

# Architecture theories

Dr. Hossam Sabry

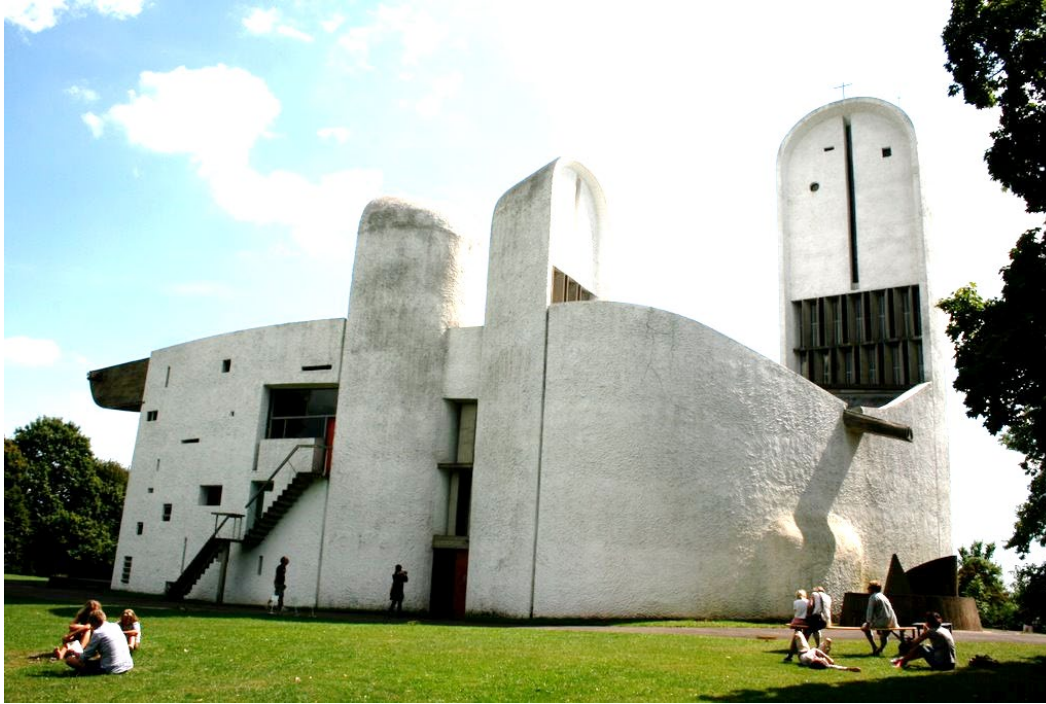


LEC\_12

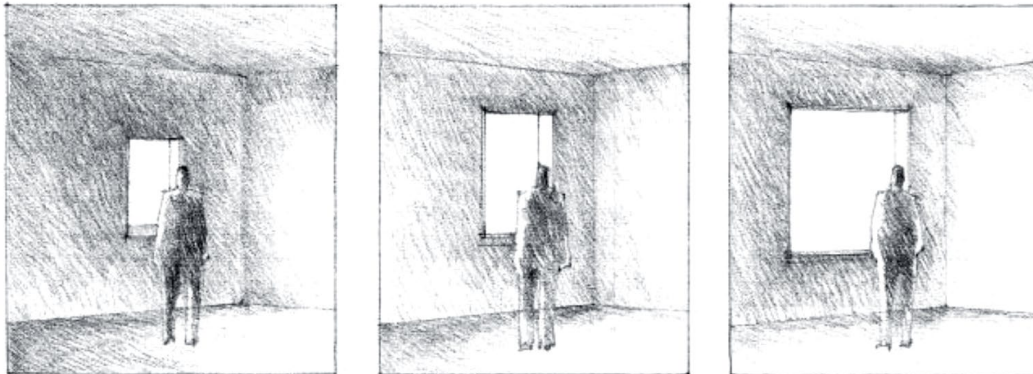
# LIGHT

“Architecture is the masterly, correct and magnificent play of masses brought together in light. Our eyes are made to see forms in light; light and shade reveal these forms...”

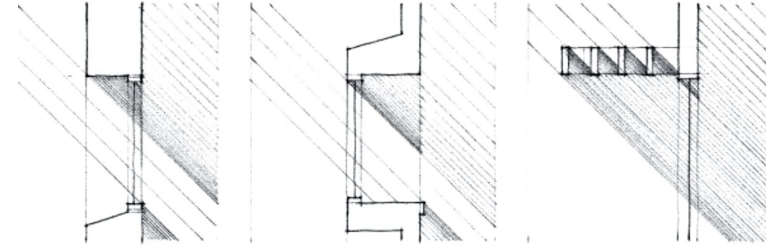
Le Corbusier: Towards a New Architecture



The size of a window or skylight controls the amount of daylight a room receives.



An opening can be oriented to receive direct sunlight during certain portions of the day. Direct sunlight provides a high degree of illumination that is especially intense during midday hours. It creates sharp patterns of light and dark on the surfaces of a room and crisply articulates the forms within the space. Possible detrimental effects of direct sunlight, such as glare and excessive heat gain, can be controlled by shading devices built into the form of the opening or provided by the foliage of nearby trees or adjacent structures.

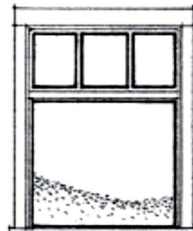





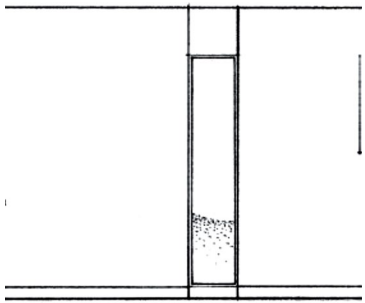
# VIEW

Another quality of space that must be considered in establishing openings in the enclosure of a room is its focus and orientation. While some rooms have an internal focus, such as a fireplace, others have an outward orientation given to them by a view to the outdoors or an adjacent space. Window and skylight openings provide this view and establish a visual relationship between a room and its surroundings. The size and location of these openings determine, of course, the nature of the outlook as well as the degree of visual privacy for an interior space.





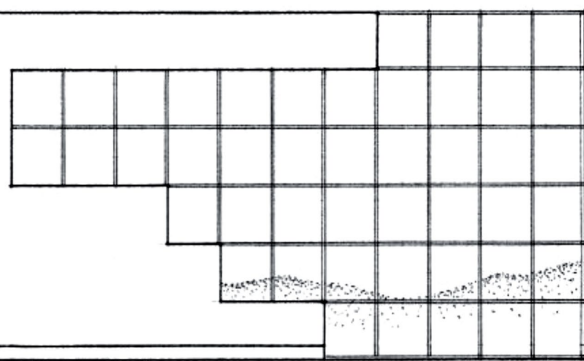
A small opening can reveal a close-up detail or frame a view so that we see it as a painting on a wall.



A long, narrow opening, whether vertical or horizontal, can not only separate two planes but also hint at what lies beyond.

A group of windows can be sequenced to fragment a scene and encourage movement within a space.

As an opening expands, it opens up a room to a broad vista. The large scene can dominate a space or serve as a backdrop for the activities within it.





