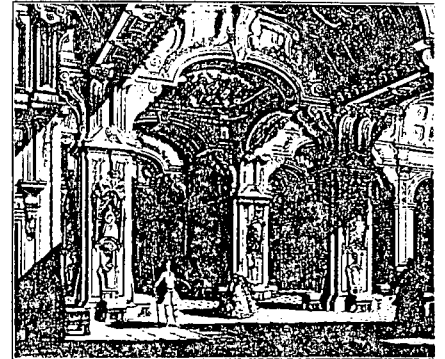
Guiseppe Galli de Bibiena, design for an opera , 1719. Sporre, 1987: 318

a new kind of spatial focus

unrealisable architecture
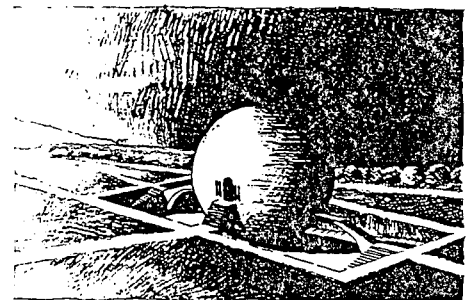
Ledoux, Project for an agricultural lodge, Maupertius. Original: Tod 1978: 64.

the intellect as focus

architecture of the eighteenth century was all about ideas. Boulée echoed some of Serlio's ideas by viewing the architect also as a painter. (Kruft, 1985:158/9) But where Serlio was mostly concerned with the visual impact of his drawings, Boullée fills his drawings with meaning.

In Boullée's competition design for a monument for Newton, architecture-on-paper becomes an experiment with space and ideas. (Refer to 3.1.1.3) Harbison (191:166) declares it as *'the most magnificent unusable space ever imagined, a dome with its literal-minded fulfilment underfoot, and a second answering dome".* He seems to think it to be *more perfect, because it successfully defies any attempt to use it.* (Ibid.) Kruft adds that *the Newton monument, which is practically without function... is the clearest expression of Boullée's intentions; the less purpose a building has, the more purely may a geometric idea be developed.* (Kruft, 1985:161)

unbuilt as truest architectural expression
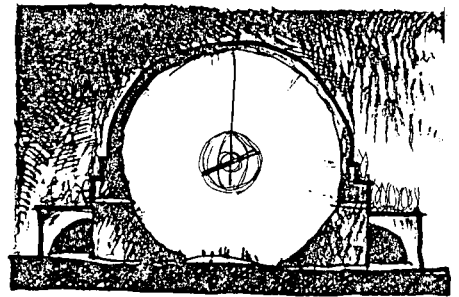
Etienne - Louis Boullée, Monument
to Newton; at night.
Original: Kruft 1985: plate 98

With this design, Boullée successfully placed architecture-on-paper within the realm of true architecture. He even succeeds in making some buildings more 'real' for architecture while only on paper than could ever be achieved by building them.

Qualities that can usually be attributed to monuments, namely those of over-exaggerated scale, inhabitability and meaning are present in their extreme form in Newton's monument by Boullée. Kruft (1985:16) shows that *Boullée must have known that his design went beyond the structural possibilities of the day, yet he did not consider this detrimental to it.* With this entry, Boullée communicates the idealism, so true to his epoch, on paper.

Quite ironic about this monument for Newton is the fact that Newton was the first to define the laws of gravity. But it is the mere existence of these laws of Nature that limits this monument to paper only. To erect this building might truly be a monumental act in honour of Newton.

Boullée succeeds in capturing ideas within created space. The spaces that he designed had no examples within the real. Therefore they were created in the imagination only. Imaginary architectural space, through Boullée's drawings and those of others of his age like Piranesi, gained a permanent position within the realm of architecture.

Boullée did another great visionary spatial project, namely the Royal Library. This *library's internal space coaxed the spectator to perceive eternity second by second, all the tiny human figures in the drawing slowing one's progress down the files. Then it strikes one that the space contains more experience than the separate physicality of all its units. One imagines reading one of the books in this library and realizes the integers here are not moments, but lives each of which could lead back into itself, stretching the experience of the whole library to impossible dimensions, immobilizing an imaginary reader in front of every book.* (Harbison, 191:164)

Smit (1995:26) comments on Etienne-Louis Boullée's work of the early eighteenth century: "*The Royal Library" with its barrel vault as imaginary space, though realistically expressed thanks to the presence of books in the architects presentation".* Imaginary architectural space realistically expressed on paper.

Peter Eisenman (1992:xv) feels that Piranesi's work had the ability to overcome the restricting and *rationalising vision* that architecture had at the time. With his architectural projections Piranesi *diffracted the monocular subject by creating perspectival visions with multiple vanishing points so that there was no way of correlating what was seen into a unified whole.*
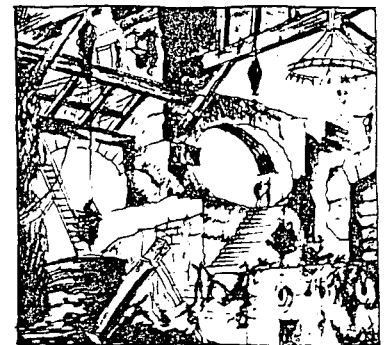
Piranesi, Fictitious space of Roman Structures. Original: Kostof 1985:54

On a larger scale, namely that of town and city planning, it is evident that certain previous Utopian plans and solutions did indeed influence the layout of real towns and cities at a later time. Kruft (1985:111) shows this in the *treatise of Albrecht Durer on fortification in 1527* which is said *to have influenced the town plan of New Haven, Connecticut, which was drawn in 1638.*

The Enlightenment focuses on the importance of ideas. Boullée's imaginary projects are substantial proof of the fact that this historical period did not regard the actual erection of the building as important. Architecture was freed from the laws of Nature, freed from reality.

2.1.4 The Modern Movement

The focus on ideas in order to express imaginary architectural space and to fill it with meaning did not change much, until the twentieth century. It took a while for a mind-shift to take place in the architect, a mind-shift inspired by the invention of the machine in the latter half of the nineteenth century.

Philosophies like Hegel's views that *reality* was *spirit or mind* and that art was one of the ultimate expressions of this reality (Sporre, 1987:380) were not expressed in architectural thought.

It wasn't until the 1920's that a constant occurrence of the same idea over the boundaries of different disciplines could once again be noted. In Jencks' review of the modern movement he shows this constant occurrence in the work of Hannes Meyer, who in 1928 *proclaimed proudly 'My League of Nations Building symbolises nothing'*. Jencks regards *this tough-minded Marxist, who had just taken over the Bauhaus*, to have no meaning, but as functioning and working *just... like a machine.* This idea can be found in different disciplines at the time: *Writers at the same time decided 'a poem should not mean, but be', Le Corbusier termed a house 'a machine for living in', Ozenfant said 'a painting is a machine for moving us', Einstein that 'the theatre is a machine for acting... Of course architecture, like a machine-gun, works or misfires as the case may be, but it also always means something, even if only the minimal idea of its own unity.* (Jencks, 1990:183)

Jencks emphasises here the fact that the Modern Movement's ideas could be free of meaning, or focused on meaning one
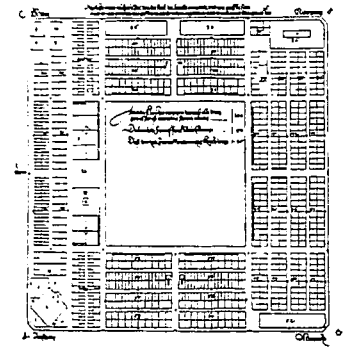
Albrecht Dürer, Plan for a utopian city, 1527 Kruft, 1985: plate 61

the machine as mindshift generator

representation without meaning

thing only. This brought meaning in architecture to the fore in architectural debate.

The whole idea of 'not meaning anything' is an expression of an age pre-occupied with meaning nothing. The focus was mainly on solving social issues created by the industrial revolution and the city's inability to accommodate the incoming masses. A project such as the Voisin Plan for Paris in 1925 by Le Corbusier (Copplestone, 1983:358) is a good example of issues addressed during the early Modern Movement. (see creating a prototype, 4.2.1)

Purpose as the generator of architecture was mostly based on physical need. Architecture as a machine was stripped of any kind of ornamentation, which was seen as clutter and thus eliminated. (Copplestone, 1983:358)

purpose as goal of architecture-on-paper

Giedion (1954:32) claims that *modern painting anticipated modern architecture* in much the same way as Masaccio, the painter, anticipated the new vision of his time. (refer to 2.1.1)

Whereas architecture was preoccupied with space as purpose and purity of form, art used basic shapes with basic colours to demonstrate how the perceiver perceives colour. (De la Croix, 1991:994)

When professor Livio Dimitriu (1990:31) comments on the Modern Movement, he sees the axonometric drawing being used as a way to *hide meaning*. Dimitriu, in his research on Alberto Sartoris, views Sartoris's re-invention of the axonometric drawing as a drawing type that *forces the crossing of the threshold between the Renaissance perspective , invented for anticipating the reality of the built world in service of a mercantile society, and a Twentieth Century concern with an idea about the world and not the world itself.* (Dimitriu, 1991:28)

the axonometric to hide meaning

According to Dimitriu, architecture quickly made up leeway. *The systematic use of the axonometric and analytic color became*

Modern Movement standards, assisting architecture to once again claim the role of summation of all arts in the context of the European avant-garde. (Ibid.) From his viewpoint in 1990, Dimitriu went so far as to classify Le Corbusier as *a relatively poor colorist.*

A local example of imaginary architectural space that was demonstrated in two-dimensional form can be found in the work of William Timlin (1892 - 1943). Martin (1995:12-13) focuses on fantasy and reality combined in a realised project of Timlin in 1933.

The ingenuity of architects, engineers, designers, builders, plasterworkers and electricians (were) combined to create the illusion of ... imaginary Europian open-air theatres in Africa. One of these was the *Colosseum in Johannesburg which was completed in 1933 and fell to the developers in 1985. The architect of this building was P. Rogers-Cooke.*

William Timlin was chosen to complete the interior of the Colosseum's Auditorium above the proposal of Rogers-Cooke. Here *Timlin gave three-dimensional expression to the fantasies of his book 'The ship that sailed to Mars' and his watercolour cycle 'The Building of a Fairy City'.*

The result is described by Martin (1995:13) as follows: "*The auditorium... belonged to another kind of world, another kind of fantasy, another kind of escape form the drudgery and often stark reality of everyday life... All around the auditorium fairy castles reached into the sky, covering it from floor to ceiling in dream buildings with barred and slit windows, coloured lights, mysterious shadows, balconies, turrets, strange vegetation and even stranger demons and snakes... and a multitude if other detail adding to the fairyland of illusion. The belief was held that such atmospheric interiors with appropriate music and lighting were soothing to the nerves and calmed perturbing thoughts.*

The imaginary architectural space as found in the fairy tales written and illustrated by Timlin were now reproduced in the built

a local example

William Timlin, drawing of the interior, Alhambra Theatre, Cape Town, 1933. Martin 1995: 18
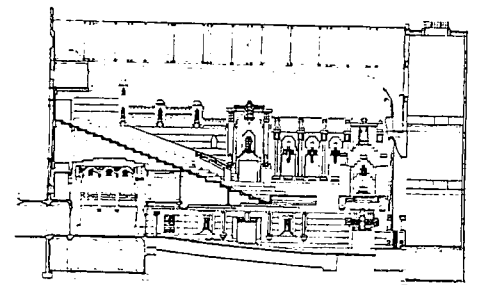
P. Rogers Cooke, Colosseum Theatr. Section as envisaged. Drawing by Jonathan Stone. Martin, 1995: 18.
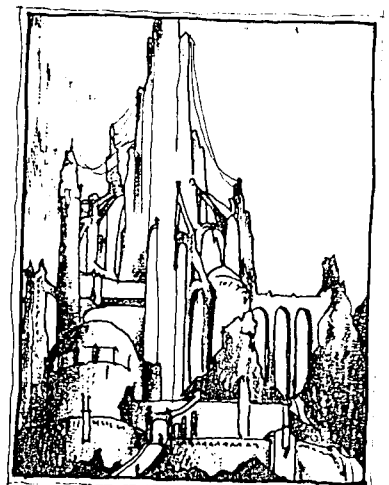
William Timlin, The Temple, Original: Timlin 1993: 41

environment as frescos against the inner walls of this auditorium. The purpose of these frescos was to visually enhance the experience of the visitor. This becomes an interplay between two-dimensional illusion and three-dimensional reality.

It is interesting to note that the focus was mainly on internally motivated needs, such as *soothing the nerves* and *calming perturbing thoughts*. In addressing the human being's inner state, Timlin did acknowledge Hegel's reality as spirit or mind. Timlin created a fantasy, an escape that strove to be more in harmony with the spirit or mind than with European Avant Garde.

In the Modern Movement free scope reigned in that the individual designer/architect could claim his own theory or approach to architecture.

individual approaches

2.2   The situation at present

The meaninglessness of things and objects leads man to feel exposed to machines and artefacts.

Already in 1941 Giedion claimed that *people (had) lost all sense of playing a part in history: they were either indifferent to the period in which they lived or they hated it. When they compared themselves with the people of other periods their activities seemed unimportant and insignificant, either good or bad. The same feeling produced an extreme disregard for the immediate past - for contemporary history, that is.* (1954:9)

individual's loss of sense to make an impact

The loss of the sense to play a part in history can also be seen as an expression of an era. At the time that Giedion writes his book on architectural history the memory of World War II was still very much a part of everyday life. Man was disillusioned by his own nature.

Commenting on the nineteenth century, Giedion (1954:13) says that *feeling could not keep up with the shift advances made in science and techniques. The century's genuine strength and*

special accomplishments remained largely irrelevant to man's inner life.

Today, the information age of the computer tends to have the same effect on mankind. Man's ability or inability to adjust to the physical world, the real, fosters or de-motivates his urge to escape to some other form of "reality", be it fantasy.

the effect of the computer

The "need" to escape from reality creates a market for other "realities" to invade and oppose reality. These other realities obtain advantages that are weighed by the need to escape from the real, and the need establishes the amount of time and money that will be invested into the creation of alternative realities (fantasies).

other realities

Together with Harbison (1991:8) we start from the extremist edges of the field... "I have chosen to see architecture almost wholly through the extremist instances I could find, those which violate ordinary logic and ordinary need, from a belief that the edges of a field are the best guide to the centre."

the extremist edges of a field

Architecture-on-paper gives the architect the opportunity to work on the edges of architecture and to investigate new fields of opportunities for himself. Today many architects create buildings before they actually become 'building architects'.

Steele (1994:7) supports this: Where architecture has historically been accomplished with a minimum of drawing, that medium has now supplanted, or at least become equal to the artefacts it represents in a wide segment of the public consciousness. Instead of art imitating life, life now imitates art, or television, or movies.

life as an imitation of art

An example of architecture-on-paper's interdependence with built architecture is visible in the work of Ron Herron, born 1930, part-producer of the magazine Archigram and currently professor at the University of East London. Ron Herron has already been around long enough to see the allegedly impractical projects in his early sketches come true in the hands of other architects, and occasionally his own. However visionary, his drawings remain

interdependent character of architecture-on-paper with built architecture

persuasive to so-called practical men, and the highly finished ones in particular contain (or appear to contain) plausible components and details and clip-on equipment for making it all happen, for making illusion realisably real. (Banham, 1994:7)

Papadakis also comments on this 'new' architecture: *The work of Zaha Hadid, like that of Tschumi, Eisenmann or Libeskind, exists as much on paper as in 3D form - as such it is a commodity of the mind, a reinforcement of the notion that the new architecture is about ideas as much as visual forms.* (Papadakis, 1992:7)

Zaha Hadid, Office Building, Berlin , 1986
Papadakis 1989 : 3

Jencks (1990:25) describes the work of **Zaha Hadid** as *'anti-gravitational architecture'.*

Of **Daniel Libeskind's** architecture (http5) it has been said that *an extra problem in the visualisation of his buildings* [exists] *in the fact that until a few years ago they were only on paper or film. Libeskind was a teacher, a theorist and a designer, but not a "building" architect. Since 1989 this has changed, for in this year he started his own firm in Berlin.*

The work of these (and other) architects is generally experimental and therefore 'violating ordinary logic and need'. As they function at the edges of the field, they cross the boundaries of architecture as a discipline and become art. For more on these and other architects, see 2.1.1 and 2.2.2.

Daniel Libeskind, Extension to the Berlin Museum with the Jewish Museum, 1989
Libeskind 1991 : 85

Jencks also described the architecture of **Peter Eisenman** as *primarily solipsistic and aesthetic.* (1990:205)

He (Jencks, 1990:30) comments on **Bernard Tschumi's** Parc de la Villette, describing it as *built of three-dimensional systems ('point grids', 'cinematic promenades' and 'surfaces') which are meant to reflect the non-place sprawl of suburbia, the de-regulation of free enterprise, the de-composition and de-centring of a society in flux. Not for him Utopia, these follies are everyday reality turned into fire-engine-red machines that relate to nothing - except themselves and Neo-Constructivism.* (Necessary to note here is

Parc de la Villette

Bernard Tschumi, Folie, Paris, 1986-7
Original: Jencks 1990:12

that terms and qualities commonly used in architecture-on-paper or fantasy architecture e.g. utopia, are now applied by Jencks, the critic, to buildings in reality.)

Haig Beck (1983:9) is of the opinion that the competition projects for Parc la Villette had a great influence on theoretical thoughts and ideas on the Paris and Europe of 1976: *The La Villette competition of 1976 drew entries from all over the world. It was a significant event: it demonstrated the extent to which architectural sensibilities were changing in America as well as Europe. Young architects in France, measuring themselves for the first time in the international arena, found in their projects for La Villette a consolidation of the particular French proposition that through architecture the urbanity of the European city could be recovered. La Villette condensed the researchers of the various laboratories into a unified and potent theory of architecture.*

Bernard Tschumi, Parc de la Villette : lines, points and surfaces. 1983
Original: UIA 1983: 29

This is an excellent example of the competition entry which generated a wide range of architecture-on-paper of which only one entry could be successful in realised state (building). Here the competition could claim to have done more than just providing a final successful project, it could claim to have changed the minds and approaches of the architects who entered it.

On presentation in 1990, Dimitriu sees *the axonometric ... (being) employed to hide meaning. Assorted graphic lubrications are produced purely and solely for their scandal and taboo characteristics, being fed and feeding in return a rampantly consumerist society. Re-presentation is being sold as the building itself. Differences are eradicated between drawn reality and built reality. Interpretation in the process of translation from one language to another carries significance no more.* (1990:31)

The axonometric drawing

Dimitriu also captured the spirit of the current age in a nutshell by stating *conceptualisation of two and tree-dimensional space is understood as a mind game (ideas) rather than an eye game (images).* (1990:28) With this he gave the 'new' architecture a free scope.
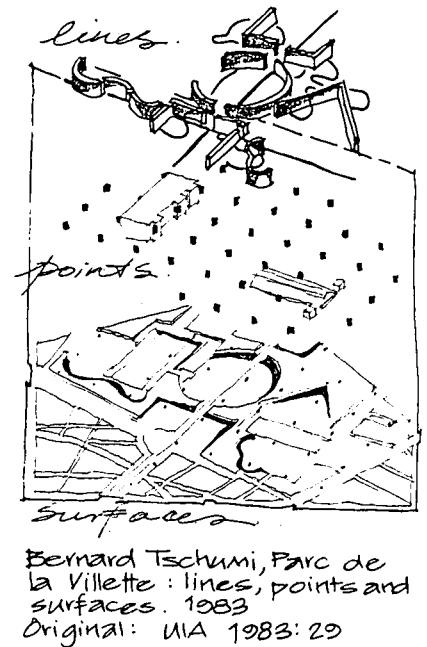
space as a mind game

It is clear that the methods are there to produce architecture-on-paper (or computer, etc.) without the handicap of materials or tools but with the additional advantage of the general acceptance of imaginary architecture as an entity to be acknowledged. The conscious rebirth of the art of architecture is a momentous event - not achieved without a good deal of soul-searching - and world architecture now finds itself in a period of experiment, invention and above all, freedom.

2.2.1 Architecture-on-paper as a design tool in the process of architecture

Through history architecture-on-paper served inter alia as the documentation of the process of architecture. It served to create a library of ideas from which insight and precedents can be obtained in order to create something new, rooted in the old. In this way it is the history of the process of architecture.

architecture-on-paper as documentation

At present, it serves as a design tool in the documentation of imaginary architectural space.

