

CHANDIGARH: A CASE FOR FLEXIBILITY IN ARCHITECTURAL CONTROL

by

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CHAPTER I

PREAMBLE

The conflict between freedom and control in design is common to urban settings with historic and significant architectural resources. On the one hand the presence of rules and guidelines are needed to strengthen a given district's character and identity, on the other hand they should achieve this while allowing progressive architectural ideas to express themselves. Guidelines have had relatively little success in achieving both objectives.

Paul Goldberger expresses his views rather strongly: "The problem of rules and guidelines is not, then, to create good architecture; they cannot do that. They exist to prevent bad architecture, and they cannot do that either".

The strength of guidelines is that they identify a variety of critical design principles and features that are likely to contribute to contextual design. More importantly, the presence of guidelines in our current pluralistic approach to architectural theories could promise a sense of community resulting from unity in the physical environment. Herein lies their true value. The understandable danger that historic districts face often results from over-emphasis on

what already exists and manifests itself in rigid and abstract guidelines. Under some guidelines cornice lines must be continued, fenestration patterns must be adhered to, building heights must not be exceeded etc. Guidelines thus tend to focus on specific requirements rather than describing the desired results. Inflexible guidelines often lead to design relationships where the new tends to imitate the old rather than being a product of the place and the time. "Such a cosmetic similarity between old and new may unintentionally devalue the existing buildings by damaging their uniqueness" (Graves, 1980). As the existing architecture loses identity, contemporary architecture faces the ambiguity between interior function and the exterior expression.

While one might guess that it is mostly historic districts that encounter such conflicts, it is interesting to consider the case of Chandigarh, India which is 'historic' only in the sense of being architecturally significant, but it still experiences all the fore-said conflicts intensely. The current shift in architectural thinking which places regionally appropriate forms in high priority is ever so strongly felt in Chandigarh. Here, there is an indisputable need to integrate Indian cultural values without losing sight of the visions that Le Corbusier had.

With a strong concern for the city of Chandigarh, not only as an architect but also a citizen with intimate knowledge of the place, the author will focus on a new direction for the growth of Chandigarh by addressing its current system of architectural controls. An alternative to the existing set of rigid rules, which will be examined in this thesis, could contribute towards the architectural quality of Chandigarh and may substantiate the underlying assumption that flexibility of its rule system is generally desirable.

OPERATIONAL DEFINITIONS

Design Guidelines: As the term suggests they should guide the designer in the process of designing contextually appropriate architecture. They should do this either by prescribing a set of conditions to be followed or by setting performance standards (Hamid Shirvani, 1985), and should have inherent flexibility that allows the architect to address different variables in the design process. This being the ideal notion, the different forms of guidelines yet pose problems of rigidity. This is one contention of the thesis. Therefore, the effort would be one of striving for the ideal.

Rule Systems: Once again, the term itself connotes a meaning of rigidity; of total control. This term is more specifically used in reference to the architectural control system of Chandigarh.

Rule systems and Guidelines (the ideal system) share a common aim of achieving architectural cohesiveness. But between them lie a continuum that ranges from flexibility to rigidity. Therefore, these are the issues (flexibility and rigidity) to be addressed in this thesis.

THE INTENT

The purpose of this thesis is two-fold and is founded on the hypothesis that systems of architectural control, that address contextualism, can be rigid and ought to be more than formalistic abstractions.

Firstly, through a study of contextual guidelines try to evaluate their nature and degree of rigidity, as well as their effectiveness in achieving their aim and explore the possibility for more flexible guidelines.

Secondly, and more importantly, with this information the author will critically evaluate the characteristics of Chandigarh as it exists, and demonstrate the need for varying degrees of flexibility in the existing rule systems of the city. With a belief that designing of large scale environments at one stroke is incorrect, the critical evaluation will focus upon the effect of guidelines upon small urban environments. With this the thesis seeks to establish a basis for deriving alternative and flexible guidelines for Chandigarh.

SCOPE

The basic issue that this thesis deals with is compatibility of old and new architecture and the role of guidelines in this connection. With an underlying concern for better contextual fit, the thesis aims to demonstrate the need for deeper understanding of the nature of relationships between the parts that make an urban environment. The view of this thesis is that guidelines ought to concern themselves with relationships deeper than the perceived ones by including traditions and cultural expression. By treating examples that are separated by time and/ or cultural variances, it hopes to throw light upon relationships in the urban

environment and how they can be better orchestrated.

This thesis is assuming that guidelines will continue to be used, but that a way needs to be found to make them more flexible in order to allow creative solutions.

PART I

CHAPTER 2

GUIDELINES AND HISTORICISM

"It is evident, that the eye is educated by the things it sees from childhood on and therefore Venitian painters must see every thing clearer and with more joy than other people." Goethe.

"The art of progress is to preserve order amidst change and change amid order" - Alfred North Whitefield.

"A need for change is the result of change....that change is continuous" (Burley). The taken for granted aspects of our world can abruptly become our intense focus, our primary concern; and most often we have change to thank for this. For it is the speed of change or its inappropriateness that illuminates the commonplace. Take for example the several blocks of 18th and 19th century grey limestone, five storey residential buildings that are seen as an immediate contrast to a new, very large structure such as the Pompidou in Paris. Harmonious settings of urban environments and orderly relationships has recently been a very important concern of the urban designer. For it is in "urban environments- where buildings touch each other or are seen in full view of each other, one serving background to each other....quality of materials, the dimensions and volumes of structures directly affect each other". (Cavaglieri). Such harmony seems inherent in the pre-industrial urban settlements--both in

significant places where design intentions are readily perceived such as Rome or Paris, and in the "natural" urban settlements that grew organically, such as the Italian hill towns and Arabic desert towns. Our ability to recognize and appreciate architectural harmony has become more intensified in the light of change that has fostered great disparities in modern cities.

Urban discordance, or in more words, the "cacophonous experience" (Goethe) that characteristically unrelated works of architecture yields came to be a priority due to one urban condition more than any other: The juxtaposition of old and new. In many cities around the world, old and new design relationships surfaced as a problem from the experience of rebuilding after World War II. Visibility of incongruities became acute with rapid industrialization which itself yielded architectural visage and character. Thus change, understood often to be recorded in the growth of cities, manifested itself in a jarring manner. Large destruction of the old, both by war and by the process of rebuilding, in many instances intensified a sentimental affinity for the old. This not merely for the visual presence of the old, but because total eradication of a physical place causes a feeling of being displaced, disoriented. The International Council of Monuments and

Sites Conference in Budapest in 1972 recognized the special circumstances that justified stylistic imitation in rebuilding cities of World War II. Thus the very roots of modern consciousness of design relationships is a strong sense of protectiveness towards historic buildings and districts. On the other hand, architectural thinking in the industrial era has yielded theories consistent with and relevant to the times; and thus we have a conflict.

The preservation field with a clearly stronger concern for the old, it appears, was the creative force for architectural control. The preservation influence persists. Architectural criticisms draw our attention to significant examples of violations or sensitive responses to historic context. Alongside suburbs grow to what could someday become detestable urban areas. For architectural control, if accepts to be a reflection of concern for architectural quality, limits itself to the historic districts or downtowns of mega cities where issues such as solar access make control necessary.

The few examples of new places that seek design unity through guidelines point to us the importance of guidelines designed to address many concerns including not just stylistic or formalistic issues but social, cultural and

technological ones.

Collective agreement extends as far as the "notion that towns and cities can and should be aesthetically pleasing; that a visually satisfying environment tends to contribute to the well-being of its inhabitants". In one case, in Massachusetts, the court found courage to recognize aesthetics alone as a basis for regulation and concluded that "aesthetics alone may justify the exercise of police power." Yet in spite of a widely shared conviction that cities ought to represent more unity, little progress is seen and more conflicts confront us. Diverse architectural theories and aesthetic visions or in other words subjectivity shrouds the field.

To everyone concerned in the making of a city its harmony is important; to the designers additional concerns generated by the single building in the urban setting makes the issue not simple. The design review boards' attempt at the co-existence of old and new through developing a system of code; a set of rules that could yield good architecture and more importantly, prevent the happening of bad architecture.

Our reflection upon urban architecture generally leaves us with two reactions. Towns and cities of the distant past

fill us with admiration for the cohesiveness and sense of unity; and a retrospection of recent growth in cities fill us with concern for their future and an intense desire to manage change more gracefully. Thus the past both motivates and offers directions and goals for the impending changes. The path to this is increasingly thought to be architectural control through guidelines. The unified appearance of old cities and towns appeal to us and we seek to re-establish this through systems of rule that are expected to 'generate good architecture.'

In retrospect, architects and environmental designers ought to look deeper than the surface in order to understand and appreciate the creative forces that ensured unity in the older settlements. Without this we would only be borrowing "appearances" of the past and strengthening prevalent conflict between form and content. It is significant to note here that the U.S. Secretary of Interior's Guidelines object to "facadism" which is defined as retention of just the facade of an old building against a totally new construction. Iroinically much of contextual responsiveness that strict guidelines yield tend to be examples of "facadism" in some sense.

A simple set of reasons can be offered for urban harmony of

older settlements; and they primarily deal with natural limitations that was not imposed by one group over another.

1. The choice of materials to build with were limited. In addition the locally available ones were used most commonly in ages when transportation was limited. Thus a singular character for a place or region was easily established. Special materials available to fewer people found their way into special buildings thus establishing a hierarchical relationship between buildings--public and private; the hierarchical relationship offering a sense of identity.

2. Methods of construction were limited in technology and knowledge. "Principles of masonry technology and bearing walls produced a similarity of volumes and even details." (Barnet). Window and door openings were limited by abilities (both technological and financial) to span them and thus yielded a harmonious relationship without any control of their geometric properties. Constructional methods had a natural aesthetic,

3. Anthropomorphism: Following the limitations, naturally the buildings and the city mirrored human scale. "Height of buildings was limited by the distance people would willingly walk upstairs" (Barnet). Street widths reflected the

prevalent modes of transportation and social order.

4. Technological limitations in the control of climate or light in buildings naturally limited physical configuration of buildings. The relationship of inside to outside was thus a shared perception by the occupants of traditional settlements.

5. Expressive attitudes to create an above the ordinary or uncommon building still drew from the common framework; this was the aspiration. A breaking away into something entirely different or new often happened because of the need felt by a society and not for personal glory alone.

"Interpretation of history is very different from imitation. Design review tends to applaud imitation and be very suspect of interpretation." (Charles Gwathmey). This sums up succinctly the problem with guidelines; all around we hear this from designers. The ideal is all too simple:

"(Guidelines) should be just that, guidelines--a list of concerns to be addressed. If you set iron clad and specific design constraints and requirements, all you're doing is creating unsolvable preconditions" (Gwathmey). The simplicity of the ideal makes it not easy to achieve. Examples of architecture that are often praised by critics

for their contextual responsiveness make us wonder if those results could have been generated through the most common type of guidelines that specify lintel alignment, window proportion, reference datums, etc. In fact an often praised example such as John Hancock Tower in the vicinity Richardson's Trinity church makes us wonder if any guidelines can be written for such a situation at all. Considering this example one is drawn to the phenomenon of relationships within the city, which is a complex one. Having rejected (largely) self-referential modernism in favour of architecture that refers back to history we naturally consider context more seriously. What is immediately perceived assumes more prominence. In an instance such as the row-housing in Boston where the prevalent height line is the dominant consideration, the height of new buildings becomes an element to be restricted. This extends to other things that are present in abundance in a given situation.

CHAPTER 3

'AESTHETICS' AND 'RULES'

Architecture, being a field that aims to build ideas and ideals and make them visible, naturally places tremendous importance upon what is seen. The way things 'look' deeply enchants architects. Further, one can notice that the most commonly illustrated examples of relationships are those involving buildings in close proximity; or in another way - in strictly visual terms. Pictorial analysis leaves out the difficult intangibles of meaning.

Napolean Bonaparte, far back in the nineteenth century claimed that the exterior of the building belongs to the society while the interior is personal, and thus ordered controls for structures flanking the boulevards of Paris. But behind the picturesque facades that flanked the wide avenues dwelt the congested urban population with epidemics, pestilence and poverty. The situation in the historic or architecturally significant districts is not very different from the Parisian precedent. While the situation in Paris may be justified to some extent owing to its times, the contemporary cosmetic attitude and concern for 'compatible' surfaces is highly questionable "and is liable to narrow the focus of architecture" (Graves).

Beauty is not skin deep. "Man's desire for 'place' extends beyond the utilitarian and physical beauty" (Schulz). Today architecture ought to be socially responsible by not merely "justifying the exercise of police power to aesthetics", but by also expressing the society based on its culture, tradition and life-styles etc. Michael Graves is right when he dismisses mere compatibility, which the current building regulations and guidelines seem to address most, to be only 'cosmetic' in nature, stating that "another interpretation of compatibility might also entail consideration of the nature of architecture as a cultural artifact and a shelter for human activity". It is "not that compatibility is wrong, but is something one should by now be able to assume" (Goldberger). Goldberger further expresses his contention that "the making of architecture is never the breaking or the following of rules. Architecture is a creative process that transcends such quantifiable things". Sharing somewhat the same viewpoint Jonathan Barnett, a noted urban designer states : "In a period where there is little consensus on what constitutes good design, reducing architecture to any kind of a rule system is exceptionally tricky.....and as rules cannot cover every aspect of a building" it becomes critical to decide what issues are the most important. Apparently, aesthetics dominates the field.

It seems that we love to disagree and still collectively attempt to reach a consensus. This paradox exemplifies the true nature of aesthetics. For, if aesthetics can be systematized and agreed upon by everyone it loses life. If we have absolutely no agreement at all- there is nothing but conflict.

From a single chair to a whole city things have to be made in relation to each other. For a city to develop its distinct character it is necessary to allow individual expression within a common framework. While this goal cannot be fully achieved, guidelines must be framed to encourage a balance between the elements of the 'life-world'- the outside and the inside; the objective and the subjective; the tangibles (quantifiable) and the intangibles.

Christopher Alexander, in his 'New Theory of Urban Design', 'invents' a system of "rules which work towards the creation of wholeness" and require "the following of the urban process: Every increment of construction in the growing city must be designed to preserve wholeness at all levels, from the largest public space, to the intermediate wholes at the scale of the individual buildings, to the smallest wholes that occur in the building details". It must also be

recognized that in this process of incremental growth and change "it is the second man who determines whether the creation of the first will be carried forth or destroyed" (Edmund Bacon).

Based on the above two statements it may be concluded that whatever may be the system of rules or procedures, and the multitude of concerns they address, in the making of the city, the intended goals will never be achieved without full cooperation and coordination of its thousands of citizens.

A system of rules that does not bear close relationship to the people, and is imposed on them will not achieve its intended aims. Rules have to be an integral part of the tradition and culture of the society. This explains why architectural controls have been a failure in Chandigarh, India.

CHAPTER 4

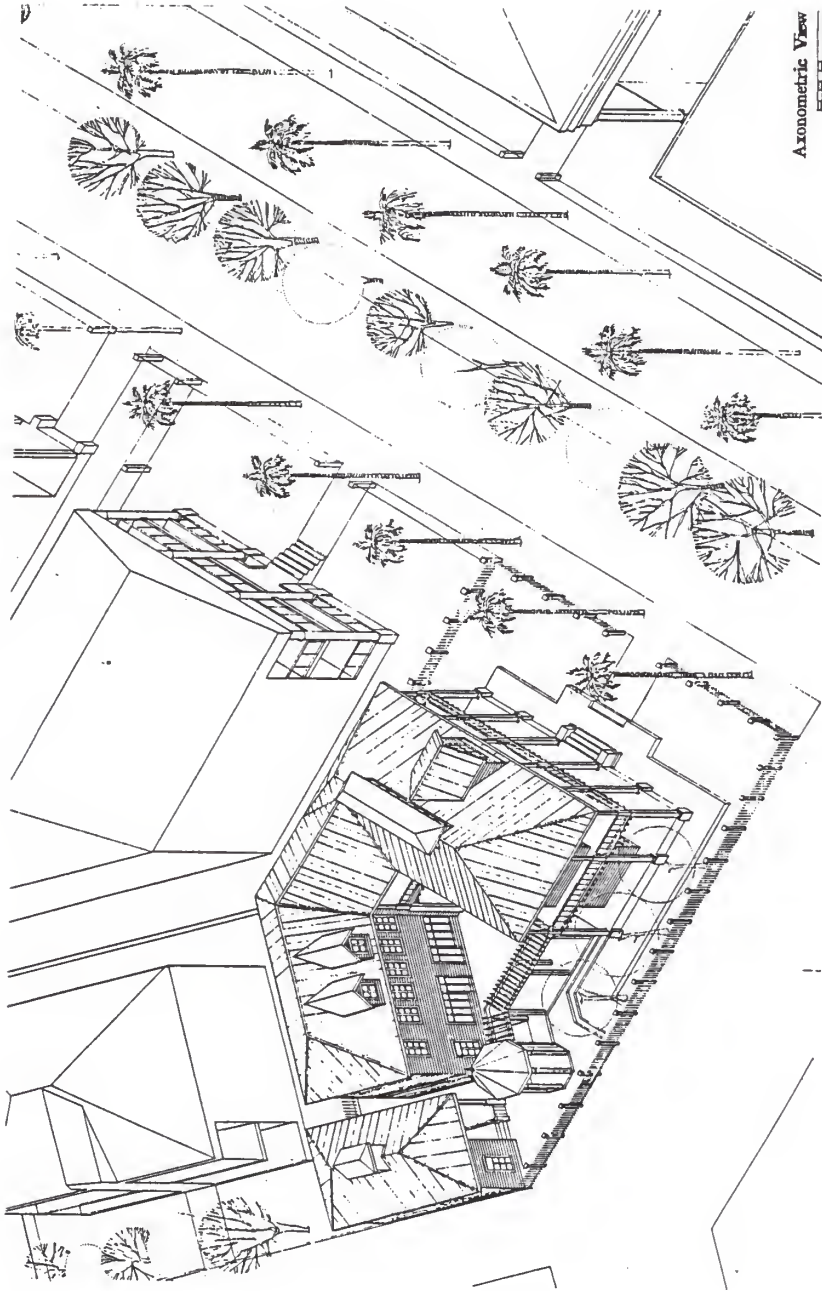
THE TOWN OF SEASIDE, FLORIDA

Seaside, the town and its architecture, has grown almost entirely out of rules. The development of guidelines for building in Seaside has historicism in its origin as much as in any example of a historic district. The codes were derived through empirical observations of the region's old small towns which Robert Davis and his architect Andres Duany and Elizabeth Plater-Zyberk favoured greatly. For example, the proportions of the squares, avenues, streets and alleys at Seaside are derived from exemplary types found in the towns studied. In an abstract sense Seaside is an attempt to re-establish traditional patterns.