# Organization

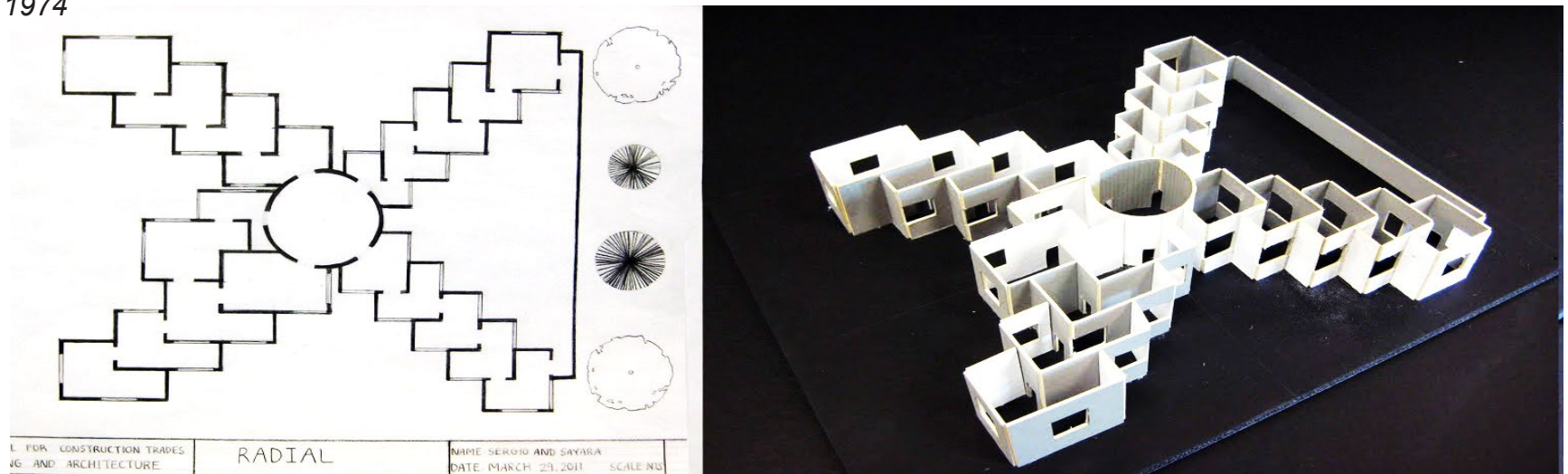
“... A good house is a single thing, as well as a collection of many, and to make it requires a conceptual leap from the individual components to a vision of the whole. The choices ... represent ways of assembling the parts.

... the basic parts of a house can be put together to make more than just basic parts: They can also make space, pattern, and outside domains. They dramatize the most elementary act which architecture has to perform. To make one plus one equal more than two, you must in doing any one thing you think important (making rooms, putting them together, or fitting them to the land) do something else that you think important as well (make spaces to live, establish a meaningful pattern inside, or claim other realms outside).”