James Corner (1993:65) views drawings as *not only analogous to construction but also to the visual embodiment of ideas.* He warns that *students and practitioners who regard drawing as merely technical and instrumental activity, or - equally erroneous - as too much of a "discipline" that somehow suppresses their thirst for self-expression, forget that for the ancient drawings were profoundly poetic and contained all of the symbolic content of the built work itself.*

visual embodiment

Corner further states that, *in drawing out other aspects of things, one must assume a different point of view, both spatially and intellectually, and remain open to an unpremeditated and unprescribed seeing. As the exact reversal of closure, where the end was already known long before anything was said or done, disclosure is a process of open-ended curiosity.*

an open-ended process

The creation of architecture is a process which is determined by the interaction between the architect and the visual representation of imaginary architectural space. It is a limited creation when the end is predetermined. Architecture that truly develops the full potential of a project is investigative in its approach and not fearful of putting new proposals on the table. It is, after all, an activity of the mind.

When imaginary architectural space is applied to architecture-on-paper, no direct representation can be obtained, for imaginary architectural space is a space that exists only in the mind. Imaginary architectural space can therefore only be represented indirectly by means of a communication medium, such as paper. (Refer to 5.2.2)

Architecture-on-paper is sometimes viewed as the development of architectural models. (That is a scaled representation.) This includes working models where design is finalised with moving paper (cardboard) around on a plane (scaled replica of the actual site).

Chernikhov : exercise in 'penetration' of rectangular planes (Model Cooke, 1983. Papadakis 1985:46

Architecture-on-paper functions as a design tool when it enables thoughts to be reduced to simplistic finalities. Composite and analogical drawings function not as instrumental tools but as vehicles for creativity and critical reflection.

2.2.2 Architecture-on-paper as impulse-inspired art.

From various sources the following "accusations" have been levelled a architects of this age for becoming individualistic, hype and self-centred, although many admit that these qualities do arouse increased public interest in architecture.

- *There has never been a time when so many reputations have been made on so little [built] work. Competitions are won on the strength of drawings alone. Yet when the time comes for completion, designs are found to be unbuildable as originally presented - if the prospect proceeds past competition stage.*

For some of the most inflated reputations, gained primarily through drawings, the realisation of even modest commissions, of a restaurant, a bar or fire station [see Zaha Hadid], is cause for a media feeding frenzy, accompanied by unprecedented amounts of hype. (Steele, 1994:7)

- *Discussion and debate have been the foundations of increased public interest [in architecture] and of the emergence of architecture as an art.* (Papadakis, 1992:7)

- *The cancerous growth of the creative individual expressing himself at the expense of the spectator and/or consumer has spread...even into design. No longer does the artist, craftsman, or in some cases the designer, operate with the good of the consumer in mind; rather, many creative statements have become highly individualistic, auto-therapeutic little comments by the artist to himself. Victor Papanek* cited by Johnson (1994:64)

the creator/designer as focus

Architecture-on-paper practised as an impulse-inspired art has the built-in possibility of becoming elitist comments on life, as the architect sees himself firstly as an artist. In principle this does not seem bad, but when the art replaces architecture as liveable art the users tend to be forgotten.

Many designs gained freedom in our time for just being 'designed' in the present global spirit of freedom of speech and action. Through history, however, a few designs can certainly be classified as partly 'impulse-inspired art'.

Already in Filarete's "Sforzinda" his illustrations and drawings gained preference above text (theory). *Filarete's 'Sforzinda' is the first thoroughly planned, and what is more illustrated, 'ideal town' of the Renaissance. It was to be built, however, not in a vague future but in the immediate present: the foundation stone is said to have been laid on 15 April 1460. Filarete plans not only its shape and layout, but above all its siting in the landscape, which he set out in drawings. Reference is repeatedly made in the text of the*
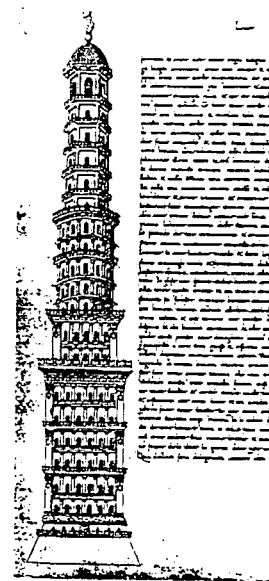
Filarete, Citadel tower of Sforzinda, Kruft 1985: plate 13

dialogue to the drawings. They are not merely 'illustrations' for the reader, but the direct product of the architect's invention. Filarete's drawings thus acquire autonomy, or even priority, vis-á-vis the text. (Kruft, 1985:54)

Kruft further views the importance of drawings in Filarete's work as opening up *a new possibility for later architectural theory, that of the text becoming quite secondary to illustrations, or even disappearing altogether... Towards the end of the work, Filarete allows his imagination free reign, in the manner of science fiction. He describes as his own invention a revolving tower in Plusiapolis, surmounted by an equestrian monument revolving with it... (Ibid)*

Kruft (1985:55) also refers to *Filarete's House of Vice and Virtue - a cylindrical building crowned with a monumental statue of Virtue.* With the section through the House of Vice and Virtue *Filarete creates a new form of architectural representation.* Kruft declares that it is in *the very extremism with which he states his ideas* [that] *his contribution to the Renaissance understanding of architecture lies.*

More recently, however, much architecture as impulse inspired art can be found in the work of architectural theorists and avant-gardists.

Daniel Libeskind gives his architecture an esoteric quality. *The experience of the mystery of architecture occupies an important place in the work of Daniel Libeskind. In his view architecture is seen as a spiritual domain, a realm than cannot be visualised, an area of invisible presence, since it deals with the unspeakable. Libeskind does not search for a synthesis of solutions, rather he tries constantly to intensify the mystery.* (Schoonderbeek, 1998:http4)

Daniel Libeskind

Lebbeus Woods' Freespace architecture, 1992, can be classified as impulse-inspired art - with his projects he established his own set of rules and principles and designed according to them. He distanced himself from the history and the process of architecture

Lebbeus Woods

in order to produce an indigestible product. (see 3.3) The criteria for Freespace are as follows:

- *Not a priori determination of use: use must be invented by those who dare to claim Freespace as their own.*

- *Difficulty of occupation: the faint need not apply*

- *Absence of discernible order: hierarchy is frustrated; heterarchy is unavoidable.* (Woods, 1992:39)

Woods deliberately tried to brake free from any laws that previously restrained the architect's means of creating new kind of spaces.

The Freespace structures are mobile. They are moved from place to place in Zagreb, from street to street, from courtyard to square, by transport helicopter; they are gypsy houses for individuals rooted only in themselves, only in the strangely social isolation of their modernity. (Ibid. p.41) As such they are objects of art, placing themselves outside the realm of architecture.

Computers as medium for design brought a new quality to architecture-on-paper. They have become a part of the physical and cultural environments in which artists work. How have the more recent developments in computing affected the worlds they make and our perception of them?

At least in two ways: *computer graphic artists can now create extremely high-fidelity representations of "real worlds", and they can now create illusionary worlds which cannot exist in time and space as they have been defined by either Newton or Einstein.* (Scott,1995:http1)

the computer's influence

Memarzia, (1998:http4) shows the dependency of *Cyberspace on the design aspects of traditional audio-visual narratives, such as cinema, stage design, theatre, storytelling and installation art.*

Part of cyberspace can be classified as impulse-inspired art, for the focus is to create art and not space. Cyberspace's main focus lies in the visual effect rather than in a true understanding (conceptualisation). What the end-product is, is perceived to be

mainly determined by the aim in mind when the architect starts a new design.

James Corner (1993:64) underlines the creative quality of drawings. He seems to think that *drawings harbour a much greater capacity for imaginative thought than is currently practised.* Corner thinks drawings are not understood nor used for their ultimate potential, namely as *vehicles for creative thinking.* According to him teachers do not recognise drawings for their ability to conceive ideas, but tend to teach drawing as "*graphic techniques*" and "*communications skills*". In this they *fail to recognise that drawing is more powerfully an activity of seeing* [to see] *and projecting* [to project].

Corner advocates the necessity of ideas in architecture - the designer should not focus on the product's image, that is how it looks. Corner feels that the designer should use these drawings as a means to investigate creative ideas. The above-mentioned architects may find justification for their 'objects of art' in this, the fact that they are more than just products of impulse - even though they may seem to be just that. The work of these architects may be claimed to be creative experiments with ideas projected on 'paper' (= medium).

architecture as art

2.2.3 As an autonomous field.

Steele (1994:7) sees Khan's sketches as *the beginning of the current wave of interest in drawing for its own sake as isolated phenomenon in architecture.*

With this Steele verbalises the notion that drawing (architecture-on-paper) can be regarded as a phenomenon on its own - recognised and appreciated without having to seek for right of existence in any other purpose.

Johnson (1994:36) focuses our attention on the fact that by the end of the eighteenth century and on into the nineteenth,

illustration far outstripped text and achieved an autonomy that persisted until well into the twentieth century. (refer 2.1)

Examples of these can be found in the work of Boullée and Ledoux in the late eighteenth century. Wieberson in 1983 regarded these architects' extreme statements of unrealisable projects to be a reflection of their *universal style based on the architectural expression of new ideals and scientific discoveries.* (Johnson, 1994:36)

In contrast to debates in favour of functionalism, Boullée's monument to Newton finds perfection in the fact that it successfully defies any attempt to use it. As mentioned before, Harbison (1991:166) declares it *the most magnificent unusable space ever imagined.*

Etienne-Louis Boullée, Design for a monument to Newton .c.1748 Original: Copplestone ; 1983 : 268

Boullée's drawings (1784) are the only evidence of this 'building' or monument: all the above-mentioned remarks are therefore based on the quality of the design as communicated on paper. The researcher feels tempted to apply Steel's quotation, earlier stated (see 2.2.2), on this work of Boullée: *"There has never been a time when so many reputations have been made on so little work. Competitions are won on the strength of drawings alone..."* (Steele, 1994:7)

Steele refers in this quotation to the work done by Zaha Hadid, for one. (Refer: *a restaurant, a bar, or fire-station,* Steele, 1994:7). Two hundred and one years after Boullée's monument, Zaha Hadid did a project for the Kurfurstendamm office building, Berlin - that is in 1985.

Zaha Hadid

Zaha Hadid, Kürfürstendamm, Berlin. 1986. Original: Klotz 1989 : 335

When Jencks (1990:273) describes Hadid's project, he claims that *the control of* [her] *paintings underscores* [emphasises] *the refinement* of this project. Jencks talks about her drawings as *carefully balanced in colour and tone,* showing each *peel and incision* in this *brilliant* project.

Architecture's relationship with society is an empowering one. According to Severino (1970:4) architecture has in the past *been recognised and used as an extraordinary powerful social force; as a profession, it served the need of society; as one of the arts, it expressed that society.* This creates a duality that places architecture in the unique powerful position *to move an idea from conception into concrete reality. Through the dynamic of architecture, ideals and goals become a pattern of unconscious, unquestioned reality.*

Maybe architecture is viewed by some as a given reality, but it will be questioned, as societal and individual needs change and evolve. Is architecture-on-paper an expression of a society's need for such a product? If the product exists, surely the need must exist as well.

Watkin (1977:12) describes architecture as *an art with its own traditions, and not a science,* thus an autonomous field in its own right. He thinks *its concern with image-making* [is] *at least no less vital than its solution of practical problems.*

Current writings on this include those of Rattenbury who claims that *architecture is a field in its own right by the combination of the ambiguous nature of the architectural drawing* (architecture-on-paper), *image, writing* (the language in which architecture is usually discussed, described and commissioned) *and the language of the cavity wall* (technology). Rattenbury also focuses on unbuilt competition entries which, according to him, *are defined as, and even mistaken for, real buildings, while built interiors or installations do not count as architecture.* (Rattenbury, 1996:7) Architecture-on-paper in this way fulfils the pragmatic rules of architecture and because of this it should be reckoned as such (architecture).

From his viewpoint within the field of landscape architecture, Corner (1993:66) warns against the *making drawings as objects for representation in glossy magazines and exhibitions in galleries.* He claims that this leads to presentations which are not in touch with

the central difficulties of landscape architectural design. Corner views this type of presentation as *"object drawing"* which *is rarely made for any other reason than itself. Like production drawing, the art object drawing is mute with respect to the poetics of landscape architectural work. If the first* (production drawing) *is cold and sterile, the second* (art object drawing) *is naive and trivial; yet it is commonplace today to see drawings taught and employed as either an instrument for efficient production or as a venue for self-esteem and graphic display.*

This inevitably poses the question: 'What are the elements of architecture and what are the problems that surround it?' If architecture-on-paper is practised mainly with the two-dimensional product in mind, it does not face the problematic nature of architecture as an object in itself.

Architecture-on-paper when practised *for its own sake as isolated phenomenon* (Steele, 1994:7) may claim the right to exist autonomously.

Its ability to communicate significant imaginary architectural space may fade, for its first priority lies in being a "beautiful" or "provoking" drawing in itself. In claiming its own right to existence, it may step outside the traditional realm of architecture, though still concerned with space.

The tradition of architecture-on-paper for its own purpose in effect started during the Renaissance with Serlio's drawings. Traces of architecture being preoccupied with the way it looks can be found ever since then. High points of this way of practising architecture were reached during the eighteenth century. A new wave of architecture-on-paper for its own sake started with Kahn's sketches and gained momentum to arrive at the situation as it is at present.

2.2.4 A future perspective

Cyber-architecture can be made to represent an architecture of fluctuating relationships, interdependencies and interactions in the

context of an expanded conception of architecture. Cyberspace can become the extension and evolution of physical architecture. (Memarzia, 1998:http4)

With the speed at which technology is developing, it seems foolhardy to make predictions as to what architecture in the future will be. The fact is that the amount of attention which imaginary architectural space in its different manifestations is receiving at the moment, is one that will not falter.

The role of the drawing, done by hand with a pencil on butcher paper, is one that may be in danger of extinction. At the very least the role of paper generated drawing will become secondary to the computer-generated drawing. (Dimitriu, 1990:24)

paper versus the computer

The way in which the computer-generated drawing will secure its dominance over the paper-generated drawing will be determined by the amount of freedom the computer will allow its user.

In 1990 Dimitriu dared to make a prediction of things to come in architecture: *Architecture, its re-presentation, and critical texts, strive to achieve the goal of describing the context without representing it. The inner vision is a state of mind truer than reality itself. It is revealed only to those who care to look and see. It announces the order of things to come, the beginnings of a perpetually renewed architecture.* (1990:31)

a future perspective

Hegel's theory of reality being a frame of mind may suddenly be reborn as truth. For the computer possesses the potential to create 'realities' that seem more real than reality itself. These alternative realities mostly come into existence to stimulate the mind, and the mind only. Feeding off reality it is an interpretation of what is known to us, what is real. It embodies through the unreal, the interpretation, the mind. Via this process of abstracting that which is known, the abstract embodiment may lead to further abstractions of the already abstract.

'unreal' reality

Therefore a future perspective would only be the mentioning of some possibilities. (See chapter 5) What seems to be central to the future is that it will centre around the mind.

Maxwell Hutchinson (1993:35), however, feels strongly that an architect's responsibility to the future of architecture is more than just speculation. He seems to think it vital for the architect to *have genuine concern, carry out research, integrate existing information, proselytise, set out harsh polemic, draw cartoons and challenge the natural conservatism of the status quo.* (All of these can be practised on paper.) Hutchinson focuses our attention on the words of T.S. Elliot in 1934 in which he warns that one always tends to cling to old traditions or that one tries to re-establish them. The real genius lies in the ability to be able to distinguish between the real and the sentimental. (Ibid.)

On the influence of cyberspace on the future of architecture, (Refer to 5.2.3.2) Neil Spiller (1993:xviii) also touches on the 'real' in the form of reality. He thinks it necessary for us to *re-evaluate what it means to be human or real. Architecture,* he predicts, *will become empathetic, mobile, event based and user moulded.*

However, reality will never cease to exist without taking any other created 'reality' with it. For the brain is born and raised in reality, to do the encoding of or programming for virtual alternative realities.

3. Chapter three: The purpose of architecture-on-paper

3.1 To provide a visual basis of imaginary architectural space in order to research

'It is imperative that we realise what future we will have depends largely on what future we want. For both individuals and cultures, the image of the future is the sum total of their expectations. An image of the future is not particularly important as revelation or as an intellectual construction; it is desperately important only in so far as it conditions present actions. A vision of the future, either personal or collective, is a psychological fact. And like any other psychological fact, it guides our actions in certain directions.' (Severino, 1970:13)

When imaginary architectural space is documented on paper, it becomes the image of the future as far as architecture (and maybe even partly society, etc.) is concerned. That image of the future can be regarded as a visual research basis for imaginary architectural space.

Imaginary architectural space cannot be measured if it is not expressed. Architecture-on-paper as an expression of imaginary architectural space, becomes a source bank to provide a research field. Research always aims to clear our understanding of a specific field, in this case architecture.

James Corner (1993:66) claims that *Leonardo da Vinci once said that one may first learn the capacity of imaginative seeing by becoming so absorbed in phenomena such as dried spittle and stains upon an old wall that one can distinguish an alternative world.*

Part of the function we use paper for is to make visible an alternative world - a world which is not perfect, but generates creative simulation and interpretation.

measurable space

Leonardo da Vinci, Study of an embrio, about 1512. Art Treasures of The World, 1964: 149

Architecture-on-paper is then used as a testing ground, the laboratory of architecture wherein theory, meaning and space are used as tools to give us a clearer picture of the field of architecture.

3.1.1 Research education (basis for theoretical debate)

"The conversion of architecture as art to business, which was begun in Bramante's office, is now complete and as a business the profession must produce. The education of the profession, also needed to run this industry, is now a big business on its own, in spite of its relatively brief life span." (Steele, 1994:7)

Steele based this declaration on the fact that computer technology (CAD, Virtual Reality, Cyberspace, etc.) has come to stay. Not since the invention of perspective during the Renaissance has architecture-on-paper undergone such a period of change.

Bramante, The Tempieto, San Pietro in Montorio, Rome. c. 1502-06. Original: Copplestone 1983: 737.

However, the question remains whether the computer screen as substitute for paper as medium to research, design and express space, will be able to maintain a theoretical debate or whether it will fail its apostles?

In schools of architecture, students practise architecture self-consciously. Heath (1984:5) claims Alexander to be the first to distinguish between self-conscious and unselfconscious design.

Alexander defines the latter as follows: The unselfconscious approach is defined as *'those artefacts* (including buildings) *that develop gradually over long periods, centuries perhaps, by spontaneous adaption of a type, making the minimum change necessary to deal with changed circumstances or some perceived failure.'* (Ibid.)

unselfconscious design

The self-conscious approach is defined as *'those artefacts that are produced with the intention of making something new and distinctive.'* (Ibid.)

self-conscious design

Heath (1984:5) applies Alexander's definitions of architecture: Unselfconscious design is *teaching through characteristic craft method of demonstration and specialisation*, while self-conscious designs are *produced by the formal process of education, for instance the existence of architecture schools.*

Heath nevertheless adds an additional influence: the *wish and will to achieve something exceptional, to do something which differed sufficiently from the established types... something the form and execution of which must be planned in advance.* (Ibid.)

Education in the arts will always have to deal with this 'exceptional' quality that will distinguish one design/painting/drawing/sculpture from another. The search for the 'new' and the 'different' could easily be executed on paper in the past, for paper was available, patient, and did not require a lot of skill in order to be used.

the exceptional

Johnson (1994:29) seems to see the adoption (formulation) of an individual architectural position as a necessity for the student in architecture. Though this adoption of an individual architectural position may seem a difficult task for a student, Johnson makes it easy when stating that *'changing position is always an option, of course..'*

Johnson compares this *pursuit of an architectural position* with a political act insofar as that it *involves active participation in the discourse. The only way to provide an educational base is to show students the trends of the discourse and the basis of specific positions.* (Ibid.) These trends and positions will be readily available to students in the form of theories and designs documented/expressed on paper.

architectural position

The educational base will also be dependent on the history of architecture described on paper by historian critics. Giedion, an

architectural inheritance

acknowledged historian, states that *we intend to see how our period has come to consciousness of itself in one field, architecture. To do this we must understand the architectural inheritance of our period, the knowledge which had been evolved in the preceding periods.* (1954:23)

With this he focuses our attention on the need to study the past, justifying in this his own profession.

