A TISSUE, A BUILDING, Santiago de Chile: transformation of the images and elements of the language of space and form into the design of a promenade

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...Paris is grey,
Rome is ocre,
Venice is gold,
Santiago is pink...
This study explores a strategy for an urban intervention in Centro Poniente, Santiago de Chile. Centro Poniente represents an urban district that needs some sense of focus and orientation.

The hypothesis is that such an intervention should be sympathetic to the character of the city fabric as manifested by the physical elements in a gamut of scales. Such manifestations are reflections of cultural norms and values. Intervention then represents an incorporation of new standards as a dialectic between permanence and change.

In its structure and sequence, the thesis illustrates a way of designing, with the purpose of making that more conscious and explicit. The incremental process of recognizing appropriate images or organizational devices and then incorporating them in an evolving project, carries the exploration through a series of studies of various components of the city of Santiago: walls, components of walls, components generated by walls; scales, dimensions and light modulation of such components all contribute to the making of a promenade acting as a catalyst for the revitalization of Centro Poniente.

Thesis Supervisor: Fernando Domeyko
Title: Associate Professor of Architecture
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Domeyko, for having introduced me to a disciplined design process.

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Cette thèse est dédiée à mes parents.
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INTRODUCTION

The Industrial Revolution and later the tabula rasa of the Modern Movement have played a notorious role in the destruction of urban culture, thus creating a need for reconciling development and the making of urban spaces, amidst city deterioration and shortage of proper housing. This dual observation becomes the underlying premise for the study of Centro Poniente in Santiago de Chile, a district faced by these problems. The intent of this study is to propose an architectural alternative to the city's plan for the renewal and revitalization of this district. The study is concerned with identifying an urban grammar -- an order of incremental but coherent physical relationships -- through which Centro Poniente, can realize its special potential. The urban grammar is not a specific invention but an elucidation of an order already implied by the existing city's physical form. The order emerges in the process of discovery; the urban grammar suggests humble guidelines for exploiting the strengths of that order. It tries to discover formal solutions which take into account the existing quality of life.

At the outset of the study, a general understanding of the dynamics of the extensive district of Centro Poniente revealed that the activity (market, commerce, festivals) occurs mostly along its periphery permeating only at the boundaries of the district. If a center is created, it is believed that it could then
LES PROMENADES DE PARIS
attract these peripheral activities into the life of the district. Such is the assumption. It is deemed that a plausible process could be introduced, with minimal intervention, to create a new order in the cityscape. (Inherent in the proposal is the assumption that most of the current inhabitants will remain in the district, and that a new population will be introduced, due to its increased attractiveness.)

In view of the above, it appears that a formal promenade, by cutting through the blocks, and creating a new public domain could be a realistic approach to the problem. Such is the proposal. The design exploration then becomes a research into possible ways of introducing a promenade into the existing urban fabric by finding an architectural vocabulary to articulate the promenade.

This promenade is to run through the interior of a series of blocks acting on the yet unbuilt portion of the blocks. By introducing a major concentrated public domain it is hoped that there can then exist a focal point for socio-cultural activities which is thought of as an important element for revitalization. To this aim sites along the promenade are used for public buildings (museums, schools, shops, etc.); commercial cultural events are to provide the desired attraction along the promenade. Some housing is also proposed both to provide housing for those associated with these major public events; i.e., shopkeepers, artisans, etc. and accommodating an incoming population. As such, the design projections attempt to provide a spine for these activities.
In Santiago, the framework is the grid dating from its founding in the 16th C. It is the largest, most permanent element of physical organization, it changes least and is therefore the most neutral part of the system. Downtown Santiago presents a perfect grid of 125m.

The Spanish-colonial grid generates the following urban forms:
- streets ("calles")
- corners
- blocks ("manzanas")
- squares ("plazas")

The figure-ground plan reveals a finer grain of pedestrian movement within the blocks that developed over time in response to the needs of the inhabitants. Many blocks contain a subsystem of "pasajes" for pedestrian use. The emergence of this network is very clear in downtown Santiago. However, this finer network is not an integrated system because each block has been developed internally without reference to the surrounding blocks.

The physical environment, transformed with the participation of its inhabitants, creates an intricate and complex grid generating the following urban forms:
- alleys ("pasajes")
- communal courtyards ("cites")
- neighborhood squares ("plazoletas")
An analysis identifies the historic patterns of the neighborhoods built environment and seeks to understand the relationship between the built environment and its users (1). The search begins with a study of the urban tissue of Santiago. On the Spanish-colonial grid of 120m x 120m, it was observed that a second, more intricate and complex grid evolved over time, responding to the needs of its inhabitants. This superposition of grids yields multiple and different urban forms which can host a great variety of functions. The urban tissue thus presents continuity, variety, and possibilities of adaptation for modification of functions linked to the evolution of the life of the district. Because the urban forms are seen as the expression of a culture, and reveal an adaptation to the physical environment, it becomes important for the urban spaces generated in the promenade to retain the meaning of these existing urban spaces. Equipped with this analysis, the study then becomes an exercise in translating existing urban forms, that maintains the image of the neighborhood, into the design of the promenade.