Yet, rules have not been derived to arrive only at certain visual characteristics of buildings. For instance Seaside adopted a requirement that each house have a front porch, because Robert Davis, its mastermind developer, had concluded that front porches encourage neighborly chatting and co-operation in addition to being traditionally well-suited to the climate of the region. Unlike the strictly ornamented porches tacked on some new suburban houses, a front porch must be eight feet deep, and extend at least half the length of the house's front wall, spacious enough

that people can use it. The mandatory picket fence, which must be individually designed, in the front yard not only gives street an urban scale but also provides privacy to the porch sitters. "...the distance from porch to fence usually must be 16 feet, pedestrians and porch sitters consequently can strike up a conversation without raising their voices". (Langdon). Thus we see an example of a guideline that addresses many concerns, including social, and offers a unifying visual characteristic to the place ; guidelines based on logic versus individual whims.

A very significant aspect of the code is that it is graphic as well as written, thus making interpretations clearer and simpler to understand by common people without professional assistance. As to the issue of flexibility, the Zoning Code of Seaside, which employs conventional tools of zoning makes an early comittment to grant "variances on the basis of architectural merit". For example, a 'bread and breakfast inn' designed by this author was deemed acceptable in the Seaside environment. It attempted to maximize the building's energy efficieny implications on the buildings form and orientation, while conforming to the Seaside Code as much as possible and thus retaining the town's character. Seaside has enough variances that reveal to us the participation of the design review comittee (Robert Davis, the developer) in



Axonometric View

BREAD & BREAKFAST INN
SEASIDE, FLORIDA
(DESIGNED BY THIS AUTHOR)

permitting these. Variations in roof slopes, deviation from the required symmetric expression of pitch roofs, a multitude of loud colors on the external surfaces of the buildings, all bear testimony to this. But flexibility as an incorporated element in the code stops with this. Philip Langdon describes Seaside as "by regulation, a place of wood shingled clapboard, and board and batten houses with deep front porches and shiny tin roofs like those on old houses in rural America."

From massing and street rhythm to materiality Seaside achieves its character through architectural control. More importantly, it is the balance between the subjective and objective elements of control that is responsible for its pleasing ambience. Mandatory codes such as the picket fence mellow the disparities such as the clash of colors.

Seaside addresses a larger issue of how to create a place where people can live differently from the way they do in the usual suburb or a resort area. It relies on logic not caprice. It fosters community and social values, that seem to be lost in today's environments. It provides a visual order within which there is a place for individual expression while supplying its inhabitants' daily needs. "In these matters town planning traditions that have been

ignored for half a century are serving as a generally trustworthy guide" (Langdon).

CHAPTER 5

THE SAVANNAH EXPERIENCE

Ideally, design guidelines are a prescribed set of conditions with sufficient flexibility to accommodate a variety of responses. Savannah's guidelines are seen as a significant example because they appear to have achieved this ideal notion. The following is an analysis of Savannah's historic district guidelines with an aim to understand their nature, and the degree of flexibility and rigidity involved.

The Historic Preservation Plan for Savannah identifies specific design elements which "if repeated or echoed a sufficient number of times, will ensure the preservation of the architecture of the area and also assure new construction to blend with the existing character. The design criteria identify 16 characteristics of "relatedness". Evidently these criteria largely address those "relevant abstracts of aesthetic quality" (Murtagh), such as materials, colors, scale, rhythm, and other visual elements.

A historic area analysis undertaken in the plan reveals a large emphasis on the city's squares, significant both to

the contemporary and the historic times as places "in which to meditate and socialize"; and which provide a sense of security, well being, identity and human scale". It is also interesting to note that as public outdoor rooms, they usually contained a public well to serve the residents of the surrounding ward. Each 'square' is associated with and accents the identity of the surrounding wards. The character and quality of the 'squares' is recognized as the very essence of Savannah. "Different types and styles of buildings both around the squares and along the streets, together with walls and fences, plantings, decorative wrought and cast iron, different paving stones and a multitude of architectural details" offer rich visual experinces-full of surprises.

The Savannah example is in a sense paradoxical. On one hand the preservation plan acknowledges "public realm" as important, in fact the strongest unifying factor in the district. Yet the design guidelines give primacy to stylistic issues of facades, thus reducing Savannah's historic architecture to formalistic - to a matter of appearances. Savannah's guidelines imply that ensuring continuity of facades for individual buildings would naturally strengthen the quality of its squares. While this is partially true, one must observe that there is a need for

guidelines that explicitly address the squares, the urban open spaces themselves. The "program for historical renewable action" recognizes that several squares have been damaged and there is loss of continuity and closure around the squares and the streets, but there are no guidelines suggesting ways to improve the existing qualities of squares and streets; ways how new areas be developed in the tradition of the older system of growth with squares (both redeveloped and old) as foci; ways how new squares should be pedestrianized rather than automobile oriented. Furthermore, there are no explicit guidelines that directly address climatic and cultural issues, as is seen in the case of Seaside (discussed earlier).

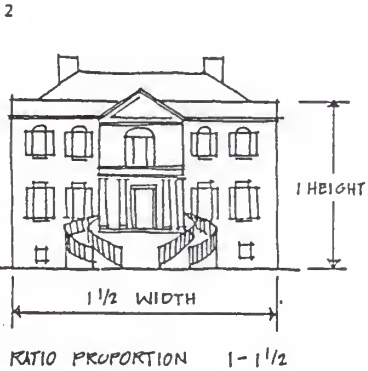
The sixteen criteria- which are to serve as guidelines in order to "preserve the integrity of the old Savannah", have been identified through the analysis of types of structures and spaces found in various parts of the city. Each of these characteristics is assigned a one point value. In order for any proposed structure to be acceptable it must have to achieve an evaluation of at least six points, that is at least six characteristics would have to be similar to those existing in the surrounding context.

While one might think that such a system that offers enough

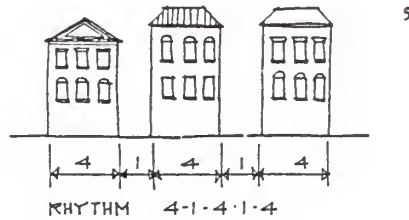
opportunities to choose would bring in flexibility, this is not the case. For, such an over-generous way brings about ambiguity and subjectivity. Someone may offer to choose any six of the 16 criteria without achieving relatedness. One can imagine the pressures on the design review boards in making decisions on the acceptability of the design proposals. It is surprising to note that, despite this, the guidelines are still in use.

"The system is too loose; it gives equal importance to all criteria, while only the height requirement is mandatory" (Lu). It is recommended that criteria, which are considered important in a district, are identified, a system should make sure that all be met while allowing variances within each criterion. This could make the system flexible, and at the same time could make sure that all important requirements be met, leaving no room for ambiguities.

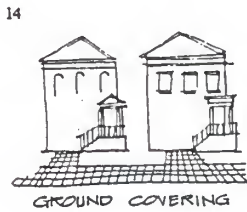
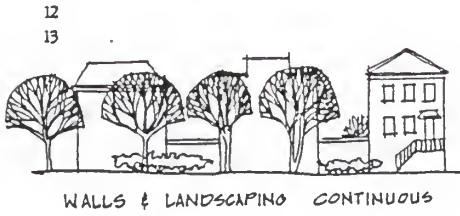
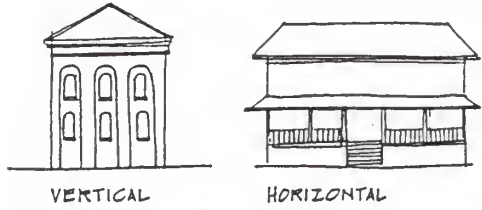
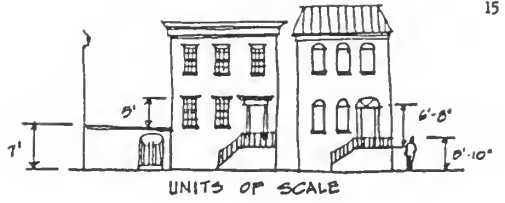
While the guidelines insist that new construction must meet the height requirement within a 10% variance, they fail to refer to the building's 'type' and its location in the town's fabric. In some situations it is quite possible to exceed or stay below the permissible height limit and still have a solution that successfully relates with its surrounding context.



The Savannah guidelines identifying 16 characteristics of relatedness. 1. Height: New buildings must be within 10 percent of average height of adjacent buildings. 2. Proportion of buildings' front facades: Relationship between width and height. 3. Proportion of openings: Width-to-height relationship of windows and doors. 4. Rhythm of solids to voids in facade: Alternation of strong and weak elements. 5. Rhythm of spacing on street: Alternation of building masses and spaces. 6. Rhythm of entrance and/or porch projections: Relationship of entrances to sidewalks. 7. Materials: Area's predominant material is a factor. 8. Textures: Predominant texture may be smooth or rough, etc. 9. Color: Predominant color may be natural or painted, etc., including trim. 10. Architectural details: Prevalence of cornices, lintel, arches, quoins, balustrades, wrought iron, chimneys, etc. 11. Roof shapes: Majority may be gable, mansard, hipped, flat, etc. 12. Walls of continuity: Walls, fences, landscaping, building facades or combinations forming cohesive enclosures on the street. 13. Landscaping: Mass and continuity of quality and quantity of landscaping. 14. Ground cover: Brick pavers, cobblestone, granite blocks, etc., may predominate. 15. Scale: Size of units and detail in relation to people; relation of building mass to open space. 16. Directional expression of front: Shape, placement of openings and detail provide a predominantly vertical, horizontal or nondirectional character. (Drawings: C. Ross Ingram. From Historic Preservation Plan for the Central Area General Neighborhood Renewal Area, Savannah, Ga., Eric Hill Associates and Muldrew and Patterson, Washington, D. C., 1966)



THE SAVANNAH GUIDELINES



"Walls of continuity" is rightly included in the guidelines and presented as an objective which may be met by "physical ingredients" such as brick walls, landscape masses, fences, or a combination of these, forming cohesive walls of enclosure around the squares and along the streets. As mentioned earlier, flexibility of such nature should be sought: where, within a specified objective, various approaches may be made to meet the objective rather than listing a number of criteria and choosing in an arbitrary fashion. All guidelines should have indications similar to this particular example.

CAPTER 6

SWISS AVENUE HISTORIC DISTRICT, DALLAS

In 1973, the Dallas urban design staff reviewed the Savannah experience when it was working on the Swiss Avenue historic district ordinance. A survey of the avenue showed a eclectic collection of architecture. The strength of this district lies not so much in its design details but in the general building forms- masses, heights and generous setbacks. (Lu). Different preservation criteria were tested for their applicability and effectiveness out of which twelve were selected.

The 12 criteria address four basic characteristics of the district:

- Qualities of the block
 - Rythm of spaces between buildings
 - Landscaping in the front yards
- Qualities of building form
 - Height-width ratio
 - Shape of facade
 - Multiplicity of roof forms
- Qualities of building treatment
 - Color
 - Materials
 - Horizontal projects
 - Distribution and proportions od facade openings
- Qualities of facade accentuation
 - Porch or entrance openings
 - Detailing
 - Embellishments

These criteria are also closely related to the zoning standards in the district ordinance - permissible land uses, lot widths, front and back yards dimensions, building coverage, heights etc.

An important feature of the above listed guidelines is that they have a hierarchial nature based on the strength of the qualities identified in the district. The criteria give more weight to those qualities dealing with area character and less weight to those dealing with individual buildings and design details. Because Swiss avenue has a conglomeration of different architectural styles, an approach such as this is justifiable. "Thus new construction or renovation must meet both of the criteria related to the qualities of the block, two of the three criteria related to building form and two out of the four qualities of the building treatment. (Lu). It is interesting to note that the criteria dealing with facade treatment and "embellishment" become subservient to the ones that deal with and affect the environment at a higher level (urban), thus allowing freedom of individual aesthetic expression that is found to be a highly subjective and restricting element in many design guidelines.

Another important feature of these guidelines is that the degree of their compliance varies and is based on the area's

character within the district. In areas with strong character, new construction or renovation must comply with a higher percentage of the given criteria whereas areas with less strong a character, less stringent standards are applied. Thus we see flexibility as an inherent part of the guidelines operating at various levels.

The Swiss Avenue historic district guidelines, like Savannah's, do not directly address any climatic and social issues. However, based on the afore-mentioned attributes, they transcend the highly subjective and loose nature of Savannah's guidelines. Looking back at Seaside's guidelines (discussed earlier), at this point, one can begin to imagine and appreciate a result that a combination of Seaside and Swiss Avenue guidelines would yield.

PART II

Chandigarh is an example of a significant and unified urban setting with stringent rules, yet, largely inappropriate to the Indian context. While unity in the environment is assured, variety - of architectural form and expression - and cultural relevance is diminished. A set of new guidelines that allow more flexibility is greatly needed.

This part of the thesis is divided into three sections. The first section deals with an urban analysis of Chandigarh in the Indian context with an aim to identify its uniqueness that warrants preservation and those characteristics it lacks as an Indian city. Also, existing 'rule systems' will be analyzed briefly.

The next section aims at presenting the essential elements of architecture in the urban landscape that yield character and life to traditional Indian settlements. Jaipur will be presented as a case study to illustrate this aspect. Shopping areas in traditional cities in India have a special significance. Instead of being strictly zoned mono - functional areas, they embody a rich mix of uses and expressions. In Chandigarh one can easily recognize the absence of this informal mixture that yields life. In the

last section existing regulations will be analyzed and evaluated for their rigidity and effectiveness through a focussed study on V4 bazaar streets which provide for shopping activities in different 'sectors' of the city.

CHAPTER 7

"Let this be a new town, symbolic of the new freedom of India, unfettered by the traditions of the past....an expression of the nation's faith in the future". (Prime Minister Nehru, 1950).

"History is a leveller and even the monuments of the past are in due course reduced to the level of relics. In this respect perhaps Le Corbusier's Chandigarh has started on this path much too soon -- while the buildings are still in active use." (Ranjit Sabikhi, 1987).

INTRODUCTION

It has been observed that an artist always seeks to discipline his creations and to be channeled within some concept of universal harmony. "It is this desire that drove the theorists of the past - Vitruvius, Duerer, Leonardo da Vinci and Alberti to seek a coherent mathematical basis for artistic creations. In order to communicate beyond the moment of its simple realization, it was felt, a design must reflect logic rather than caprice." (Norma Evenson). In the creations of Mies van der Rohe the desire for a governing discipline is apparent in the modular design. Frank Lloyd

Wright's organic architecture was based on coherent interlocking order of all elements of a structure based on a conception of natural growth. Le Corbusier's discipline is a system of proportioning called the "Modulor - a harmonic measure to the human scale."

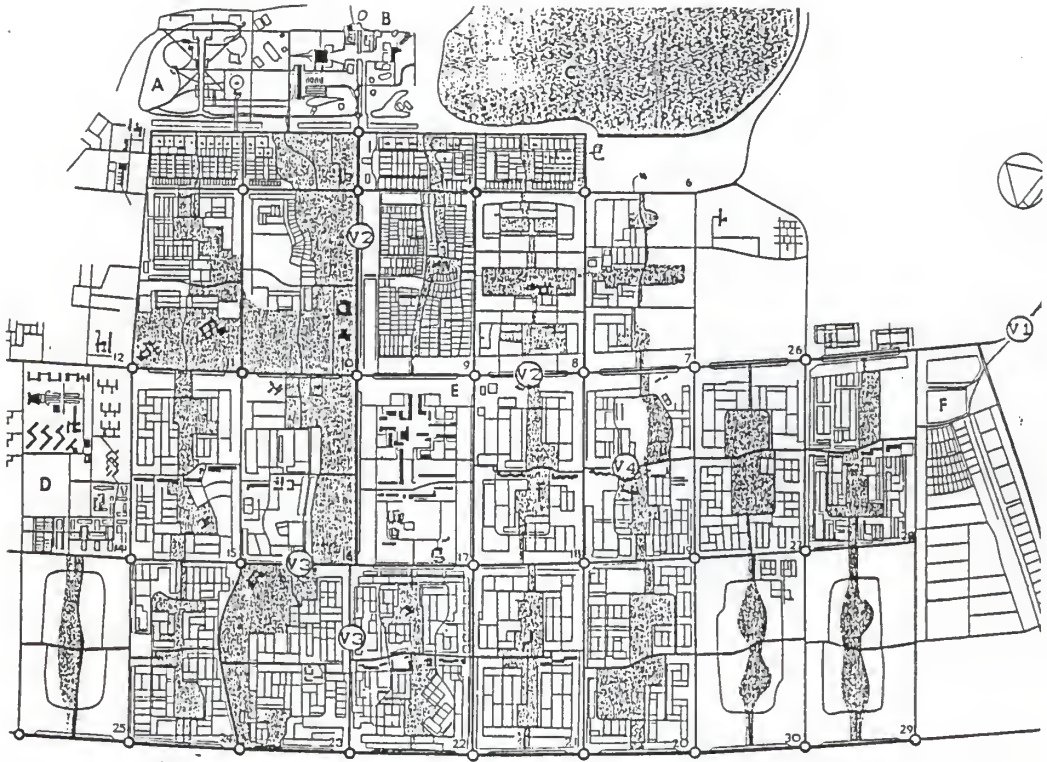
It was hoped by Le Corbusier that the Modulor would be used to establish universal proportions in the planning and architecture of Chandigarh, since its values were based not on abstractions but on human body. But despite such convictions, the architectural grain of the city is insipid and lacks the human element. So the questions arise: how did a weak structure rise on the strong foundation of a rational master plan, and, if order is the key to life, why is Chandigarh not alive?