*Charles Moore, Gerald Allen, Donlyn Lyndon*

*The Place of Houses*

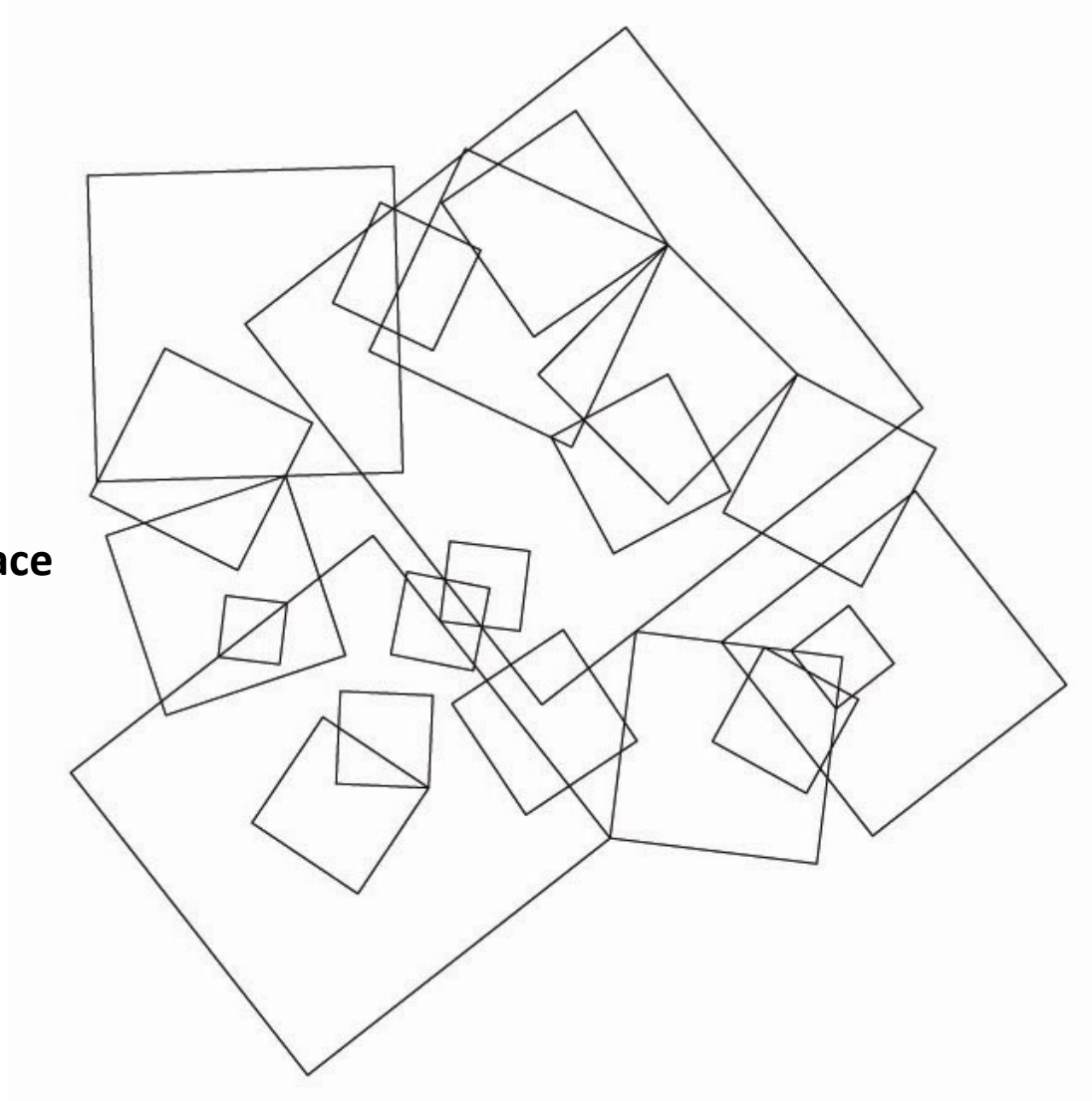
1974





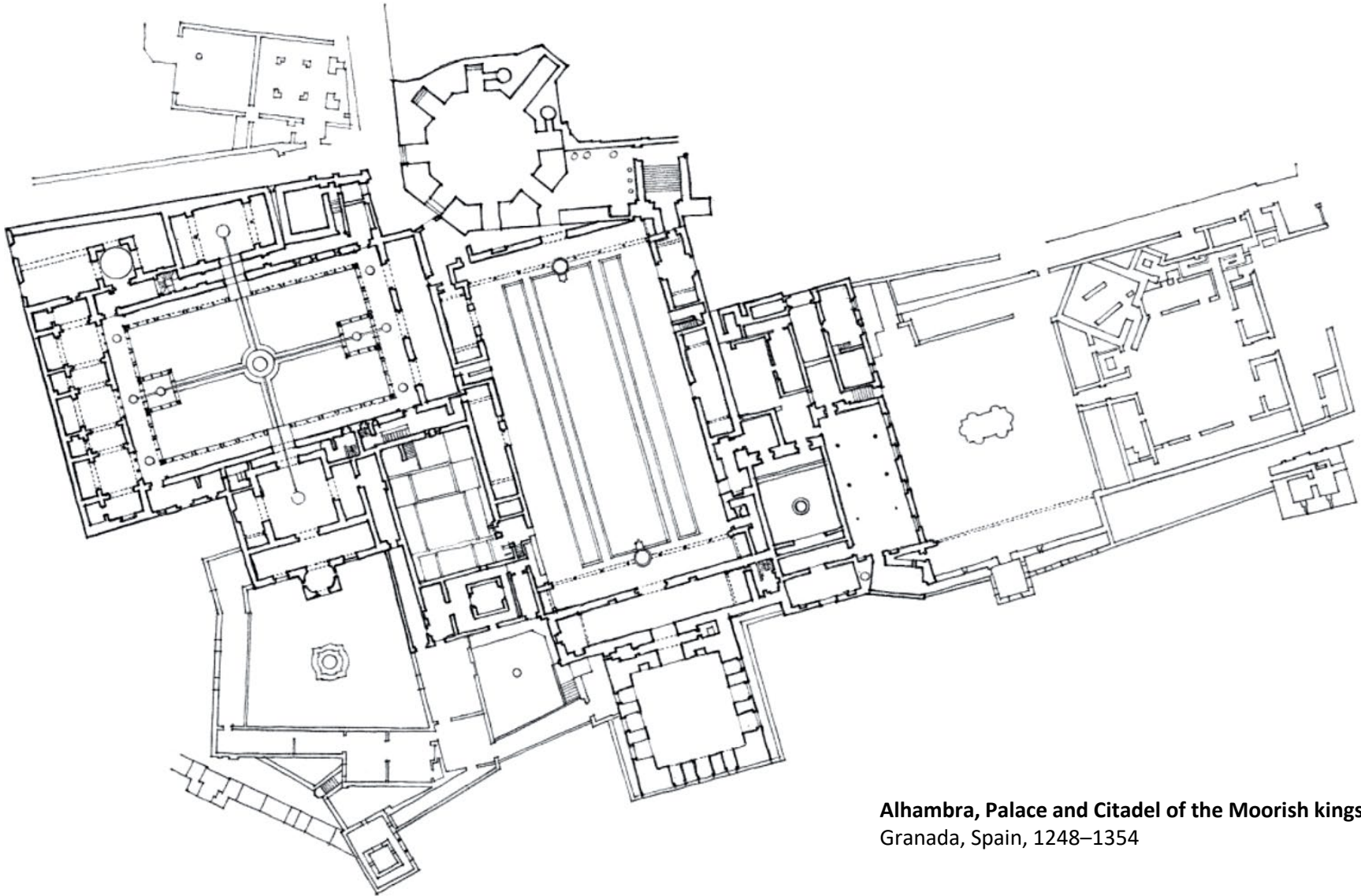
# Organization

- **Organization of Form & Space**
- **Spatial Relationships**
- **Space within a Space**
- **Interlocking Spaces**
- **Adjacent Spaces**
- **Spaces Linked by a Common Space**
- **Spatial Organizations**
- **Centralized Organizations**
- **Linear Organizations**
- **Radial Organizations**
- **Clustered Organizations**
- **Grid Organizations**



# ORGANIZATION OF FORM & SPACE

This chapter lays out for study and discussion the basic ways the spaces of a building can be related to one another and organized into coherent patterns of form and space



**Alhambra, Palace and Citadel of the Moorish kings,  
Granada, Spain, 1248–1354**

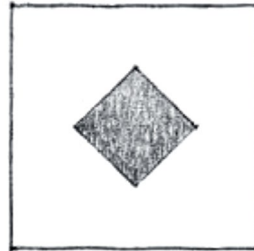


# SPATIAL RELATIONSHIPS

Two spaces may be related to each other in several fundamental ways.

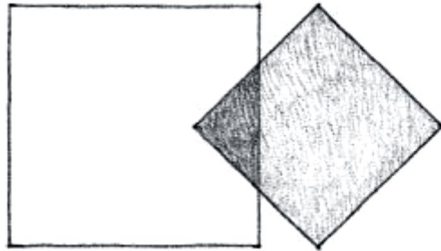
## Space within a Space

A space may be contained within the volume of a larger space.



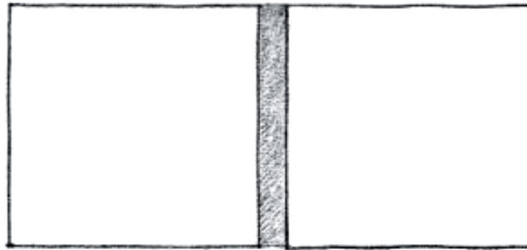
## Interlocking Spaces

The field of a space may overlap the volume of another space.



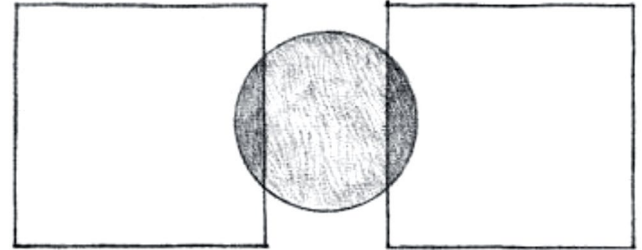
## Adjacent Spaces

Two spaces may abut each other or share a common border



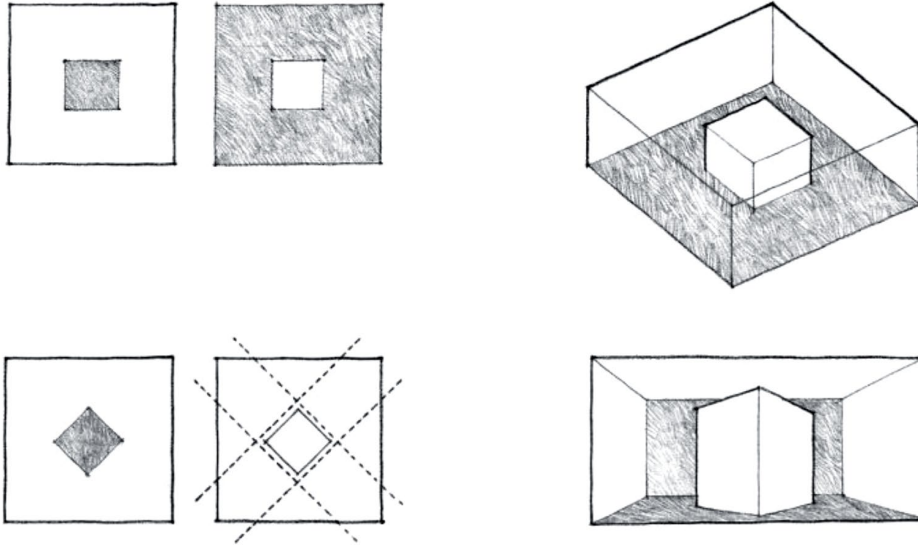
## Spaces Linked by a Common Space

Two spaces may rely on an intermediary space for their relationship.

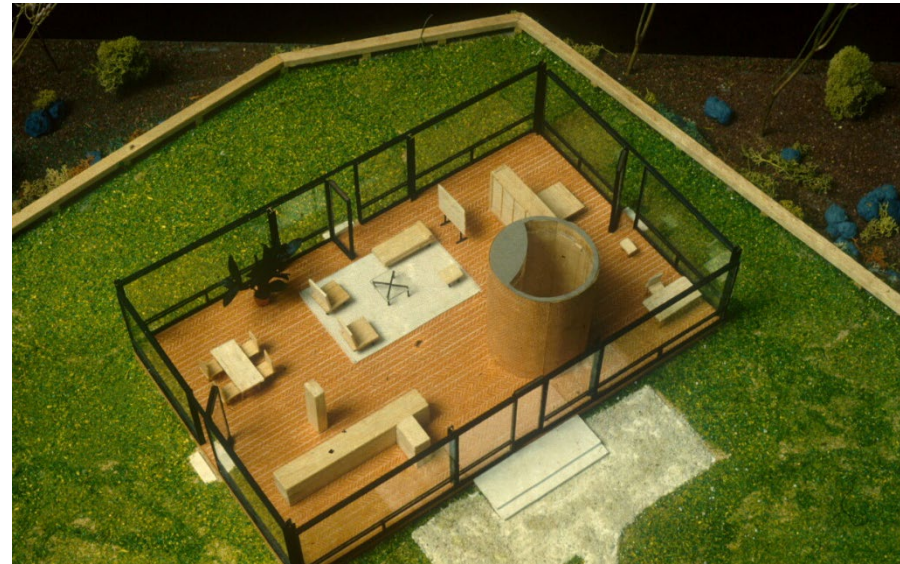


# SPACE WITHIN A SPACE

A large space can envelop and contain a smaller space within its volume. Visual and spatial continuity between the two spaces can be easily accommodated, but the smaller, contained space depends on the larger, enveloping space for its relationship to the exterior environment.