It was observed that the city is made up of large singular structures (blocks), subdivided into individual and collective domains (dwellings) to contrive a range of scales. The alignment of these structures within a block can, in relation to the streets, be perceived as walls with openings for entrances into individual dwellings and blocks. This is analogous to the "zaguan" in a typical Chilean house, where the "zaguan" is the dark passage leading to lighted courtyards. Therefore, the wall can be seen as a basic component of the range of elements in the built cityscape.
The wall can be understood as the basic component for the range of elements in Santiago's built space: (a) círculo, (b) zaguan, (c) pasaje.
The research uses the concept of the wall as the basic element for generating the urban promenade. The wall is perceived in various forms: the wall curtain, the colonnades, the stairs, the amphitheater form, all of which represent transformations. These forms vary as the opening and containment take on different shapes and dimensions. Thus, it was necessary in the analysis of the character of Centro Poniente to understand the wall as:
- an element composed of surfaces (or barriers) and openings;
- a modulation of its generic type leading it to take on different forms;
- the juxtaposition of these forms to create spaces within the framework of a city (i.e., corners, squares, arcades);
- urban elements made of the collection of these former elements, to provide a larger spatial order.

It is hoped that through this process of development leading to a design concept, the image of the character of the place can be adequately translated. Such is the importance of character that when Vitruvius writes of the Agora, he states:

"The Greeks lay out their forums in the form of a square surrounded by very spacious double colonnades, adorn them with columns set rather closely together, and with entablatures of stone or marble, and construct walks above in the upper story."

The emphasis so far has been on the aggregation of elements which can be seen as a means to modulate other spatial qualities like brightness and darkness. Because of Santiago's latitude light comes down vertically, offering remarkable contrast between brightness and darkness or,
rather, light and shade. As reflected in the vernacular architecture, Centro Poniente's built landscape testifies to the inhabitants' understanding of this high light contrast which they manipulate by giving it physical form. This concept acquires its highest significance in the organization of the "zaguan" and the courtyard as a modulation of lighted and shaded sequence of spaces. Through this observable pattern the understanding of the importance of dimensions in the making of places can be accentuated.

Dimensions are not the only tools which manipulate light qualities, but are also means for providing opportunities for different levels and kinds of interaction in space. The purpose of dimension studies is to understand how, in designing the urban spaces for the promenade, these spaces are made to accommodate the range of light sequences in the context of an urban environment whereby efficiency in the use of space is mandatory. Dimensions from a range of urban schemes have been studied. These dimensions are used as a disciplined design approach for understanding the possible articulation for the 1060 meter promenade.

The analysis on urban dimensions reveals how the urban event, or urban furniture, acts as an organizing force to define space sequences. To this effect, podiums, kiosks, water pools, gates, punctuate the promenade as they further intensify the urban scale of the promenade and encourage street participation.

In summary, the analogies for the method of design could become a series of rooms in light (squares), linked by a series of "zaguanes" (connectors of shadow). Furthermore, even the
Santiago house, with its interior courtyard, adheres to the proposition of a formal, rigidly bounded promenade, a courtyard type surrounded by rooms. From the observation of dimensional and perceptual images of Centro Poniente the meaning of the elements constituting Santiago's urban fabric is hopefully respected. However, the promenade introduces a new hierarchy among the existing components while also allowing for changes in the functions to appear. Perhaps then, a certain degree of coexistence between permanence and change may be said to have been achieved. This new component, or urban element, can be named. The nomenclature used for the purpose of the study will be "paseo", a term which partakes of the Spanish tradition of parading.
CONTEXT

The non-directional grid of Santiago serves as a neutral framework for variable infill. It was well placed at the time of its foundation, in the 16th C, as a system capable of growth on relatively flat land. It offered the possibility of ordered extension, limited only by the natural boundaries of the hills and river. As the city expanded, however, the frequent repetition of blocks became monotonous, making orientation difficult and confusing. By now, the perception of the relationship between the parts and the whole has become almost abstract. Perhaps the streets and blocks are no longer adequate as the largest elements of organization. The paseo, by creating a spine and introducing a new scale, may not only create a center but also increase the legibility of the area.

The Centro Poniente area presents the particularity of an irregularly laid out Spanish-colonial grid system allowing for oversized blocks or "manzanas" to appear (blocks vary from 200x 95m to 180x 70m). Ten oversized blocks, running alongside a major thoroughfare, linking downtown Santiago to its central park, Parque de la Quinta Normal, is chosen as the potential site for this hypothetical intervention. The paseo is to run through the interior of the blocks thus acting on the least built portion of the site. However, two housing developments are found towards the interior of the blocks and these cannot be removed. Their
position in the blocks justifies for the three axes which control the design of the paseo.