HISTORICAL BACKGROUND

Only a few urban settlements in India can be traced back to clear beginnings. Chandigarh's uniqueness lies in the clarity of its origin. It was a product of the crisis and disorder prevailing immediately after Partition and Independence in 1947. The need to disown a befuddled past and exploited history manifested itself as a need to

represent order and rationality. Modernization, westernization then seemed the answer to Indian problems. India had few individuals capable of handling such a project and traditional building types offered no solutions. "We could not go on with domes forever." (Patwant Singh). "India at independence was a nation with an ancient civilization but strangely without past in the sense of an active, self-confident culture to guide a rebuilding; more accurately, its rulers chose not to deploy the culture that did exist. Victorious nationalists imported foreign culture, an act that derived its legitimacy from a belief in universalism of science. And Le Corbusier delivered" (S. Prasad).

Le Corbusier came to India after the death of Mathew Nowicki, one of the architects initially commissioned for the Chandigarh project. India and Le Corbusier were an odd couple. "Corbusier - the formidable exponent of discipline, order and "machines for living" believed that geometry was the only means of expressing the world. India, always the essence of brilliant disorder, was at that time more chaotic than usual." (Diane Ward). Chandigarh presented Le Corbusier with a set of technical and social conditions far removed from the industrialized society for which he had always projected his scheme. Corbusier's team consisted of Pierre



CHANDIGARH MASTER PLAN

A-- RAJENDRA PARK

B-- CAPITOL COMPLEX

C-- LAKE

D-- UNIVERSITY (Sector 14)

E-- CENTRAL BUSINESS DISTRICT AND CIVIC CENTER (Sector 17)

F-- INDUSTRIAL AREA



--THE RESIDENTIAL SECTOR -- the basic unit of the city

Jeanneret, Maxwell Fry and Jane Drew. While Le Corbusier was

in charge of the master plan and the design of important buildings--like the ones that form the capitol complex and the city center--the other three were responsible for the work at a neighborhood level--housing, shopping, schools--work, responsible for what might now be termed the Chandigarh style.

ORDERING OF THE CITY

"I believe it to be natural that an inner law should animate a work created by a human being. Let me refer to the dictionary: Rule: to guide; principle, law; discipline, order." - Le Corbusier.

The plan of Chandigarh is characterized by:

1. A grid system of streets - the grid 1200 x 800 meters defines a residential sector.
2. The axes and the hierarchy of roads.
3. Strict zoning and segregated uses.
4. A garden city ambience of vast open spaces.

Evidence of these characteristics may be seen in almost all of Le Corbusier's earlier 'utopian' urban schemes.

Some of the general criticisms against Chandigarh are:

First, it has failed utterly to provide for all citizens, as was the expressed intention of its designer. The adopted plan aims at producing a pleasant social atmosphere, which

will allow everyone to live together peacefully. Yet, despite these aims one of the cruel ironies of Chandigarh is that it has no room for the people who built it; none either for those who clean and service it or pedal its well used rickshaws. The plan was to accommodate thirteen categories of housing, which not only fail to contribute to the overall diversity in types, but the lowest of the thirteen categories is too expensive for a large number of people.

Secondly, the design of the city fails to respond to the Indian cultural and climatic context; to the tradition of the street as a multi-functional space and to customs like street vending and hawking and small craft production near or in the home. The streets are too wide and isolated to sustain a sufficient intensity of activity, and, unlike the traditional narrow streets are exposed to heat and dust. The dense pattern of inward oriented courtyard houses, and a need for privacy, typical of the traditional fabric, is absent in the garden city ambience of Chandigarh. In addition, zoning precludes the mix of activities essential for rich and complex street life. In the V4 shopping streets of Chandigarh the sense of liveliness of the traditional Indian bazaar is missing. That there is still a place for this and a craving for such intense activity is poignantly reflected in the various unauthorized informal shopping

areas that have sprung in different parts of Chandigarh.

Another criticism of Chandigarh is that the car has been given primacy in a city where less than 5% of the population have access to one. Chandigarh is still very fortunate not to have elevated freeways, but the wide roads of the city are over scaled and still remain mostly empty. The irony is that the city "was made for the pedestrians a lot of opportunity to walk in pleasant surroundings." (Le Corbusier). Expressing his views on the same issue Charles Correa has written: "In the middle of a scorchingly hot afternoon, you will see hapless Indians plodding along on foot or by cycles down mercilessly long straight roads, between brick walls to infinity."

"The city was more designed than planned economic groups have been segregated in assigned sectors and separated by vast expanses of unlandscaped scrub jungle. The enormous distances make few concessions for the poor, who cannot afford a bicycle, let alone automobiles." (Diane Ward).

Finally, Chandigarh may be criticized as being generally "placeless" and its architectural grain dull and depressing. There is too much open space, so that a "sense of place,"

and a room or a frame for activity is never formed. This blankness persists in most parts of the city. The buildings are loosely placed most conspicuously in the Capitol Complex. The Capitol Complex offers no room for the mixture of uses; shops, entertainments etc., so that it is placeless all the time.

Chandigarh embodied an attempt to apply western conceptions of urban design, a rather unimaginative application of Le Corbusier's urban design formula, to the Indian environment. "Chandigarh seems odd for another reason: No other city was built entirely in the 1950 idiom. Elsewhere even large developments are surrounded by buildings earlier or later." (Ward).

Perhaps the most noteworthy aspect of the present master plan of Chandigarh is that it provides for the integration of two orderings and two scales: first, a large geometric framework linking the monumental elements of the city, providing for rapid traffic, and defining the residential sectors; and second, within these sectors, opportunity for establishment of more varied, informal elements, appropriate for pedestrian domestic environment. "It is in this creation of multiple scale--in recognition that a city is not all one thing--that the present plan of Chandigarh

represents an advance over many previous urban plans of Le Corbusier in which a uniformly mechanized scale has been applied to an entire urban entity." (Evenson). Unfortunately the most notable failure of the city which can be largely attributed to its rigid rule systems--which will be dealt with in detail later--has been in the interior development of the residential sectors.

"Chandigarh is a city where rules were obeyed, too well perhaps, and with so little imagination and insensitivity that the result at present has neither visual appeal nor functional practicality . . . What is lacking throughout the development of Chandigarh is an eye for scale, for the aesthetics of the non-motorized environment and the awareness of intimate textures of Indian town life." -Norma Evenson.

ARCHITECTURAL CHARACTER AND 'THE RULE SYSTEMS'

The residential sectors, which form the basic unit of the city contain "miles of low chunky buildings" all built in some variant of the 'International Style'. In citing the general aspects of architecture of Chandigarh, Jane Drew, one of the designers involved, once stated: "Gone is the light aeroplane look of Mies van der Rohe's architecture... no vast glass areas to create interpenetration of exterior and interior." Her statement is an indication of the nature of the problem--certainly not Indian - that the design team was trying to solve at the time of Chandigarh's inception.

It is largely government housing which gives Chandigarh its definite character, not only because of its extent, but also through the effect it has had on private building. In the early days of the Chandigarh project, Pierre Jeanneret, Maxwell Fry and Jane Drew established a set of house types which, with some modification still govern all construction and which have given the city its visual character. The basic idiom was established as an architecture of one or two story inexpensive brick houses in terrace formation. Of the three architects, Jeanneret has had most pervasive influence owing to the length of stay in India. Although the architects were restricted in material to locally available brick, they differed considerably in their employment of this as a medium. Plastering over brick, frequently used by Jane Drew, was not encouraged later because of its maintenance costs. Attempts to employ precast concrete in balustrades and decorative panels are seen in Fry's earlier designs.

Jeanneret worked largely with exposed brick and his earlier houses exhibit considerable experimentation in the production or in varied surface treatments. In some cases wall surfaces would exhibit a repetitive pattern of projecting bricks, in others a perforated brick jalis would

be used. The brick jalis, used frequently in Jeanneret's houses, receive occasional tampering from tenants, who carefully placed the bricks in the interstices to plug up the openings, an alteration seen in the verandahs where greater privacy is desired.

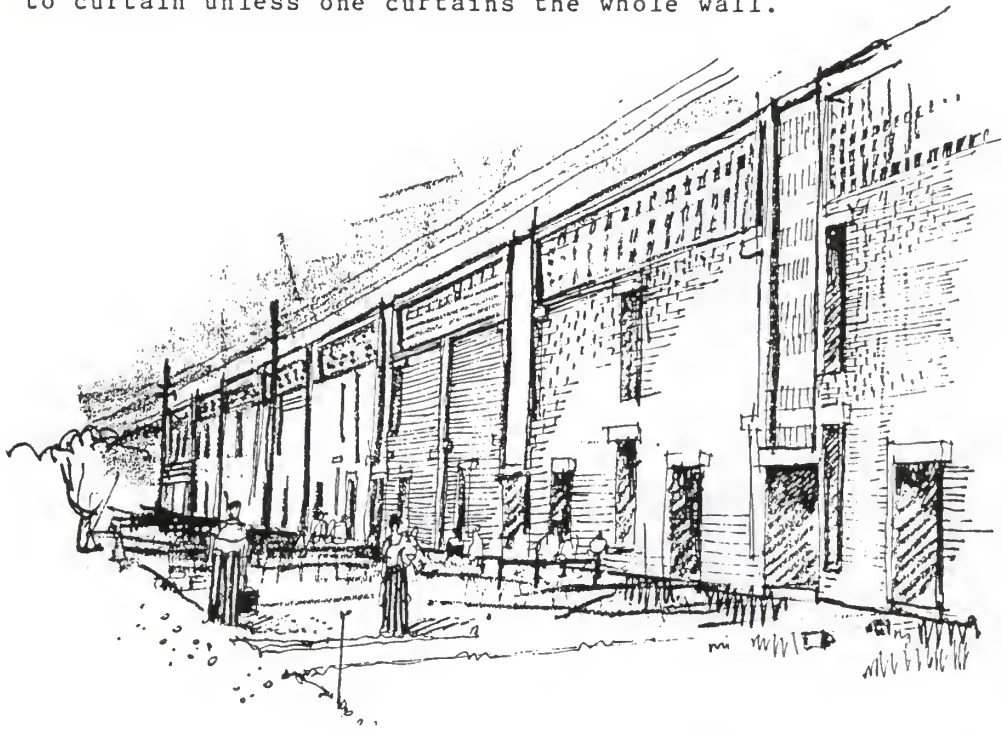
Le Corbusier and his team shared a conviction that "though the new Indian architecture would have a number of universal qualities--geometrical, spatial, proportional--it would emerge essentially from a scientific approach to the problem of climate." In Chandigarh the traditional verandah is replaced by a brise-soleil, of which a strong empirical criticism is given by Charles Correa: "Sunbreakers: They are really dust catching pigeon-infested contrivances which gather heat all day and then radiate it back into the building at night, causing anguish to the occupants. They are not nearly as useful as old fashioned verandahs which are far cheaper to build, protect the building during the day, cool off quickly in the evenings."



Le Corbusier was an aesthete, and so were the members of his team. Perhaps the designers were more concerned with the visual expression of climatic control than with its actual effectiveness. Le Corbusier once stated that "a city made for speed is made for success," but in India "it might be more appropriate to say that a city made for shade is made for success." (Evenson).

The use of exposed brick with heavy white accents--usually taking the form of plastered cornices and projecting window trim--is one of the most characteristic aspects of Jeanneret's design. Such "stylistic mannerism" have until today been wholeheartedly adopted in various designs in the city and contribute much to defining the "Chandigarh style". He also introduced two types of fenestrations--a long vertical window band and somewhat scattering over the wall surface of multiple small windows. The latter is more

'decorative' than functional, for such windows are awkward to curtain unless one curtains the whole wall.

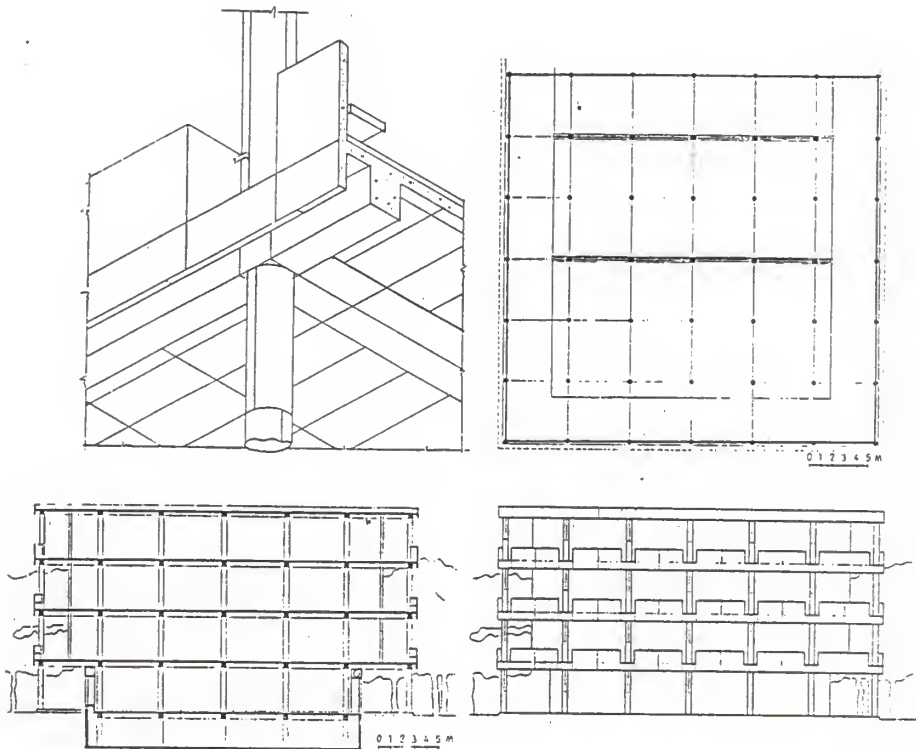


However, the housing types that helped to define a Chandigarh style of building must be appreciated for their attempts at experimentation--where ideas of material, sun control, methods of internal organization etc. were studied and a large variety of different solutions emerged. Here one must decrie fact that little attempt was made to analyze the traditional prototype of the inward looking house, organized around internal courtyards deriving all its light and ventilation from within, and having minimum openings to the outside--thereby retaining a strong sense of privacy while

still allowing the existence of narrow streets with adequate shaded areas for walking.

Instead, we have European style terrace houses adapted to the Indian situation with the usual front and back setbacks and a system of trees along the sidewalks to provide shade. What seems to be most disturbing is that the work produced by the Indian staff has been in no essential way different from the foreign architects, and that they have blindly perpetuated the established idiom. "Indian Planning appears often to be concerned with the repetition of an established formula, rather than understanding the principles that may motivate an urban design." (Evenson).

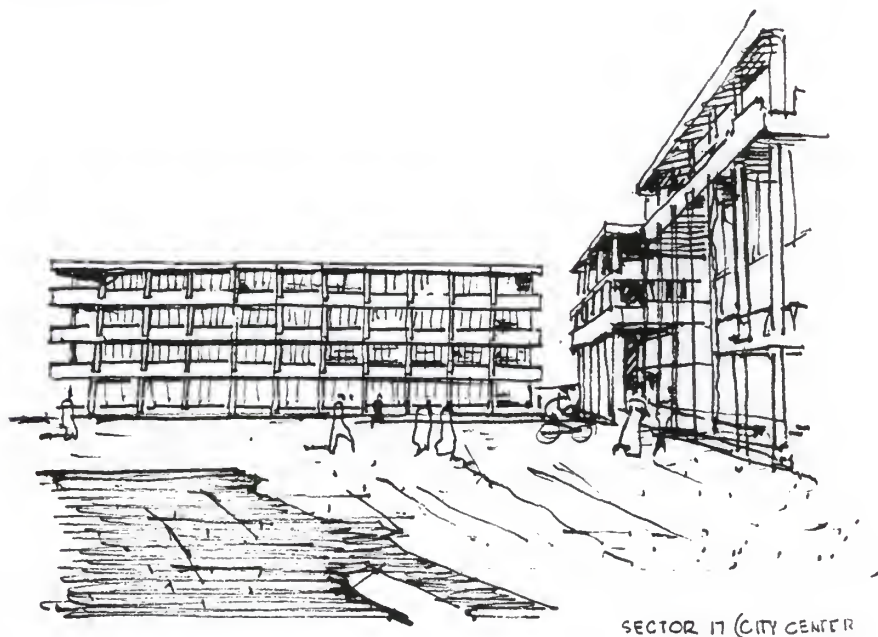
The architectural idiom established by Le Corbusier for the City Center, like the rest of Chandigarh, is influenced by the limitations of materials and technology. But unlike the two storied brick buildings within the residential sectors, the four storied buildings of the city center are essentially of reinforced concrete. Le Corbusier created a construction scheme for all buildings erected or to be erected here. These standardized drawings till today are used as 'architectural control' for the city center.



Standardized drawings for buildings in the City Center

The plans can constantly vary in keeping with their functions as office buildings, hotels, shops etc. but within the established framework--the elevation being 57 ft 7 in. high; the structural grid of 17 ft 3 in ; a 12 ft wide

compulsory verandah on all sides; circular concrete columns on the facades; curtain wall to be composed of narrow vertical panels; use of only primary colors on all doors and windows etc.



SECTOR 17 (CITY CENTER)

Among the disadvantages of placing commercial establishments behind uniform facades is the difficulty in establishing landmarks by which one may be oriented. Also, a shopkeeper has no way of distinguishing his premises.

The plan of the city center appears much too monumental for the character of the buildings. To the pedestrian there is no sense of enclosure, and there is no way to avoid walking vast expanses of unshaded concrete jungle.