As a means to bring the individual theoretical position of the student into contact with architectural practice, the student can be given an existing site and problem as a project. Here architecture-on-paper overlaps with reality. Leatherbarrow (1993:7) states that an architect/student of architecture should not take this site for granted, but should *question the defined perimeter in which the building to be designed will have its place.* He feels that they depend too much on site plans and largely miss the creative aspect of site definition. By bringing the student during his studies into contact with the real site, his design (architecture-on-paper) may teach him in later years to approach reality in a more creative way.

the site

The broad spectrum of the public do not know what they want when it comes to meaningful architectural space. Whatever notion they had was formed by the misleading trends advertised by glossy magazines or the stylistic approaches of uneducated 'plan-drawers'. Lebbeus Woods (1996:26) asks not without reason: *"Who will do this job of educating the public? The architect does it with the work that he or she does. But: By and large the world is ignorant of architecture and will remain ignorant, regardless of our efforts".* This statement can be a challenge to architecture-on-paper as a means of educating the public/client by means of the media, etc. (Why does the public need architecture? Who needs to be educated? And ultimately - do they need to be educated in appreciating architecture or should the building speak for itself?)

educating the public

The public's interaction through the written debate (architectural theory on paper) can at the same time be a positive influence on

architecture itself. Public discussion of general issues helps to direct architectural thinking into definite channels, and the desire to achieve a solution for such general problems also creates the building opportunities, which are essential, if architectural projects are to become reality. (Brawne 1992:120)

Another problem that occurs is that the client is not able to understand or 'read' the plans, elevations and sections of his architect's designs. Sanoff (1991:ix) offers a solution for this through the visual environment: *A focus on the visual environment as a medium for communication can expand the dialogue between researcher and responder, between researcher and designer and between designer and client. There is today a wide range of media and methods available for expanding our comprehension of our everyday visual environment - all that can be listed as architecture-on-paper or a subdivision of architecture-on-paper as visual research methods in design. This can be for example diagramming, photo-interviewing, simulation, videotaping, and CADD etc.* (Ibid.)

client in-ability to understand

This whole line of thought had its origin in Steele's claiming architecture's conversion from art to business. Kambiz Memarzia (1998:http4) indicates a vast void in the use of computers as educational tools: *Currently the field of electronic architectural education consists mainly of documented existing works of architecture of other real world artefacts. For example, 'the Ultimate Frank Lloyd Wright' - takes the user on a multimedia tour of his architecture, city planning and furniture design. The majority of these packages allow for no actual interactivity, insofar as the user can only access information and not experiment.*

Frank Lloyd Wright, Solomon R. Guggenheim Museum, New York 1943 - 1959 Original: De la Croix, 1991: 1037.

In the education of architects today it is obvious that the use of Computer Aided Design (CAD) is a skill that students need to master in order to be able to function in architectural practice. What Memarzia suggests is that the computer can also be applied in the education of the architecture student as it is applied in many other disciplines: i.e. as a 'replacement' or as a substitute for the lecturer. This is a field of research in itself.

computer as substitute lecturer

Maxwell Hutchinson (1993:39) sees it as the responsibility of the students of architecture today to engage with the future in a meaningful and a responsible way. According to him the *burdensome mantle of the 1950's academic pomposity* is discarded by architectural education today:

"The New Age architects of tomorrow will confidently set their eyes above the temporal travesty of stylistic preference and plan a future of human proportion: on the moon, in my backyard, and just around the corner, Wherever. For architecture with wings on their heels - the sky is the limit. If we're lucky." (Ibid.)

The sky is the limit: it seems to be an option that this sky can be taken to be Cyberspace.

3.1.2 Examine meaning - creation of symbols.

"Like much art, buildings often have a virtual or imaginary component, not that they are liable to vanish like thoughts, but they are more precarious than they ordinarily appear, because pre-occupied with meaning something." (Harbison, 1992:7)

Architecture-on-paper can function as a medium to examine the possibility of creating symbols that can act as a vehicle to communicate meaning. When Harbison declares *buildings* [to be] *preoccupied with meaning something*, Macrea-Gibson (1985:73) eliminates the function of inhabitability as an essential requirement for meaningful architecture. Macrea-Gibson argues that *the monumental building does not require the movement of human beings to give meaning and it constructs no mirror of the city life.* It does however have an 'imaginary' component - that of symbolising some important happening/person, etc., that has meaning for a certain group of people/culture.

architecture as symbol

Corner (1993:64) states that *projection is never value-free. Measured survey drawings, for example, are projections of ground to paper that are always constructed according to particular*

codes and conventions. No projection/drawing is executed without an end in mind. This indicates that the site plan and other documentation/working drawings (architecture-on-paper) also contain meaning.

When architecture-on-paper leads to the realisation of new practices, a new theoretical approach comes into being e.g. deconstructivism and other -isms. Fish views theory as a form of practice, *the extent of which its introduction will or will not give rise to change, small and large, cannot be determined in advance.* (Johnson 1994:33)

Johnson (1994:34) reacts to this by stating that *theory's role in the practice of architecture has been thought to guide practice, but its effect has actually been to mediate the day-to-day decisions of practice through discourse, either on the broad level of architectural media or the intimate level of the special dialogue that occurs between designer and artefact. It mediates the practice of architecture by intervening between a proposal or concept and the history of all previous proposals and concepts, whether fictional, unbuilt, or built.* (Johnson 1994:34)

At the same time, in reaction to acceptance of meaning as one of the criteria for true architecture, architects like Eisenman and Lebbeus Woods create structures that are stripped of meaning to emphasise some point held. In the words of Woods: "*I saw these as structures, a kind of tectonic manifestation, a kind of form that was not quite yet architecture, not something inhabitable, in fact inhabiting a kind of abstract zone. ...Freespace structures...free of any kind of predetermined meaning and usefulness.* (Woods, 1996:17) These freespace drawings as architecture-on-paper, though not acknowledged as architecture by the architect himself, still debate the presence of meaning in that their predetermined meaning was 'to be stripped of meaning'. (Refer to 2.2.2)

architecture and meaning

This debate which may lead to the conclusion that all architecture has meaning, whether intended or not.

Rykwert (1982:58) confirms this by stating that *the architect or planner's business is in the first place with what he can manipulate: with the brute matter with which he will operate and with his surfaces, whose scansion will transform the inert material into a carrier of intentions.* When space is therefore designed on paper, the architect is busy manipulating space and is giving it meaning/intentions by transforming it. The process of architecture is in motion.

Bonta (1979:22) means to say that *a truly meaningless architecture or art would remain outside the realm of culture - and thus it would cease to be architecture and art.* By containing meaning it is possible that architecture-on-paper could be seen as architecture. Bonta came to the conclusion that *theory can change practice by legitimising usage condemned by previous theories* - giving meaning to space by means of architecture-on-paper as medium.

Any object or artefact that is generated within a culture possesses meaning simply because it was created. The fact that it exists is enough evidence that a need existed for the creation of the object/artefact. To place any object outside the realm of culture means that such an object was not created by man.

In Bernard Tschumi's Parc de la Villette, Paris, his follies are intended to be 'mad' - architecturally mad so that visitors could better appreciate the constructed nature of normality. They were buildings built to service no particular function, because their function would come from the way visitors to the park interacted with them. These follies, when put alongside the Freespace structures of Lebbeus Woods (Refer to 2.2.2) tend to be just as real or as non-real as the others. The follies, intended to have no meaning, find meaning through the interaction of the visitor. The Freespace structure, again without function or meaning, demands our attention when Woods states that *"the faint need not apply"* and when he pleads *heterarchy instead of hierarchy*, thus trying to make his product available to everyone: *gypsy houses for individuals from street to street.* (Woods, 1992:39)

meaningless architecture

Bernard Tschumi & Lebbeus Woods
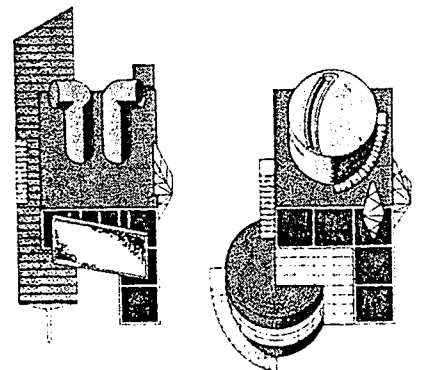
Bernard Tschumi, Parc de la Villette, Paris (La Case Vide, Detail, 1985) Papadakis 1989:83
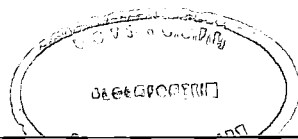
Smit (1995:31) gives another perspective on Woods' designs. *With his visual insight, Lebbeus Woods is creating and recreating at the moment bio-morph imaginary worlds. He is concerned with existing cities and not with future cities as social-theoretic propaganda like Le Corbusier and Van der Rohe. Woods' work can be seen as a break away to the unknown. His polemic is scientific and is born in the light of Einstein's revolution - cities as metaphors of new cities. His architecture is science-fiction, a subtle rhetoric of things to come, a genuine utopia that is a-geographic and bio-morph.*

With this Smit indicates that meaning in Woods's designs is founded in the future - in things to come, in search of Utopia.

Through the follies (and this goes for the Freespace structures as well) Tschumi performed *a stylistic exercise, a play with aesthetics, the look, of high modernism - futuristic, mechanistic pure, uncompromising.* (Woolley, 1992:201) With these projects, the one built, the other unbuilt, Tschumi and Woods both ignored the historical culture of architecture - creating new symbols with a different kind of 'non-meaning' meaningfulness. Meaningful because it is an expression of an age, a product of a culture, a state of mind.

Bernard Tschumi, Folie No. 7, Parc de la Villette, Paris
Original: Gössel 1994: 368

On the creation of new symbols an extreme can be found in Boudrillard's (1981:202) view that signs should carry meaning which transcends culture and social background. *...The system circulation of signs... abolishes all reference, or even becomes its own referent, designs (e.g. sketches) the passage between societies.*

This may be the next step when dealing with signs. Currently the environment can be viewed as a projection of a social model, designing its own death. (Ibid.) This can lead to the restoration of nature (which is true meaning, not limited by political or social rules) as simulation model. Any social references will be discarded. Architecture-on-paper provides a dynamic tool to

research meaning, meaning that already exists in imaginary architectural space. This space may transcend the cultural limits.

3.1.3 Experimenting with space itself

The site plan with its *dimensional and linear definition... is generally taken to propose a division of space,* according to Leatherborrow (1993:7) He defines space as *a container so great that it has no limits at all. Space extends so far as to include all actual sites, and more, even all possible sites.* Leatherborrow puts space in the hands of the space-maker or designer when stating that space is unlimited until it is confined to a certain shape with boundaries and identity.

Leatherborrow on space

Piaget (1956:6) shows that our *'space-consciousness' is based upon operational schemata,* that is *experiences with things.* Piaget viewed the way in which children play as an investigative process, a *vital form of research.* (Rheingold, 1991:375)

Piaget on space-consciousness

Rheingold (1991:372) quotes from Bruno Bettelheim's article in the Atlantic Monthly, March 1987, titled 'The Importance of Play'. Bettelheim believes that *a child, as well as an adult, needs plenty of what in German is called 'Spielraum'. He defines this word as more as the obvious meaning, namely 'free scope, plenty of room' but as the will to 'move... one's mind, to experiment with things and ideas at one's leisure,... to toy with ideas'.*

Spielraum

Jencks (1990:273) finds such a 'spielraum' project in the work of Zaha Hadid, 1983. Her *winning competition entry for the Peak Club in Hong Kong* is reckoned to be *one of the first projects to convey... dynamic space,* according to Jencks. He describes the project as follows:

In one of her 'exploded isometric' paintings she shows architecture flying apart over the styled mountains of this coastal city. Building elements and rock outcrops... are equated. All of this is made
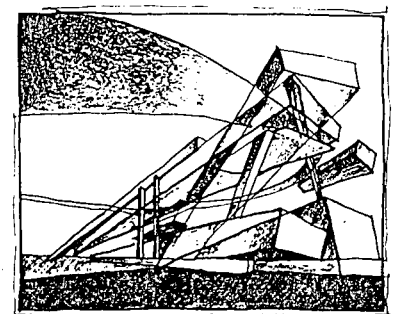
Zaha Hadid, Hong Kong Peak, 1981-3, Elements of the void. Original: Papadakis 1983:126

more explosive by an oblique viewpoint - an anamorphic projection - which gives a distorted picture except from one point of vision. Zaha Hadid used the isometric projection on paper as skill to experiment with space - succeeding so well in this, that her entry won the competition. *Unfortunately the club was never built.* (Jencks, 1991:273)

Architecture-on-paper is not only functioning at the present time as medium of experimentation.

In history *Bramante's 'illusionistic' choir in Milan is one of the steps leading from Massaccio's fresco* [also a form of architecture-on-paper] *to St. Peter's in Rome.* This *choir in the church of Santa Maria Presso San Satiro (1479 - 1514) is actually only a small niche. It was half built up and half painted, in order to produce the greatest possible effect of depth with the space at the artists disposal.* (Giedion, 1954:36) Bramante's choir functions as interface between architecture-on-paper and built 'physical' architecture. It is an experiment with space itself where drawings (on a wall) assist physical architecture to create spatial illusions.
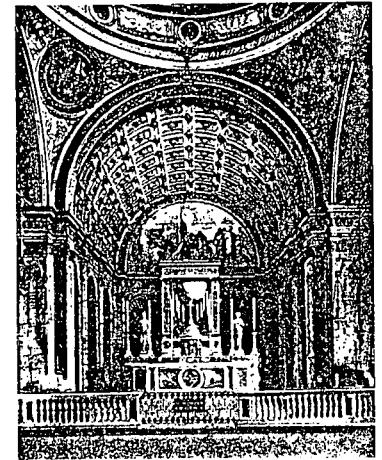
Bramante, Illusionistic choir in Santa Maria presso S. Satiro, Milan, 1479 - 1514.
giedion, 1954: 36.

Norberg-Schulz (1971:10) distinguished between five space concepts:

Norberg-Schulz on space

- *the pragmatic space of physical act*
- *the perceptual space of immediate orientation*
- *the existential space which forms man's stable image of his environment*
- *the cognitive space of the physical world and*
- *the abstract space of pure logical relations*

He defines these as follows: *Pragmatic space integrates man with his natural, 'organic' environment, perceptual space is essential to his identity as a person, existential space makes him belong to a social and cultural totality, cognitive space means that he is able to think about space, and logical space, finally, offers the tool to describe the others.* (Norberg-Schulz, 1971:10)

Norberg-Schulz does not include imaginary space. According to his definitions,

- imaginary architectural space is not necessarily pragmatic for it may estrange man from his natural environment.

- Imaginary architectural space is not always bothered with identity and orientation, it seeks to leave these behind, disposing of them as unnecessary weight.

- Imaginary architectural space reaches out to become multi-dimensional, making room for whatever space man can imagine.

- Imaginary architectural space may enlarge man's image of what space can be, but functions free of the physical world and its limitations.

- Imaginary architectural space is in essence abstract. If Norberg-Schulz thinks of abstract space as a tool to describe the other, imaginary architectural space gains significance.

When Norberg-Schulz's 'space' is substituted with 'imaginary architectural space', it is possible to make an easy derivative as to whether the statement is still true. This indicates that the concept of imaginary architectural space is just as definable as the concept of space.

Space is only allowed to enter the gates of architecture on the condition that it is subjected to the self-referential, autonomous, rational terms with which the profession protects itself form the world beyond. Space IN architecture, not architecture in space... The latter proposition challenges the presumed authority of the profession. (1997:http7) This quotation from the internet challenges architecture to put itself in service of space, to allow space to experiment with architecture.

When referring to paper specifically as medium, architecture-on-paper is not able to challenge architecture in the same way. This is an indication that architecture-on-paper does broaden architecture's field of practice.

3.2 Architecture-on-paper to create and investigate theory

'Architectural historians have consequently found it easy to fall back on the belief in a unitary, all pervasive Zeitgeist ... Everything is seen as 'a reflection' of something else - the economic structure, the spirit of the age, the prevailing theology and so on. There is an evolutionary assumption that in each epoch a new economic structure or a new Zeitgeist is 'struggling to be born'. It thus becomes the obligation of the creative spirits, be they poets, architects, or whatever, to 'express' that new nascent spirit.' (Watkin, 1977:113)

Zeitgeist

Architecture-on-paper has been used throughout history as a means of experimenting with new ideas. The earlier handicap of drawings dissolved in time, to bring expression on paper more in line with reality.

Architecture-on-paper has matured to the extent that it possesses the ability to set Watkin's 'nascent spirit' free. Zeitgeist and avant-garde are two terms describing the spirit of the time and the most advanced ideology to work towards predicting the Zeitgeist of the future.

In 1982 Barthes (1982:191) saw the avant-garde object as essentially theoretical: *the double pressure of politics and intellectuals ensures that it is now theoretical positions (and their exposition) which are avant-garde, and not necessarily creative work.* Wondering what the new role of theory is, he answered that its *active role is to reveal as past what we still believe to be present: theory mortifies, and that is what makes it avant-garde.* Though theory in our time still seems to reign as avant-garde, creative work as found in architecture-on-paper, computer animation and virtual reality seems to be competing well for this threshold.

theory as Avant-Garde object

Kruft (1985:16) seeks understanding for this time-bounded quality of architectural theory: *In order to appreciate how architects saw*

history and theory

their task it is of great importance to understand the theoretical foundation of architecture at the time, and how this had evolved. Theory of architecture always belongs to a historical context which is in part causative. New systems emerge from debates on older systems; there is no such thing as an entire new system, and if a system claims to be of such, it is either stupid or dangerous. Thus architectural theory and the history thereof are synonymous, to the extent that the present position always represents a phase in a historical process.

Harbison (1991:10) does not see this close relationship between architectural theory and history as always positive when warning that *the past can fertilise the present,* but it can also *cascade violently into it, exerting an immobilising curse.*

Another close relationship exists, namely that between the history of theory and the history of architecture-on-paper. This relationship is obvious when, in search of a history of architecture-on-paper, the researcher finds it documented in books and papers on the history of theory. Architecture-on-paper becomes a tool to create and investigate theory.

theory and architecture-on-paper

On the question: What is architectural theory? Kruft (1985:13) asserts it to be *the history of thought on architecture as recorded in written form.* This brings another dimension to architecture-on-paper: that of the written word (Also see 5.2.1), with the words describing/criticising architecture as found in the past/present by the architecture historian/critic. Kruft views *architectural theory as synonymous with its writings,* again emphasising the strong relationship between architectural theory and architecture-on-paper, namely their interdependency.

theory as thought

Jencks (1990:14) - also an architectural critic - credits Peter Eisenman's *editorial 'Post-Functionalism' in the pages of his significantly named magazine 'Oppositions' as the birth of the new Mods.* With this Jencks underlines the belief that architecture-on-paper - in this case Eisenman's magazine article - has the strength at its disposal to create theory.

The history of architecture-on-paper can be found documented from various views: the perspective drawings of Filarete, the paintings of Piranesi, the experiments of various architects within the theory of the time, etc. It provides a visual basis for evaluating theories of the past.

Emil Kaufmann (cited by Kruft,1985:16) said the following in 1924: *Artistic theory is itself no more than an expression of the spirit of the age, and its significance does not reside in the fact that it points the way for its own age, but in its serving subsequent generations as a monument to past ideas.*

<div style="float:right">artistic theory</div>

Kruft agrees with Kaufmann on the fact that architectural theorists write for the age in which they are living, but the influence of these writings can also be felt at later times. *Vitruvius, for instance, was of virtually no consequence to Classical Rome, and his meteoric rise to fame began only in the fifteenth century.* (Kruft, 1985:19)

Architecture-on-paper did not only exist in history as a means of documentation. In her essay 'Architecture as an object of thought' Patricia Lombardo sees *Piranesi's fragmentation, distortions and contamination as too rich to be mere 'bricolage'. They compose 'a systematic criticism of the concept of space', allowing the historian to reinterpret the mid-eighteenth century European culture.* (Diani, 1988:82) An example of paper functioning as historical data-base.

<div style="float:right">critical theory</div>

Piranesi, artist and architect, uses his drawings as critical tools, commenting through them on the thoughts and ideas of the time in which they were executed: architecture-on-paper expressing the 'Zeitgeist".

When theory expresses the Zeitgest, its widespread implication is noticed across the boundaries of the different disciplines. *While tending to be formulated at first in the literature* [see 5.2.3], *theory in its various incarnations cannot be ignored in the present intellectual climate; theory between the disciplines addresses in*

significant new ways the theory's place in contemporary intellectual debates. (Kreiswirth, 1990:cover)

Jencks comments in the same year (1990:14) on Deconstruction's first appearance in the literature as follows: *As often happens, a literary event preceded an architectural one: written word and spoken word led a change in the more dependent sign systems, the visual arts and architecture.*

Paper serves as medium between the disciplines - a basis on which ideas can be formulated, imaginary spaces being defined (whether in words or lines - see 5.2.1/5.2.2), available, easily duplicated, economic.