The terrain descends gently to the park with a slope of 1.2%, thus creating opportunities for level changes combining both stairs and ramp systems.

The paseo ties in with an existing "greenery system":
- the Avenida Cummings at one end, a broad tree-lined street, which attracts market festivities;
- Plaza Yunguay, a green square, situated mid-way in the paseo and associated with a church and a busy cross-street;
- Parque Quinta Normal, Santiago's central park.

Existing public buildings are incorporated into the paseo, and are associated with a square or "plaza".

An existing school becomes associated with the paseo through a series of courtyards.

A national art museum is proposed to terminate the paseo on the edge of the park.

Housing is also proposed to provide for the desired incoming population. Workshops directly associated with the paseo are to be incorporated with the design of the units to accommodate the existing artisans' population and encourage some commercial activity along the promenade.

The east-west orientation of the promenade creates contrasting edges along the paseo; one in light, the other in shadow. The design of the promenade is to play up this difference.

The paseo is not only treated as a directional path, running through a series of blocks, but also transforms itself into a series of courtyards when the size of the block is such that the connection between the two bordering street becomes less evident (over 70m as discussed in a following chapter). Thus is generated a series of promenades and courtyards forming the paseo.

As mentioned earlier, Centro Poniente, is an urban structure that remains through time but testifies to a continuous creativity and participation for the change of space by its inhabitants. Transformation and human activities take expression through the following elements in light and landscape:
- squares ("plazas")
- streets ("calles")
- neighborhood squares ("plazoletas")
- alleys ("pasajes")
- communal courtyards ("cites")
- private entrance corridor to the house ("zaguan")
- interior private courtyard ("patio").

Each of these elements will be identified separately with respect to their dimensional and perceptual qualities.
"Architecture takes place in the wall." Venturi

The different urban forms of Centro Poniente are almost all defined by walls, as the alignment of the blocks and dwellings present a continuous surface which folds and bends to create a variety of urban forms. A wall is thus proposed as the possible ordering and defining element for the promenade. The wall grants the freedom to alter behind the stabilizing effect of a "public facade" thus reconciling public stability with private unpredictability.

Examples are used to show how the concept of the wall has been consciously employed to create urban spaces.

This chapter deals with the various transformations of the wall as it takes on different forms responding to both, the particular function of the public spaces and the inner complexity of the inner tissue of the site.

Modulation of its generic type are identified as belonging to the Chilean landscape (terraces, steps, amphitheatre form, colonnade). These forms will be utilized to landscape the promenade.

The study goes on to examine how the juxtaposition of these forms yields certain definitions: corners, arcades, squares, courtyards. Rules for each type are elaborated in accordance with their position and dimensions as observed from the historic patterns.

Finally, the physical environment is understood as a collage of the elements of the wall providing a larger spatial order. Particular attention is given to housing which is conceived as a habitable wall.
Miletos, plan of North and South Markets in the Hellenistic period
Public space: 159 x 189 m
The Greeks used the stoa, a wall with an addition of a screen system, to recuperate a public facade in their cities. Later, the system was applied as a unifying device to give uniformity and continuity to a series of public buildings.

St. Peter's square
A screen defines a monumental square.

Uffizi
Public space: 21 x 163 m
A habitable wall defines an effective frontier between public and private. Public space assumes the directive role while the building is treated as a "free" response to adjacency.
precedents

Place Vendome
A free standing wall first encloses a public space, it is only later that houses are built behind these facades.

Regent Street
A wall is created by cutting into an existing fabric and later adding a habitable wall to recuperate a facade.

"Symposium Berlin Alt and Neu", Alison Smithson
An anonymous running screen, a viaduc, is proposed to restore uniformity by filling the gaps in the ruined areas of Berlin.
chile
Proposal for the first "manzana" in the paseo. A public outdoor space, allowing for representations, shows the use of a stepped wall. The square is associated with an existing church and an existing "plazoleta". Dimensions of the square: 42x55m
families of walls

STEPS
A wall treated as steps acts horizontally rather than vertically, thus explaining why steps are often associated with landscape formations (terracing). Treated horizontally, it is often only a minor intervention, however, if built up to a vertical, it rapidly begins to acquire monumentality due to the build up of a solid mass. The Chilean landscape, its indigenous architecture, seem to suggest the use of stepped walls as mass rather than an intermediary articulation between two levels. Steps, in a pyramidal form, will therefore be used to define places along the paseo rather than to merely express level changes. Treated as such, they offer the advantage of creating sitting areas. Furthermore, its vertical and horizontal planes, break up the light, thus exploiting Santiago's high light contrast.

AMPHITHEATRE FORM
The amphitheatre form is seen as a stepped wall shaped to serve a particular function.