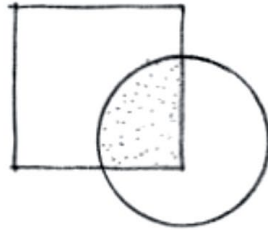
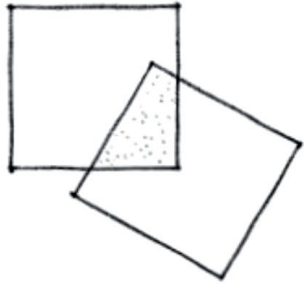
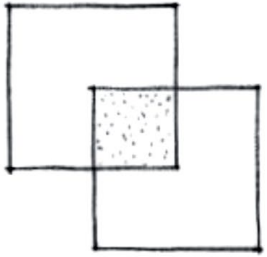
The contained space may also differ in form from the enveloping space in order to strengthen its image as a freestanding volume. This contrast in form may indicate a functional difference between the two spaces or the symbolic importance of the contained space.



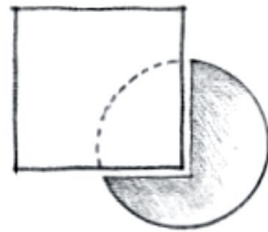
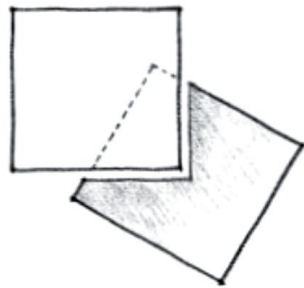
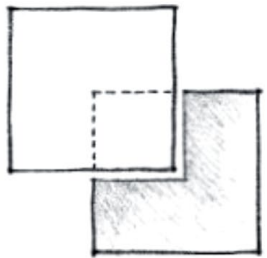


# INTERLOCKING SPACES

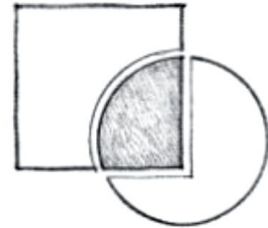
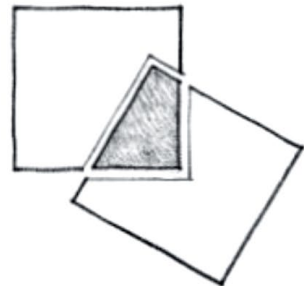
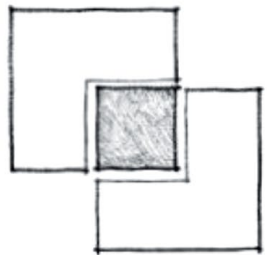
An interlocking spatial relationship results from the overlapping of two spatial fields and the emergence of a zone of shared space. When two spaces interlock their volumes in this manner, each retains its identity and definition as a space. But the resulting configuration of the two interlocking spaces is subject to a number of interpretations.



The interlocking portion of the two volumes can be shared equally by each space

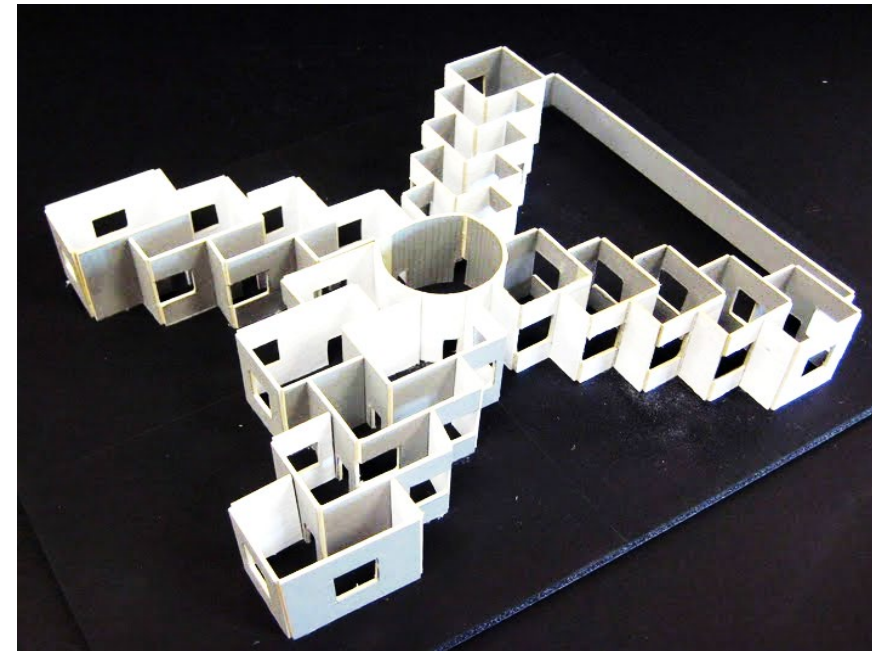
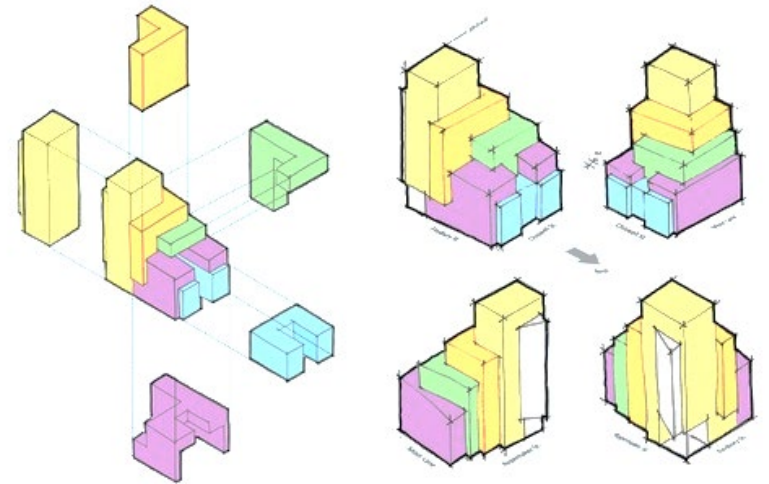
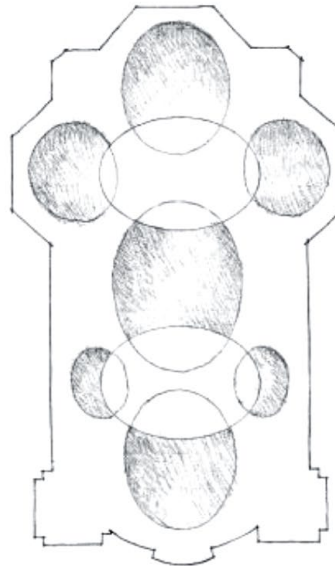
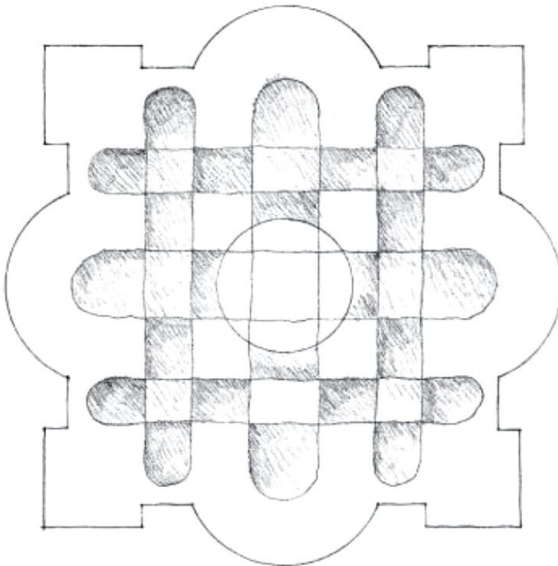
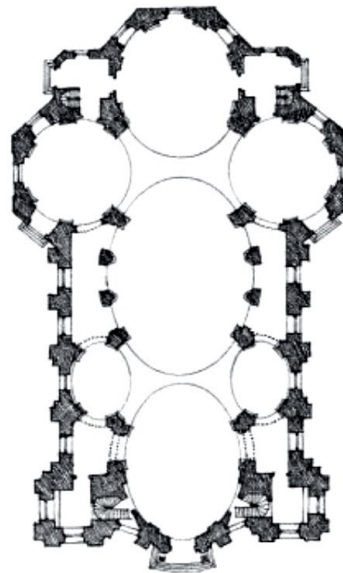
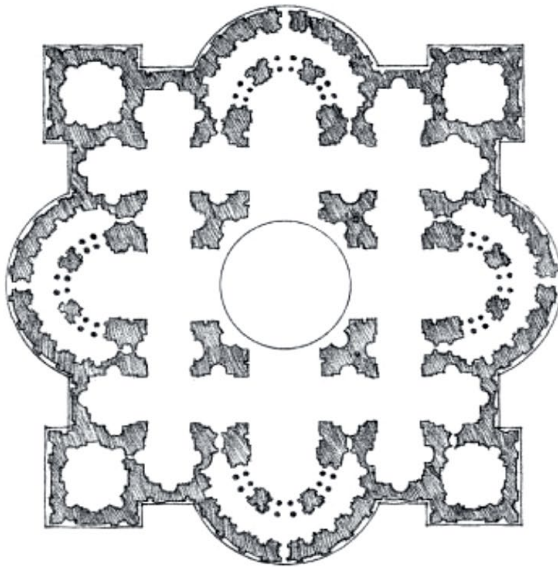