When Lebbeus Woods said the following concerning his designs on paper, it can be viewed as a reaction to Charles Jencks writings from the previous year:

> Woods (1992, 40): *"In a consumer society, the only resources is to make one's work indigestible. Otherwise it will become the inevitable end-product of all processes of consumption: excrement."*

> Jencks (1991:9): *"..the fate of all successful movements, is something to be celebrated. Born in a fit of love, they grow to maturity all to quickly, are vulgarised, mass-produced and finally assigned to the scrap-heap of history."*

Both these indicate what has been said: *Theory mortifies, and that is what makes it avant-garde* (Barthes, 1982:191). But theory cannot mortify unless it also *ceaselessly invents itself, invents theoretical positions, otherwise it will have to mortify itself.* (Kreiswirth, 1990:232) Architecture-on-paper can serve here as the invention medium or the invented product.

In conclusion, Kruft's warning about the presumption that 'new thoughts are obviously better thoughts' should be taken to heart:

literature's influence

theory mortifies

Developments are usually the result of new needs and new techniques, though they may also be the expression of purely intellectual ideas. By no means can one assume that the onward march of historical development is accompanied by a rise in the quality of architectural theory; in fact, intellectual stagnation and loss of sophistication can often be observed.

New representation technologies (e.g. computers) are replacing historical ones (paper) at a tremendous rate. The individual should strive to maintain an objective viewpoint about globalisation and the internet, using his/her "filters" to eliminate all that is not quality.

3.3 Architecture-on-paper as a bridge between theory and practice

Bonta quotes Kaufmann to have argued in 1924 that *although*   parallels
practice is not a direct consequence of doctrine, they are both equally conditioned, equally unfree. Between artistic doctrine and artistic practice, concluded Kauffmann, *there is no casual relationship but parallelism. One may add that artistic interpretation is also rooted in it's times, conditioned and relatively unfree: interpretation also are parallel to artistic practice and doctrines.* (Bonta, 1979:123)

The conclusion can thus be made that our expressive systems are reflected in the trends of contemporary architectural and artistic production and in our response to the production of the present and the past.

For the sake of the next argument by Bonta (1979:129), 'theory' can be replaced with the term 'architecture-on-paper: *A building can naturally reflect its belonging to a certain style or a certain type, as a matter of fact, without there having been a conscious effort by the designer in this direction; or designers can take a deliberate effort to let buildings proclaim its stylistic or typological affiliation. Also, interpreters may perceive or fail to perceive the presence of design intentions – either in their dealing with types or*

styles. Moreover, buildings achieve their meaning – typological or historical – as a result of their position within a system, and placed within different systems their meaning is bound to vary. Both architectural history and typology are therefore subject to architectural theory. Theory, not the history of typologies, is the true bridge between typology and history. (Bonta 1979:129)

Kruft (1985:16) asks the question: *'What is the relationship between architectural theory and the built architecture of its time?'* He comes to the conclusion that theory alternates between being *an 'ex post facto' set of reflections complementing, justifying, and individualising what has already been built* on the one hand, and *it lays down programmes and requirements for architecture to fulfil.*

Architecture-on-paper, with its closely knitted relationship with architectural theory, can serve as the medium for post-mortem examination of existing built architecture, on the one hand. On the other, architecture-on-paper can challenge buildings before being built by serving as a "check-list" for architecture at a specific time.

Kruft warns however that *there is a certain ambiguity in the influence of theory on built architecture. It can lay down laws which make it almost impossible to produce really bad architecture; at the same time, making aesthetic conventions normative can stifle, or at least hamper, creativity.* (Kruft, 1985:17)

The strength of architecture-on-paper may therefore be found in its post-mortem quality, as a medium to examine past theories, ideas, mistakes, to be learnt from for the future.

However, the true meaning of architecture-on-paper as a bridge between theory and practice can however be found in the fact that Kruft shows examples in which the one cannot function properly without the other. When he searched for historical cases in which architectural theory functioned in close relationship to actual buildings, he listed the names of great architects who *left a body of theoretical work in addition to their architecture: Palladio*
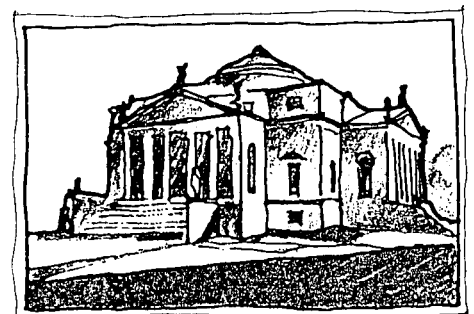
Palladio, Villa Capra, begun 1550, Vincenza, Italy. Original: Copplestone 1983: 194

and Frank Lloyd Wright [his drawings of unbuilt designs for Talliesen as architecture-on-paper], *for example...* The interdependency of these is voiced by Kruft who views it as essential for the observer to have the knowledge of both their theoretical work as well as their built architecture in order to fully understand their work. (Kruft, 1985:17)

Kruft also shows an application in history by referring to city planning (Refer to 2.1.3): In 1527 *Albrecht Durer published... a treatise on fortification. The town plan of the town of New Haven in Connecticut, drawn in 1638, is said to be influenced by the Utopian town plans of Johan Valentin Andreae's 'Christianopolis' (1619) and Villalpando's reconstruction of Solomon's Temple.* Kruft feels that the work of Durer influenced it much more than these named above. Whatever the case might be, it can be concluded that in town planning certain previous Utopian plans and solutions did indeed have an influence on the layout of real towns and cities.

Durer's influence

James Corner (1993:64) writes from another architectural perspective, namely landscape architecture. He comments on the value of drawings for the builder: *For the builder, drawings are demonstrations, showing through analogy how particular ideas may be projected and built in the landscape. Unfortunately many landscape architectural offices tend to use drawings in a codified, production-line sequence that quickly enables the project to be brought to closure in a neutral, objectified and self-limiting way.*

drawings for the builder

This relationship between theory and practice cannot be seen as complete without referring to a new way of 'building bridges' between them: namely computer technology.

Nixon (1996:40) describes a new intersection as follows: *From Vitruvius' ancient Rome to roaming in virtual reality, architecture is forming a hybrid at the intersection of physical space and cyberspace. 'Recombinant Architecture' is the name Mitchell gives to hybrid architectural form that are beginning to appear*

along the infobahn, at the intersection of physical architecture and cyberspace.

Harbison (1991:161) identifies a vulnerability in the dualistic existence of theory and building (practice) when he mentions that *no other art is vulnerable in a remotely similar way.* In his explanation of this vulnerability he touches on architecture manifested on paper on the one hand, and opposite it structures in stone and brick.

dualistic nature of architecture

4. Chapter four: The significance of imaginary architectural space.

4.1 As first step in the design process.

If architecture-on-paper can serve as the bridge that spans the distance between theory and practice, between idea en building, it can be said that imaginary architectural space is the first step in the design process. By means of architecture-on-paper as documentation medium, the space becomes known.

Frascari, (Borbe, 1979:1315) when talking on Architecture as Text, stated that Kahn emphasises the fact that *there exists an order preceding design. This order stems in the man himself and in his whole cultural expression.* It is the same Khan who was earlier quoted (Refer to 1.5.2) to have said that *'Architecture does exist in the mind'.*

In the process of making architectural space, imaginary architectural space reveals its significance in the very first step:

- It may be a game that never gets communicated or
- imaginary architectural space gets lost in memory because it was never communicated and may never be recalled. Architecture-on-paper communicates these spaces and saves it from 'non-existence'.

4.2 The significance of communicated imaginary architectural space

When imaginary architectural space is communicated, the communicator is creating a representation of the mind's image. This representation comes into existence with its own goals, which can be any of the following:

- Creating a prototype (by means of a communication medium such as paper, a hardboard model or computer)

- An expression of fantasy (towards Utopia)

- A challenge to technology

4.2.1 Creating a prototype.

The term prototype is generally understood to be *an original thing or person of which or whom copies, imitations, improved forms, representations etc. are made.* (Oxford Complete Wordfinder, Reader's Digest. 1990:1227)

Giedion (1954:20) gives architecture a 'living' quality with the next quote: *An architecture may be called into being by all sorts of external conditions, but once it appears it constitutes an organism in itself, with its own character and its own continuing life. Architecture can reach out beyond the style to which it belongs.* (Giedion, 1954:20)

architecture as a living organism

Christiaan Norberg-Schulz (1971:13) also gives architecture a life of its own. According to him *it is nonsense to say that man is always the centre of architectural space, and that the directions of architectural space change with the movement of the human body. Architectural space certainly exists independently of the casual perceiver, and has centres and directions of its own.*

One can therefore come to the conclusion that imaginary architectural space can be seen as the first prototype model: the model of the mind.

Heath (1984:7) states that *models in the sense of analogues, which can be constructed and manipulated in advance of actual execution, are essential to self-conscious design. The use of such analogues, or more accurately homo-morphs, is in fact what makes self-conscious design self-conscious. Plan and action are separated. The balance between what is part of the plan and therefore self-conscious, and what is part of the execution of the action and therefore taken for granted, both historically and according to the nature of the task...*

the need of models

Heath justifies this by showing that in a historical overview of design the *progressive, if slow, development in the power and scope of modelling, through the oldest methods, literal physical models and drawings, continue in extensive use.* (Ibid.)

These models have been replaced through history by drawings and latterly by Computer generated models as well as animation that takes you through a building in 'three-dimensions'.

Heath sees the built model as the next step: giving physical body to the mind's model by creating a scaled version.

Antonio Gaudi's plaster models of the Sagrada Familia, Barcelona, at the present time located in the basement of the incomplete building, have the power to give a clearer view of the building (even though it is a scaled version) than the building itself. Some of Gaudi's models of other projects were even full-scale, temporarily erected as experiments preceding the real thing. These models function as architecture-on-paper, built as experimental exercises for the real. When imaginary architectural space is communicated through scaled versions, be it scale 1=200, 1=10 or 1=1, etc., by means of architecture-on-paper, with cardboard or cheap materials, architecture-on-paper functions as architecture.
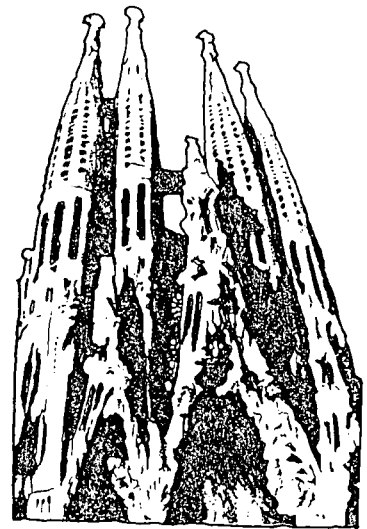
Antonio gaudi, Church of the Sagrada Familia 1884 - 1926 +. Original: Van der Meer, 1997.

models

Rheingold (1991:213) views *a good model [as] a thinking tool and a communication device that gains value when it is used by a group or people who are organising some kind of 3D spatial structure like a building or a port.*

Another example of the communicational power of prototype models can be found in the present time: Daniel Libeskind's exhibition at the NAI building.

From their website (http5) the NAI said the following:
Generally visitors at an architectural exhibition have to be satisfied with models, drawings, photos or computer animations to get an impression of the three-dimensional feeling created by
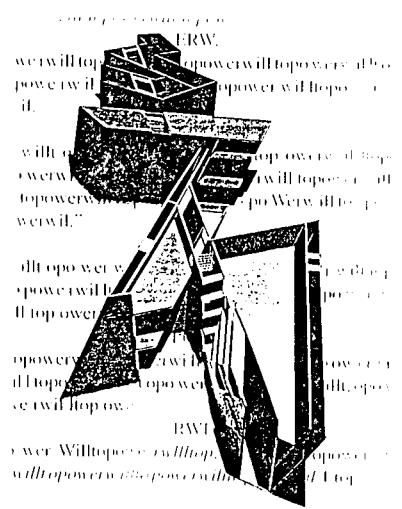
Daniel Libeskind, Extension to the Berlin Museum with the Jewish Museum, 1989. Original: Libeskind 1991:90

architecture.   But even the most sophisticated computer animations cannot replace the physical experience of space.

Special about this exhibition is the fact that an approach has been opted for in which a survey of Daniel Libeskind's work is given in a labyrinth designed by him for the occasion and made in close co-operation with Cecil Balmond of the Ove Arup engineer's firm. This allows the visitor a three-dimensional experience of the Libeskind architecture, in a way which is not possible when using the traditional ways of representing architecture...   The construction transforms the NAI large hall into a completely new space. It consists of a spiral labyrinth (maximum height 9 metres), made from fifteen slanted walls with an overall surface of 1800 square metres. The spiral is based on the design for the extension of the Victoria and Albert Museum in London.

life-sized models

Here a replica "model" big enough to walk around in is being used to change one space into another - one that reminds one of the architect's work that is being exhibited. It becomes the exhibition area for drawings done by the Architect's firm for buildings completed or under construction, by an architect known for his working only on paper or with models. The question can be asked as to whether the scale of 'a "model" e.g. 1=100 makes it non-architecture while the full scale building (1=1) does in fact make it architecture. This means that the fact that the full-scale building is habitable gives it another quality - one on which architecture depended to exist through most of known history.

Umberto Eco (1986:299) comments on scaled versions of buildings as found at expositions: *The architecture of the contemporary exposition is used to connote symbolic meanings, minimising its primary functions. Naturally an exposition building must allow people to come in and circulate and see something. But its utilitarian function is too small in comparison with its semantic apparatus, which aims at other types of communication.* Here the prototype model functions as a medium of communication, and not as the habitable product.

When debating the value of prototype models (whether in the mind or in scaled form), one cannot ignore the 'walk-trough' model that is possible through computer technology.

Rheingold (1991:29) argues in favour of the architects: The *idea behind using architectural walkthroughs as one of the "driving problems" for Virtual reality development is that the main thing architects do is envision models of three-dimensional structures. This is a complex cognitive and perceptual task, exactly the kind of problem that humans still solve better than computers.*

He describes architects as people who *build up mental models of the projects they want to construct, but those models only exist in the individual architect's mind's eye and that explains why so much sketching and drafting go into the job of communicating those mental models to clients.* Rheingold does see the 'mental models' as more real when the architects begin to *communicate their specifications to contractors. The architect's model becomes formalised - but they are still depicted on a flat sheet of paper or display screen.* (Ibid.)

mental models

Rheingold (191:29/30) concludes that *a three-dimensional model large enough to walk though* can serve the architect's means of conceiving three-dimensional space as well as help him to give this imaginary space more reality when presenting it to his client.

Architecture-on-paper gives architects a powerful tool to express imaginary architectural space. Through the refinement of representation it is possible for the architect to bring the client closer to the final project that will be built.

Prototypes attempt to be examples for reality that are as close as possible to reality. The computer gives the architect even more tools with which to create models. These models can be represented in so many more different experiences. The focus is reality and as such prototype serves reality.

It is representative of imaginary architectural space, as it is generated in the mind and communicated via a communication medium, such as paper or more recently the computer.

When Le Corbusier designed his Radiant City for three million people in 1922, he produced another kind of prototype: a vision to be applied in another unbuilt project of his, a mere three years later. In his Plan Voisin for Paris (1925) he *applied the techniques of the city of three million to Paris.* (Tod, 1978:139)

Copplestone (1983:358) finds this application of Le Corbusier's theories to other real and ideal projects daring but with some peculiar flaws for such *brilliantly ambitious schemes.* Projects like Plan Voisin may contain many solutions, but may lead to a lot of new problems to solve, according to Copplestone.

In 1972 this Plan Voisin itself can be found in part represented in a self-conscious design by Rem Koolhaas. In his City of the Captive Globe, Koolhaas represents New York City as a Rationalist icon town. Koolhaas' design is without context or time in order to *banish any reality which does not serve* [his] *original mania,* because he placed different icon buildings from different times on one city plan. Here one finds Le Corbusier's original towers (1925), the Plaza Hotel, the World trade Centre and many others together in a layout of blocks, each representing its own kind of madness. (Jencks, 1990:133/134)

Rem Koolhaas used this application of built and unbuilt intentionally iconic to communicate the thoughts of his time in an architectural language. Architecture-on-paper serves to provide some of the icons to create a powerful image without time and context. Koolhaas thus used built (e.g. World Trade Centre) and unbuilt (e.g. Corb's tower from Plan Voisin) together with the same content and placed built architecture and architecture-on-paper on level terms with this approach.

The City of the Captive Globe in 1972 functions as a Rationalist Utopia. Architecture-on-paper functions as one of the

Le Corbusier's Radiant City
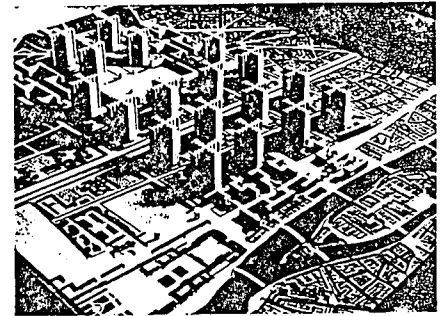
Le Corbusier, Plan Voisin for Paris . 1925
Kruft 1985 : plate 185

City of the Captive Globe
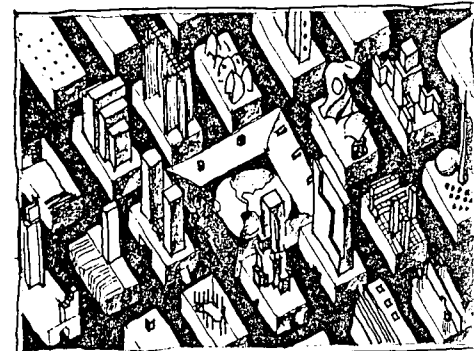
Rem Koolhaas, City of the Captive Globe . 1972.
Original : Jencks 1990 : 135

experimental fields for Utopian dreams in search of a place to become real.

Another example where utopian city-planning functions as prototype for future projects and debates, can be found in the concepts of Jane Jacobs' classical 'The Death and Life of Great American Cities', 1961. Coleman (1985:9) cites her arguing that *it was not enough to observe what has been bad about cities and then invent what might be a good substitute.* Jacobs expects utopian proposals to focus on more than aesthetic appearances when striving to *promote a stable social structure.*

Jane Jacobs

In applications of Jacob's prototype concepts for future city development, we find Oscar Newman's 'Defensible Space' of 1972. Coleman (1985:13), however, does not seem to think Newman's proposals are of the same brilliant standard as Jacob's classic.

The social undertone of these concepts reminds one very much of those of Le Corbusier. His theories on city planning can be found expressed in a series of plans for new cities in 1920. When Copplestone (1983:358) reviewed them in retrospect, he found them to create just as many problems as that they were solving. He singles out one in particular, namely Brasilia, designed according to the Corbusier ideal, which he describes to be *at best unlived in, and, at worst, uninhabitable.*

Brasilia

These prototype models with utopian qualities must therefore be judged objectively from more than one viewpoint before being applied to specific situations. They did however start a new debate at the time and provided a basis for new ideas, and should be recognised for these qualities.
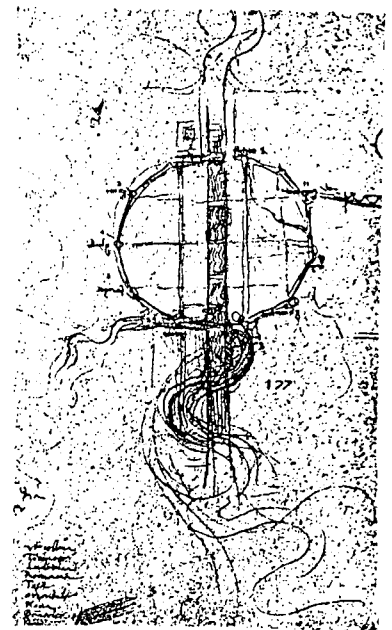
Leonardo da Vinci. The city of Florence changed into an 'ideal city'. Giedion 1954 : 53

Lebbeus Woods makes use of a competition project to set a prototype. In his projects for Sarajevo and Havana he proposed *in various forms a number of peripheries and edges commonly referred to as 'walls'.* In his project named 'The Wall' he tried to make spaces for 'people of crisis', giving them space inside the

Lebbeus Woods

traditional wall as a new place where they can belong. However, he does not make predictive designs, but rather tries to provide *guides indicating ways of reforming the space that will stimulate transformations by others.* With this he gives the occupier of the space free range to make space for himself within the set boundaries of the 'wall'. (Woods, 1996:69)

By means of this competition entry, Woods sets a prototype for other architects to learn from - giving the user of the space a voice also in the quality of his surroundings. He designs a prototype 'building' as well which is not specific in its definition of boundaries, but adaptable to clients needs in the specific architectural context.