COLONNADE
The colonnade is used as a screen creating further definition along the edges of the paseo. Colonnades, like steps, breaks up the light into patterns. Planted trees are considered an architectural element which further help define the paseo. The spacing between "natural" and "built" screens (arcades) will differ according to criterias set further along the study.
definitions made by the wall

The wall is perceived as a modulation of its generic type, steps, amphitheatre form, colonnade. The wall is deployed throughout the paseo to articulate the edge condition and provide enclosure.

The juxtaposition of forms, created from the modulation of the wall's generic type, produces spaces or urban events within the framework of the city, in other words, streets, arcades, containements, corners.
CALLES
Centro Poniente's streets are all approximately 12m wide. Since the width of the street is dictated by the grid, and not its use, some streets are very congested while others are fairly empty.

Streets are defined by a continuous wall of buildings since the first infills occurred along the edges of the block. The building's heights vary from one to four stories, although one story is predominante. Thus the rapport in section is approximately 1 to 2.

Quieter streets, residential in character, are often lined with trees. Inhabitants are found to claim the sidewalk in these streets. Such participation is encouraged along the paseo since it becomes a quiet street par excellence, freed from vehicular traffic.

PASAJES
Pasajes belong to the interior network of the blocks. Downtown Santiago's pasajes have developed into covered commercial arcades. However, Centro Poniente's pasajes are only narrow alleys which permit access into the interior of the blocks. Entrances to dwellings open perpendicularly into them.
Dimensions
The width of the pasajes of Centro Poniente vary from 3 to 4.50m. Due to their narrowness, these are often thought of as dark corridors equivalent to the zaguan of the Chilean house. An example of street participation shows how inhabitants transform a pasaje into a "zaguan" by running guirlandes across it.

PASEO...proposal
Dimensions
Length: 1060m
width: 21m
section: 1 to 3
How these dimensions were arrived at is explained in the chapter related to the study of dimensions.
Arcades do not belong to Santiago's repertoire of urban forms, as they do in Bologna for example. However, these certainly belong to the repertoire of the individual dwelling's architectural vocabulary.

Private interior patios are often lined with columns. These define a circulation zone around the most public area of the house. They act as a light screen and provide coolness by creating shade.

Position
In view of their use and micro-climate advantages, arcades are proposed along part of the paseo on the most exposed facades (facing north since it is the southern hemisphere).

Dimensions
The spacing between the columns is chosen according to specific criteria. The bay size is to allow housing units to be able to "plug in" to the arcade. 4.50m, on center, was first retained as a plausible spacing between the columns since it was measured in many public arcades (actually varying from 6m to 4m) and offered the possibility of "plugging in" a minimum width housing unit (room size, 3.60m, plus minimum circulation, 0.90m). However, a study of different unit configurations revealed that 3.20m was a more convenient size to work with in order to achieve the type of unit layout
desired. Thus, arcades along the paseo present two different spacing between its columns: 4.50m for a wall screen to be directly associated with a public building and 3.20m for an arcade to be associated with residential development.

The height of the arcade is determined at 3.00m. This, despite the fact that 5.50m was found as an appropriate "public" height in many cities (Paris of Haussmann for example) because it allows to add a mezzanine level (called "entresol" in Paris). However, in the context of Centro Poniente, 5.50m was considered too excessive since alone, the arcade would have exceeded the height of most of the existing structures. A lower arcade also presents the advantage of protecting more effectively from the sun.

The depth of the arcade is set at 2.10m (1.80m being a "generous" corridor width allowing for two persons to cross each other).
Running in parallel fields, the wall can create streets and arcades, and if it is bended, it creates containments.

PLAZA (square)
Position
There are different ways of creating a plaza within a grid system.

The most obvious way, is to leave a block totally unbuilt. Such is the Plaza de Armas, the main square of downtown Santiago (125mx125m). This case is not presented, since the paseo only deals with interventions within the blocks.

An other method to contain a space in a grid system, is to use the grid as a frame of reference for the urban event. The same way the free plan can accommodate the platonic solid, the grid fabric can contain the platonic void.

Plazas proposed for the paseo will thus be formed with is later approach. Plazas will be created by carving out the blocks or several blocks.

Most successful plazas are found to be the ones enclosed on their south side, thus allowing for the best sun exposure.

Dimensions
Plazas vary in size from 27.00 to 40.00m in width and 27.00 to 117m in length (1).
PLAZOLETA
Plazoletas are small neighborhood squares.

Position
These small squares occur alongside a street, often at the corner of the blocks. Because the paseo is to create a circulation spine, plazoletas can start occurring inside a block, just off the paseo, recreating a similar situation to that of the street. Plazoletas are to be contained primarily on their south side.

Dimensions
Plazoletas vary in size from 13.50 to 27.50m in width and 13.50 to 40.50m in length (1).

CITE
A cite is a group of dwellings with one way access into enclosed semi-private communal open space. Thus, cites should be contained on four sides providing a single entrance from the paseo.

Position
Cites are related perpendicularly to one of the following: plaza, street or pasaje.

Dimensions
A cite should not exceed 21x33m (1).