The interlocking portion can merge with one of the spaces and become an integral part of its volume.



The interlocking portion can develop its own integrity as a space that serves to link the two original spaces

# INTERLOCKING SPACES



Plan for St. Peter (Second Version),

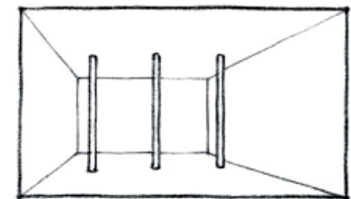
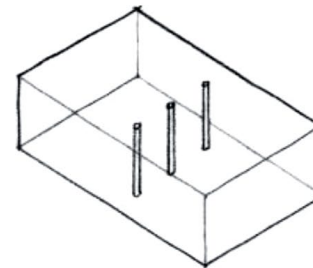
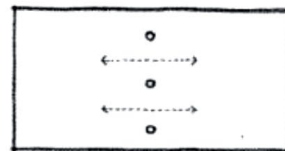
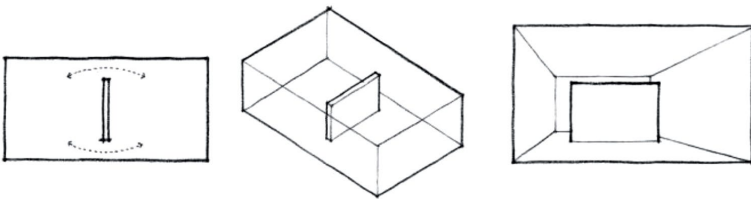
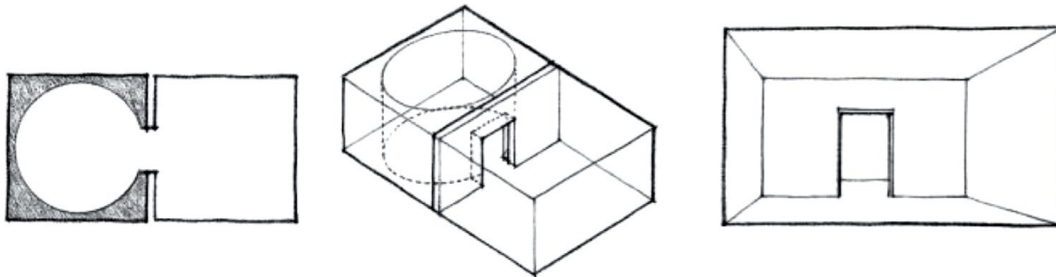
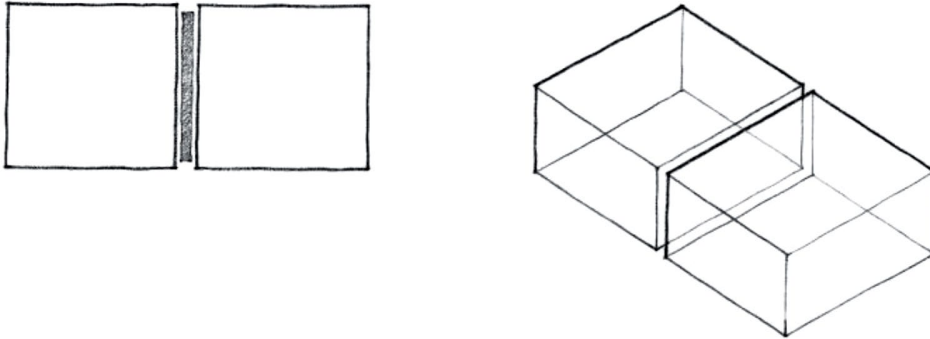
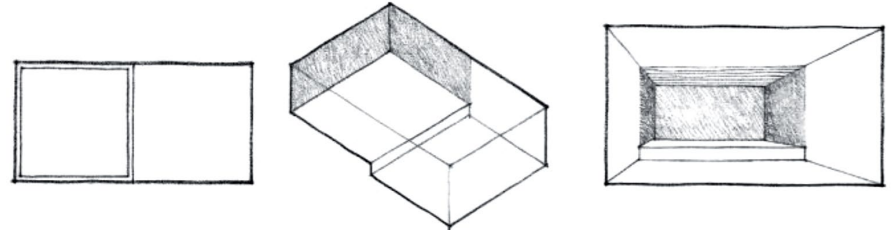
Pilgrimage Church



# ADJACENT SPACES

Adjacency is the most common type of spatial relationship.

It allows each space to be clearly defined and to respond, each in its own way, to specific functional or symbolic requirements. The degree of visual and spatial continuity that occurs between two adjacent spaces depends on the nature of the plane that both separates and binds them together.

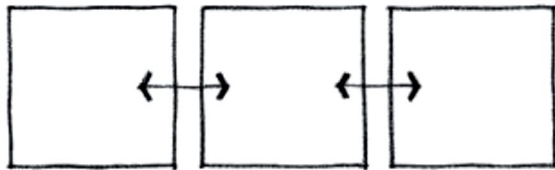
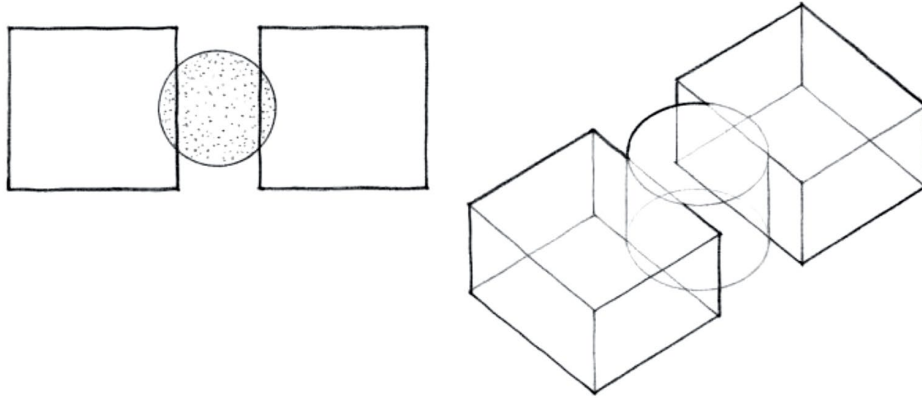


# SPACES LINKED BY A COMMON SPACE

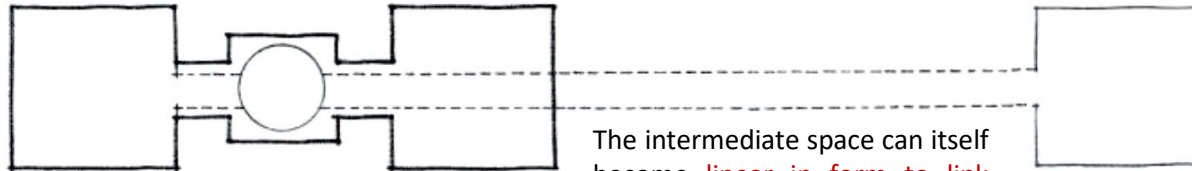
Two spaces that are separated by distance can be linked or related to each other by a third, intermediate, space.