In the earlier stages of development within the residential sectors, architectural controls were still a fledgling. Repetition of building designs and the visual uniformity that ensued were a result of a) the need to accommodate the rapid influx of people into Chandigarh, and, b) economy of construction. There was little attempt to control private building beyond the customary building laws.

As building progressed Chandigarh planners became increasingly dismayed to find uneven roof-lines, varied patterns of fenestrations and projecting balconies contrary to the architectural spirit of the established vocabulary. Soon a blanket was laid to cover up the emerging Indian patterns; and strict building rules were applied to remedy the situation.

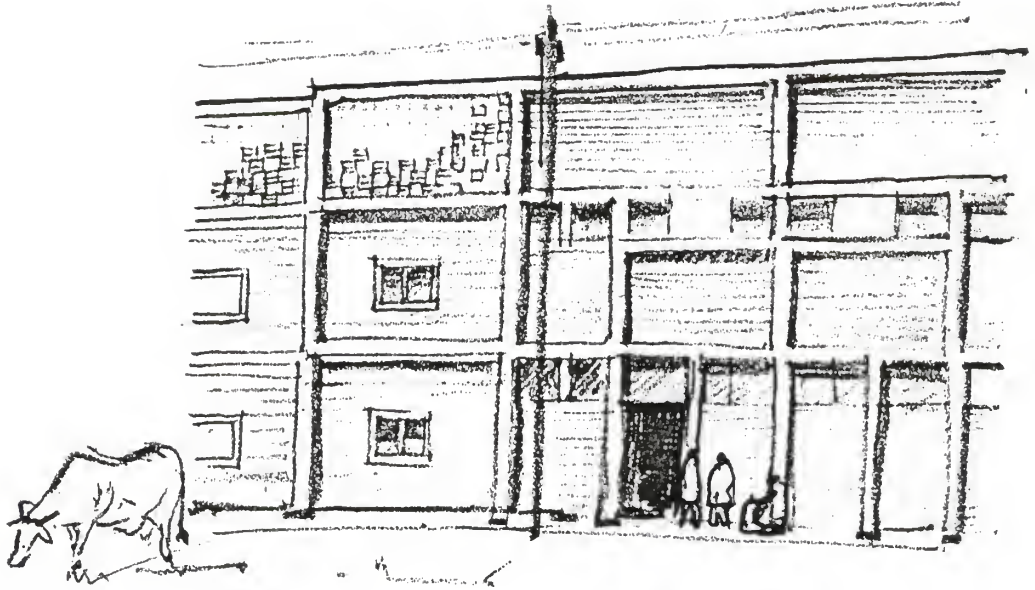
Today building rules in Chandigarh have taken the form of 'Architectural Controls', 'Frame Control', 'Facade Controls', 'Special Controls'. Although they control and cover different types of construction within the city, they are variations of the same theme. Out of these, 'Frame Control' is most critical since it controls most residential buildings in Chandigarh. This law "comprises in fixing the extent and height of party walls and a top course connecting these thus forming a frame. The building portion which can

be of any design stays behind the frame. Certain standard sizes of doors and windows have been specified from which persons may choose and use in any manner they like. In this way, harmony is provided by the frame and variety by the individual treatment of every building." (from a text on a Frame Control drawing in 1958). The mandatory frame surrounding the house on all sides must be 18" beyond the building line and finished in concrete and plaster. Further uniformity is produced by specifying exposed brick as the material for all external walls. Also prohibited are "applied decoration, like crosses, swastikas, names of persons and houses".

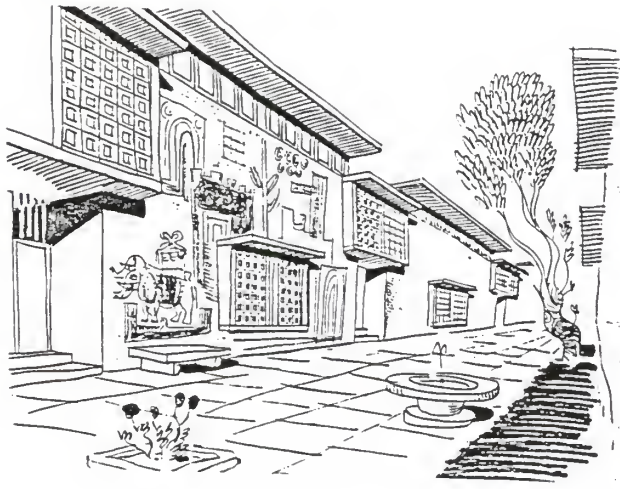


Facade controls form a part of "architectural control" where the interior designing is left to the discretion of the owners while maintaining the prescribed facade. Thus banks, hotels, shops, offices, residences must have the same architectural expression, generating uniformity that causes confusion in the environment. "Full architectural control" applies to all commercial buildings and houses along the V4 shopping streets and shall be discussed in detail later. The question is, should the controls be enforced to an extent that the living environment stagnates with militarism in architecture? The obvious answer is no. But in Chandigarh, development is continuing along those lines.

A rigid manifestation of 'controls' is also very strongly felt in the developing areas in Chandigarh. In the Phase II residential development, building regulations have restricted sizes and placement of entrance gates, dust bins (which no one uses) and boundary walls. Terraces must be located towards the rear and enclosed with brick jalis for which there are prescribed designs. The controls have established a deadly uniformity--precluding the creation of variety, color or excitement--producing an atmosphere even less desirable than the "tasteless and the competitive vulgarity" that one always wished to avoid.



The streetscape is dull and monotonous with no variation in roof lines or building facades. The lack of projecting balconies leaves the walls totally unprotected in harsh sun and rain. Not only have the regulations restricted diversity of forms, they have done this without substantially improving design. Behind the 'frame' lie much bad designs with the same disguise as the misery that lay behind Haussman's 'grand facades' of Paris. Here one begins to appreciate Nowicki's great awareness and sensitivity for local indigenous feeling--attempts to produce a varied treatment of surface through the use of slight projection, screen and painted decoration--creating a design idiom in harmony with the local traditions.



NOWICKI'S SENSITIVITY
FOR LOCAL INDIGENOUS
FEELING

In addition to the aesthetic shortcomings of much of the design, Chandigarh houses also suffer from deficiencies in workmanship. Bricklaying is often slovenly and the quality of brick uneven; plastering and painting are often crudely done and wooden detailing badly finished. The rules fail to deal with quality control.

Chandigarh, being a new city and a modern experiment in town planning, has had a strong impact on other towns in India, particularly the ones bordering it--Mohali and Panchkula. Thus architectural controls in Chandigarh assume a very critical role in determining the architectural character and quality of these and other new towns.

It is most unfortunate that in the succeeding years no effort was made to reexamine the controls--that have not only ignored the rich intimate textures of the Indian

tradition but have also stagnated creativity in Chandigarh. Perhaps, efforts made to reassess the controls have not been allowed or encouraged by the 'rulers'. To substantiate this point consider the following extract from an interview with Aditya Prakash, who is a practicing architect in the city and was once involved with the Chandigarh project with Le Corbusier.

You have been actively associated with the framing of the city's byelaws which seem to have lent the city a harmonious but regimented look. Can you elaborate on Le Corbusier's original guidelines on this issue, if any?

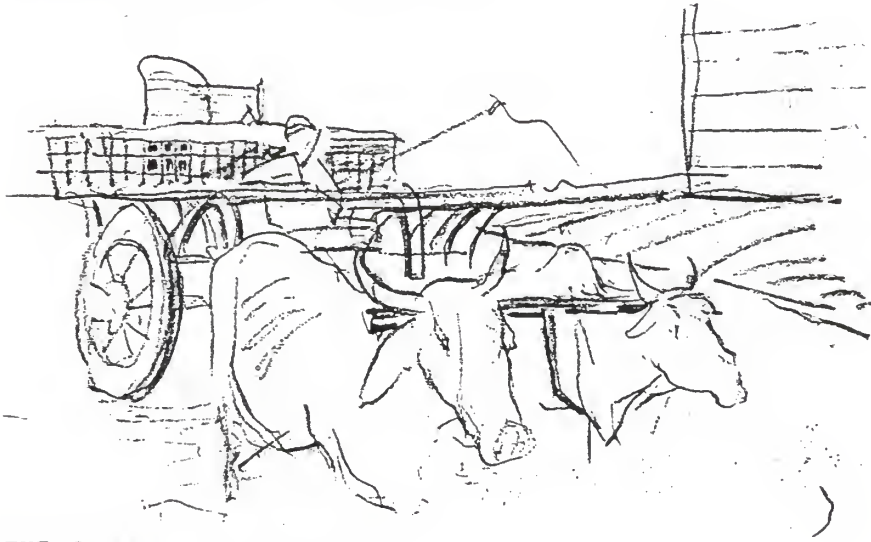
Prakash: Le Corbusier didn't give me any guidelines, but he had made plans for the growth of the city in which he had worked out a grid.

So I felt that in the case of small front houses the important element is the common wall, and if one can control the common wall and its height then one can do what one wants behind that. That was the basis for evolving the frame control system in the city. I still consider this a very good tool for working, but it has also to be continuously evolved, in the sense that its orientation with different situations and the variations in the same situation should be studied. This unfortunately has not been done, so the system has tended to become stereotyped; whereas I would have thought that every two or three or maximum five years a new set of control plans should be evolved which should harmonize

with what exists, and at the same time give enough variety to the growth system.

I have done many studies myself, but it seems like a habit, that if a system is working, why touch it? That tends to rule the working of the governments now. Whereas when I took it up, there was no obligation to do so. In fact, it was done against the wishes of the government. They didn't want us to meddle with the byelaws and cause problems to the public. In fact when I had made them, I was asked to explain them to the public before they would be implemented and convince the public of their advantages. If the system continues in that spirit it will certainly bring control, variety and urban character to the city. But if we follow a principle blindly anything will deteriorate.

"Along the base of the Assembly--clothes are draped as makeshift tents to house whole families; scarlet 'saris' are spread out to dry in the fierce sun; women tend fires on the plaza; white bullocks pull on the dry grass; great scavenging birds circle overhead. The modern capital has been Indianized." --Diane Ward



THE CHANDIGARH CULTURE

Chandigarh is both very Indian and not. Anything given in the course of time is appropriated and transformed into "Indian" by the culture. Charles Correa refers to this as the "blotting paper" phenomenon as against the "melting pot" situation of America where each culture is transformed and finds expression in new ethnic guises". (Ranjit Sabikhi). Yet, to many Indian urban dwellers the feel of the city is foreign and non-Indian in character. The appearance of it as 'non-Indian' is a less bothersome fact than its inability to support some inherent cultural actions and expressions.

Citizens of Chandigarh like their city as much as any citizen could like his or her hometown. They are unconscious of the vitality and variety that could be Chandigarh. That such qualities are not demanded by the people is no indication that they are not needed. As an Indian but an 'outsider' (in the sense of a conscious architect and also a resident of another city who has lived in Chandigarh for only five years) the author recognizes what the city lacks and has strong intuitions of what could be. In the proposal for change, the author will be ever conscious of avoiding the classical mistake of not recognizing what the citizens value even if it were to clash with some personal sensibilities.

Chandigarh would have failed in its symbolic purpose if it had not attempted to embody a high standard of physical amenity, one which would represent an improvement over many older towns and serve as a truly modern city. This improved standard is also reflected in the citizens of the city. The Chandigarh culture is a culture of eminence. Because of a large number of people in administrative and clerical occupations, Chandigarh, by Indian standards, is a highly literate community.

Whether literate or not, people in the subcontinent share

cultural roots and values. The educated white collar working group is adaptive to change; oftentimes even passive to it. This passivity helps sever traditional patterns. Appreciation of Chandigarh for its improved order, legibility and amenities alone does not entirely justify its design and cannot make us turn away from what Chandigarh ought to be.

More than anything else it is the vigour of order, the geometric organization that is seen as a blessing by the citizens of Chandigarh. The masses are unaware of the glory of Le Corbusier's architecture. "They appreciate the clean air -- free of pollution, the extensive green spaces, the trees and the flowers, and also the health and educational facilities that the city provides. They are unaware of the architectural masterpieces in their midst which make it the Mecca for architects from all over the world. In fact they are baffled by these monumental buildings and cannot understand their significance..... It is an acknowledged fact that what the architects think is banal and ordinary, forms the framework for a full and satisfying life for its citizens, and what excites the architects generally leaves the citizens cold and unmoved". (Ranjit Sabikhi).

That the people are ignorant of Corbusier's majestic works

or even Chandigarh's reputation in the modern world of architecture and city design is not a bothersome fact. What is more crucial, which again the residents seem to be unaware of, is that Chandigarh lacks the presence of an "Indian" place; an "Indian" town. The search for whatever is "Indian", should be very important in Chandigarh.

THE CITY WITH RULES-- CONCLUSION

The sense of ordered and structured growth is the very nature of Chandigarh, and this very nature warrants respect. It would be foolishly romantic to propound a 'doing away with' the existing rule systems and hope that the big city of Chandigarh would 'organically grow' like other Indian settlements. Thus the need for the continuance of a rule system becomes all too apparent.

Monumental architecture of disparate cultures dot the sub-continent. Le Corbusier's monuments have room too. But while many towns grew to support the strength and position of their monuments Corbu's monuments have progressively lost ground. They have been criticized as the origin and cause for the monotony of Chandigarh's urban fabric. To me this is a paradigm of misinterpretation. Taking Chandigarh as it was

given, it is possible to imagine a rule system that would have avoided the present dull grain of its architecture. Adaptation of a system, whether geometric rectilinear or more intangible and abstract, need not mean regimented monotony that one sees here. The adopted framework has allowed no variations for any good reason. Although many buildings do not come close to the nature of buildings that Corbusier had designed, the regulatory system has ever been fostering Corbusian themes of standardization, and has various types of control in form of 'zoning plans', 'frame controls', 'facade controls' and 'architectural controls'.

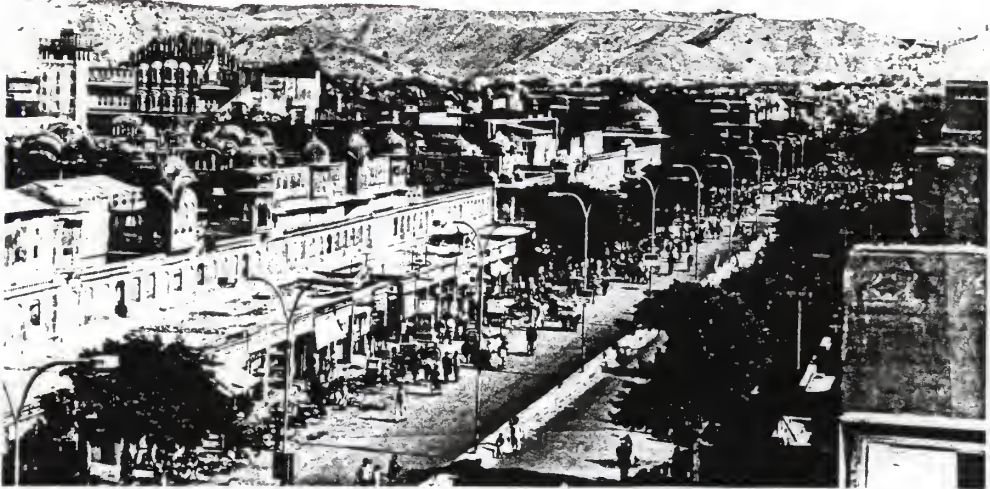
The existing building rules follow only the superficial devices of Le Corbusier's work--the now ubiquitous brise-soleil, often employed on all sides of a building as a decorative device rather than a functional shield. The power and plastic expressiveness which is at the heart of Le Corbusier's design is ignored. 'Picturesque' borrowing of Corbu's vocabulary has meant a never ending row of circular concrete columns, brick facades and the omnipresent basic colors of red, yellow and blue on all fenestrations. The regulatory system has encouraged the strict copying with the same fear that is prevalent in some of the 'historic districts' in the U.S. Architects in the city are not to blame. They do what they are 'asked' to do. However, one may

question their calm and reactionary disposition.

Chandigarh questions our understanding of 'unity'. Its unity is superficial, and achieved only through repetition. A lack of room for personal, idiosyncratic and cultural expression makes unity here synonymous with oppressiveness. Here, we suddenly learn to recognize and appreciate variety within unity.

CHAPTER 8

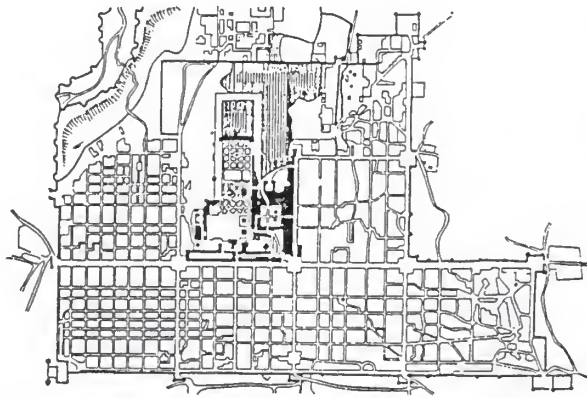
THE WALLED CITY OF JAIPUR: A CASE STUDY



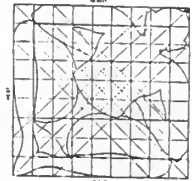
INTRODUCTION

In every respect Chandigarh presents a strong contrast to the character of traditional Indian city. The basic plan of Chandigarh and its grid structure invoke a strong sense of order, and a reference to this aspect has often been made in reference to the walled city of Jaipur. While one can easily observe the parallel nature of Jaipur and Chandigarh, one can also notice that, inspite of being a product of conscious design and continued architectural control, Jaipur fits more easily in the cultural and architectural context of India. Thus studying Jaipur to determine how this has

been possible can yield clues to giving direction to Chandigarh. The British historian, George Mitchell, has observed that any study of cities and symbolism in Asia must inevitably focus on Jaipur. According to him, it is the best preserved example in India of a town laid out according to traditional Hindu theory.