PATIO
The patio is a visually private open space within the domain of the dwelling; a microcosm of the cite. It is a light receptacle where the addition of screens (trees, trellis) act as a light filter.

The patio lay out implies a single unit to the plot, and is therefore considered uneconomical to consider as a type for a housing development. However, its basic characteristics will be retained for the design of units.

Position
The patio is often situated in the middle of the dwelling but it can also be found towards the front or back of the unit.

Dimensions
Patios vary from 3x3m to 9x9m.
corners

The reciprocal of any containment is a corner.

The diagram illustrates the treatment of corners in the Centro Poniente area: the "wall" recedes or protrudes.

Because the corner is seen as a potential place for interaction, it is treated as a void, rather than as a solid. However, the edges of the paseo should be defined and function as gates, or "zaguanes" to announce the paseo. The proposal is to extend into the paseo (building shadow) while allowing for circulation underneath it.

Three types of corners are developed:
(a) one bay street corner
Position
West end of the block, on the street (morning sun)
Dimension
3.20(w) x 6.40(l) x 5.50(h)
(b) two bay street corner
Position
East end of the block (afternoon sun)
Dimension
6.40(w) x 6.40(l) x 5.50(h)
(c) interior block corner
Position
A corner occurring within the block
Dimension
3.20(w) x 3.20(l) x 3.00(h)

Corners are fixed elements in the design.
diagrams showing corner conditions
It has been mentioned that, along residential streets, inhabitants extend their private domain into the sidewalk. In order to encourage the inhabitants' use of the paseo, screens are proposed as two rows of columns built alongside the dwellings (a). They are to provide sitting and gardening facilities. Private extension of the dwelling and public sitting is differentiated in its orientation in respect to the paseo.

**Position**
Running 1.80m away from the built edge.

**Dimensions**
Spacing between the columns is to be 3.20m, on center, to allow for the system to be possibly tied in with a housing development. The width is to be 2.00m in order to eventually become part of an arcade system.
composition of the wall

The wall is seen as a continuous surface with openings to allow for movement and light.

Arcades define bays, and these generate a system of coordinates acting as a frame of reference for placing openings.

Dimensions of the entrances for the various elements of the built scape (pasajes, cites, zaguanes) are studied. The size of window openings will be addressed at the end of this chapter.
PASAJE

Entrances to pasajes in Centro Poniente are defined by:
- a gate in the continuous building facade
- or by setting back one side of the entrance

Proposition

Existing pasajes abutting onto the paseo will be addressed in the following manner:
- a gate with an accessible second level will signalize the presence of the pasaje from the paseo
- dimensions
Its width should be integrated with the 3.20m bay system, thus creating an opening of 3.20x 5.50m.

CITE

Entrances to cites are defined by similar criterias:
- narrowness of the access way in relation to the interior space
- a gate in the continuous building facade
- a set back of one of the side walls

Proposition

One or both entrances are set back creating cool and ventilated sitting areas, thus simulating the zaguan in the private dwelling.
- position
entrance to the cite is to occur perpendicularly to the paseo
- dimensions
cite entrances belonging to the proposed housing complex have fixed dimensions: 3.20(w) x 3.00(h); its length is equal to that of one unit, 8.00m.
collage: builtscape as a collage of the elements of the wall
This chapter deals with housing associated with a public arcade. It aims at achieving a reasonable coexistence between public and private requirements while respecting the existing historic patterns of the neighborhood. A conceptual housing model is developed.

Programmatic requirements
Some units are to be associated directly with a workshop, opening on directly to the paseo. This is to encourage commercial activity along the paseo.

Entrance to units do not occur in the arcade since arcades are to be associated with commercial activities: artisan's shops, cafes, shops. Entrances into cites occur from the arcade and entrances to units from the cites.

Unit lay out
Domeyko's study of the Chilean house type abstracts essential notions for the development of a conceptual model for the unit. It is important to understand these because they represent the basic notions of the system. They might also imply the structure for the production rule.

- The width of the site is always smaller than its length (ratio 1 to 3). Only one side faces the street, or any other public domain, and the other three are surrounded by walls. The entrance can only occur on the side facing the street.
Exterior spaces stand out as positive elements and begin to imply three main zones: (a) anterior zone: street; (b) interior zone: patio; (c) posterior zone: garden. These become main elements of organization grouping rooms around a fix zone in the front of the unit and a flexible zone towards the rear.

The structure also re-enforces the horizontal zoning and penetration occurs perpendicular to these.

The circulation pattern is very consistent. It always follows a sequence: street to zaguan, zaguan to patio, zaguan to almost any room (light sequences will be analysed in the following chapter). The zaguan becomes the important transition space between public and private.