4.2.2 As an expression of fantasy (Towards Utopia)

Utopias afford consolation: although they have no real locality there is nevertheless a fantastic, untroubled region in which they are able to unfold; they open up cities with vast avenues, superbly planted gardens, countries where life is easy, even though the road to them is chimerical...utopias permit gables and discourse: they run with the very grain of language and are part of the fundamental dimension of the fabula. Jacques Derrida cited by Johnson (1994:70)

Less strictly, utopia applies to any concept or application aspiring to an ideal. What is not made clear by dictionary definitions, however, is that utopia is primarily a social construct, not an architectural one; it is largely indifferent to its **physical manifestation**.

The origin of the word Utopia is found in 1516. Sommer (1969:145) dates it back to this year when Sir Thomas More, a writer, described an imaginary island called Utopia in his book with the same name, *which enjoyed perfection in politics, law and family relations.* Sommer shows that *More's choice of a name was not accidental and came from the Greek ou (not) and topos (place) to*

origin of the word

emphasise that Utopia did not and probably could not exist, although it was an ideal island towards which men could strive.

Tod (1978:29) views More's "Utopia" as the book which gave a name to the whole tradition of *speculation in ideal states,* to the spirit of change and excitement which were typical of the time.

The concept of Utopia as well as the word itself, according to Sommer (1969:148) is *surprisingly frequent in architectural books and articles. It seems to fill much the same role for architects, as does health for medical practitioners and efficiency for engineers - the ultimate goal.*

Johnson (1994:71) comments on the architectural equivalent of the Utopian ideas of Colin Rowe and Fred Koetter, formulated in 1978. According to Johnson they *discern two versions of the utopian idea, the classical utopia, 'an object of contemplation' with the ideal city as its architectural equivalent, and the activist utopia, 'a blueprint for the future' or 'an instrument of social change', its architectural equivalent being almost every architectural or planning invention since the Enlightenment aspiring to some kind of perfection*

Rowe and Koetter

If architecture-on-paper can be the search for Utopia, for the ultimate in design solutions, the problem-solving quality of architecture-on-paper must be ignored, for utopia as the ideal situation is not concerned with problem solving as such.

Banham counters utopia and the ideal city, saying that *utopia is often obsessional about the proposed social system, but not too concerned about architectural form. Only in the nineteenth century...did the two kinds become conflated, and only in the twenties was social Utopia confused with 'architectural adventurism'.* (Johnson 1994:71)

Banham

In 1904 Tony Garnier's Industrial City project was exhibited in Paris. As is found in the projects of Ledoux and Godin and others, this Utopian project also addressed the social problems at the time, for
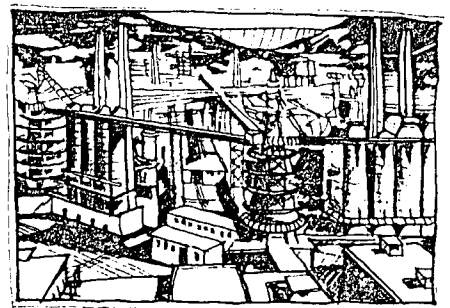
Tony Garnier, Cite Industrielle 1898 - 1904.

example in the schools of Garniers Industrial City where boys and girls were to receive the same education. (Tod, 1978:128/9)

Johnson (1994:52) reports on Tony Schuman to have said of the projects of Garnier, Ledoux and Godin, that they "*share a belief in the perfectibility of human society and in the role of architecture as intrinsic to this transformation.*"

According to this quotation, the work of these architects, who all designed architecture-on-paper, strives after perfectibility of human society through their designs. As such, architecture-on-paper's role in utopia / the perfect city, is one to be acknowledged.

Johnson himself sees *Utopia as alive in architecture, not as a conventional idealised future but as an exilic present, a no-place here and now that design-talk is trying to assemble, unfamiliar words attempting to massage unfamiliar architects into likely candidates for a consummate future.* (1994:73)

Fantasy's role in Utopia is recognised when Hume (1994:xii) states that *it becomes the search for Utopia in the deliberate departure from the limits of what is usually accepted as real and normal.* Hume agrees with Marcel Schneider that *the fantastic lives on illusion, or delirium sometimes, always on hope and above all on the hope of salvation.* (1994:15)

Utopia as fantasy

In literature, fantasy's attraction for the writer is the act of creating a secondary world - imaginary architectural space. *Tolkien used fantasy for its refreshing effect of defamiliarisation, the newness available to us only after we have freed ourselves form our sense of possessing the familiar.* (Hume, 1994:16) Tolkien communicates fantasy, but also fantasy space.

Hume (1994:20) further defines fantasy as *the desire to change givens and alter reality - out of boredom, play, vision, longing for audience's verbal defences.* He views Tolkien's way of identifying fantasy as 'human activity' as appropriate and adds that fantasy

Hume on fantasy

possesses the ability to *activate whatever it is in our minds that gives us the sense that something is meaningful.*

With this focus on fantasy's role in literature, Hume concluded that, in literature, fantasy serves the following functions: (Hume, 1994:196)

(Note: an application of fantasy as found in imaginary architectural space is made by the researcher. The fact that it is possible to apply the role of fantasy to other disciplines, underlines the Utopian quality of fantasy as ideal and its existence across the boundaries of the disciplines.)

- *It provides the novelty that circumvents automatic responses and cracks the crust of habitude.*

  Habit in architecture, as in any other discipline, leads to stagnation which in turn kills creativity - a vital necessity for design.

- *Fantasy encourages intensity of engagement, whether through novelty or through psychological manipulation.*

  When communicated on paper, fantasy can be used as bait to grab the attention of its audience and so communicate new ideas (theories) to a wider audience.

- *Fantasy provides meaning-systems to which we can try relating ourselves, our feelings, and our data - it asserts relationships.*

  Fantasy can function as a tool in architecture-on-paper in search of meaningful space.

- *Fantasy encourages the condensation or images which allows us to affect its readers at many levels and in so many ways.*

  Fantasy in architecture broadens the field of the profession - links it with other disciplines.

- *Fantasy helps us envision possibilities that transcend the purely material world which we accept as quotidian reality.*

Fantasy challenges architecture in respect of other possibilities for materials, technology,   etc.

(Note that fantasy in this application could easily be replaced by imaginary architectural space without losing meaning.)

Fantasy may be viewed in a positive way above, but it also may possess the ability and power to estrange us from the physical world in which we have to function. According to Mosco (1982:ix) *the dominant fantasy...will offer masses of people the opportunity to learn, shop, bank, work, play, and generally enrich their lives without ever leaving the living room.*

Our physical world thus becomes smaller, while our fantasy world (e.g. cyberspace) which is not physical becomes the space within which we live our lives (this space is limited only by our imagination).   Maybe Severino (1970:3) was talking sense when writing in 1970 that *it appears that architecture today (1970) is considered less and less necessary and is used, if at all, as a cosmetic!*

On the thought of estranging, Virginia Madsen (1996:http6) *finds the ability to be everywhere and nowhere at the same time without leaving home... the promise of the new era of telecommunications.*   She views this as *an image of a new architecture.   Of safe, high-speed travel, where the opaque space between 'here' and 'there' is rendered as absolute transparency, promising the elimination of There, collapsing it into Here, into Home.*

A new focus for living is starting to develop: reality now simulates fantasy. This thought is strengthened by Rheingold (1991:19) when stating that *another way to see Virtual Reality is to recognise that in the closing decades of the twentieth century, reality is disappearing behind a screen.*

smaller physical reality

fantasy as reality

Madsen argues that *the utopian ideals of modernist architects like Le Corbusier, who sought to open up buildings with light, have been replaced by new windows - TV and Computer screens - which, according to Scott McQuire, may lead to the overexposure of domestic space.* (1996,http6)

She further warns that *these apparent windows are in danger of becoming walls, walls on which we are able to project intense and phantasmagoric displays of ourselves illuminated by the glow of the new frontiers.* Madsen views this new window, that is the 'Screen Window', as an intrusion into man's domestic and private space. She sees some of this as very realistic, but adds that *there is a compelling sense of unreality that this is all soap opera, a fiction.* (Ibid.)

Fantasy has the ability to be present in physical architecture. Woolley (1992:201) states ironically that, *just as the industrial revolution produced a mass migration from farm to factory, the post-industrial revolution seems to be producing a mass migration from factory to fantasy. Just as Disney has turned imaginary fairy castles into buildings, so tourism has turned Europe's buildings into imaginary fairy castles.*

The past becomes a fairytale and everyone wants to be a part of the fictionalised reality.

According to Woolley (1992:201) *Paris is itself a theme park.* President Mitterand issued a set of 'grand projects' in the form of monuments to be designed and executed as part of celebrations of the bicentenary of the French Revolution: *a glass pyramid covering the entrance to the Louvre; a soaring square at La Défence, extending the axis of the Champ-Elysées; a people's opera house at the Bastille; an urban park at la Villette.* (Refer to 3.1.1.2)

Like the castles from the Middle Ages, these structures do present a history. But through lack of understanding its content they become

reality presented as fantasy
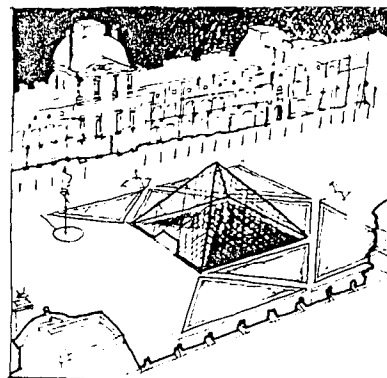
IM Pei, glass entrance to the Louvre, Paris 1984-9
Original: Jencks 1990: 182
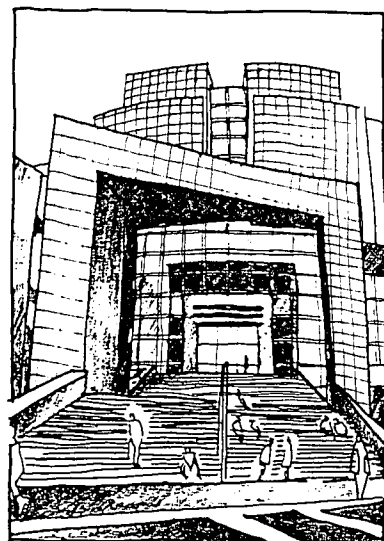
Bastille Opera House, Paris
Original: http://11

part of a fantastic reality that influences their viewers only by the way they look.

Suzanne Stephens (1990:72) refers to the fantasy world of Disney filled with different considerations for the design architects. *Disney's utopian environments have always been about fun and fantasy, where life is clean, the good guys always win, and the intellectual age is somewhere under 11.* She says *that architects are warned that the pursuit of fantasy can easily lead to the frivolous and the kitschy - the nemesis of "good" architecture.* For architecture-on-paper this real make-believe world of Disney's is the result of a world first created on paper, hundreds and thousands of drawings to make the people of this world alive in their fantasy world - the making of a film. Here the physical architecture is exact replicas of the fantasy world - intended to be fantasy.

Eco (1986:43) also reports on Disneyland in connection with Utopia when he quotes Louis Martin classifying it as *'degenerate Utopia' - a degenerate utopia is an ideology realised in the front of myth.* Eco sees Disneyland as *more hyperrealistic than the wax museum, ...because the latter still tries to make us believe that what we are seeing reproduces reality absolutely, whereas Disneyland makes it clear that within its magic enclosure it is fantasy that is absolutely reproduced.*

In reports on the Disney hotels and office buildings that saw the light the last few years, Vincent Scully and Paul Goldberger (1988:45) report that the real lacks the quality of the imaginary. Scully sees the New Disney World as *somewhat pretentious, less appealing, much less affective than the old,* housing executives and projecting the message of wealth which is lost on the *innocent eye* and out of place in Disneyworld. These hotels and office blocks may be accepted as serious architecture, but they have lost the magic of the imaginary world when the scaled buildings of Disneyworld were exact replicas of the movie and the original drawings. Sometimes, it seems that fantasy loses its imaginary quality when it becomes real.

the Disney hotels
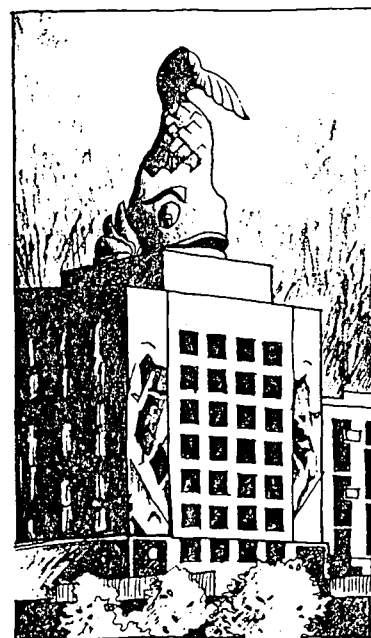
Michael graves, Walt Disney Dolphin Hotel. Original: Architectural Design: Post-Modernism on trial, : 45

While speaking of the movie-scene, Andrew Benjamin (1994:23) touches on another expression of fantasy through imaginary architectural space: that of the presentation of *the architectural within films that seeks to project the future.* The field of film production does offer the 'architect' of the stage on which this film is shot the advantage of a wider audience to be influenced.

Needless to say, most of the times this fantasy-world is not the focus of a movie, but merely the background, used to give a time-quality, etc., to the movie itself. The main function of this architectural fantasy world is to underline the script and to make it more real.

However, it is difficult to ignore films like Ridley Scott's "Blade Runner" of 1982 which predicts the appearance of Los Angeles in November 2019. (Benjamin, 1994:23) This disintegrated Los Angeles does still appear possible from a current perspective in 1998, but in contrast the Star Trek series of the 1960's appears to make use of childish mannerisms. (Hutchinson: 1993:38)

In short it is necessary to conclude that although the close relationship and interdependency of architecture and film is a study field in itself, its relevance for the sake of this study is to show that predictions of future architectural developments do tend to be naïve and untrue. These utopian images of times to come are again place and time related, for the stage designer predicts the future from his position in the present.

When Frampton (1980:280) describes Archigram's visions of walking cities in 1961, he cannot help regarding them *as the return of a repressed creativity, as the implosion of utopia upon itself.*

In the same way in which Koolhaas used New York City's master-plan (Refer to 4.2.1) to comment on existing buildings from different periods in his City of the Captive Globe, one finds Etorre Sottsass commenting on existing utopian dreams in his series of Pop Art lithographs in 1972. With his 'Walking City, Standing Still"

Etorre Sottsass

from this series, Sottsass commented through his lithograph on utopians *that believed in the linearity of technical progress.* According to Sottsass these beliefs were conquered by time and nature. One finds in this work the Walking City of Ron Herron, without legs, stranded on a beach together with tilting skyscrapers sinking into the sand. (Klotz, 1985:60)

Ettore Sottsass, Walking City, Standing Still, 1973
Original: Klotz, 1984:280

Etorre Sottsass used his lithographs as architecture-on-paper to comment on other utopias expressed on paper. Imaginary architectural utopian spaces on paper function as the research field for utopia itself.

Utopia challenges the designer/architect/dreamer/space-maker to produce imaginary visions of the ultimate space/place. In search of the ultimate 'non-place', they have to design and redesign space.

If architecture exists in the mind - that is without place - then Utopia (non-place) can be regarded as existing. This Utopia, that is the subjective idea of perfection, tends to manifest/communicate itself through history on paper. (Refer to 2.1)

reality of utopia

Utopia is a name that comfortably suits what it stands for. For Utopia will always be a subjective idea in subjective expression. The emphasis in Utopia shifts as different people communicate it.

4.2.3 To challenge technology

'There are those who hold there are no unbuildable buildings, only unbuilt ones. But even if we leave aside gross infringes or gravitational or other natural law - like three mile unsupported bridge spans or office buildings taller than the atmosphere is thick - we have no trouble finding interesting designs which would be betrayed by the techniques used to erect them.' (Harbison 1991:161)

A paradox exists between progress in the media and progress in technology. The media makes use of new mediums (e.g.

computer technology) to develop and represent fantasy further and further from the present, that is 'estranging' us from reality. Technology has the ability to make fantasy all the more real by means of new structural solutions (e.g. using Virtual Reality to make non-existing space possible to be experienced).

Architecture-on-paper may not be able to be carried out because of its far-fetched technological impossibilities, but the mere fact that the design challenges the technology brings into being the possibility that a technological solution may exist for this problem in the future.

An example from the past can be found in the already discussed work of Etiene-Louis Boullée. *His design for a cenotaph to Isaac Newton, the father of modern science and one of the greatly admired intellects in the age of Reason, was among many drawings based on the models from earlier civilizations - Rome, Egypt, Nineveh and Babylon. It was in such ideas that Boullée was able to free himself from the practical problems of construction and present a kind of architecture as yet scientifically impossible.* (Copplestone, 1983:268)

It has been argued that architecture-on-paper challenges technology to make imaginary architectural space realisable. When technology gains the ability to realise this dream, the need for such a realisation may no longer exist. The new ability, however, may lead to solutions of other existing problems/needs, which justify the challenge in the first place.

Architecture-on-paper dares technology to enlarge the amount of different expressions available in reality. But through the medium of the computer, technology creates a new field of expression so close to reality, that it can be seen as opposing reality with 'real' experiences in fantastic realms.

new expressions

Kambiz Memarzia (1998:http4) foresees that *in the near future, architecture experienced in four-dimensions and perceived as real, will not necessarily require physical building. This is due to the*

ever increasing advances in virtual reality technologies and the rate at which important discoveries are being made. This statement questions architecture as a profession.

However, computer technology has its drawbacks, as illustrated when Mitchell, cited by Nixon (1996:43) stated the following: *What architects and urban designers have always been concerned with is creating places for human interaction and supporting human interaction... So it seems to me that this is still what you have to do. But now you have to do it not just with bricks and mortar and doors and passageways and roads and piazzas and that kind of thing. Now you have to do it as well with telecommunications systems and software.*

computer as challenged technologies

Computer technology thus requires additional skills, which brings the education of these architects into the picture.

Rheingold (1991:17) seems to eliminate this argument when saying that *virtual reality is already a science, a technology, and a business, supported by significant funding from the computer, communications, design, and entertainment industries world-wide.*

The computer's power, demonstrated in the field's massive growth, makes it a force to be reckoned with, and impossible to ignore.

Rheingold (1991:61) further describes an enabling technology as *one that makes another technology possible. Virtual reality based on computers and head-mounted displays has been dreamed of for decades, but had to wait for enabling technologies of electronic miniaturisation, computer simulation, and computer graphics to mature in the late 1980s.*

The close relationship between different disciplines can be connected with the term 'convergence'. According to Rheingold (1991:62), *convergence is related to enabling technologies, but adds a slightly different flavour of the unpredictable: history shows that apparently unrelated scientific and technological paths may*

related technologies

converge unexpectedly to create an entirely new field. Sometimes, people working at the esoteric fringes of their fields may not even be aware that their work is converging on the research others are doing in fields that are not obviously related.

Computer technology is one that is being used and studied across the boundaries of the disciplines. It is a tool in aid of research on the one hand, and an object being researched on the other.

Kambiz Memarzia, however, does not see this as the threat that some think it to be, and he makes quite a controversial statement: *Cyber-architecture will not replace real architecture any more than virtual reality will supplant real experiences. Technology affects everything but replaces little.* (1998:http4)

the effect of technology

When Mitchell (Nixon, 1996:43) suggests that *what we need to do is extend the notion of architecture to encompass all of the means that are available for creating places of human interaction* it may be interpreted that architecture should extend its frame of reference to more than the obvious places of human interaction. This thought pleads for architecture-on-paper (being architecture) to extend its field of practice in order to encompass all of the means available for communicating places/spaces.

5. Chapter 5: The significance of paper as a communication medium for imaginary architectural space

Communicating is the basic aim in Louis Khan's theory: "to express is the reason for living" and "communication is reached by means of art", Khan stated. (Frascari, Borbe, 1979:1315)

In his writings on semiotics (the science of signs), Frascari deals with graphics as a system of everyday communication. Kreiswirth (1990:135) sees semiotics as a bridge between the disciplines, *'semiotics as a model for the specific contribution discipline could make, through semiotics, to the theoretical and practical developments of the other*.