The visual and spatial relationship between the two spaces depends on the nature of the third space with which they share a common bond.

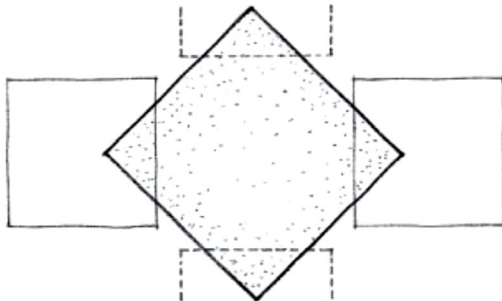
The intermediate space can differ in form and orientation from the two spaces to express its linking function.



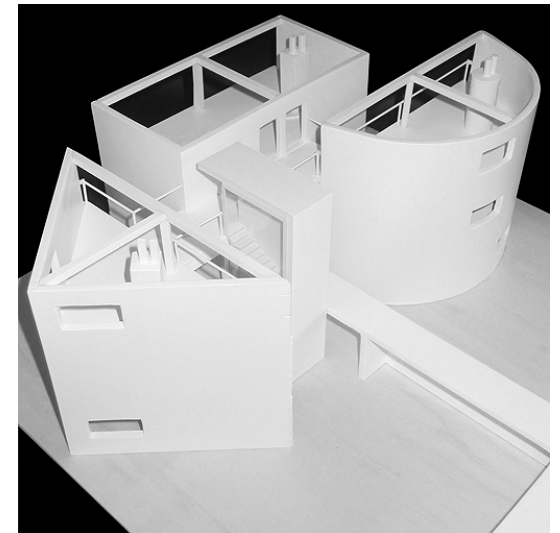
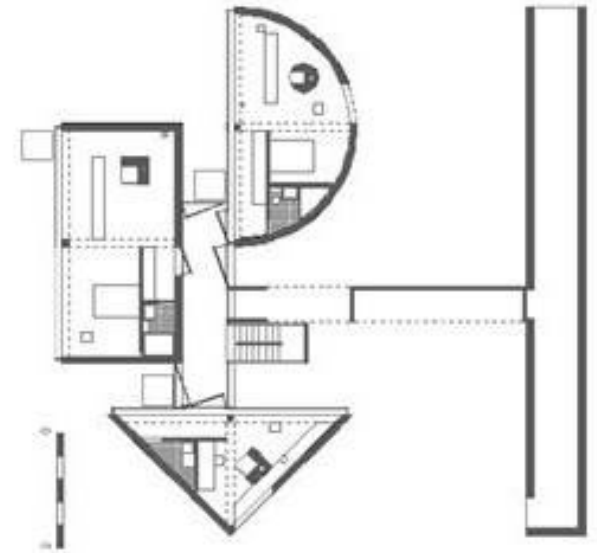
The two spaces, as well as the intermediate space, can be equivalent in size and shape and form a linear sequence of spaces



The intermediate space can itself become linear in form to link two spaces that are distant from each other



The intermediate space can, if large enough, become the dominant space in the relationship, and be capable of organizing a number of spaces about itself

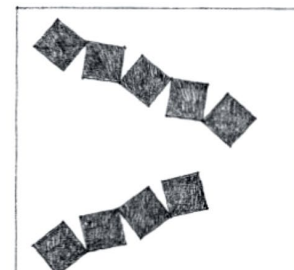
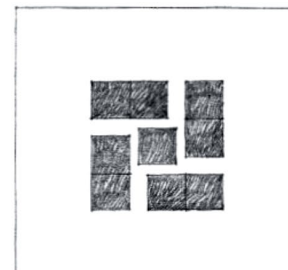
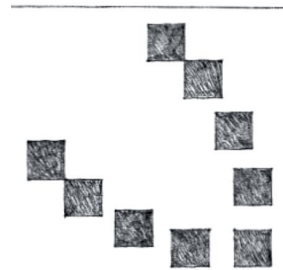
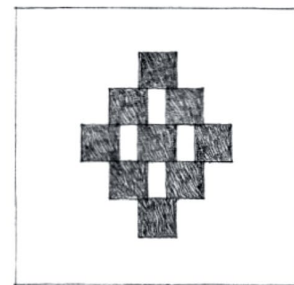
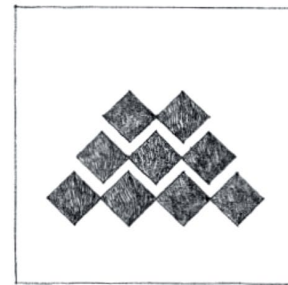
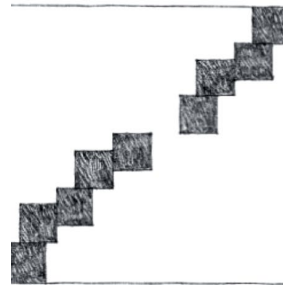
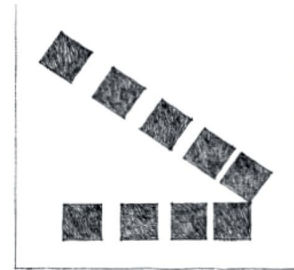
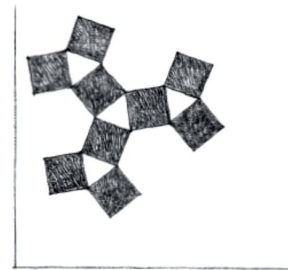




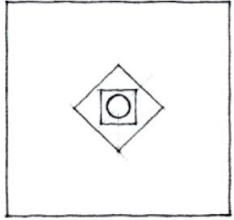
# SPATIAL ORGANIZATIONS

The following section lays out the basic ways we can arrange and organize the spaces of a building. In a typical building program, there are usually requirements for various kinds of spaces. There may be requirements for spaces that:

- have specific functions or require specific forms
- are flexible in use and can be freely manipulated
- are singular and unique in their function or significance to the building organization
- have similar functions and can be grouped into a functional cluster or repeated in a linear sequence
- require exterior exposure for light, ventilation, outlook, or access to outdoor spaces
- must be segregated for privacy
- must be easily accessible

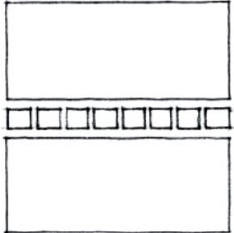


# SPATIAL ORGANIZATIONS



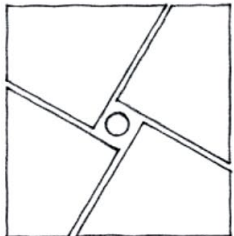
## **Centralized Organization**

A central, dominant space about which a number of secondary spaces are grouped



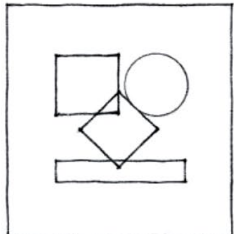
## **Linear Organization**

A linear sequence of repetitive spaces



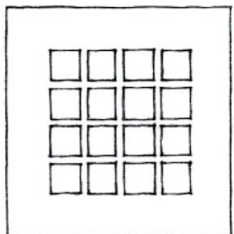
## **Radial Organization**

A central space from which linear organizations of space extend in a radial manner