OLD CITY OF JAIPUR



VASTU-PURUSA-MANDALA



CHANDIGARH



A JAIPUR
SECTOR

In light of the intent of this thesis, along with a conclusive focus on Chandigarh's shopping areas, the study of Jaipur is focused on its bazaar areas. Traditional bazaars embody a rich mix of uses-- residential, commercial, public, etc-- and are full of life and vibrance. Notwithstanding the inter-relationship and overlapping of the various aspects, the scope of this study is the architectural appreciation of the building element, i.e. the analysis of facades; urban space analysis of streets and squares; climatic analysis; and space organization; all in the context of Hindu planning and design principles.

HISTORICAL PERSPECTIVE

Jaipur's conception and execution marks the realization of both the "abstract and physical objectives" (Doshi) that king Jai Singh, the city's founder, and Bhattacharya, the architect, shared as a vision. Based on the Vastu Purusha Mandala (a sacred framework that governed ancient Indian town planning) the plan of Jaipur has a grid-iron structure and has nine squares (chokris) with the Palace Complex dominating the heart of the city. Despite the rigid framework, the organic development of the different segments over time created a lively and a vibrant city. The facades

along the main roads throughout the city were designed and constructed by the state to ensure aesthetic control. This is evident in the continuous shopping arcade along the road with residential structures rising behind it. Yet another method of facade control which was used was to maintain uniformity is the color of buildings. The major roads were abutted by building facades of pinkish stone (later terracotta wash was used), a feature that earned Old Jaipur its name of the "Pink City".



Foot Notes:

1. (a) An alternative view regarding pink color is that the city was originally painted cream, but later, perhaps to cut down the glare caused by the reflection of the strong

mid-day sun, the white city was changed to pink. A hue prepared from the combination of white (lime) and powdered under burnt terra-cotta "(geru)" was used.

(b) Another explanation to the ubiquity of pink color is based on literature on Hindu art and architecture, according to which each caste group in the society is assigned and identified by a particular color. The king who built the city was a "Rajput", that is, of "Kshatriya" caste, which is associated with the red color. This assumption may be correct, as the whole town plan was derived from Hindu literature on architecture, and the society that went about executing it was extremely religious.

THE SOCIO-ECONOMIC CONDITIONS:

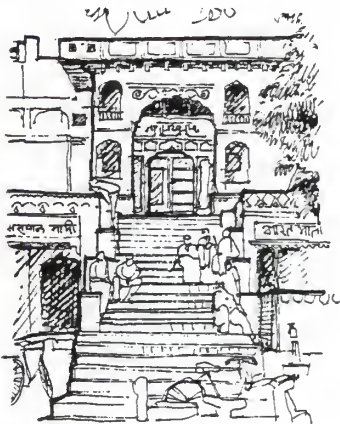
The planning and architecture of Jaipur reflects the social order of its time. Being a princely state, social stratification was feudal in nature-- the king occupying the most strategic position followed by high officials in the near vicinity and so on. Civic spaces like streets and chaupars (squares) formed an efficient network spread out over the city to ensure adequate social interaction.

A Jaipur sector (chokri), being 800m x 800m in size, formed a safe and an intimate pedestrian environment. Within the grid of sub-sector roads 'mohallas' are situated, accommodating about 40 to 50 residential plots each. Since the inhabitants of mohallas belong to a single caste and pursue the same trade, social cohesion became even stronger. Apart from sharing common facilities such as drinking water, workshop areas, etc., their religious practices and festivals are similar. All such factors contribute towards strengthening community ties.

'Haveli', the dwelling unit for a joint family (smallest economic unit in the social structure) was organized around the courtyard. The courtyard was the common space; accommodating facilities like drinking water, space for washing clothes, play area for children, in addition to providing ventilation and daylight. "The havelis on closer examination prove to be a result of an intricate layering of social, religious, functional, climatic, spatial and structural requirements." (Gijre)

RELIGION

About ten thousand temples in Jaipur demonstrate the religious backbone of the society, and till this day religious processions are carried out to keep up the religion and culture. "Temples became more special and significant because they served as institutions for learning, and generated a sense of community in socio-cultural terms". (Doshi). Large temples are located at the chaupars. Records indicate that temples, which already existed on the site when the town was laid out, were accommodated within the plan. One may thus find a few temples right in the middle of the major roads; they are the only structures allowed to break the continuity of the facades. Flights of steps leading to the main floor of the temple from the road further make the temples stand out as distinguished landmarks of the city.

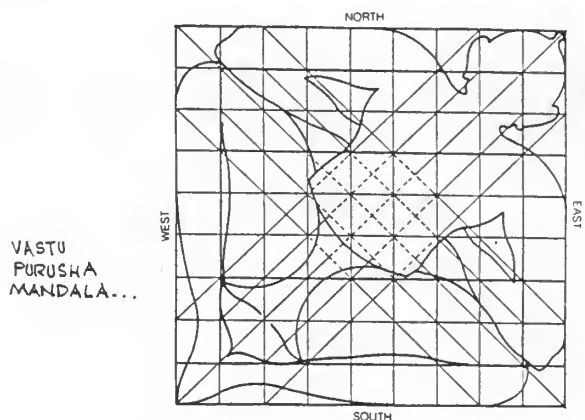


STEPS TO THE TEMPLE

CULTURE AND TRADITION

Vastu-Purusha Mandala (environment, energy, astrological chart)

According to ancient texts: "A long time ago something existed that was not defined by name or known in its form. It blocked the sky and the earth. When the gods saw it they seized it and pressed it upon the ground, face downward. Brahma (Lord of Cosmos) had it occupied by the gods to hold it down and called it Vastu-Purusha. Thus, an existence which did not follow any principle is defined by Brahma who forces it to assume and retain a certain form, mandala, with the aid of gods presiding over it.



"With the central location presided over by Brahma, the inner and outer rings of the mandala were occupied by 44 other Vedic gods. In Indian symbolism, a square represents a celestial world with the gods appropriately sited over the

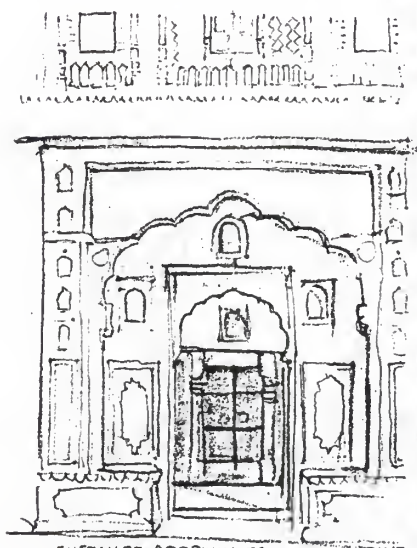
mandala and the Vastu-Purusha Mandala assumes great significance in town planning and architecture.

"The Vastu-Purusha Mandala is an image of the laws governing the cosmos, to which men are just as subject as in the earth in which they build. In their activity as builders, men order their environment in the same way as once in the past Brahma forced the undefined purusha into a geometric form. For the architect, building is an act bringing disordered existence into conformity with basic laws that govern it. This can only be achieved by making each monument, from the hermit's retreat to the layout of a city, follow exactly the magic drama of the Vastu-Purusha Mandala". (Volwahren)

"A circular shape refers to the movement, the cyclic movement of time. A square cannot be moved by itself but is a final, equivocal form. As a perfect form it is used by the Hindu to indicate the absolute. . . Since the square was mystical, absolute basic form that does not permit any variation in the course of construction, it could all the more be embellished with abundant decorations." (Gijre).

In Jaipur the square form is used persistently at all levels, starting from the town layout to the small fenestrations in the building facades. Ancient Hindu

treatises have also instituted principles regarding building orientation, location and materials to be used, etc. In Jaipur some of these have been taken into consideration. "... Materials used are not only coordinated with caste but also with sex. A temple constructed in stone and brick is associated with Gods, while the ones in brick and wood, enshrine Goddesses. Entrances to houses of a particular caste group are from particular cardinal points. Elements like portals, threshold, niches (for lighting 'deeyas') had a religious significance." (Gijre).



ENTRANCE DOORWAY TO
A HOUSE

CULTURE - THE TOTAL EQUIPMENT
OF IDEAS AND INSTITUTIONS
AND CONVENTIONALIZED
ACTIVITIES OF PEOPLE
- AMOS RAPOPORT



HOUSE SPACE ORGANIZATION

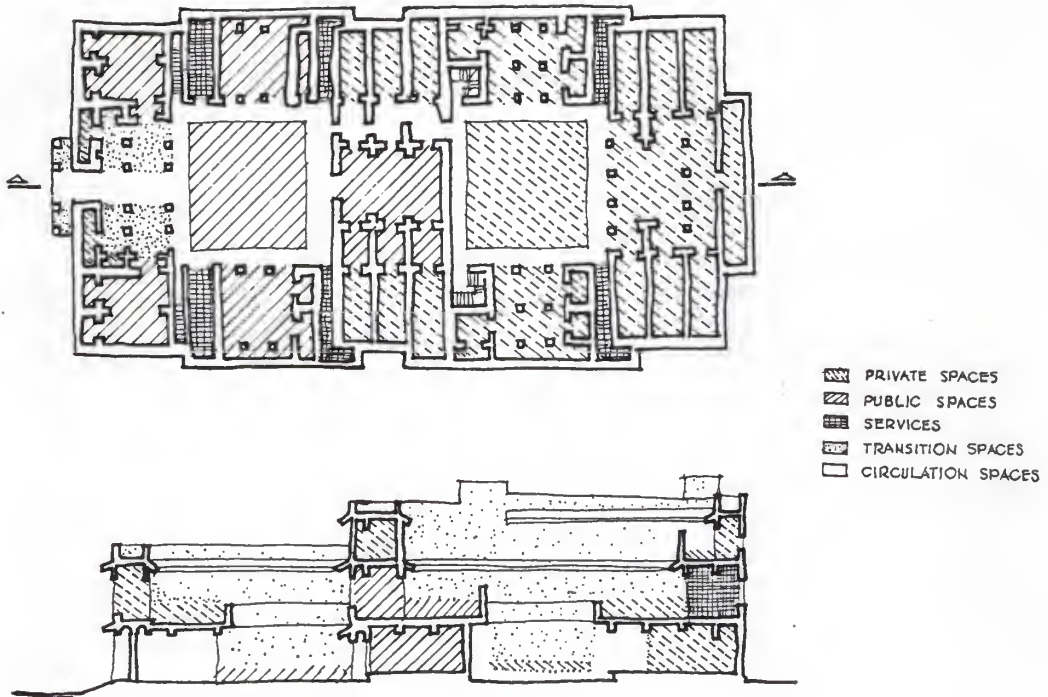
"Life is uncertain; so are economic and social conditions. Hence, the nature of planning and building forms should take into account these uncertainties as part of the design parameters." (Doshi). The overall layout of Jaipur, the design of streets and individual buildings have an ambiguity and open-endedness built into them. The spaces in buildings incorporate flexibility, designed to include various activities and varied notions of privacy. Though rooms may be formed as compartments, they need not necessarily be used for a particular function, big or small. "The character of space is only established through the functions that take place in it." (Doshi)

The house form was not simply a result of physical forces-- climate, material and technology-- or any single causal factor, but was the consequence of the whole range of socio-cultural factors seen in their broadest terms. Religion affected the form, plan, spatial arrangement, and orientation of the house. The central location being presided over by Brahma, in the Vastu-Purusha Mandala, suggests that there be a courtyard in the center of the house. It is the organizational element in the house and a gathering place for the family. Being a private realm they

give a feeling of relief and peace away from the hubbub and strains of the city. The external balconies of the house or verandas facing the road become a response to the public domain. "A house is compared with the human body and the courtyard with the eternal soul, and thus with Brahma." (Doshi).

A study of space organization in traditional Jaipur houses conducted by Balkrishna Doshi, who is regarded as one of the masters of modern Indian architecture, yielded important observations. They are as follows:

- central axis; entrance and courtyards along central axis
- degree of privacy with depth
- covered spaces around courts
- circulation spine meanders to achieve privacy
- transitional elements (entrance gate, otta, verandah) highly pronounced
- courts form nodes for vertical and horizontal circulation
- different stairs for different privacy zones
- services situated on the periphery of the house
- degree of privacy increases on upper floors
- private intermediate terraces



(Source : B Doshi)

CLIMATIC CONSIDERATIONS

The climate of Jaipur is characterized by:

- Hot and dry climate
- Bright sunlight with lots of glare
- Mean temperature 77 degrees F.
- Average rainfall 23"

In a hot climate, such as Jaipur's, the overwhelming natural phenomena are dazzling sunlight and vastness of open space.

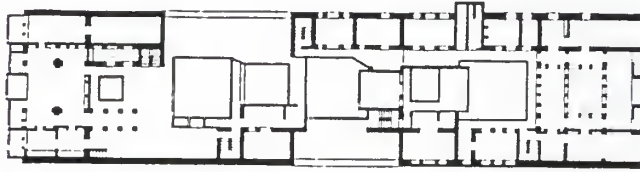
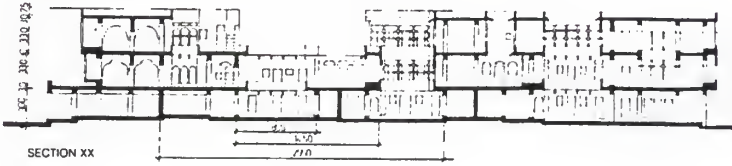
The need for shade in summer is greater than need for sun in

winter. The design of Jaipur responds very well to the hot climate by sensitive handling of sun and space. The close knit urban fabric reduces the surface area of the built-form in relation to its volume, thereby significantly reducing solar gain.

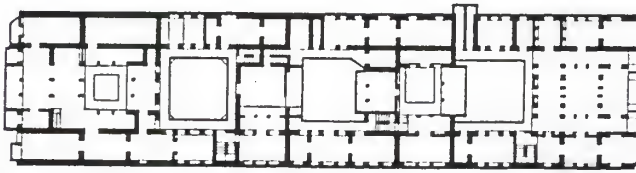
Courts are provided in all the houses for passive cooling and are shaded during summer afternoons by the surrounding walls. "These courts help to cool layers of air at night and this trapped air is prevented from heating during the day by limiting the court's plan dimensions in relation to their height." (Doshi). In larger houses a series of small courts are provided instead of one large court.

The walls are thick with high thermal resistance. A minimum of openings are provided in external walls to prevent hot summer winds from entering the house. Few large openings still have wood shutters which helped in excluding hot winds while permitting cross ventilation when opened at night. All openings are protected with overhangs, known as chajjas. They are filled with delicate latticed stone screens that prevent direct sunlight and cut down the glare of the reflected sun in the street. The roofs receive considerable solar radiation, and are heavily insulated by layers of 'surkhi' (limestone) in which stone chips are embedded.

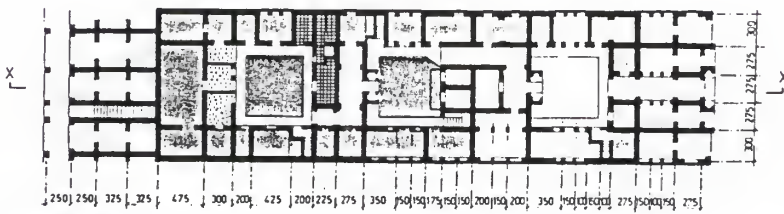
HOUSE DIMENSIONAL STUDIES THREE COURT HAVELI ON JAUHARI BAZAAR



SECOND FLOOR



FIRST FLOOR



GROUND FLOOR

(Source : B. Doshi)

MATERIAL AND TECHNOLOGY

Most construction in Old Jaipur is in stone, not only due to its local availability but also because of its religious significance. The use of stone was multifarious--beams, columns, walls, brackets, louvers etc were all made in stone. Limited load bearing and spanning ability of stone resulted in establishing a module, both in plan and elevation, which when repeated produced harmonious rhythms. Stone was carved and embellished in a certain style. Thus, the built form of the culture also derived from the the limitation of materials and technology.

ARCHITECTURAL STYLE

The hybrid style of Jaipur is a result of an amalgamation of principles and characteristics of both Islamic and Hindu styles, although the latter one dominates. Symmetry is inherent in both plans and elevations and this principle is extended to forms of fenestration. Apart from symmetry, the square form has been extensively used, from the shaping of the city to enclosing a window space in the facade. Decoration was an essential part of the architectural style, contributing to the rich diversity within the environment.

The elements used for this purpose were motifs, made prominent through the use of white painted plaster. The shape of these motifs were derived from the forms of solids and voids in the building facade, together reinforcing the harmonious character of the environment. Floral patterns derived from Islamic style and scenes from Hindu mythology were also used.



It seems clear that there was a definite framework within which the hybrid style flourished, the constraints for the framework being derived either from the rich Indian culture and tradition, or arising from the natural limitations of climate and material. It is critical to note that despite the constraints there was room for many individual variations within the framework which could be adapted in

various ways. Although the possible range of expression appears to be limited, it is precisely this limitation of expression which made any communication possible.

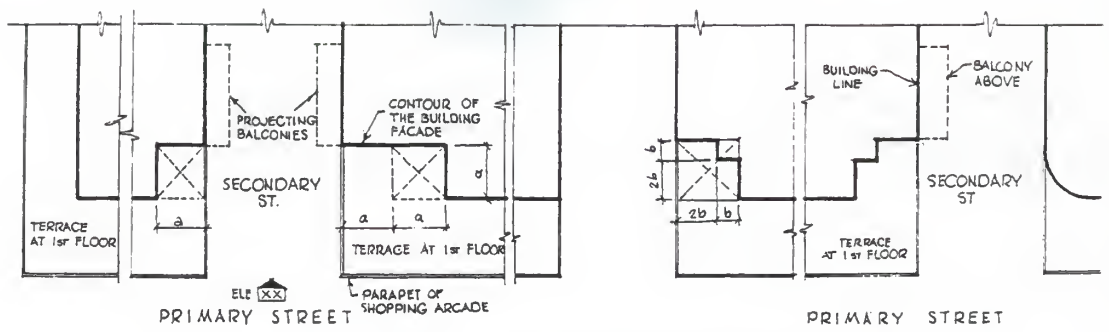


ANALYSIS OF STREETS

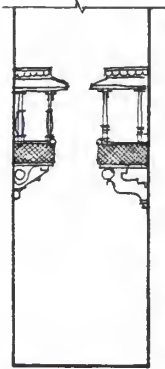
The street network at Jaipur follows a definite hierarchy. Major roads that form sector boundaries are 33 meters wide and are subject to maximum government control of building alignment and facades. Continuous shopping activity takes place on the ground level while the upper floors are used for residential or public purposes. The secondary grid of streets are 16.5 meters in width, and commercial activity, here, tends to be of a more specialized nature.