In architecture-on-paper, definitive principles exist in communicating space on paper: texture that condenses, lines growing darker to the front, etc. These are rendering techniques to create the illusion of depth in a drawing.

Corner (1993:66) views drawings as ways *to think and see in a more complex way...to overcome a blinkered, singular viewpoint and to relinquish total control.*

Another constant factor which is present in all aspects of imaginary architectural space - communicated on paper - is that the viewpoint is always determined by the architect himself. This is in contrast with physical architecture, where the user can experience it from many viewpoints. With the predetermined viewpoint of architecture-on-paper, the designer/architect can manipulate the way in which the building (space) is being experienced.

Even in virtual design, this predetermined viewpoint is present, as the route that the user will follow is designed in advance in contrast to the client choosing any viewpoint he wants.

graphics

Corner (1993:64) reviews drawings as they are used in landscape architecture: *Drawing is perhaps all and everything that landscape architects do. Only in rare and special circumstances do they actually build; others do that, such as masons, carpenters and gardeners. Instead, landscape architects draw. They draw in order to construe and construct visions and arguments about dwelling and landscape. More precisely, landscape architects draw to "project" ideas that may be built and sited.*

For Corner paper becomes a screen to make visible what is being generated in the mind. The 'projection' only serves as a medium between 'generated image' and the product in a different form, namely its built form.

Much of what passes for drawing today, however, evidences a general confusion about how drawings work with respect to creativity and poetic production. (Ibid.)

This implies that the way drawing works with respect to creativity and poetic production differs according to the aim in mind when drawing.

The following chapter focuses on paper as well as on other communication mediums to communicate imaginary architectural space.

5.1 Architecture-on-paper as a medium restricted by its own nature

In 'linear perspective' objects are depicted upon a plane surface in conformity with the way they are seen, without reference to their absolute shapes and reflections. The whole picture or design is calculated to be valid for one station only. (Giedion, 1954:30)

With this Giedion shows the restricting nature of paper as medium. Paper may possess the ability to provide a basis on which three-dimensional projections can be represented, but it stays two-

dimensional in its existence and this brings certain restrictions that are not present e.g. in computer generated three-dimensional models.

Paper also provides a means to communicate pictures to perceivers: *pictures inform by packaging information in light in essentially the same form that real objects and scenes package it, and the perceiver unwraps the package in essentially the same way.* (Rheingold, 1991:64)

When the perceiver is able to "unwrap" the package in essentially the same way as it was "wrapped" by the designer, paper gains the ability to communicate space in its physical form and becomes more than just a three-dimensional drawing on a two-dimensional plane. The medium plays an essential role in communicating ideas to the perceiver (client, etc.). However, the side of an object that is not illustrated can still be viewed or "unwrapped".

The advantages and disadvantages of paper as a medium as found through the research this far, as well as additional advantages and disadvantages, will now be listed:

5.1.1 Advantages of paper as a communication medium

Paper as a medium of communication and representation has many obvious advantages that, for the sake of this study, need not to be academically grounded.

From an educational viewpoint, it is easy to find an example at the beginning of an architectural career. When first year architectural students enter a school of architecture, the obvious medium on which they express themselves, is paper. It is a medium that does not require teaching from the start for them to be able to use it. The obvious advantage of paper in this situation is in short 1) availability, 2) cost, 3) variety, 4) familiarity with the medium (not

every student can work on a computer), 5) paper is easy to carry, 6) it can be stored, 7) it represents information, etc.

5.1.2 Disadvantages of paper as a communication medium

Objective measures of physical characteristics of the environment that are clearly related to human factors, are temperature, noise level, and the visual areas, lightness. The variables when studying the visual environment tend to be the qualitative. (Sanoff, 1991:3,4) Paper may be able to capture light at a specific moment, but obviously cannot change this light quality through time.

inability to represent the environment

Gibson's theories (1971:280) suggest that, *while the same visual information may be contained in the real environment and in a picture, they do not provide the same stimulation. Pictures record information, not the sensory data.*

The computer (also incorporated in the term architecture-on-paper) has a certain danger: Woolley (1992:248) warns us that, *to ascribe the computer as a medium with powers to discover the imaginary realm, would be as absurd as ascribing the typewriter with the power to discover the world of literature. The computer's apparent universality has distracted us from the important fact that it performs just one function: it computes.*

Till (1996:9) said the following on this: *We hear that representation is getting ever more 'realistic', when in fact it could be argued that the more crude a rendering, the more real it is.*

reality

Memarzia focus our attention on the fact that, *in today's world of architecture, what is actually buildable differs greatly from what is perceived to be buildable.* (1998:http4)

Paper may be deceptive: what you see is not necessarily how it really is.

paper deceptive

Memarzia also shows that, in the same way that drawing may be used in a wrong way, so too may computers. *In today's architectural practice, computers are used for evaluation, communication and documentation purposes. More commonly, however, they are used as two-dimensional drawing machines.* (Ibid.)

A computer being used like paper is a computer not being used to full capacity. However, it is difficult for the architect to approach the computer as medium of communication in a way that is totally different from one that he/she has been using for years: that of paper.

Corner, previously quoted as a landscape architect, warns his colleagues to beware of reducing or over-indulging when drawing as they *spend the greater part of their educational and professional lives in making drawings.* His warning is based on the fact that history shows that *shifts in the techniques and conventions of representation have had a direct effect on the design of space.* Corner feels that the final built world can appear *aestheticized and scenographic* when it originates from drawings which focus mainly on being two-dimensional graphic displays. The opposite focus, however, is also one to be aware of. Corner warns that sterile drawings that function only as instruments of production may lead to an impoverished and prosaic built world. He concludes that *we might now be in the exhilarating position to recognise that the building of a more imaginative and rich environment lies first in the abandoning of reductivist and over-indulgent drawing and, secondly, in the making of drawings that function as vehicles of disclosure.* (James Corner, 1993:66)

architecture-on-paper as disclosure

With this Corner dismisses drawings for the sake of drawings alone. The purpose of drawings should be to communicate the imaginary space in the architect's mind, not to create a scenographic space while trying to make a beautiful picture.

In this lies the main disadvantage of paper as medium: the fact that it tempts the architect's dualistic nature to present reality artistically on paper. For architects stand with their one leg in art and the other in science. (And, for some, with their heads in cyberspace.)

5.2 Different communication symbols on paper

"In language we have sounds and meanings, in art we have, at one level, colour and line, at another level spaces and objects." (Borbe, 1979:1319)

Dhwareshwar (Kreiswirth, 1990:231) saw the *new avant-garde as theoretical avant-garde replacing artistic avant-garde. In this theoretical avant-garde, Kreiswirth strives towards visual poetics - a visual poetics tries to make recent developments in literary theory and philosophy work for visual analysis. (Ibid. p136)*

words replacing drawings

This close relationship between literature and visuals (pictures) as described by Kreiswirth serves as an example of "the merging of disciplines" - a new phenomenon of this time.

Different disciplines can be found trying to communicate imaginary architectural space. Whether it was their aim in the first place to do so, or whether it happened as a "side-effect" in the research of something else, imaginary architectural space is communicated within as well as without the boundaries of architecture as a discipline.

5.2.1 Words as a representative system to communicate space (language = verbal)

The environment can be represented by different modes. Although verbal descriptions have been used to represent the environment, direct or indirect methods decrease the possibility of misinterpretation. (Sanoff, 1991:3)
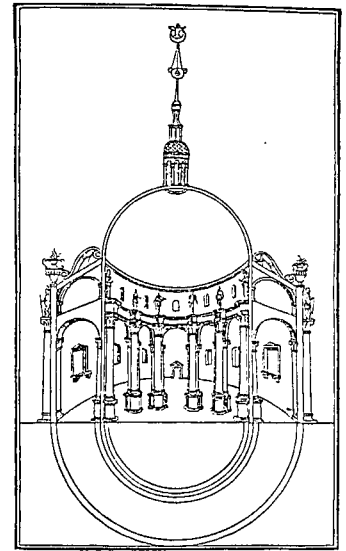
Words are seen here as language to describe or explain space, not as concept-formulating or written theory on architecture. This includes fiction, non-fiction, science fiction - describing a space/place, whether imaginary or real, with so much accuracy and detail that it creates a spatial image in the reader's mind's eye. This is interactive space-making in the sense that the reader interprets the words into spaces within his/her own frame of reference. Every reader's picture will look different.

Through history the written word can be found communicating imaginary architectural space. Kruft (1985:60) traces the cross-influence of architecture and literature back to as early as 1499 when *Francesco Colanna, a Dominican friar, wrote a novel named Hypenerotomachia Poliphili.* This novel in the form of a *reconstructed dream* describes a "utopia" based on the *idea that nature and architecture combine in planned unity.*

Kruft (1985:62) finds its significance for today in the fact that *it has a new mode of feeling for architecture. The dream journeyings of Polifilo, in pursuit of his beloved Polia, are the framework for lengthy descriptions of architecture, enriched by literary fantasy.* Kruft claims that Colanna's *borrowings from Alberti and from a Latin translation of Filarete are clearly detectable.*

Francesco Colonna: Hypnerotomachia Poliphili, Temple of Venus Physizoa. Kruft, 1985: plate 24.

In the sixteenth century this occurrence is documented again by Kruft (1985:121) who finds that *the notions of ideal architecture extend into literary circles of France, as demonstrated by the fictional descriptions by... Francois Rabelais (1494 - 1553). The artistic society lives in the ideal building of Thelema (=will). Thelema is a Utopia within a Utopia.* (Ibid. p.123) Kruft finds it to have a *remarkable visual quality, in which the influence of Philibert Delorme (Rabelais' architect friend) may surely be seen.* (Ibid.)

Depiction of the Abbey of Thelema in Rabelais' Gargantua; 1840. Kruft, 1985: plate 76

In a local example, William Timlin (1892 - 1943) tells about a journey through space in his book: The Ship that sailed to Mars. The architectural relevance of this storybook for children features in Smit's article of 1995: Fantasy architecture with reference to William Timlin. Smit finds similarities between Timlin's work and

Timlin

others. The drawing of "the Raising of the Tower" can, according to Smit (1995:27) be found back in the work of Frank Lloyd Wright in Phoenix 1957. *His tower in a representation of the "Arizona State Capital" is nearly identical to that of Timlin: shiny, high and crystal-like transparent. Timlin comments on his own tower that it is Strange indeed... that the most fairylike thing in the land of the Fairies should be a monument built by man.*

Timlin, a qualified architect, used words and drawings to create imaginary worlds. His inability to distance himself from using existing architectural manifestations/buildings when creating an imaginary world shows again that man's perception of Utopia is determined by the time in which he lives and works.

The next extract from Tuttle's science-fiction novel 'A Spaceship built of stone' (1987) is a more temporary example of imaginary architectural space "painted" through words:

William Timlin, The Raising of the Tower .
Timlin 1993 : 95

Tuttle

"(p. 105) *I came upon a vast and ruined city in the dessert. Long ago, huge building blocks had been hewn from rock, cut to fit together so tightly that mortar was unnecessary. It was a city not of straight lines, but of rounded corners and circular enclosures, walls towering twice a man's height. It seemed immense and harshly white against the blue sky and emptiness of the dessert...*

At last I found it. There was a large, semi-circular enclosure at the very centre of the city. Inside, a hole cut into the earth. Without hesitation I lowered myself into it, my dangling feet finding purchase on a stairway carved into the rock.

(p. 106) ...and the alarm went off. Groggy and fumbling in the dark, I stopped it, then sat up, switched on the light, and reached for my cigarettes. I felt disorientated and confused. Unlike most of my dreams, this one had the force of reality, of some remembered event. Had I dreamed of those people and underground tunnels before, or had my memory in the dream been nothing more than the dream of a dream?"

Tuttle uses the dream as well (cf. Colanna's dream journeyings of Polifilo) to take her character through 'journeys' in imaginary architectural space.

Jencks (1990:17) comments on the architect's relationship with the written word: ...*Most architects, like most people, are bored by labels, finding them reductive and constricting, like ill-fitting suits. There is much to be said for the view that all labels - stylistic, ideological, historical - distort the perception of architecture and reduce it to verbal categories. This contamination by language cannot be denied: architecture is created and perceived through non-linguistic codes which have their own integrity, and words can just get in the way. At the same time, however, words and classifications cannot be avoided in creation and perception.* Jencks also calls on semiotics to show that the linguistic sign dominates our universe today.

Jencks places all the above manifestations of imaginary architectural space in language through time in one hat with this comment: ..*words and classifications cannot be avoided in creation and perception.* (Ibid.) Whether it was Colanna (1499), Rabelais (1494 -1553), Timlin (1892 - 1943), Tuttle (1987) or a legion of other types of literature, they all used imaginary architectural space in order to tell their story. In this way, we can react to Jencks by stating that "imaginary (architectural?) space can hardly be avoided in creating literature".
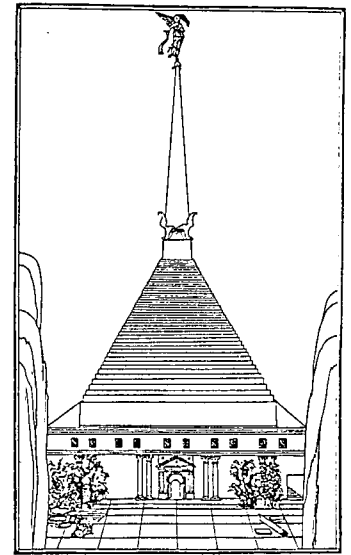
Francesco Colonna, Hypnerotomachia Poliphili, 1499. Pyramid with obelisk. Kruft, 1985 : plate 23

5.2.2 Lines (drafting) as a representative system to communicate space (visual communication)

Where architecture has historically been accomplished with a minimum of drawing, that medium has now supplanted, or at least become equal to the artefacts it represents in a wide segment of the public consciousness. (Steel, 1994:7)

Steel shows the new recognition which drawings are enjoying: that of being acknowledged for its influence on the perceiver.

Sanoff (1991:11) reports that Palmer and Arnheim held different views of visual images in respectively 1968 and 1954: Palmer saw *visual images* not as *duplications of the environment but merely representations* of it. Arnheim describes a theory traditionally held by artists that *the image is a faithful reproduction of the object itself; that the trained observer sees images as what they represent.*

representation

With this Arnheim touches on the subject of the 'training' that the observer of images should have in order to understand their relationship to the real object.

James Corner underlines this 'subjective' quality of the observer as well as of the maker of the picture/drawing: *When one projects ideas onto paper, images occur that can project back into the imagination of the maker, opening possibilities. Similarly, when viewers 'read' a drawing, they project their own values and biases into it.* Corner does not feel it necessary for the absolute dimensions of a work to be *explicitly given* but he feels that such information might come from one's experiences with them. *Drawings that enable such participation and exchange are more likely to be conducive of genuine creativity than drawings that are singular and deterministic in their content.* (Corner, 1993:66)

subjectivity
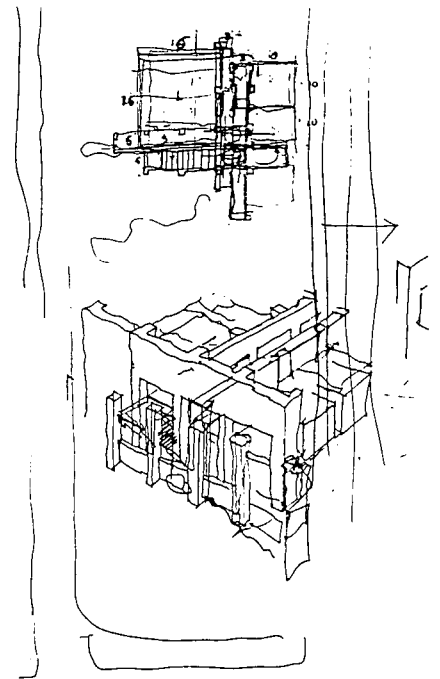
Peter Eisenman, Free hand sketches : House VI, Cornwall, Connecticut . 1972 - 3. Gössel 1994 : 289

Corner views all drawings as having intrinsic values (*no projection is ever ideologically neutral*) and therefore finds the tendency to use them *in a mechanical, linear way* to be uncritical of their value as well as to neglecting *the creative dialogue that can occur through drawing.* (Ibid.)

The fact that drawings in architecture have to communicate in different ways is embedded in their diverse qualities. In the process of architecture, in order to have a built object as result, they have to

- function as first production of images in the design process
- give body to the concept

- finalise design ideas for the client (sketch plans)
- convey the actual dimensions and technical detail to the building site and its workers (documentation)

These steps can be skipped sometimes when someone like Alberti Sartoris appears on the scene. *He is credited as the re-inventor of the axonometric in this century and proponent of the analytical use of colour in architectural representation,* according to Dimitriu (1990:26).

the axonometric

Sartoris found in the 'recycling' of the axonometric drawing a solution to a problem of his time, namely that architecture was viewed to have had an economy of construction, but drawings did not reveal the same *spare and single-minded* quality in their representation. By using the proposed axonometric drawing, he established *continuity between the early times of cathedral building, the Beaux-Arts manual of the Nineteenth century, and modern times. Sartoris considers axonometric the most efficient and clear tool of production in architecture: "It is possible to build directly from the axonometric, as I have done in the case of a small house with modular floors".* (Ibid.)

According to Sartoris (Ibid.), the axonometric was the perfect graphic instrument to set the Modern Movement apart from previous historic movements. A *'five point manifesto'* on the axonometric was the result:

- *Economic at all levels of discussion*
- *Scandalous, for this type of representation became elevated from a craftsman's mode to an architect's.*
- *Timely, for it enables architecture to keep pace with the already developed cubist expression in painting and sculpture and, less explicitly, with some of the literary experiments of the period, such as Proust or some of the vorticists.*
- *Significant, for it shifted the emphasis of architectural representation away from the eye's perception and closer to the mind's perception of three-dimensional space.*

- *It allowed the systematic introduction of the use of colour as an analytic tool - another Sartoris "first" - reinforcing the notion of modelling through patterns and not mere perceptual structures.* (Dimitriu,1990:26)

The axonometric projection as a way of drawing competes with the perspective of the Renaissance.

In 1966 Till speaks highly of the perspective drawing: *In its final form, architectural space is objectified, subject to quantification and measurement. This is more clearly manifested and enabled in the use of perspective as the prime mode of spatial representation.* (Till, 1996:9)

To project imaginary architectural space on paper is to make visible what is being generated in the mind. The perception (drawing), be it axonometric, isometric, perspective, etc., makes the interactive process possible. The first lines may only represent the general concept or idea of what will be created It is merely a stage in the design process and is not the final product. It must generate a response to what is made visible in order to refine, to define and "grow" into what will be the final product.

5.2.3 Other mediums to communicate imaginary architectural space

The computer and the ability to design with it, is a much-debated subject. The history of architecture-on-paper with paper as focus is such a rich one, that it is hard to believe that this tradition may become extinct.

However, in Sutherland's design of the forerunner of CAD-software packages, namely "sketchpad", (Refer to 5.2.3) he however created a medium that competes with the age-old skill of drawing, namely that of drawing with a "light pen" on a "screen".

Scott (1995:http1) believes in the use of computer graphics in the arts: *Artists have always had the ability to create illusions,*

sometimes with particular effectiveness; and artists have always had the ability to create fanciful, physically impossible worlds (Dali, M.C. Esher, science fiction and fantasy illustrators). But the use of computer graphics lends a difference of degree of the spectator's illusion. (Scott, 1995:http1) This difference is located in the fact that it is a dynamic experience, whereas paper gives a static view.

Salvador Dali, The persis-
tence of Memory , 1931.
Original: Sporre 1987:449

In trying to define mediums other than words (5.2.1) and lines (5.3.2) through which to communicate imaginary architectural space, a vast 'new' (for already relatively old) discipline comes into question: the field of computers (design, drawing, simulation, virtual reality, cyberspace etc).

In order to understand this field with its own agendas and spheres of influence, we must understand its history and meaning.