Proposal
Dimensions
As mentioned earlier, it was important that the bay size, chosen to generate the paseo's "wall", should be of a workable width to allow for housing development to "plug" into it. 3.20m, on center, is retained since it allows for adequate size rooms within a single bay. A unit consists of either one or two bay sizes, yielding units of 6.40m and 9.60m. The living areas are the fixed zone of the units. These do not alter whether, the zaguan is single or double loaded, in other words, whether the unit consists of one or two bays. Bedrooms are considered the flexible zone.
RELATION OF COLUMNS TO OPENINGS
This study, of the relation of the column to the position of the zaguan for the different unit widths, was made prior to the decision to avoid creating private entrances directly in the arcade.

The variables were:
- width of the units: 4.50m; 6.00m; 7.50m; 9.00m
- width of the zaguan: .90m or 1.80m with vertical circulation
- a minimum width room size: 3.00m

Rule:
- the column was to always correspond with one of the side walls of the zaguan

The exercise aimed at arriving at a flexible system which would allow endless aggregation of any different unit type.

Conclusions:
Each system was found to be self-generating, in other words, that it could keep repeating itself. However, not all systems permitted the aggregation of any unit type. Such was the case for unit A' and C', where the exterior wall of the unit did not match the column, whereby creating difficulties for the next aggregation of a unit. These, however, are "neutralized" by respectively C and A, and the system is allowed to continue.

The system was estimated to be flexible enough for its purpose.
Sketchs explores the ways of aggregating the different units. The openings do not represent the actual size of windows, they only delimit the zone where these can occur. Windows in Santiago are more often vertical for best control of the light. The rapport of height to width should be maintained between 1 to 2 or 1 to 3. Thus, position of the windows are not fixed, they are only confined to a zone.
2nd

/unit B
From the extensive analysis undertaken by Domeyko [1] of popular urban dwelling in Santiago de Chile, an understanding of the light modulation in the individual dwelling evolved. The "zaguan", a dark and narrow passage which connects the street to the interior open air "patio" of the house, creates a distinct movement towards light in the following rhythm: light, shadow, light. The fact that the "zaguan" acts as a dark and narrow connector between two levels of privacies, is an important concept towards understanding how it becomes a key organizing entity for the reading of the city fabric as a whole. In fact, the alternation from light to dark appears systematically as one progresses in a vertical relationship from the more private to the more public spaces in the city.
spatial continuity

patio / zagúan / cité / pasaje

Spatial continuity: alternation of light and shade combined to a continuous entity with distinct properties and dimensions for each of its component parts.
plazoleta / calle / plaza
"zaguán" as a concept

If "zaguan" is a Spanish term restricted to housing nomenclature, in the context of this study, we will refer to it as if it were a generic term. It will signify to us the dark connector zone between two sources of light that is inherently related to a movement system.
The following plates are an illustration of how this concept has been utilized to explain the implications of how a design projection for a promenade can be inserted into the city's network. The plates speak of a light sequence moving from light to dark.
light sequence: 

| light | dark | light |

paseo: Connector between the market and the park
Passage through the blocks: connector between streets
Entrances to a block: connector to an interior space within the block
a. thoroughway passage: connector between the paseo and the cite
"Zaguán": connector between the street and the patio
A light sequence, light, dark, light, can only occur if movement occurs perpendicularly through series of horizontal fields. This remark leads us to consider the concept of connectors, or zaguanes, as links between light and dark horizontal fields.
paseo blocks
city
cite
dwelling.
CONNECTORS: movement
"zaguanes"

The opposite page shows examples of how shadow is "built" along the paseo. Greenery is considered an important commodity for achieving this.

Movement is encouraged by framing, with the shaft of the zaguan, the light in the next horizontal field.

The act of moving through a dark horizontal field conveys a sense of having reached something, arrived somewhere: (a) finds itself in Y while (b) is still in X.

This chapter deals with "building" these different fields in order for the paseo to read as a sequence of events: entice and register movement.

A plan is found at the end of this chapter showing the placement of these connectors within the promenade.
The paseo is conceived as a series of promenades (connectors) and squares. Three plazas were designated for their association with public buildings and larger open spaces. These blocks occur at the beginning, middle and end of the paseo. Essentially, then, all the other blocks are treated as connectors (a). However, other urban events can occur.

Block (b) is an example where a plazoleta occurs along the street. Two factors are fixed.
- Its position in relation to the block: on the west side of the block, associated with the double bay corner end
- Its dimensions: the plazoleta should not be more than 42m deep and 21m wide (paseo+plazoleta=42m).

Block (c) is an example where the plazoleta occurs within the block. Three factors are fixed.
- Its position south of the paseo.
- Its dimensions:
  21m wide
  33m deep
Characteristics:
Announced from the paseo by a gate.

Block (e) is also a case of an other special condition. It is when a plaza is created over two blocks.
The plan presents the juxtaposition of the different block types. The particular arrangement of these blocks was arrived at from the dimension studies presented in the following chapter. Dimension studies provided the framework for organizing a sequence of events.
"I could tell you how many steps make up the streets rising like stairways, and the degree of the arcade's curves, and what kind of zinc scales cover the roofs; but I already know this would be the same as telling you nothing.