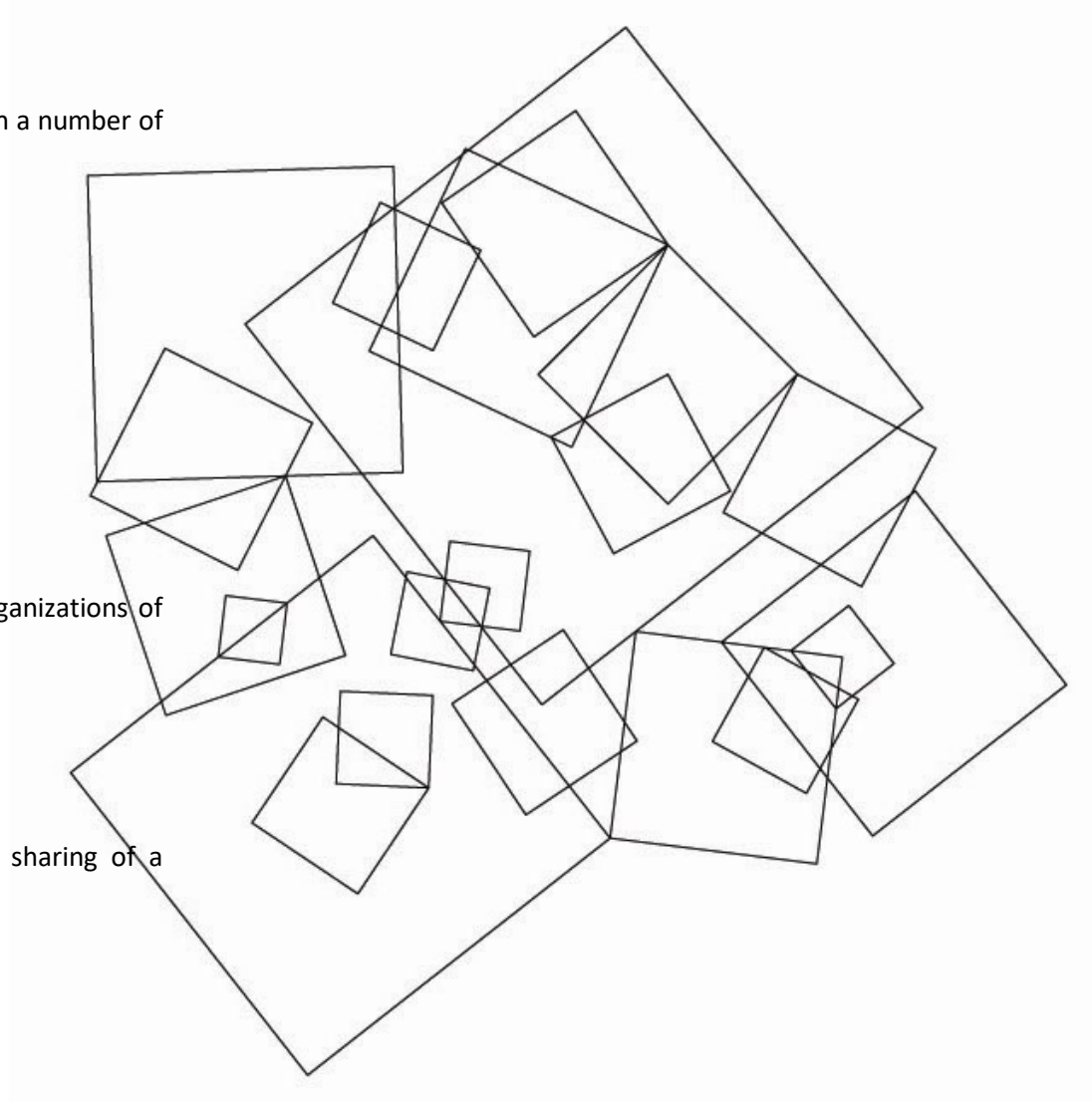
## **Clustered Organization**

Spaces grouped by proximity or the sharing of a common visual trait or relationship



## **Grid Organization**

Spaces organized within the field of a structural grid or other three-dimensional framework



# CENTRALIZED ORGANIZATIONS

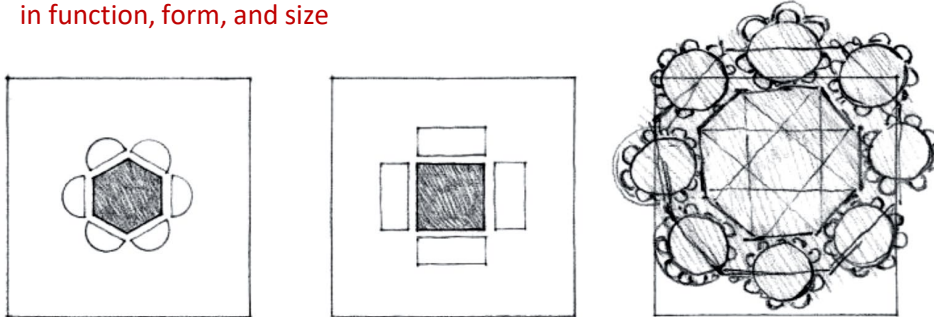
A centralized organization is a stable, concentrated composition that consists of a number of secondary spaces grouped around a large, dominant, central space



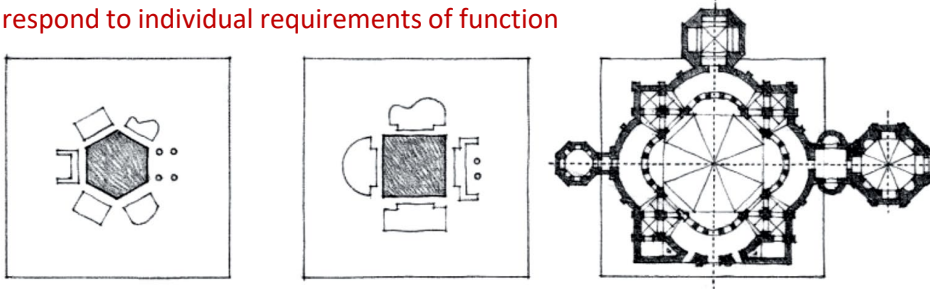
The central, unifying space of the organization is generally regular in form



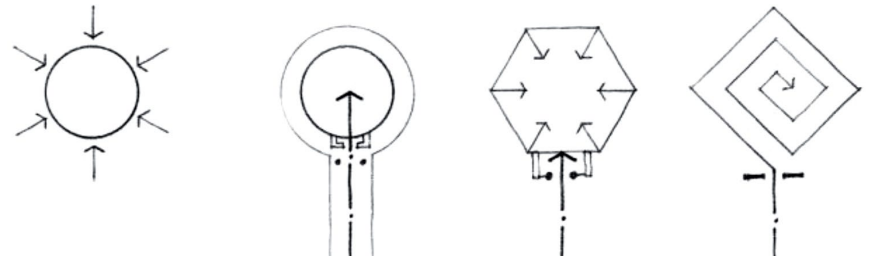
The secondary spaces of the organization may be equivalent to one another in function, form, and size



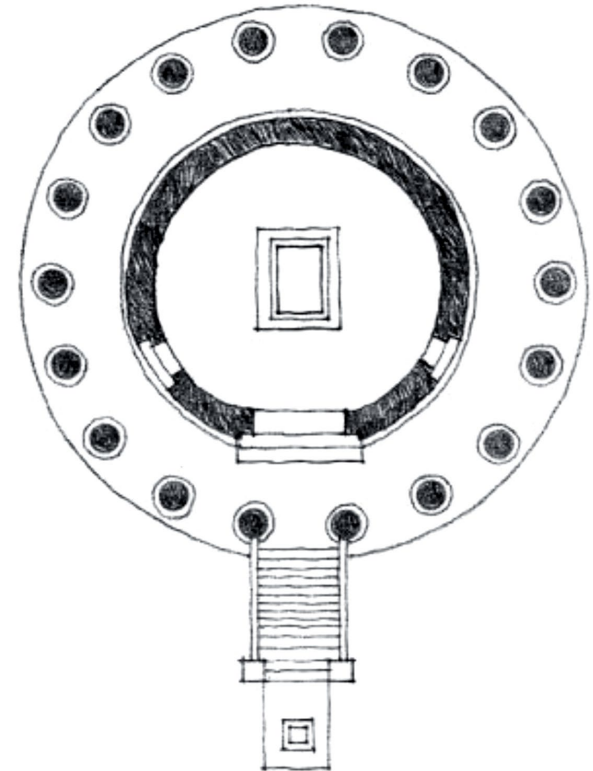
The secondary spaces may differ from one another in form or size in order to respond to individual requirements of function



entry must be specified by the site and the articulation of one of the secondary spaces as an entrance or gateway.