The tertiary street network further divides sectors into mohallas, the smaller residential clusters. These streets vary from 8.25 to 4 meters in width, and serve as access streets to residences.

In retrospect, both Jaipur and Chandigarh plans, with their hierarchial street patterns, provide for two orderings and two scales-- a larger geometric framework, and, an intimate residential conglomerate. The difference, however, lies essentially in the consolidation of the two patterns to act as a whole. Whereas in Chandigarh this dichotomy is marked by sharp contrasts and a formation of clearly defined zones, the well knit fabric of Jaipur, on the other hand, exhibits a blending of its parts. For example, an analysis of street intersections in Jaipur reveal a careful handling of building corners. A variety of imaginative solutions allow for the continuity of space, form and activity from one ensemble to another. Further, one can also notice a gradual dilution in the extent of control as one moves from the main bazaar streets to the inside of the sector.



BUILDING CORNER DETAILS AT STREET INTERSECTIONS

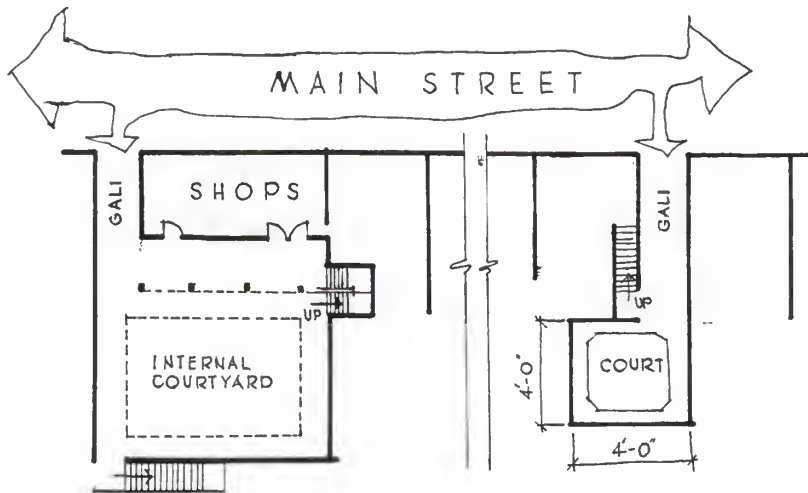


ELEVATION-XX



An important aspect of the main bazaar streets is that they either terminate at a visual or an activity landmark, i.e. gateways and chaupars (public squares), which help in defining comprehensible boundaries to the street. Yet another interesting feature are the narrow 'galis' (offshoots) from the main streets to small internal

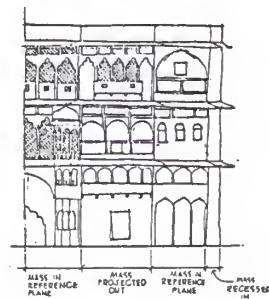
courtyards that incorporate vertical circulation apart from allowing light and ventilation into the living areas.



Alongside the formal bazaars that line the streets of Jaipur are the informal make-shift arrangements of vending and hawking. In fact these unplanned enterprises are an inevitable and integral part of any Indian shopping environment. Not only do they add color and life to the market ensembles, they also satisfy the shopping psychology of the Indian people who love to haggle and bargain. Since these informal market enterprises are largely mobile, the shopping character is never static-- it keeps changing all the time.

Build-to-plane: The build-to-plane characteristic was an essential part of the building legislation for the main street in Jaipur. The three to four storied building mass

along the major streets is essentially in the same vertical plane; the space of the street is contained within these walls. Interestingly, individual elevational units recess in or project out from this reference plane and this occurs within an acknowledged range--usually two feet. These projecting elements in the facades are not merely superficial in nature, but are clearly reflected in the plan as usable spaces.



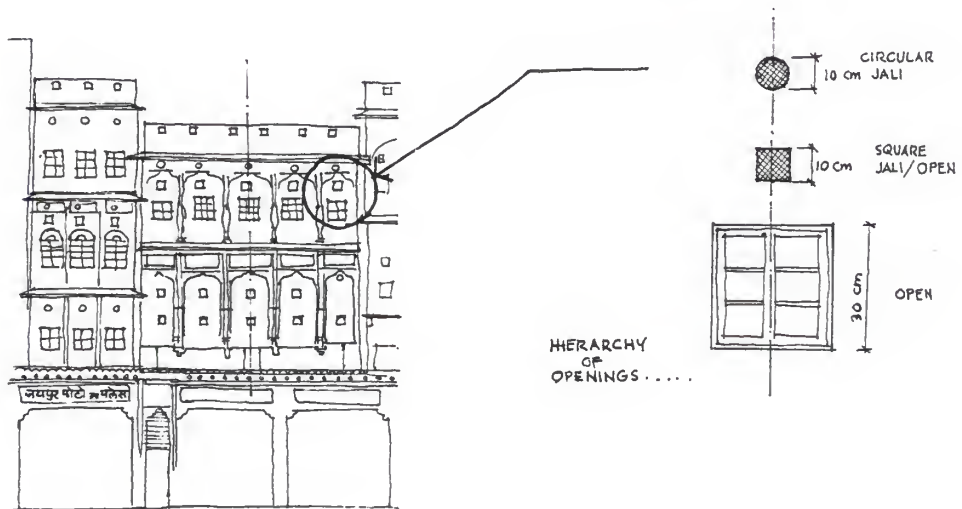
Horizontal and Verticality: The horizontal character of the bazaar streets can be attributed to the continuous chajja projections and the shopping arcade. The chajjas that shade the facades keep varying in height and are occasionally broken up by projecting balconies and pavilions (chattris), and thus prevent horizontal severity. The chattris appear as if growing out of the straight roof lines, thereby adding interest to the skyline.



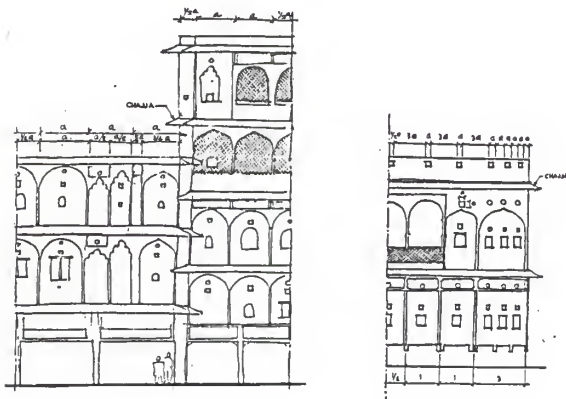
Being expressed as a clearly distinguishable element, the shopping arcade makes a strong visual statement. Apart from giving a unified character to the street it absorbs the impact of the changing building skyline and the interplay of solids and voids in the building facades. Further, it also

helps in reducing what could have been an overwhelming impact of the three to four storied pink colored facades.

Solids and Voids: A definite module is followed by the void in the form of windows, ventilators, jali panels, etc. Further these various kind of fenestrations observe a hierarchy. Since the void and mass are complementary to each other, the bulk mass, being a response to the climate, is broken up into smaller masses. The critical dimensions of each void fall within a certain flexible range, and this subtlety avoids both monotony as well as incongruity. This approach continued not due to any strict adherence to government rules; it continued by following an established traditional pattern.



Moving past an individual building, one experiences a rhythm of masses to openings; "rhythm being an ordered recurrent alternation of strong and weak elements." (Historic Preservation Plan, Savannah) Further, Hindu literature on architecture maintains certain rules pertaining to rhythm; usually an odd number is repeated in a definite order. For example, some of the popular rhythms used in Jaipur are: 3; 1-3-1; 1-3-5-3-1 etc, and vary with the frontage of individual facades. The rhythm followed may be picked up by any element, that is, windows, projected balconies, bay windows, decoration, etc. Since the square form is used extensively either as solid or void, it may tend to be monotonous. This is overcome by the use of various combinations of rhythms. For example, assuming each side of the square is 'a', then solutions for a parapet detail are: 1a-a-1a-a-1a; 2a-a-2a-a-2a; 5a-a-5a-a; 2a-a-a-a-a-a-2a-a-a-a-a-2a etc. (all "a" being void).

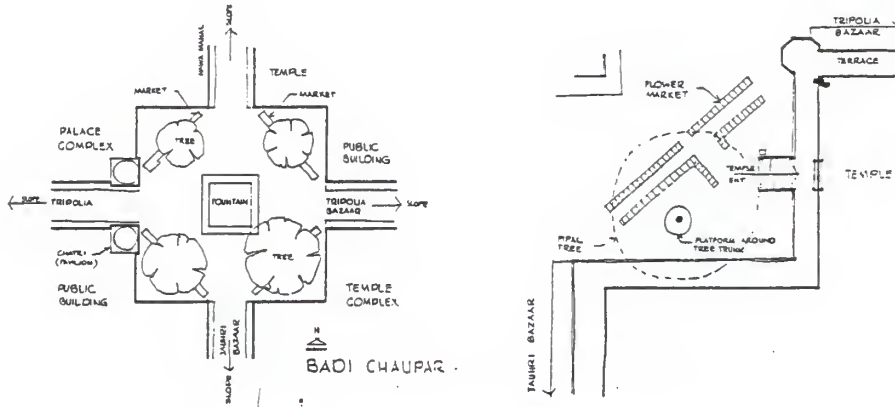


CHAUPARS-- Public Squares

One of the most distinguishing features in the entire urban fabric of Old Jaipur is the 'chaupar' (square) which occurs at intersections of the main streets. Creating an open square, thrice the width of the major roads at the intersections, the city acquired three such squares measuring about 100m X 100m. Considering that the city was planned for about 60,000 persons, these squares could definitely be considered adequate for public gathering on festive occasions. Considering that motorized movement did not exist until forty years ago, the chaupars till that time must have created a unique urban experience, no doubt enhanced by the controlled facade treatment enveloping it.

Badi Chaupar: This square, like others, is marked by the continuity of the shopping arcade from the main bazaar streets. Also located here are temples and public buildings. One of the unique features of this square, from the urban design standpoint, is that all streets gently slope away from it. This not only helps in reinforcing the focal interest of the streets, but also, by enlarging the frame of human vision, yields clarity in the environment. Four, huge, 'pipal' trees occupy the four quadrants of this chaupar,

under the enormous shade of which thrive small informal markets laid in a diagonal configuration.



LANDSCAPING

Few trees were planted at the time the city was built, as the king, the city's founder, preferred uninterrupted views. With the passage of time more trees were planted, not merely to provide shade and visual relief, but also for psychological and sacred reasons. Trees sustain a variety of informal bazaar activities--under their shelter operate cobblers, barbers, hawkers, and beggars. At the foot of the large tree trunks are permanent platforms, constructed in stone and lime mortar, which serve as get-together places for elderly people. Occasionally a small idol is installed, either within the carved out tree trunk, or, placed in its vicinity.

Thus trees are a significant and integral part of the urban ensemble of Jaipur, and this is true for other traditional Indian cities. And, for all that they provide to the people, they receive as much love and care in return.

THE PINK CITY - CONCLUSION

The preceding study of Jaipur reveals the layering of many factors in conditioning the city's built form: the socio-

cultural forces, including religious beliefs, family structure and its basic needs, social organization, and, the physical forces, including climate, material and technology; the latter being closely related to the former. According to Amos Rapoport, the author of 'House Form and Culture', the socio-cultural factors are more important than climate, technology, material and economics in influencing the built form, the latter being "best regarded as modifying factors than form determinants." This hypothesis has reasonable bearing in the case of Jaipur.

Nevertheless, it is, of course, the interplay of all the fore-mentioned factors which best explain the consistency as well as rich diversity in Jaipur's built environment. Even among severe physical and cultural constraints, the resulting visual order of the building facades accomodates room for many variations and possibilities. These very constraints, however, limited the range of expression thereby avoiding excessive contrast. This limited availability and use was overcome by the diversity that resulted from the use of these forms in different combinations and rhythms. Further, the resulting framework had certain tolerance limits within which variations could be made. These constraints, that formed the framework, were, or may be considered as, a form of indirect means of

control. Similarly, the imposition of pink color on all building facades, and the deliberate addition of the shopping arcade may be considered as a direct form of control. For reasons enumerated earlier in the study, it may be concluded that the resulting ordered, but diverse, architectural character of Jaipur is largely an attribution of a balanced co-existence of both the direct and the indirect nature of controls. This duality is perhaps the essence of Jaipur, and its presence can be felt at many levels--from the city structure to the design of individual building facades.

Culture and the built form are interdependent. "As soon as the culture or way of life has changed, its form would become meaningless." (Rapoport) Yet, many aspects of Jaipur still retain validity when the culture that created them has long since disappeared. In Jaipur, housing and settlement forms are still usable even though meanings attached to forms may have changed greatly. "In fact, in human, as opposed to technological terms, such forms may often be superior." (Rapoport) There is ample evidence that suggest that human needs have not changed suddenly and drastically in the last few decades as some of us would like to believe. For example, the human needs for privacy, social intercourse and spiritual development are as much valid in the modern

Indian context as they had been in the past. What has changed is the technology and materials which have influenced the living patterns to some extent. But in no way should technology be allowed to determine human environmental standards.

"Certain aspects of human behavior and way of life are constant, or change very slowly, and that replacement of the old forms is often due to prestige value of novelty rather than lack of utility or even unsatisfactory relation to the way of life. Similarly, acceptance of old forms may also be due to the prestige value of old things rather than any real continued validity of the forms." (Rapoport)

Today Indian architecture is becoming aware of its rich cultural heritage and traditional architectural features, but there is quite a confusion about the process by which they can be absorbed into the contemporary life. Many a times designers are led astray by the mistake of taking traditional forms for granted and considering them as a given without any socio-cultural background. In the context of modern Indian architecture, with special reference to Chandigarh, the conscious hybridization of existing contemporary style and features adopted from traditional styles, however brilliant they may be, will never create

anything but a dead mixture of unrelated forms. One may have to go beyond the matter of styles to the sociological, ecological, ethnic and cultural circumstances that created a particular tradition.

For, tradition is not something that is formed once and for all--it is not static and changes constantly through minor adaptations rather than by abrupt manuevers. Some traditional features of Jaipur thus may not be entirely applicable to the modern times. They may, however, be considered as a good standard to go by, and must be constantly reevaluated to be adapted to the present needs. For example, the mythological and cosmological significance of the Vastu-Purusha Mandala, and, with it the square form, may not be as relevant or understood by the people today. There is, however, also evidence that "if scrupulously followed, it (the Mandala concept) ensures certain minimum standards, at least climatically, because the chart (Mandala) relates the layout (of buildings) to orientation; which allows the refreshing breeze to enter into all the spaces including the sleeping areas." (Doshi). Similarly, there may be many other elements and aspects of tradition, like 'chattris', 'chaupars' etc., that may have practical, if not religious, implications and validity in the modern context. These must become subjects of continued research.

CAPTER 9

A STUDY OF "V4 SHOPPING AREAS" OF CHANDIGARH

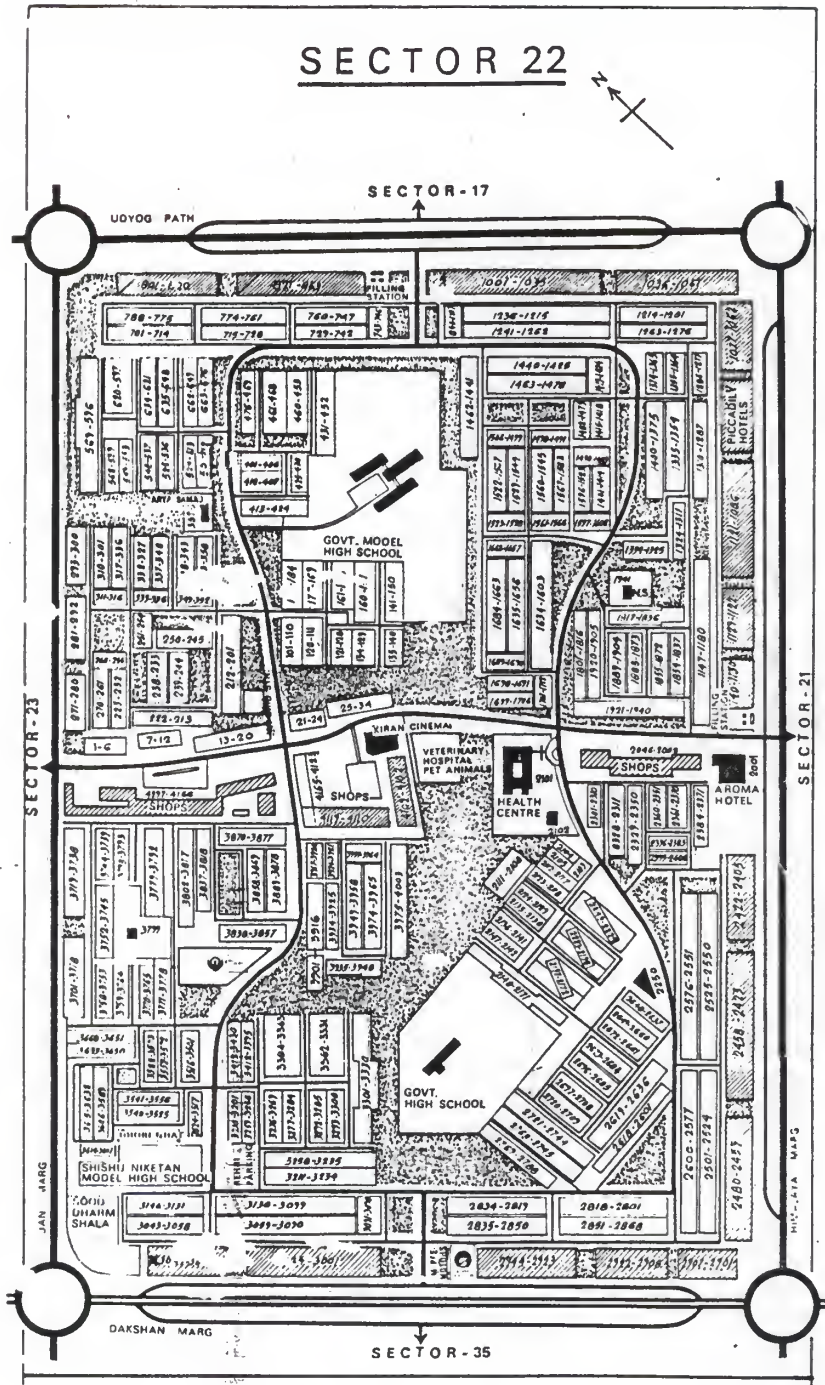
In this chapter, various aspects of the V4 shopping areas of Chandigarh will be analyzed in light of the existing 'rule systems' and compared to the findings in Jaipur. While focussing on the shopping areas of Sector 22, the first developed and most completely and densely built of all sectors. Certain aspects of other shopping areas will also be illustrated where necessary. The study seeks to substantiate the underlying assumption that flexibility in Chandigarh's rule systems is desirable. Conclusions will be drawn in the form of recommendations which may form some basis for deriving future guidelines for shopping areas in Chandigarh.