The city does not consist of this, but of relationships between measurements of its space and events of its past..."

Italo Calvino: Invisible Cities

This chapter explores dimensions as one aspect of a disciplined design process. Various urban schemes and building complexes are analyzed. A recurrent set of dimensions begin to appear along the investigation. These were found to be transcultural. This observation lead to hypothesize that, these recurrent set of dimensions were somewhat related to man's perception and apprehension of space, and that, over time these developed into conventions. Hence their persistent appearance throughout urban schemes. These "conventions" serve as guidelines for tackling the problem of intervening at such a vast urban scale.

Results of these investigations are applied directly for the structuring of the paseo, as demonstrated on the plans inserted at the end of this chapter.

Note: Dimensions are only the best approximation.
Egyptian temples often had the measurements of public squares, however, these were not genuine squares because they did not function as such. Nevertheless, they remain relevant for the study of urban spaces as an example where a totality is achieved through a series of sequential architectural experience.

Concepts to be retained:
- organization on an axial sequence, the axis dictating the movement
- the totality exists within the boundaries of an architecturally framed enclosure
- dimensions:
  - "public" space of 42x33m
  - sequential events found to be occurring every 55m and 70m
  - length of the total "journey" approximating 110m
Greek acropolises often express a lack of the desire for spatial integration. It was volume, the mass of structure or sculpture, that was the interest of the artist.

In order to find some kind of system for the layout of the acropolises, a Greek archeologist, by comparative studies of ancient Greek acropolises and city centers, tried to prove that the individual buildings were arranged corresponding to the laws of perspective and the capacity of the human eye and its angle of vision. The nature of the research remained somewhat suggestive, however, in analysing the range of dimensions found in the lay out of the Greek agora (chosen over the acropolis because the desire for shaping space is more apparent here than in the great sanctuaries) it might be of interest to keep in mind that the dimensions of the public squares could be related to man's angle of vision -- varying between 27 and 18, in the vertical plane, and 60 in the horizontal.

Observations:
- a diagonal movement bisects the space
- the placement of urban furniture is such that almost equal dimensions begin to occur throughout the space

Concepts to be retained:
- a regular bay system of enclosure does not necessarily need to bound the totality of the space, the stabilizing effect can be obtained from recurrent set of dimensions which appear with the appropriate placement of the urban furniture
- dimensions:
  - 40m, defining a sub-space of the larger whole
  - 110m, defining an uninterrupted length of the space
  - 5.50m, height of the public ground floor
Palmyra's main street is lined on both sides of its entire length by two colonnades each 4.8m wide.
The main street is broken up by the crossing of secondary streets. Joints are acknowledged by an increase in the architectural definition:
- triumphal arches
- monuments
- increase in the articulation of the colonnade itself

Concepts to be retained:
- use of a free running screen to define the main street on its entire length
- articulation of joints
- dimensions:
- 21m, the width of the central shaft
- 1066m length of the entire street compared to the 1060m of the proposed promenade.
PALMYRA. PLAN OF THE MAIN STREET
After Cassas, *Voyage pittoresque de la Syrie, de la Phénicie* ...
hagia sophia
The shaft at Nancy provides an example where squares are combined with a promenade to arrive at a total configuration.

Elements which act as a unifying force in the composition:
- skillful deployment of detail (gilded wrought-iron balconies, screens, gates, lanterns, grilles)
- use of a central axis controlling the design

Concepts to be retained:
- The creation of narrow spaces as a link, or connector, between larger open spaces
- the creation of a shaft, design in depth, to keep people in movement
- architectural unity achieved by a regular bay system
- the use of green as a precious commodity providing for the design quality for one of the spaces
- use of gates to define all entrances to the promenade from the city
- dimensions:
  - 20m, width of a connector defined by an 8.00m high enclosure
  - 70m sequence articulates the most urban part of the promenade, Place Stanislas
  - 430m, length of the totality
stanislas, nancy
Haussmann was able to act on the entire city of Paris because a system of standardization was elaborated for all its component parts.

The design principles applied to the restructurization of Paris were no other than those developed by Andre Le Nostre in his garden designs:
- creation of vistas
- use of bi-polar tension along a main axis
- use of ronds-points for intersection of movement systems
- use of trees as an enclosing agent

From these concepts, Haussmann developed a hierarchy in the movement system:
- "les avenues", broad tree-lined avenues (120m) which often ties in the city with its park system; promenades often flank these avenues
- "les boulevards", main thoroughfares (40 to 70m) often flanked by one or two side streets; the width of the "island" between the boulevard and the side street is generally found to be 8.50m, a place which often accommodates a market
- "les rues", (20 to 30m)

With these three movement systems, Haussmann was able to cut through medieval Paris and bring the city to read as a unified whole. Buildings were erected to create a facade for these new streets; cornice height, bay size, window openings, choice of materials, were all imposed. The result was a homogeneous "wall" of buildings which clearly defines the frontier between the compactness of Paris' older tissue and the opening up of space in the boulevards.