5.2.3.1 Defining Cyberspace

The term "Cyberspace'" was first used in the science-fiction novels of William Gibson, in his 'Cyberpunk' trilogy known as 'Neuromancer', 'Count Zero' and 'Mona Lisa Overdrive'. (1997, http 7) *"Cyberspace" finds its roots in the Greek word 'cyber', meaning "steersman".* (Rheingold, 1991:184)

Esher. Original: http 6

Pickering (1969:vi) gives Gibson's definition of Cyberspace visions as *images of the 'space behind the screen'.*

Memarzia (1998: http4) interprets this credited author as follows: When *Gibson, science fiction writer, first used the word 'Cyberspace' in his dynamic vision of the digital future, found in the pages of 'Neoromancer' (1984) and Count Zero (1987), he was referring to a new type of parallel universe brought to life and supported by the world's computer banks and networks. His futuristic visions of a new mode of reality are rapidly leaving science fiction and becoming real science.*

Other definitions of Cyberspace include the following:

- Novak (1990:38) *Cyberspace is architecture, cyberspace has an architecture, and cyberspace contains architecture.*

- Benedict (1993:56) *Cyberspace is a to-be-constructed geography, a new planet, not yet laid out and without weather.*

- Pickering (1969:vi) *Cyberspace is presented not only as a place but also as a movement; a frontier with a populist surge showing where culture is going. It has architectural interest to the extent that it is increasingly able to display real space.*

- (1997: http7) *Cyberspace refers to the "data space" of a network of computer systems - the numerical encoding of a real or imaginary Cartesian space.*

- Spiller (1993:xviii) *Cyberspace is the place that is not place, a place inside a computer, accessed by (currently) 'Virtual Reality" technology.*

From the above-mentioned definitions it is obvious that the computer functions as a medium to communicate imaginary architectural space to such an extent that it becomes almost real. As communication medium, it is a technologically advanced medium and deserves reference.

Virtual Reality, often mentioned in the same sentence as cyberspace, refers to *the subjective experience of the 'data space' of the computer system when the computer translates numerical co-ordinates into a visual, aural and tactile display. It is the apparent world the user enters while using the system.* (1997: http7)

virtual reality

According to Pickering (1996:vi) the word 'virtual' previously meant 'almost', but he defines its recent meaning as found in virtual reality as *'real-seeming', the world of cyberspace and the simulacrum.*

Cyber-architecture is building in cyberspace. All architecture (cyber or real), by virtue of its cultural nature, portrays and broadcasts information. However, when using architectural metaphors as a medium for organisation and distribution of information in cyber-architecture, the designer must consider the fact that the meaning and understanding of architectural elements and artefacts of cyber-architecture are intrinsically different to traditional architecture. (Memarzia, 1998: http7)

In these different approaches to space (real, imaginary or cyber), lies the understanding of the fact that we live in a time where technology forces us to change our perspective views regarding space and space-making.

As this study is approached from an architectural viewpoint, it is necessary to understand the computer and its relevance to architecture.

5.2.3.2 The computer in perspective relative to architecture

With Novak's (1990,38) definition that 'Cyberspace is architecture' (Refer to 5.2.3.1) the dependency of cyberspace on architecture becomes apparent.

cyberspace as architecture

Cyberspace is, in a particular way, architecturally rich because radically new actions and structures are possible (see 4.2.3).

Cyberspace differs from physical space in that it cannot communicate with the user's senses – feel (climate), touch (textures), extended space (boundaries), etc.

This fact gives free scope to the designers of Cyberspace, as Memarzia (1998, http4) states: *Environments and places can be designed to exist in the digital realm. Furthermore, the ways in which these environments are represented are becoming increasingly realistic. The designers of cyberspace have ultimate*

unlimited spatial design

control over every aspect of their imaginary environments, to the point that even the laws of physics can be altered and tailor-made. This is architecture without limits, where the site is as big as the capacity of the technology that drives it; where politics no longer constrains and the status quo is momentary. The designers of cyberspace environments are only limited by the creator's imagination.

This may be true. Campbell, however, argues that it is not possible to invent new spaces and worlds without them containing some qualities of the real:

reality as anchor

The relationship between imaginary architectural space and physical architecture is one of cross-influence. *Most of the examples of virtual architecture have one thing in common: they use the metaphor of physical architecture to one degree or another in order to represent electronic information.* (Campbell, 1996:http2)

The fact that cyberspace is anchored in the physical world (designers of cyberspace behind computer programs) makes it part of the milieu of architecture. The physical reality becomes a measure for architecture – taking place in Cyberspace or on paper: this advanced technological development has the ability to enlarge the field of architecture.

The quality of cyberspace that distinguishes it most from real 'built' architecture, is the fact that cyberspace exists free of gravitation and its consequences. In the work of Zaha Hadid, there are signs of this defying of gravity. The difference is that she intended her work to be built in reality. Jencks (1990:205) reviews her IBA Housing Block as follows: In *the Neo-Constructivist repertoire Zaha Hadid has perfected the 'flying beam' and 'cocktail stick', and the anamorphic projection which makes Deconstruction so beautifully decentred, dislocated and - in her words and Leonidov's - anti-gravitational. This Neo-Constructivism is populist, optimistic and realistic about mass-culture. It seeks the promise hidden within modernism of a hedonistic play with social and technical forces.*

free of gravitation
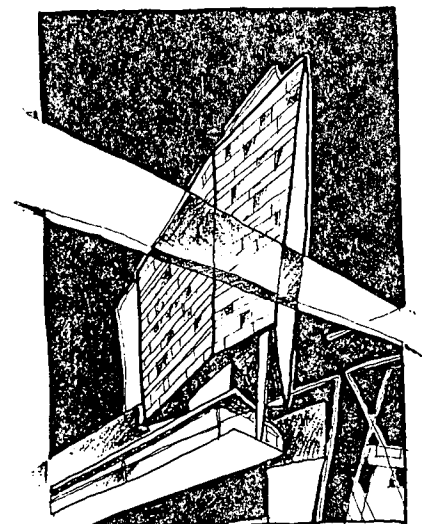
Zaha Hadid, IBA Housing Block 2, West Berlin. 1985 Original: Jencks 1990: 205

The relevance of paper is often called in question when viewed against the seemingly unlimited capacity of the computer. Rheingold (1991:74) quotes Douglas C. Engelbart, an electrical engineer, to have said the following on virtual reality: When *I first heard about computers, I understood from my radar experience that if these machines can show you information on printouts, they could show that information on a screen.* 'Paper' now becomes a projector, a screen.

computer screen versus paper

Rheingold (1991:89) compares Sutherland's invention of 1963 namely "sketchpad" (a software product) to *pigments on limestone cave walls* of thirty thousand years before. *The cave painting and the first interactive computer graphics were both attempts to influence the consciousness of the viewer, as a means of imparting important cultural information.*

sketchpad

Sketchpad gives a computer operator the ability to *create sophisticated visual models on a display screen that resembled a television set. People could create images in the most natural way possible, by using their hands and eyes and a penlike device to 'draw' them* (Ibid.)

With this invention, *Sutherland opened a window, and pointed to the day when people would be able to go through that window and enter the abstract territory that computer simulations could create.* (Ibid. p.93)

Paper functions as a bridge between the cave-man drawing and the computer. The moment that the approach changes from two-dimensional visuals to three-dimensional virtual reality, paper and the methods to present reality on paper do not function anymore as the basis for visual communication. A new phase of presenting imaginary architectural space is entered.

paper as bridge

It was also Sutherland who created the first virtual object in 1966 - *a cube, about two inches on a side, that appeared to the person*

wearing the HMD (Head-Mounted Three-dimensional Display) as an object of light, floating in space. (Rheingold, 1991:109)

Rheingold (Ibid.) dares a prediction of this virtual world's growth: *By 2010, that first room of Sutherland's will have multiplied itself into a virtual cosmos. It is impossible in today's terms [to predict] how vast that future cyberworld would be.*

Even now, with the year 2010 just twelve years away, it is already impossible to envision the magnitude of this Cyberworld, this virtual cosmos.

Relevant to the study, however, is the fact that this vast cyberworld had its origin in the simple (at the time complicated) perspective of the Renaissance. *The Cyberspace technologies that permit a user of a virtual reality system to apparently move through a coherent simulated environment make use of tools that have been known for many hundreds of years. These are scientific linear perspective and the Cartesian co-ordinate system.* (1997: http7)

perspective as basis

Systematic techniques to create illusions of reality date back to ancient Greece. (Refer to 2.1.2). Classical painters had known how to create illusions of depth by means of geometrical rules. The Florentine architect, Fillipo Brunelleschi is credited for having discovered these laws of scientific linear perspective. It is these same mathematical rules which are deployed to create the illusion of three dimensions on a computer screen or virtual reality headset. (Ibid.)

John Pickering (1996:vi) finds the reason for cyberspace having architectural interest in the fact that *domains, and their structures, inevitably express meaning through their design, situation and use.* The structures that are used in cyberspace contain information in different and totally new ways and this shows a new kind of empowerment.

Rheingold (1991:179) is of opinion that *the CAD revolution was*
indeed as ubiquitous as it was invisible to most people. Rheingold
finds the *levers of change* not always to be visible: *most people*
don't see designers and architects working with computers instead
of tracing paper to design soapdishes and skyscrapers - but
everyone sees and lives among the effect of CAD tools. These
tools are viewed by some as '*Intellect amplifiers*' *for scientists,*
doctors and architects.

When the computer is placed in service of man to function as
'intellect amplifier', it becomes a means to stretch the human
ability. Rheingold does however quote Walker to have predicted
the following in 1989: *Cyberspace will not merely provide new*
experiences, like new rides at a carnival. More *than any*
mechanism yet invented, it will change what humans perceive
themselves to be, at a very fundamental and personal level. In
cyberspace there is no need to move about in a body like the one
you possess in physical reality. You may feel more comfortable, at
first, with a body like the one you 'own' but as you conduct more
of your life and affairs in cyberspace your conditioned notion of a
unique and immutable body will give way to a far more liberated
notion of "body" as something quite disposable and, generally,
limiting. You will find that some bodies work best in some situation
while others work best in others. (1991:191)

May this be a new world for architecture where a certain body will
need a certain environment = architecture? But what is the frame
of mind when 'constructing' or designing a new body? Is the focus
visual, or what other mindsets or perspectives will the designer
adapt when designing? What is ultimately the function of this new
body? What will it ultimately try to communicate? In the answers
to these questions lies the future of cyberspace and will mankind
be able to understand his own true nature which will be freed from
the physical reality.

5.2.3.3   Advantages of the computer

This medium's powers become active when people enter cyberspace through the Internet – it is not just the information that flickers screens, but an icon for something much more than its use value; a potent sign of the powers of the medium. (Pickering, 1996:vii)

The 'powers of this medium' is something that cannot be ignored or be regarded as non-existing. From the following quotations it is easy to see that the advantages far outnumber the disadvantages:

- Rheingold (199:116) feels that *although artists can use any medium to evoke imaginary worlds, cyberspace carries the worlds themselves.*

- Cyberspace is more than just a blank piece of paper in front of you, daring you to design. It is in itself already a place, a world with hidden dimensions.

- Memarzia (1998:http4) shows that *cyberspace, experienced directly in three-dimensional space, can be seen as the nearest simulation of the architect's mental model.*

Paper, on the contrary, is still only two-dimensional containing three-dimensional illusions e.g. the perspective drawing. (Also on this, cf. Campbell.)

- Campbell (1996:http2) states that the *capacities of the Internet are not limited to two-dimensional data. Three-dimensional environments have been created and shared in real-time as virtual worlds.*

- John Pickering (1996:vii) adds that the computer offers more   inter-active
  than paper: Unlike *books* (paper) *the images on screen do more than represent information, they are interactive and ... they access another screen connecting the operator to new domains and services.*

- Memarzia (1998:http4) talks of yet another dimension: *Cyberspace is not limited to three-dimensions, since any two-dimensional plane or point may unfold to reveal another multi-dimensional spatial environment.*

  more than 3D

- Memarzia (Ibid.) also claims that *traditional methods of drawing perspectives are extremely labour intensive, but modelling the building in three-dimensions on a computer allows one to examine any number of views or a fly or walk through of any building.*

  modeling

- Virtual reality with its close relationship to architecture (as shown before) plays an important role in other disciplines, expanding the field of architecture: The *"New Age" movement in the US similarly has come to see virtual reality as an aid to expanding spirituality. And because it appears as a revolutionary technology it also reflects the millenarian aspects of the New Age movement.* (1997:http7) Also: *Virtual reality enables unbuilt structures, from buildings to aircraft, to be viewed and analysed.* (Ibid.)

  expanding field

Norberg-Schulz (1971) starts with the home (our corner of the world) in structuring existential space, then he moves up to the street level, then geography/nation/world/space/? Would cyberspace not have been the next step in this analysis of space if it existed at the time of the completion of this analysis? Would it be a further development of the maxi-cosmos, regulating it from within one's home (one's corner of the world), bringing this whole circle together again?

Because Cyberspace enhances experience more than architecture-on-paper has the ability to do, Cyberspace becomes a greater opposition to reality than architecture-on-paper would ever be able to be. Part of Cyberspace's attraction lies in the viewer's ability to examine a created world by "moving" through it. The viewer guides his own eye and has more control over his "surroundings".

control

In 1983 Kennith Frampton (1983:58) gave computer technology the upper hand over drawings when he accused the other arts (recognising computer simulations hereby as art) of a loss of nerve: *Throughout the creative trajectory of the late 20th century the avant-gardist impulse has entered its decline, with the singular exception of the post-Humanist arts which were born 'de noro', so to speak, from the body of the machine itself. Photography, cinematography, television, film, video, electron-cybernetic simulation, plotting, and recording systems; these are the media which are still able to sustain the thrust of socio-cultural modernization. They bear upon the living present without hesitation; without any of the ubiquitous loss of nerve which has come to characterize all of the older arts. It is as though these instruments alone are able to afford man channels through which to continue, to perceive, conceive, command and manipulate a world which has otherwise disintegrated under the impact of modernization.*

decline of Avant-Garde

5.2.3.4 Disadvantages of the Computer

Kambiz Memarzia (1998:http4) argues the implications of Cyberspace by comparing Cyberspace with the qualities that make architecture realisable in reality, which are physical constraints (or its absence), scale, etc. She further states that *different knowledge is required when the designer designs architecture e.g. knowledge of structure, material, environment, social and human forces.* When one designs Cyber-architecture one has to have a *knowledge of software, visualization, interface,* etc. as well as the above mentioned.

technical knowledge

Rheingold (1991:69) declares the problems to be found in the fact that people view the computer as a threat: For *better or worse, the maintenance of human civilisation for the foreseeable future will require both minds and computers. Right now, humans and our information-processing technologies don't work together especially well.*

threat

Jean Baudrillard, the French "postmodernist" writer, is quoted to have said *that the new media, far from bringing a Toffleresque liberation are bringing about a new kind of alienation.* (1997: http7) Is this true of this (the twentieth) century with all the technology available as well? Is "'architecture-on-paper" as now found in "architecture-on/in- screens" estranging us from our true experiences of spaces and places? Maybe so, listening to Woolley:

estrangement

The champions of virtual reality and computer simulation...are wanting to make artificial reality real. To them, it promises not just a world where you can eat fat without getting fat (or design buildings without having to take responsibility for its structural state), not just a metaphor, but the actual creation of any world you can ever want to imagine – fantastic, fabulous, terrifying, infinite, enclosed, utopian... (Woolley, 1992:7) However, he does also mention the darker side of this Utopia:

This 'wonder-world' may sound like the new way of being in space and looking at space. But like all wonder-worlds, it has its built-in flaws. Empowered by the personal computer, liberated by virtual reality; the individual becomes the God of his or her own universe. The sight of someone wearing a virtual reality headset is the ultimate image of solipsistic self-absorption, their movements and gestures meaningless to those left outside. (Woolley, 1992:9)

self-absorption

Neil Spiller (1993:xviii) also touches on the argument of man's position it cyberspace. He sees the *anthropocentric scale of the human frame as useless in cyberspace,* and makes it obvious that man can be either an ant or a collection of machine parts or whatever, for that matter, because *cyberspace will be complex and fluid ... spatial archeology* [sic.] *will be commonplace.* This may seem either an advantage or a disadvantage, compared to how the problem is approached. It does however indicate that the human body is insignificant in cyberspace, which may lead to man's being estranged from reality. It also gives architecture in cyberspace free range to function out of the ordinary context of architecture.

estranged from reality

In 1954 Giedion (1954:19) asked whether it is possible for architecture to be examined out of its context, as an organism in its own right:

We are looking for the reflection in architecture of the progress our own period has made toward consciousness of itself - of its special limitations and potentialities, needs and aims. Architecture can give us an insight into this process just because it is bound up with the life of a period as a whole. Everything in it, from its fondness for certain shapes to the approaches to specific building problems which it finds most natural, reflects the conditions of the age from which it springs. It is the product of all sorts of factors - social, economic, scientific, technical, ethnological. However much a period may try to disguise itself, its real nature will show through in its architecture, whether this uses original forms of expression or attempts to copy bygone epochs. It is an unmistakable index to what was really going on in a period that architecture is indispensable when we are seeking to evaluate that period. ... But if architecture is the result of so many conditions, is it either proper or possible to examine it out of its context, as a finite organism in its own right?

understanding a period in time

Cyber-architecture defies many of these conditions: the global village does not have much of place for ethnology, sociology and time (the present). It focuses on a future where maybe it can become real.

Cyberspace and virtual reality chase utopia (non-place), daring to catch up with it. A non-place comes into existence...when human beings do not yet recognise themselves in it. Desert islands, tropical forests cannot, or rather could not – because they have disappeared – be called non-places, for they were in fact spaces eventually to be conquered, that is to say, virtual places. Maybe computer technology will catch up with utopia in its chase thereof. When utopia is reached, the searchers may find that it was a lonely search in an imaginary world.

There is an experience when you are dreaming of possibilities being there, that anything can happen, and it is just an open world where your mind is the only limitation. But the problem is that it is just you, you were all alone. And then when you wake up, you give up all that freedom. (Woolley, 1992:13)

6. Chapter 6: Conclusions

When this study initially started, the researcher wanted to focus mainly on visual images as represented on paper, which, at the time were regarded as imaginary spaces, 'captured' on paper.

As the research progressed, however, it became clear that imaginary architectural space was a far greater field to do research on than could initially be foreseen.

Great difficulty was being experienced when trying to incorporate spaces that were generated outside the field of architecture, like images from Tolkien's books or even Walt Disney's Fantasy Castles. Likewise science-fiction movies or the vast world of video games were difficult to use as research material.

The reason for this being that no academic records were found that covered these spaces. This fact made it difficult to accommodate Disney's fantasy castles and other imaginary spaces created outside an academic institution.

The above-mentioned did figure in the study insofar as it was relevant to the field of architecture as a discipline. The research material that was found and which proved relevant to the study led to the chapter layout on which the study was then based.

The conclusions will be summarised under three main headings, namely

- Architecture-on-paper as a visual basis to examine imaginary architectural space.
- The significance of imaginary architectural space.
- The interdependency between imaginary architectural space and architecture on paper.
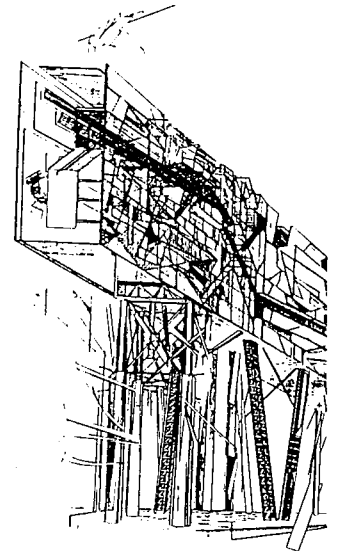
Daniel Libeskind,
Berlin City Edge. 1987
Original: Libeskind
1991: 72

6.1 Architecture-on-paper as a visual basis to examine imaginary architectural space.

Architecture-on-paper was initially taken to be only architectural space that was communicated on paper. However, as the study progressed, it became clear that the term should also include models, computer-generated models and written descriptions of imaginary architectural space.

- Architecture-on-paper proved to be a reliable source to examine imaginary architectural space. Architecture-on-paper had a tendency to be loaded with meanings, symbols and ideas about how the world and certain affairs should work throughout history. This is true even today when communicating architecture-on-paper. That is why architecture-on-paper has the ability to broaden the field of architecture: it demands a different need than just to build, inhabit or experience a physical building. It is obsessed with the mind and an inner need.

- Architecture-on-paper is a reliable record of how imaginary architectural space developed. It is also an expressive system for the meaning that was meant to be captured in imaginary architectural space.

- Architecture-on-paper provides the link between imaginary architectural space and architecture in reality. Many imaginary architectural projects proved to be unsuitable for reality, even though the spaces are very real, i.e. Boullée's monument to Newton. It possesses meaning, since no projection is ever value-free. (Corner, 1993:65)

Visual images tend to be poorer and more difficult to understand than the written word when it comes to capturing meaning. With the research into the history of architecture-on-paper, it was necessary to read the text together with the pictures/drawings in order to understand the symbolic meaning and contents. This

shows that symbolism and contents are both time restricted, as seen in the work of Frank Lloyd Wright, Le Corbusier and Louis Kahn who all used text together with their drawings in order for their buildings to be understood.