THE URBAN FRAMEWORK:

"In the (traditional Indian) bazaar the sense of urbanity intensifies, and all the life of the town seems to be distilled and concentrated amid the noise of the peddlers, the profusion of goods and the movement of crowds." (Evenson).

Essential to the organization of Chandigarh's 'Seven V' street system (refer appendix) devised by Le Corbusier, and bisecting each sector, is a V4 or bazaar street. Aimed at

SECTOR 22



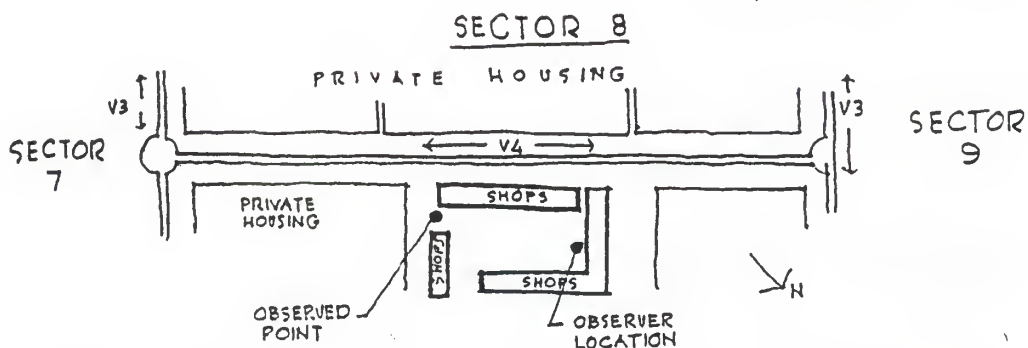
permitting only relatively slow traffic movement, the V4 was originally planned to follow a slightly irregular path across the sector. Shops are intentionally located on the south side of the V4 to ensure shade to pedestrians and for eliminating the necessity of frequent street crossing. Because in India shop-owners like to reside on their business premises, residential quarters are provided on the upper floors. Also located along the V4, are commercial, public, recreational and religious uses. A common feature to all sector shopping areas is the lately legalized 'rehri' (mobile shop) market which in itself creates a lively marketing scene. Although the layout of the bazaar buildings varies from sector to sector, the linear pattern is consistent.

Jane Drew, describing the creation of bazaar areas, has stated: "A sector is a small world but it presents many of the same problems of a big town. Scale has to be established, and to this end the 'hub' of the sector, the market, had to dominate a little over the housing areas. The architects who had a better sense of the importance of physical environment than administrators, laid down that the main part of this center should be three storied and also be strictly architecturally controlled."

Although rationally conceived, the bazaar areas of Chandigarh tend to lack the excitement and color of the traditional bazaar streets in older Indian towns, such as Jaipur, a condition partly attributable to the restriction of the shops on one side of a rather wide road. In older Indian towns, the bazaar streets are narrow and contain open shops on both sides of the street yielding a lively market ambience. That there is still a yearning for this pattern in Chandigarh, is reflected by numerous commercial establishments that have sprung up on the residential north side of the V4.

Although the purpose of establishing a shopping street instead of isolated bazaars was presumably to create a flow of commercial activity leading from sector to sector, the interrupted and fragmented placement of bazaar buildings vitiates any real sense of continuity along the street. A loose dispersal of different landuses within strictly zoned areas further diminishes a sense of coherent street character. The over-sized plazas suffer from an unwarranted scalelessness resulting in a loss of comprehensible, urban enclosures. "The last thing one needs in a bazaar is excessive open space or, God forbid, grass. The atmosphere of the Chandigarh bazaar street as it has been developed, reproduces much of the antiseptic vacancy of an American

shopping center, lacking only the twenty-acre parking lots to complete the illusion." (Evenson) Perhaps the Chandigarh planners seem to have forgotten that open areas require constant and expensive maintenance if they are not to become barren eyesores.



The integration of various building types in Jaipur, on the other hand, along with a dense pattern of shops that are

aligned to form a continuous wall along the street, generates a sense of wholeness in the bazaar environment. The lack of spatial definition of the bazaar streets of Chandigarh can also be attributable to the absence of focal landmarks, such as the 'chaupars' and gateways that form an essential part of the urban framework of Jaipur. Another characteristic of Jaipur that is missing in the bazaar areas of Chandigarh is the dramatic juxtaposition of scale in which narrow 'galis' (offshoots) suddenly give way to a small residential court, a temple enclosure or a marketplace.

Apart from rehri markets which are zoned and separated from the bazaar buildings, there are in Chandigarh, like in Jaipur, many small unplanned enterprises of vending and hawking which form an inevitable part of India's retail commerce. However, there is no accommodation for many of these small peddlers in Chandigarh who now gather in makeshift locations. One questions too, the lack of accommodation of craftsmen. The economic life of every town in India still includes a number of small artisans, carpenters, cabinet makers, metal workers, etc., who require workshops and for whom there is no provision whatever in the Chandigarh plan.

RECOMMENDATIONS:

Whatever deficiencies might be found in the development of shopping areas, in fact, in Chandigarh's plan as a whole, they still continue to be a part of the current planning vocabulary. The repeated application of a single urban design formula has become a 'rule' in itself. Therefore, a fulfillment of the city's need for flexibility in the rule system, and a quest for virtues present in much traditional Indian town building, must begin from a change in attitude of the Chandigarh administration in order to foster a more creative and experimental approach to design. A re-examination of the urban framework of the shopping areas of Chandigarh is therefore desirable, and guidelines for their future restructuring must be derived. Following are some suggestions:

- A compactness of the urban fabric along with an integrated mixture of uses could contribute towards creating a bazaar street environment as a collective, unifying framework. Outdoor public spaces should be conceived in an integrated relationship with the surroundings. Further, they need to be designed and maintained with as much care as buildings.

- Shops could open on both sides of narrower streets. This might not only be helpful in accommodating the growing need for office and miscellaneous commercial space in the bazaar areas, but could also yield a rich and complex street life.

- It might also be desirable to provide accommodation for customs like street-vending and hawking and small craft production. Inclusion of such commercial workshops within the bazaar areas might not only add liveliness, but bolster the economic life of the city as well. They should be integrated with the bazaar buildings in the form of permanent establishments instead of being segregated into zoned areas.

- Provision of gateways and other nodal landmarks in the urban framework could not only mark a sense of arrival and provide orientation, but could also be helpful in reinforcing the spatial definition of the bazaar street.

THE 'RULE SYSTEM' AND ARCHITECTURAL EXPRESSION:

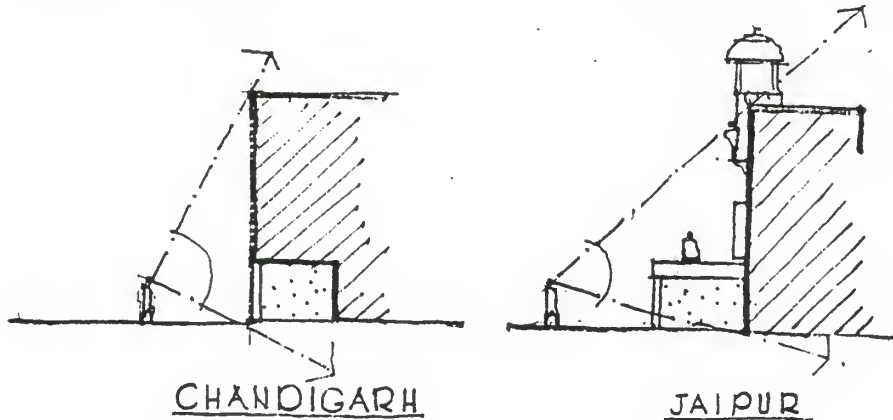
". . . the sari is just a five and a half meter long piece of cloth, but when worn, looks totally different on each woman despite its standardized production. This suggests that when elements provide inherent flexibility, personalized combination and individual identity can emerge." (B.V. Doshi)

The bazaar buildings are placed under "full architectural control", a category requiring construction according to prescribed drawings produced by the Chandigarh administration. A set of detailed standardized drawings with specific dimensions are used as a criterion in approving a new project. The drawings specify all three dimensions of the building, construction details, frame dimensions, usage of materials, colors and even ornamentation. Any design changes or addition require approval.

A set of these drawings may be obtained from the office of the chief architect, Chandigarh administration. They are offered to the owner of the land who, in the interest of the approval of his building, makes certain that his architect complies with the criteria. Visual features of the bazaar building of Chandigarh have by and large remained constant since its inception in the early 1950's. Stringent adherence proves convenient to all parties involved due to expediency and economics. Thus the system rules.

Although the facade treatment of shopping areas varies throughout Chandigarh, all bazaar buildings adhere to the basic scheme established in the designs produced by Jane Drew for Sector 22. All shops are set behind a continuous

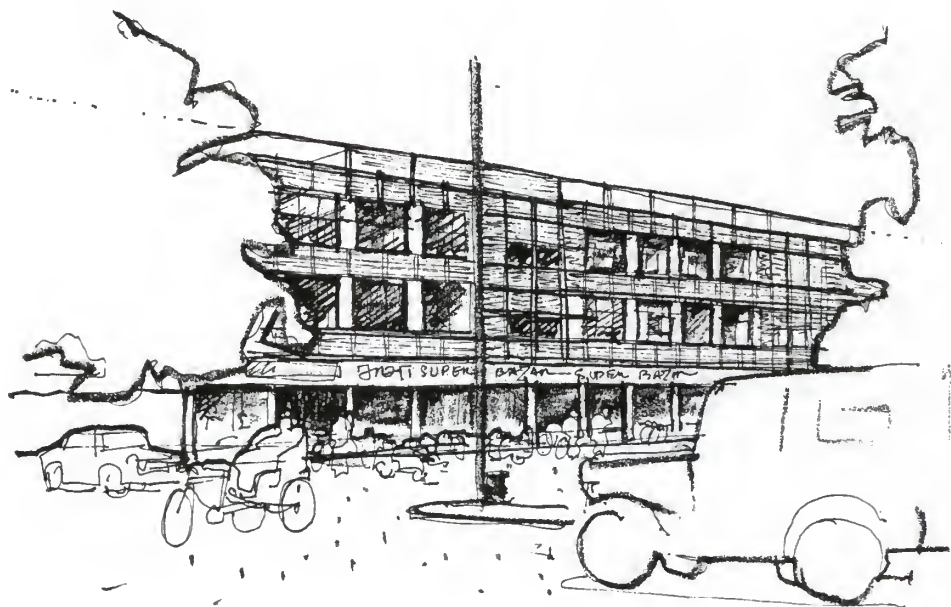
veranda providing a shaded walkway to the shoppers. However, from an urban design standpoint, the caved-in type verandas of the V4 bazaars, fail to establish as satisfying a human relationship with the buildings, both in terms of scale and perception, as the clearly expressed shopping arcades of Jaipur.



The V4 is markedly inferior in visual attraction to the average Indian bazaar street. Although a consistent employment of the economical brick and concrete as building materials has contributed towards the architectural unity of the bazaar areas, their stereotyped and unimaginative use has yielded a dull aesthetic. "It is the bad detailing which makes it (materials) unaesthetic." (Prakash)

Not more than two shop designs were produced for Sector 22, one employing red brick facing and white trim, the other using a cream painted plastering surface and masking the

balconies of the upper flats with a brise soleil. In addition to the shop flats, the bazaar areas also include rows of small one-story shops. However, considering a total of 225 shops in the area, this limited variation in shop types and sizes, fails to match the needs of a number of vending types.

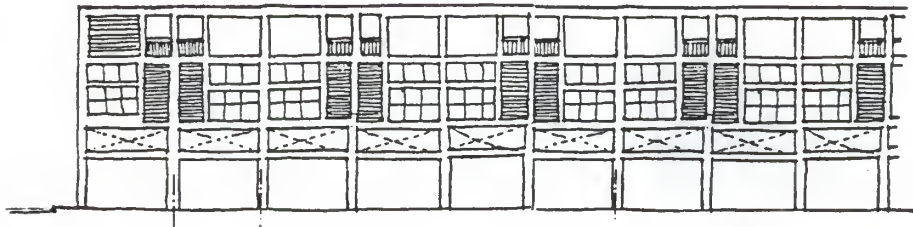


The seemingly endless rows of regimented units form the most depressing aspect of the shopping areas. Facade composition is essentially boring. The rhythmic interplay of solids and voids, and, the harmonic tension among the horizontal and vertical elements, that furnish visual interest to the building facades in Jaipur, is totally missing in the bazaar areas of Chandigarh. Building lines and skylines are

extremely rigid: the compulsory frame that projects nine inches beyond the building line limits all projecting elements of the facade and thus prohibits the deeply overhanging balconies and chajjas. The controls make no allowance for any vertical projecting elements, like 'chattris', over the roof lines. In Jaipur, on the other hand, a dynamic exposition of projecting and receding elements in the aligned facades yields a rich diversity without losing an implied sense of order.



In Chandigarh there is absolutely no room for individual expression. The facades bear no relationship to the building types over which they are blindly imposed. Thus, banks, post offices and restaurants, which form a part of the bazaar areas have a similar architectural expression and must fit the given prescribed dimension of an established module. The result is a significant lack of orientation in the environment.



BAZAAR STREET ELEVATION : CHANDIGARH



BAZAAR STREET ELEVATION : JAIPUR

The argument is not that dimensionally coordinated systems have to be eliminated. Variety and interest cannot be assured by merely doing away with the rule systems. A dimensionally coordinated system should have many options

within itself. Thus a small vendor (needing 4 foot wide space) would be given as much importance as a bigger shopkeeper who needs a 16 foot wide space. A limitation of any sort should not imply a monotony that is characteristic of Chandigarh. In Jaipur a rhythmic juxtaposition of a handful of forms have yielded a seemingly rich diversity.

RECOMMENDATIONS:

The sense of order and structured growth is the very nature of Chandigarh and is seen as a blessing by its citizens. This order is worthy of respect, and a continuance of a rule system may be desirable. What may be needed, however, and seems feasible, is a modification of the rigid government program to permit some variations. Following are some recommendations:

- The problem of insufficient architectural identity and deadly uniformity of the bazaar areas may be overcome by considering an increase in the variety of building arrangements; the resulting variety of types could be controlled through a Zoning Code system. (Refer: Seaside Zoning Code). The proposed code with clear systematic guidelines for proportions, dimensions and materials etc.

should outline the conditions which the design ought to achieve, and contain suggestions of different ways in which the conditions may be met. Such a system could ensure the implied sense of visual order while permitting variations to achieve architectural diversity.

- Establishment of minimum dimensions or minimum and maximum spatial standards could permit the designers to meet the conditions in many ways.

- A shopping-grid module may be established which, when used in different combinations, is flexible enough to accommodate a variety of vending needs.

- Creative handling of building materials should be encouraged by suggesting that variations from the guidelines be brought before the Chandigarh administration to be evaluated on architectural merit.

- Based on the Jaipur precedent, common reference planes, both vertical and horizontal, could be developed to bind all building types, with variations permitted within a specified range.