For the remodeling of Paris, extensive plans were drawn up and collected in Alphand's Promenades de Paris, of which a few plates are included in this study. Because the plans for these urban spaces combined both functional and aesthetic ("plaisir de l'oeil") rational, they will be closely examined for the purpose of this study.

Concepts to be retained:
- use of trees as an enclosing agent fully integrated with the design of the urban spaces
- standardization of urban elements
- controlling vistas
- dimensions
  210 to 390m conceived as a workable length for articulating the totality
  110m (55+55)
- 70m marking sequences
- 20m, width for a promenade
- 8m width between two rows of trees
- 5.50m height of the first floor, often consisting of one ground floor and a mezzanine (entresol)
The Rockefeller center presents an urban intervention within a grid system.

Concepts to be retained:
Dimensions
- a main axis is developed for 310m
- again 70m and 110m are used to break up the scheme
- a plaza at the edge of a block measures 35x26m
- the promenade leaving from Rockefeller Plaza is 16m wide, divided into two pedestrian lanes each 5.50
A typical section was arrived at early on in the design.

21m was found to be a standard width for a public movement system (Palmyra, Nancy, Haussmann's Paris). A distance which allows for visual contact from across the paseo.

The paseo is broken up in five lanes:
-(a) 8.00m
-(b) 5.00m
-(c) 3.00m for the lane running along the houses and 2.10m for the width of the covered arcade serving commercial activities

Several dimensions were retained from the investigation.

-70m, is thought of as a workable distance for articulating sequences. It deals with movement. Often used for urban schemes, 70m also appears in very imposing building complexes - movement "captured". 70m generates 140m (70+70).

-55m, is thought of as a middle range distance situated between 70 and 42m, in other words, it is seen as the minimum distance in the 70m sequence and the maximum dimension for a 42m space. 55m generate 110m, a dimension often found in urban schemes, it seemed not as much related to movement but to a static building (stoas for example, which can be thought of as two "building sizes", 55+55m.

-42m, is a dimension often found in public spaces (Roamn forums). It is perhaps related to man's angle of vision which allows to encompass a figure in its totality at a distance of approximately 20m. Thus, a man standing in the middle of a 42m space can "control" to either edge of the space. Therefore, 42m can be seen as twice the 21m retained for the section of the paseo.

The first plan is a direct application of these set of dimensions. It was also what provided the first set of decisions for the design.

The second plan is a succinct summary of the preceding one.
This chapter is an eclectic collection of different notions suggested throughout the process of the study. It deals with urban furniture. These furniture are conceived as standard elements, similar to Hausmann's small edifices which he dispersed through Paris.

It suggests some design for gates which are thought of as important elements for creating light modulation.

It talks about the use of water as a light reflector.

It talks about "folies". These being free interpretations of small public shelters with undetermined function.
"miradores" : vistas

Look outs or "miradores" are proposed as visual escapes from the channelled vista of the paseo. Their generic form is to be a stepped pyramide - a detached fragment of the stepped wall.

(a) The paseo is situated perpendicularly between Santiago's two mountain ranges. The pyramidal shape of the "mirador" is to create associations with the distant landscape. The Japanese call this technique "shakkei" (borrowed scenery).

(b) The oblong" mirador" is positioned along with the movement of the paseo, thus enticing a forced acceleration of the visual perception.

(c) When seen from the plazoleta, the pyramide conveys a sort of timelessness creating a static equilibrium.
Gates are considered as important element in "building" the desired shade and announce a specific urban form.

Types:
-A free standing gate, occurring perpendicularly to the axis of the paseo. It differentiates connectors from squares within the paseo. It functions as a "mirador", with access to a second level, and as a stage set.

-Gates which are part of the continuous plane of the wall occur necessarily perpendicularly to the paseo. There are two types:
  a gate announcing a pasaje will have two levels
  a gate announcing a cite will have only one.
The use of water in the paseo further accentuates the modulation of light from light to dark. The concept is the same as the one developed by Le Nostre in his garden designs. Le Nostre exploited the two conditions of water: water at rest which becomes a "miroir" and water in motion.

Water pools were placed at the end of "allees" where these opened up to let the light in. Thus, water was placed at the edge of connectors to further intensify, or "miroir" the light of the open space.

Running water was used by Le Nostre along descending paths leading from one miroir to the other.

Thus, it is proposed to similarly place water pools at the end of zaguanes or allee of trees (a).

Because the paseo offers a slight slope, a system of irrigation is proposed that will associate movement (connectors) with running water.
"folies"
"mirador"

gates

water: "miroir"

"allée d'eau"

"folies"
PROJECTIONS
AFTERTHOUGHTS
REALIZATION  REPRESENTATION  APPREHENSION
'Any city planning worthy to be called organic must bring some measure of beauty and order into the poorest neighborhood.' (William A. Reilley)
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