Imaginary architectural space could well be investigated over time and its development could be determined.

Therefore, meaning is still limited to paper in order to be fully understood. Architecture and imaginary architectural space may need to free themselves through a thorough investigation into how to symbolise meaning in geometric form and in a three-dimensional environment, whether real, in virtual reality or imaginary.

6.2 The significance of imaginary architectural space.

Imaginary architectural space comes into existence within the designer's mind. Thus space exists prior to any means of communicating it. As a product of the mind it is influenced by the age in which it is produced, for the mind gets raised in the preconceptions of an age.

- Imaginary architectural space is indispensable as the first step in the manipulation of space. Imaginary architectural space also reveals the obsession, conflicts and problematic that were captured within an age.

- Imaginary architectural space nearly always carries some form of a utopia or dream with it: solving difficulties in reality to improve the quality of a real environment.

- It is only recently that technology advanced to such an extent that imaginary world can be visited and explored - technology as found in cyberspace.

- Imaginary architectural space is ultimately a mind game. It is aimed at internally motivated needs and thus becomes more

Daniel Libeskind, City Edge, Berlin. First Prize IBA City Edge Competition. Original: http://5

true as the imaginary world expands through the use of technology. Technology has advanced to such an extent that the imaginary world expands much faster than reality can aim to achieve.

Architecture is an art that has the potential to make an appeal on many levels of reality and can be described as a multi-dimensional art. The quality of the architectural object can only be tested by the number of levels it makes an appeal on, as well as the impact it has on the selected levels. These levels range from the pre-physical to the metaphysical. To ignore certain aspects of reality impoverishes the spatial creation. By focussing on only one or two aspects of reality, however, one can communicate a stronger view of the chosen aspects and life as a whole.

Therefore the success of imaginary architectural space can only be determined by the goals the architect has when creating imaginary architectural space.

The field of architecture is enriched and broadened by imaginary architectural space. Imaginary architectural space functions as a border-activity of architecture and gives the architect the freedom to function as an artist, philosopher and myth-maker.

Imaginary architectural space is as much a product of an age as any other. It expresses the values of a period in time as much as the philosophy or art that was generated does.

Fantasy starts to replace reality and even transforms past realities into fantasy.

In this study Khan has been quoted to have said that 'architecture exists in the mind'. With this imaginary architectural space gains recognition as architecture. The significance of imaginary architectural space can be found in its reference to the place where architecture originates: the mind. As such it is the closest reproduction available of the original idea, of the mind's model.
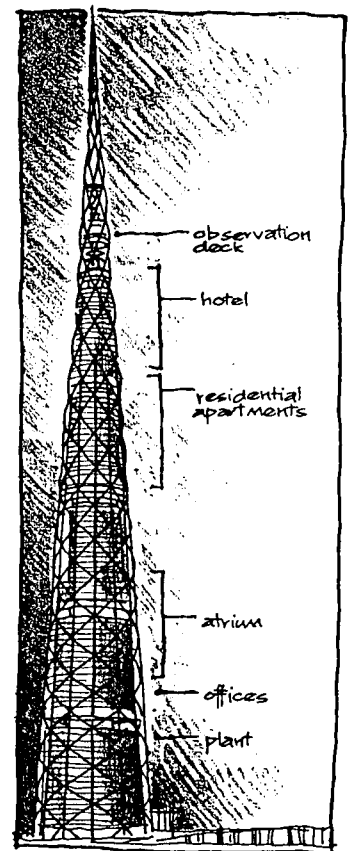
Norman Foster, Millenium Tower, Tokyo, designed 1989. A city in a single building. Original: Van der Meer 1997.

6.3 The interdependency between architecture-on-paper and imaginary architectural space.

Imaginary architectural space cannot be communicated without architecture-on-paper. But man's knowledge of the medium in which he expresses himself has a significant influence on precisely what he is able to communicate.

Architecture-on-paper sees a new era with cyberspace and virtual reality to communicate imaginary architectural space. The future possibilities of this medium still have to be seen. The value of spaces generated in this medium seems enormous at present. The fields that cyberspace can open for architecture may prove worthwhile. This new medium broadens the experimental field for imaginary architectural space to be exploited, a field that may actually influence reality - as we know it - beyond recognition.

Corporations that sponsor the investigation of the commercial and entertainment value of imaginary architectural space already exist. The exploration of imaginary architectural space is mainly done by computer. It will prove interesting to see what new kind of building forms this may bring into existence: on the one hand entertaining imaginary architectural space and on the other building forms that accommodate and expose imaginary architectural space.

The study proved repeatedly that imaginary architectural space - when expressed on cave walls, paper, through models, or computer screens, or whatever - influences the practice of architecture insofar as that it is the essential first step in the process of architecture. The significance of this influence varies according to the intentions of the designer himself, as well as to a lesser extent, some external influences.

A good example of this was found in Le Corbusier's theories in the 1920s as found in a series of plans for new cities, and its application in the development of Brasilia.

In retrospect, it is therefore necessary to change the original hypothesis from:

- Imaginary architectural space as expressed on paper has a significant influence on the practice of architecture, to

- Imaginary architectural space as expressed through a medium is a significant part of the practice of architecture.

The process of architecture gains hereby significance as a series of the communication of the original idea (imaginary architectural space). First communicated through a medium it may/may not result in built form. For, as long as there are visionary architects, imaginary architectural space will find a means of expression whether cave walls, paper or computer screens are available, or not.

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8. Appendix

8.1 List of Words

Architecture

Architecture will be taken to be space that comes into being via a design process to resolve an existing need, whether this need is externally or internally motivated.

Architect

A person with a degree in architecture who received an architectural education at a School of Architecture.

Architecture-on-paper

For the sake of this study, architecture-on-paper will be taken to be the description/communication of designed space as found in drawings, words, and images on different presentation mediums (see chapter 5). As such architecture-on-paper contains space of which the boundaries have been determined only on a medium, whether this medium is paper, the computer or other models that communicate space. Such a space has not been embodied in reality.

Architecture in reality

Only after architecture-on-paper has been completed in built form it becomes architecture in reality - a three-dimensional reality which can be experienced with the physical body.

Architectural position

Johnson compares the *pursuit of an architectural position* with a political act insofar as that it *involves active participation in the discourse. The only way to provide an educational base is to show students the trends of the discourse and the basis of specific positions.* (Ibid.) These trends and positions will be readily available to students in the form of theories and designs documented/expressed on paper.

Architectural inheritance

The educational base of architecture will be dependent on the history of architecture described on paper by historian critics. Giedion, an acknowledged historian, states that *we intend to see how our period has come to consciousness of itself in one field, architecture. To do this we must understand the architectural inheritance of our period, the knowledge which had been evolved in the preceding periods.* (1954:23)

Architectural language

Imaginary architectural space and architecture-on-paper can be viewed as different kinds of architectural language.

Cyberspace

The term "Cyberspace'" was first used in the science-fiction novels of William Gibson, in his 'Cyberpunk' trilogy known as 'Neuromancer', 'Count Zero' and 'Mona Lisa Overdrive'. (1997, http7) *"Cyberspace" finds its roots in the Greek word 'cyber', meaning "steersman".* (Rheingold, 1991:184)

Designer

a person with designing skills in one or more of the disciplines depending on design for its existence, e.g. an artist, architect, city planner, interior designer, etc.

Drawings

James Corner (1993:65) views drawings as *not only analogous to construction but also to the visual embodiment of ideas.*

Experimental architecture:

The work of architects like Zaha Hadid, Tschumi, Eisenmann or Libeskind and others is generally experimental and therefore 'violating ordinary logic and need'. As they function at the edges of the field, they cross the boundaries of architecture as a discipline and become art.

Imaginary architectural space

For the sake of this study, imaginary architectural space will be taken as space that only exists, or that is still retained in the mind - the phase before it becomes architecture-on-paper, which is expressed on some kind of medium.

Impulse-inspired art

Architecture-on-paper practised as an impulse-inspired art has the built-in possibility of becoming elitist comments on life, as the architect sees himself firstly as an artist. Lebbeus Woods' Freespace architecture, 1992, can be classified as impulse-inspired art.

Model

Rheingold (1991:213) views *a good model* [as] *a thinking tool and a communication device that gains value when it is used by a group or people who are organising some kind of 3D spatial structure like a building or a port.*

Perspective

A possible explanation for the confidence with which perspective was used, may be the fact that perspective was about the way objects were seen, without reference to their absolute shapes or reflections.

Phenomenon on its own

Drawing (architecture-on-paper) can be regarded as a phenomenon on its own - recognised and appreciated without having to seek for right of existence in any other purpose.

Process of architecture

The creation of architecture is a process which is determined by the interaction between the architect and the visual representation of imaginary architectural space. It is a limited creation when the end is predetermined.

Prototype

The term prototype is generally understood to be *an original thing or person of which or whom copies, imitations, improved forms,*

representations etc. are made. (Oxford Complete Wordfinder, p1227)

Semiotics

The science of signs

Significance

Significance is limited to what is viewed or regarded as important for a specific time. Significance therefore suppose a value system which is time limited, for it is intended for the age in which it is valued as important.

Space

Space, therefore, is understood to be that element of architecture where boundaries are determined by the physical elements of architecture. These physical elements of architecture can, in simplistic terms, be referred to as the floor, roof and walls.

Spacemaker

Designers of space, not necessarily educated architects, e.g. designers of cyberspace.

Spielraum

Rheingold (1991:372) quotes from Bruno Bettelheim's article in the Atlantic Monthly, March 1987, titled 'The Importance of Play'. Bettelheim believes that *a child, as well as an adult, needs plenty of what in German is called 'Spielraum'. He defines this word as more as the obvious meaning, namely 'free scope, plenty of room' but as the will to 'move... one's mind, to experiment with things and ideas at one's leisure,... to toy with ideas'.*

Symbol

Architecture-on-paper can function as a medium to examine the possibility of creating symbols that can act as a vehicle to communicate meaning.

Theory

The researcher relies on Johnson's statement (1994:32) that theory can be interpreted to be the line of thought that governs the design process. It need not be clear-cut before the design process actually takes place, but can be reinvented and altered according to new problems or facts that arise while the designer is busy resolving the design problem.

Theoretical frame of reference

A theoretical frame of reference is that line of thought/ideas that governs the design process. As such it is inspired by the spirit of the age in which it is formulated, for it resolves the design in a way that tends to be typical of the age in which it is designed... This frame of reference can be seen as a library of ideas that can be argued as to why certain design decisions were made.

Time frame

Theory is trapped within the time span (time frame) in which a certain space is designed. The designer is influenced by the age he lives in, whether it is a conscious or sub-conscious activity.

Utopia

Utopia applies to any concept or application aspiring to an ideal. What is not made clear by dictionary definitions, however, is that utopia is primarily a social construct, not an architectural one; it is largely indifferent to its physical manifestation. The origin of the word Utopia is found in 1516. Sommer (1969:145) dates it back to this year when Sir Thomas More, a writer, described an imaginary island called Utopia in his book with the same name, *which enjoyed perfection in politics, law and family relation.*

Virtual reality

Virtual Reality, often mentioned in the same sentence as cyberspace, refers to *the subjective experience of the 'data space' of the computer system when the computer translates numerical co-ordinates into a visual, aural and tactile display. It is the apparent world the user enters while using the system.* (1997: http7)

Zeitgeist & Avant-Garde

Zeitgeist and avant-garde are two terms describing the spirit of the time and the most advanced ideology to work towards predicting the Zeitgeist of the future.

8.2 Synopsis (English)

Architecture-on-paper: a study on the significance of imaginary architectural space.

Hypothesis: Imaginary architectural space as expressed on paper has a significant influence on the practice of architecture.

The purpose of the study is to determine whether imaginary architectural space has a significant influence on the practice of architecture.

Architecture-on-paper was used as a source of reference, since the expressional possibilities of imaginary architectural space on paper are limited by the imagination and medium only. Architecture-on-paper is created as a term and is used in this study to include architecture that was generated in other mediums than built architecture, i.e. models, computer-generated drawings, paintings, etches, etc.

The research preceding the study led to the chapter layout, therefore a short summary of the chapters:

Chapter one: Criterion of architecture

In this chapter different opinions on the true nature of architecture were investigated. These varied from 'architecture as the art of building' to architecture as something that 'already exists in the mind', excluding all physical elements, except the mind, as generator.

For the sake of this study architecture was taken to be space that comes into existence via a design process, to resolve an existing need, whether this need is externally or internally motivated.

Already in the investigation into a definition of architecture, it was clear that the different definitions of architecture that were found, was influenced by the time in which it was formulated.

Chapter two: The development of architecture-on-paper

Paper as a medium to communicate imaginary architectural space was only fully developed early in the Renaissance. All previous attempts to communicate space were limited to planar representations and referred more to the actual form of objects.

In addition to relevant manifestations of architecture-on-paper through history, this chapter also accommodates architecture-on-paper in the present situation. In this regard it functions as impulse-inspired art, a design tool in the process of architecture and as an autonomous field where it claims a right to existence.

Chapter three: The purpose of architecture-on-paper

The different manifestations of 'architecture-on-paper' are acknowledged for its experimental qualities where it function as a laboratory for education, examination and investigation. It is also acknowledged for the fact that it functions as bridge between the theory of architecture and the practice thereof.

Chapter four: The significance of imaginary architectural space

This chapter emphasises the importance of communicated imaginary architectural space, for when this space exists in the mind only, it's significance is restricted. The significance of imaginary architectural space is defined as the first step in the process of architecture, which leaves the field open to a variety of different directions as the next step. Amongst other this involves the creation of prototypes; the expression of fantasy; a challenge to technology; or on the more practical side, the communicating document to the building team who have a built product as focus.

Chapter five: The significance of paper as a communication medium for imaginary architectural space

The restrictive nature of paper as a medium of communication is stated by researching its advantages and disadvantages. This restricted nature seems to be the reason for the development of other mediums of communicating imaginary architectural space. In this regard, computer technology seems to be taking the lead and gives a new perspective to the practice of architecture.

Chapter six: Conclusion

The interdependent character of architecture-on-paper and imaginary architectural space is central. The main focus is located in the fact that imaginary architectural space is the significant first part of architecture, not an external influence on the process of architecture. This led the researcher to change the original hypothesis to:

Imaginary architectural space as expressed through a medium is a significant part of the practice of architecture.

The process of architecture hereby gains significance as a series consisting of different means of communicating the original idea (imaginary architectural space). First communicated through a medium it may/may not result in built form. It is therefore obvious that a final built product is not essential for the practising of architecture, and it is also obvious that imaginary architectural space will find a means of expression whether cave walls, paper or computer screens are available, or not.

8.3 Synopsis (Afrikaans)

Argitektuur-op-papier: 'n Studie na die betekenisinhoud van denkbeeldige argitektoniese ruimtes.

Hipotese: Denkbeeldige argitektoniese ruimte soos vergestalt op papier het 'n betekenisvolle invloed op die beoefening van argitektuur.

Die doel van die studie is dus om te bepaal of denkbeeldige argitektoniese ruimtes 'n betekenisvolle invloed op die beoefening van argitektuur het.

Argitektuur-op-papier het gedien as 'n verwysingsraamwerk aangesien die ekspresiewe moontlikhede van denkbeeldige argitektoniese ruimtes slegs beperk word deur, die verbeeldingswêreld en die medium. Die term 'argitektuur-op-papier' is vir die doel van die studie geskep en sluit ook die gebruik van ander mediums/aanbiedingsmetodes as die voltooide argitektoniese gebou in, byvoorbeeld die gebruik van modelle, rekenaar gegenereerde tekeninge, kunswerke, etse, ensovoorts.

Die navorsing wat die studie voorafgegaan het, het gelei tot die uitleg van die hoofstukke. Vervolgens 'n kort opsomming van die hoofstukke.

Hoofstuk een: Kriteria vir argitektuur

Hoofstuk een ondersoek verskillende menings ten opsigte van die ware aard van argitektuur. Hierdie menings wissel vanaf 'argitektuur gedefinieer as boukuns' tot argitektuur as iets wat 'alreeds in die bewussyn bestaansreg vind', sonder enige fisiese elemente buiten die intellek as generator daarvan.

Vir die doel van hierdie studie word argitektuur omskryf as ruimte wat geskep word deur middel van 'n ontwerpproses met die doel om bestaande behoeftes te bevredig. Hierdie behoeftes kan intern of ekstern gemotiveerd wees.

Alreeds met die ondersoek na 'n definisie van argitektuur was dit duidelik dat verskillende definisies van argitektuur beïnvloed is deur die tyd waarin dit geformuleer is.

Hoofstuk twee: Die ontwikkeling van argitektuur-op-papier

Papier as kommunikasiemedium is eers in die vroeë Renaissance ten volle ontwikkel. Alle voorafgaande pogings was beperk tot planêre voorstellings wat gefokus was op ware vorms en groottes.

Addisioneel tot die relevante historiese verskynsels van argitektuur-op-papier, word daar ook in hierdie hoofstuk gefokus op die huidige manifestasies daarvan. Hierdie manifestasies kom onder andere voor as impuls geïnspireerde kuns, 'n ontwerp werktuig in die argitektoniese proses en as 'n outonome veld met 'n eie bestaansreg.

Hoofstuk drie: Die doel van argitektuur-op-papier

Die verskillende manifestasies van argitektuur-op-papier word erken vir hul eksperimentele kwaliteite. Hierdie kwaliteite funksioneer as 'n laboratorium vir opleiding, ondersoek en navorsing in die veld van argitektuur. Argitektuur-op-papier se verdere waarde lê in die feit dat dit as 'n 'brug' tussen die teorie van argitektuur en die beoefening daarvan in die praktyk funksioneer.

Hoofstuk vier: Die betekenisinhoud van denkbeeldige argitektoniese ruimte

Hoofstuk vier beklemtoon die belangrikheid van gekommunikeerde denkbeeldige argitektoniese ruimtes, aangesien die waarde van hierdie ruimtes beperk is wanneer dit slegs in die bewussyn bestaan. Die waarde van denkbeeldige argitektoniese ruimtes word beskryf as die eerste stap in die proses van argitektuur. Dit laat die veld oop vir verskeidenheid in die daaropvolgende stappe. Hierdie verskeidenheid kan die volgende insluit: die onwikkeling van prototipes; as uitdrukking van fantasie; 'n uitdaging vir tegnologie, of, aan die meer praktiese sy, 'n kommunikasie dokument aan die bouspan wat 'n voltooide gebou as fokus het.

Hoofstuk vyf: Die betekenisinhoud van papier as 'n kommunikasie medium vir denkbeeldige argitektoniese ruimte

Die beperkende aard van papier as 'n kommunikasie medium word ondersoek aan die hand van die voor- en nadele daarvan. Hierdie beperkende kwaliteit blyk die rede te wees vir die ontwikkeling van ander kommunikasie mediums waardeur uitdrukking gegee kan word aan denkbeeldige argitektoniese ruimtes. Rekenaartegnologie blyk die leiding te neem as deel van hierdie 'ander' medium, en gee 'n nuwe perspektief aan die beoefening van argitektuur.

Hoofstuk ses: Samevatting

Samevattend word gewys op die interafhanklike karakter van argitektuur-op-papier en denkbeeldige argitektoniese ruimtes. Van besondere belang is die feit dat denkbeeldige argitektoniese ruimte 'n integrale deel is van die proses van argitektuur, naamlik die essensiële eerste stap daarvan, en nie slegs 'n eksterne invloed op die proses van argitektuur is nie. Hierdie feit lei die navorser om die oorspronklike hipotese te wysig na die volgende:

Denkbeeldige argitektoniese ruimte soos vergestalt deur 'n voorstellingsmedium is 'n betekenisvolle deel van die beoefening van argitektuur.

Die proses van argitektuur verkry hierdeur waarde as a reeks uitdrukkings van dieselfde oorspronklike idee (denkbeeldige argitektoniese ruimte) deur middel van verskillende medium en metodes. Indien hierdie idee gekommunikeer word deur mediums, mag dit lei tot 'n voltooide gebou al dan nie, as resultaat. Hierdie voltooide produk is dus nie noodsaaklik vir die beoefening van betekenisvolle argitektuur nie. Dit is duidelik dat denkbeeldige argitektuur wel 'n metode van uitdrukking sal vind, of daar nou grotmure, papier of rekenaarskerms beskikbaar is of nie.