SPACE ORGANIZATION AND USAGE:



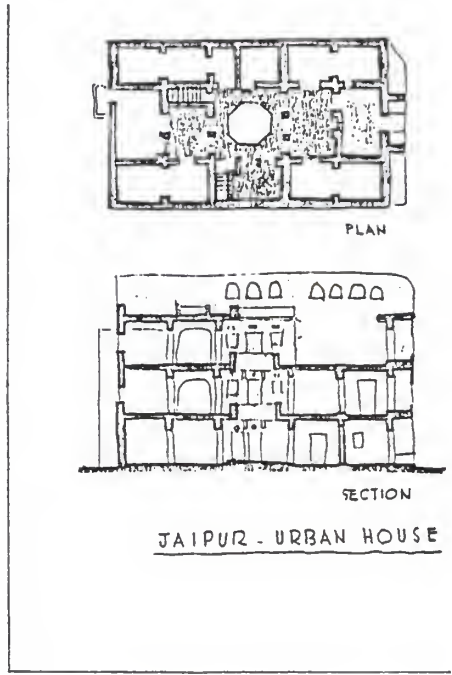
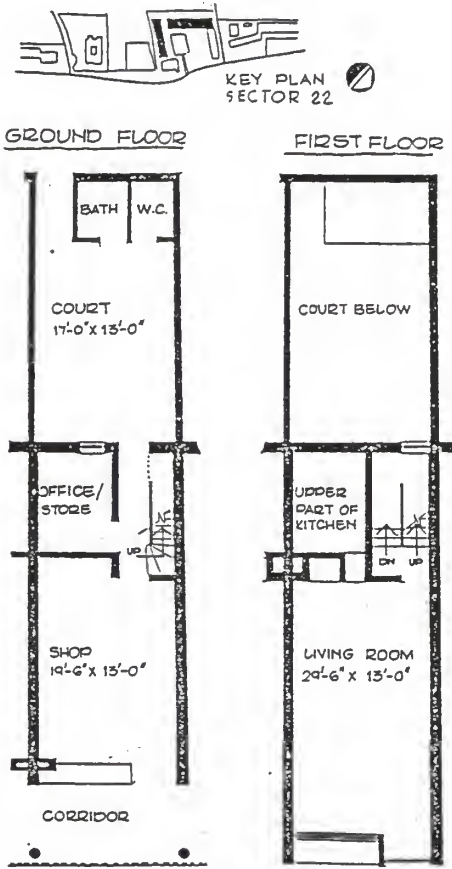
The present housing program of Chandigarh makes no allowance for variations in family size and needs. There is enough evidence throughout Chandigarh of efforts on the part of tenants to achieve more living space in the frequently crowded dwellings. Small verandas, which are often screened by the 'brise-soleil' (sunbreakers), are often illegally boarded up to make an extra room. Similarly, the covered roof shelter, called a 'barsati' and designed for storage of portable beds, is mostly illegally enclosed. "The extra room in a country like India where the joint family system

combines with unemployment to squeeze fifteen people into one room is always useful." (Evenson)

"Spaces in traditional buildings incorporate a flexibility. They are designed to include varied activities and varied notions of privacy." (Doshi) In the shop-cum-flats of Sector 22, residential activities are distributed, rather crammed, into four different levels. The resulting isolated and monofunctional compartments may be seen as an endorsement of Le Corbusier's dictum of "house as a machine to live in." The spaces lack the human warmth which is otherwise typical of traditional Indian houses. "A 'house as a machine to live in' is a concept of an industrialized society where the house is considered as a place a person comes to relax in. ... the (traditional Indian) house was much more than a place to relax in. It was an area of productive activity." (Prakash). Spaces in traditional buildings, like in Jaipur, are organized around a central courtyard, observe a definite hierarchy, and are well correlated.

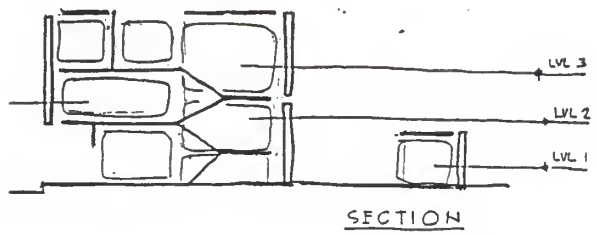
Although the housing program of Chandigarh was supposed to represent an improvement in living conditions, the present physical and functional standards fail to meet residents' satisfaction. The living spaces are cramped in size and lack proper natural lighting and ventilation. The toilets are

provided only on the ground floor causing much inconvenience to the residents who live on the upper floors.



CHANDIGARH

PLANS



The following are some results of a survey conducted by Abha Kachru to determine satisfaction levels of the users in the V4 bazaar areas:

- 75% of the shop owners do not live on their business premises due to lack of adequate residential accommodation.
- 70% of the shop owners feel the need for more shop area and storage space.
- 65% of the shop owners feel that a grouping together of the same shop types could boost their sales.
- 80% of the shoppers feel the need for a greater variety in shop types. They also experience difficulty in identifying shops.
- Everybody surveyed found the essential amenities like drinking water and public toilets lacking.

Among the problems encountered by the shoppers in the bazaars is the obstruction of movement in the verandas which is caused by the stacking and displaying of goods and articles outside the shop's premises. While this is an inevitable part of the Indian shopping activity, a solution to this problem may be found in shop designs of traditional Indian bazaars. Here, a projecting plinth in front of the shop prevents the spill over of goods into the shopping corridor.

RECOMMENDATIONS:

The 'shop-cum-flats' need radical changes and improvement in their design and internal space organization. Guidelines must be derived so as to encourage the reinstatement of the courtyard concept in buildings. Guidelines should do this by enumerating the climatic, hygienic, social and functional advantages of having a courtyard. Courtyard sizes could be derived by establishing standards for adequate provision of light and ventilation in buildings.

The large number of housing units which have been tampered with by tenants suggests that possibly a number of residents might accept a type of housing which could be augmented by the occupant. Houses could be designed for example, with rear veranda and terrace areas which can be enclosed by the tenant to make extra rooms without damaging the exterior appearance of the building. Allowances could also be made for construction on some percentage of roof areas with approval from the design review commissions (Chandigarh administration).

CLIMATIC ANALYSIS:

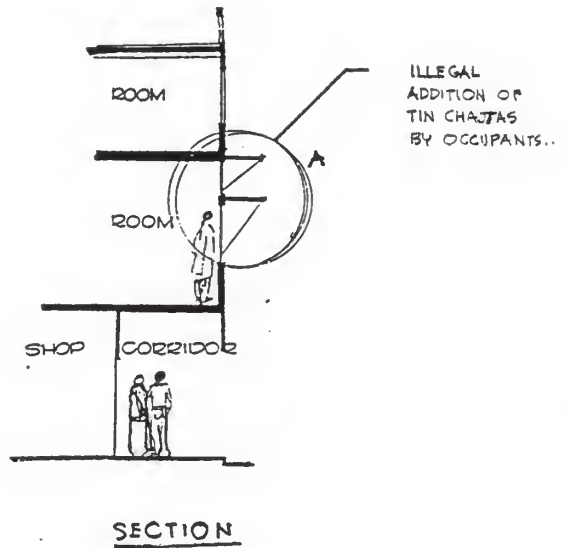
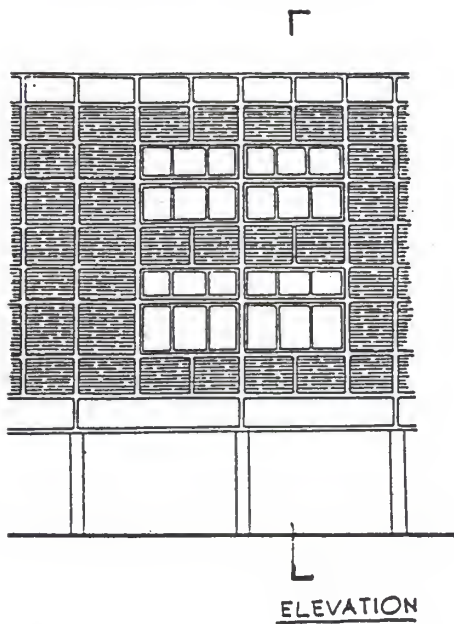
Justifying the importance of climate in Indian architecture, Maxwell Fry, one of the architects involved with the V4 shopping project, has stated: "There is no surer way of suitable architecture, one that is in accord with the deepest realities of the country (India); for it is climate that dictates agriculture, moulds customs, and affects even religion. Climate is a great element in India. To discover its laws and obey them is to create architectural character as directly as possible. It is not easy to find out the working of these laws, but where the approach is honest the resultant character is good."

The bazaar buildings are widely separated and thus are exposed to the harsh tropical climate of Chandigarh. Although some design efforts have been made to keep living rooms on the north side of the buildings, the use of excessive glazing in these rooms is, however, questionable. The vast concrete paved areas that abut the bazaar buildings reflect and radiate considerable heat into the buildings. Further, the glazed areas are not protected from the harsh evening sun.

Although the "egg-crate" sunbreakers, which are a

replacement of the traditional verandas, seem to work effectively in theory, but practically they have been a failure. Not only are they more expensive to build than the old fashioned verandas, they radiate heat gained during the day back into the building at night. Because they are non adjustable and have specific dimensions, they have limited applicability and effectiveness. Furthermore, the repetitive use of these panels yield a dull architectural expression.

In the villages around Chandigarh, houses are built of mud clay, with thick walls and very few openings. The resulting interiors are very cool. The spaces derive light and ventilation from the internal courtyard which also provide passive cooling. None of the traditional Indian vernacular building methods have been utilized in Chandigarh. The lack of deep overhangs, such as the chajjas and projecting balconies typical of Jaipur buildings, leave the windows unprotected from sun and rain and subject to weathering. At numerous places in the bazaar area, illegal tin chajjas and cane curtains have been added by the occupants.



RECOMMENDATIONS:

Almost any traditional town, with narrow shaded streets and inward oriented courtyard houses that are specifically designed to exclude the sun, demonstrates a more effective way of dealing with the tropical Indian climate than is evidenced in Chandigarh. While recognizing the virtues present in traditional Indian vernacular town building, design guidelines should give primacy to the climatic aspect in Chandigarh's building process. They must present ways by which traditional approaches towards climate can be adapted to the givens in Chandigarh.

Following are some recommendations:

- Wide separation of the bazaar buildings across sizzling concrete pavements is undesirable and inappropriate to the climate of Chandigarh. At an urban design level, guidelines should, thus, encourage a more compact layout of buildings.

- Guidelines should specify daylighting and ventilation standards.

- A use of a wide range of sunshading devices, including chajjas, trellises, projecting balconies and the ubiquitous brise-soleil, should be encouraged. An increase in available options could prevent the monotony generated by the over-use of one particular and not very satisfactory solution. The "Tower of Shadows", a monument designed by Le Corbusier for the Capitol Complex in Chandigarh and erected in 1988, is unique in that "it ensures that the sun is fully cut off on any day, and at any hour, round the year, from all directions. The Tower of Shadows is therefore a very useful working laboratory for students, architects and planners to easily understand the effect of movements of the sun and thus evolve possible designs for effective shading devices." (Wattas).

SOCIOLOGICAL ANALYSIS:

Although conceived as a defined social unit in which inhabitants may find a sense of community, the Chandigarh sector lacks the social homogeneity often seen in the traditional towns of India. Traditional bazaar areas in India acted as social places where people met and gathered, and in which daily events of social interaction, politics and business took place. Here, sociability was largely determined by the coherent, integral nature of spaces and a rich mixing and juxtapositioning of activity. Similarly, the 'sense of place' was determined by sociability, by the kind of space that maximized human contacts.

Chandigarh bazaars on the other hand lack any real potential for social and political interaction among people. This can be largely attributable to a loose dispersal of activities, and a lack of intimate spatial enclosures in the area. In all sectors, for example, rehri markets have been separated from the formal bazaar buildings, both of which cater to the needs of different types and economic groups of people. This has resulted in a polarization and insularity of social activity and thus accounts for a low social mix and interaction.

Chandigarh shopping areas also lack focal points and nodes of general community interest. The chaupars (public spaces) of Jaipur, on the other hand, situated at meeting point of bazaar streets, possess much potential for social interaction such as in the Greek Agoras. Their spatial composition in relation to the city's urban framework, and the arrangement of a variety of activities around them, are instrumental in reinforcing social unification.

In all the bazaar areas of Chandigarh, entrances to the living quarters located on the upper floors is from the back alleys, thus resulting in a separation of human activity. Chandigarh bazaars seem dead and deserted particularly after shopping hours. In Jaipur, on the other hand, narrow offshoots that link the bazaar streets to small internal residential courtyards help in maintaining social contacts, and thus keep the bazaars alive all the time. The residential verandas on the upper floor in Chandigarh are all masked by sunbreakers. This, along with the absence of projecting balconies, pavilions and terraces inhibits visual contacts among people, and thus affects sociability.

RECOMMENDATIONS:

In contrast to the traditional Indian bazaars, the Chandigarh bazaars seem to be reduced to fulfilling merely an economic function in the sector. Design guidelines should be directed towards a reinstatement of the lost social values in the bazaar environment. Through essential changes and modifications in planning and design, both at an urban and at an architectural level, a higher level of social interaction may ensue. Some of the recommendations, such as: compaction of urban framework, humanization of scale, integration of formal and informal enterprises, all of which have been included earlier in this chapter could contribute towards social cohesiveness in the bazaar areas of Chandigarh. In addition to those already listed, the following recommendations may also be considered:

- Projected balconies and terraces in the buildings should be encouraged to open towards bazaar activity. Direct access to upper floors may be granted from the bazaar side.

- Provision for social and cultural events, like marriages and festivals, within the bazaar should be made. Common facilities like drinking water, milk booths, and oil depots should also be included in the bazaar areas.

LANDSCAPING

Chandigarh is unique for being, perhaps, the only landscaped city in India. At the time of its inception a scheme was devised by Le Corbusier in order to establish appropriate patterns of greenery throughout the city. As a part of this scheme, V4's or shopping streets were to be planted with a different color of flowering tree, as well as with other trees, in order to give a separate, individual character. The bazaar areas were also intended to include park belts like the rest of the city's areas.

In the arid climate of Chandigarh, however, greenery does not thrive without constant care and maintenance; and with the limited finances of the city, the landscaping program seems to be too ambitious. Although the brightly colored flowering trees, planted along the V4, help in ameliorating the dull character of the bazaar street, they are essentially poor in form and foliage. The necessary, large, shade trees are totally missing. Also lacking are bodies of water which could ameliorate the micro climate of the bazaar areas.

Although the flowering trees may seem to fulfill their aesthetic function in the bazaar street, one might question

their role in supporting social activities. In traditional Indian towns, trees acted as places for social and religious gatherings and accordingly received voluntary public care and attention. In Jaipur, for example, trees sustain lively mini markets under their enormous shade, and also carry platforms for social get-togethers. Learning from these traditional attributes, trees in the Chandigarh's bazaar areas could be planned to accommodate the informal rehri (mobile shop) markets and other makeshift arrangements of vending.

V4 BAZAAR AREAS - CONCLUSION

From the preceding analyses of the V4 bazaars of Chandigarh it appears that an extensive set of 'design guidelines', as an alternative to the existing rigid 'rule systems', is extremely desirable. It also ought to be understood that the new set of guidelines must present fundamental architectural and planning possibilities consistent with the Indian economy, climate and way of life. By addressing a larger set of such issues, rather than those currently considered, guidelines could yield the desired flexibility. Further, to be effective they should meet the basic objectives of protecting and promoting significant values of the

environment rather than acting as set of dimensional prescriptions.

Any rules or guidelines, however, cannot guarantee the desired environment in Chandigarh. They may, however, "provide a checklist, a reminder list so that evaluators can easily ascertain whether a design has touched a number of important bases." (Goldberger) "They may also never substitute for the exercise of judgement by the architect." (Carlhian) Above all it is the people of Chandigarh who will ultimately ascertain the destiny of their city.

"It is not because the original plan has been a failure, but because planning effort has stagnated." (Evenson). But with an acknowledgement of its basic deficiencies, and through a continuous and devoted effort of amending them in light of the major realities of the Indian situation, in times to come Chandigarh may well emerge as the finest city of modern India.

APPENDIX

V4 SHOPPING AREAS IN RELATION TO THE 7V's OF CHANDIGARH

In developing the plan of Chandigarh, Le Corbusier employed a scheme of traffic separation which he termed "the 7V's" (les Sept Voies). The 7V's represented an attempt to develop a fully organized, universally applicable system dividing traffic into a series of seven categories comprising a hierarchy of circulation ranging from arterial roads to apartment house corridors.

The specific organization of the 7V system in Chandigarh is as follows: The V1 represents regional roads leading into the city from the outside, while the V2 designation refers to the two major cross-axial boulevards of the city. One of these provides the ceremonial avenue linking the central district with the capitol complex, while the other forms a cultural-commercial axis. Surrounding the residential sectors and establishing a grid pattern of the city are the V3 streets intended for fast moving traffic. Bisecting the the long side of each sector is a bazaar street -the V4- following a slightly irregular path and permitting a variety of slow moving traffic. The V5 is a loop road intersecting the V4 and serving as the main distributor within the sector, while V6 lanes give additional access to houses. A strip of parkland containing schools extends through each sector,

providing continuous bands of open space throughout the city,
and including the V7 pedestrian paths.

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CHANDIGARH: A CASE FOR FLEXIBILITY IN ARCHITECTURAL CONTROL

by

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AN ABSTRACT OF A THESIS

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ABSTRACT

This thesis is an argument for flexibility in systems of architectural control. It is also a substantiation of the view that building regulations ought to concern themselves with relationships deeper than those commonly referred to by including traditions and cultural expression.

Guidelines for generating orderly growth have been common in towns and districts of the U.S. In the first part of the thesis, some noteworthy of these guidelines have been evaluated for their nature and degree of rigidity as well as their effectiveness in achieving their aim. Following are the districts that have been studied:

- The Historic District of Savannah, Georgia.
- Swiss Avenue Historic District, Dallas, Texas.
- The new town of Seaside, Florida.

Of these, Seaside's guidelines were found to be the most encompassing and successful. Not only were they found to be more accommodating to the varied individual expressions towards producing a unified district, they achieved this while incorporating social, cultural and climatic factors.

The second part of the thesis is focussed on Chandigarh,

India, which is a city with stringent building rules. An urban analysis of Chandigarh in the Indian context has been done to identify its uniqueness that warrants preservation, and those characteristics that it lacks as an Indian city. The 'rule systems', here, were found to be extremely rigid and non-accommodating to individual expressions, thus resulting in a dull and monotonous environment. Following the Chandigarh analysis, Jaipur, a traditional Indian town, has been presented to illustrate some essential elements of architecture in the urban landscape that yield character and life to traditional Indian settlements. The built form of Jaipur was found to be conditioned by many physical and socio-cultural forces.

In light of the Jaipur study, existing rules of Chandigarh have been analyzed for their rigidity and effectiveness through a focussed study of bazaar areas in the city. This analysis led to the conclusion that a set of design guidelines that allow for more flexibility as an alternative to the rigid 'rule system' of the city is greatly desirable. The final chapter contains some recommendations that could form a basis for deriving future guidelines for Chandigarh.