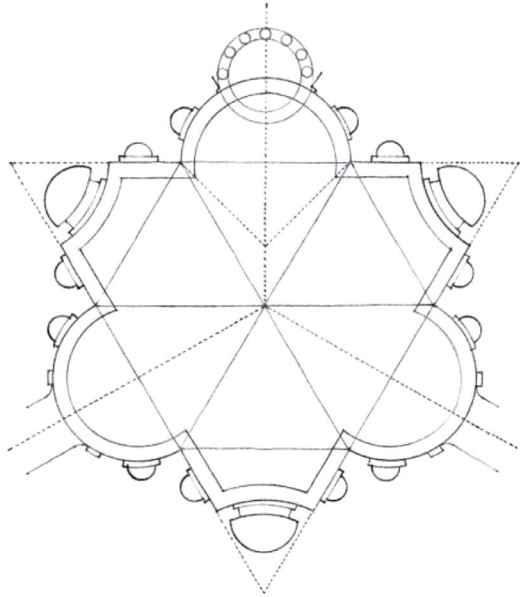


The central organizing space may be either an interior or an exterior space.

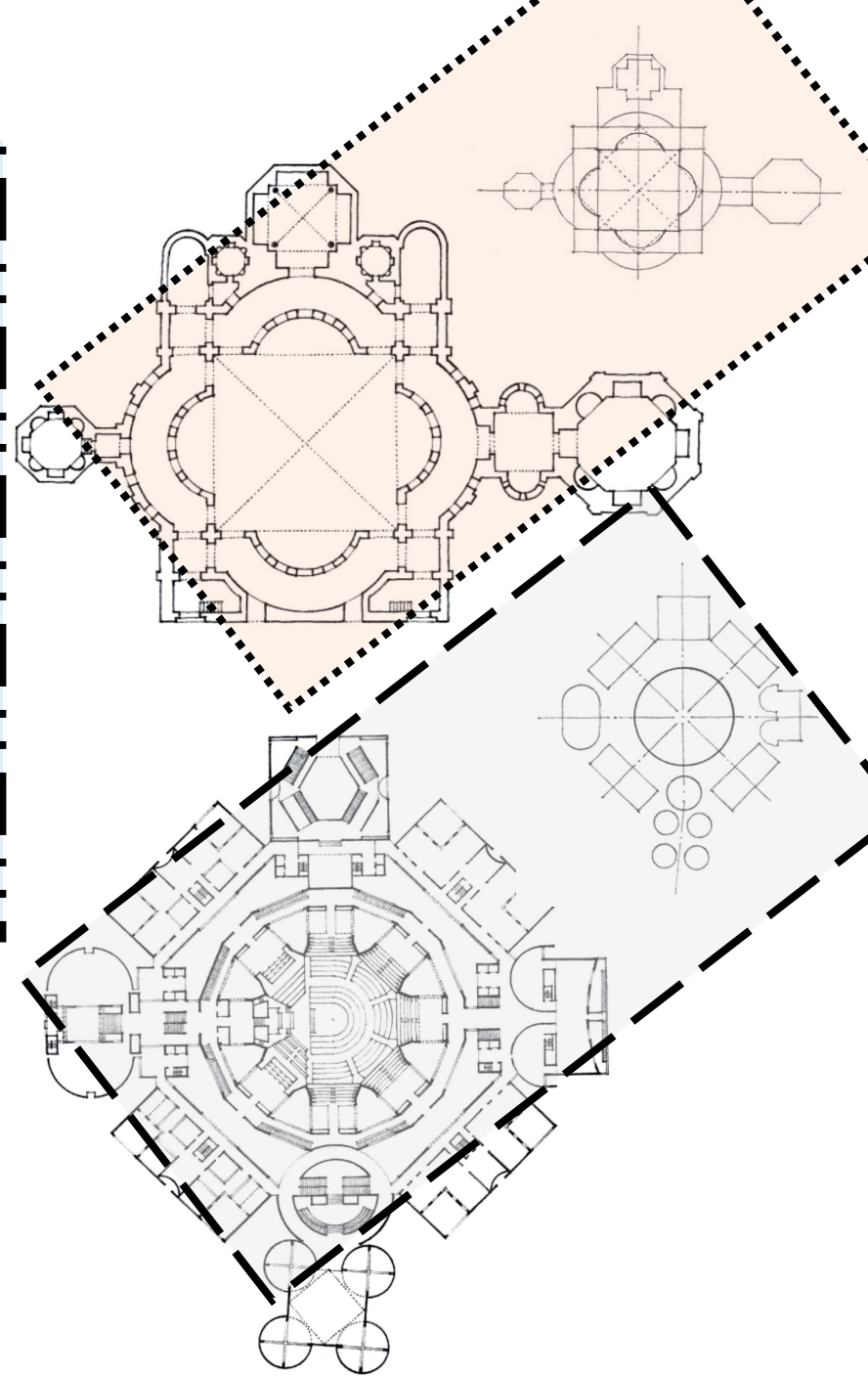
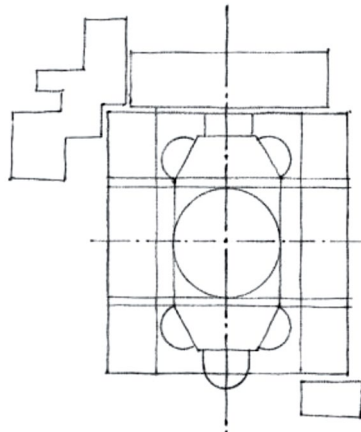
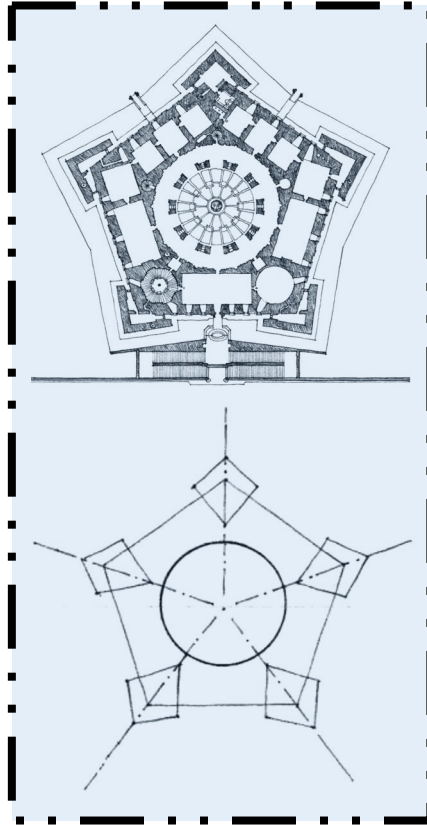
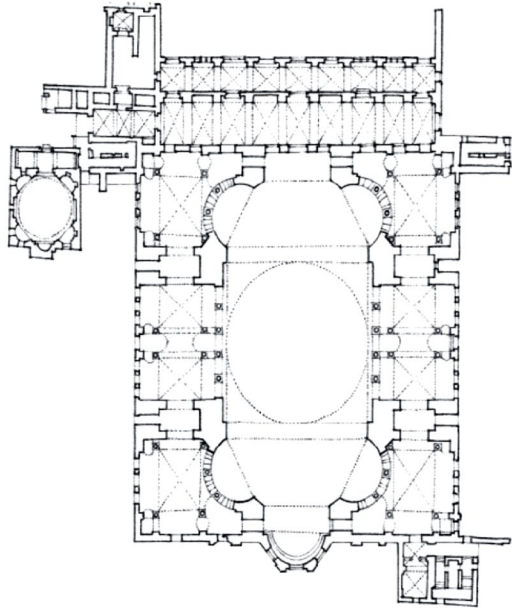




# CENTRALIZED ORGANIZATIONS



St. Ivo della Sapienza, Rome, 1642–1650

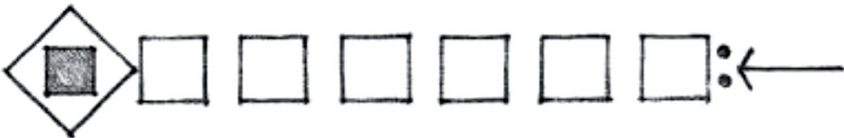
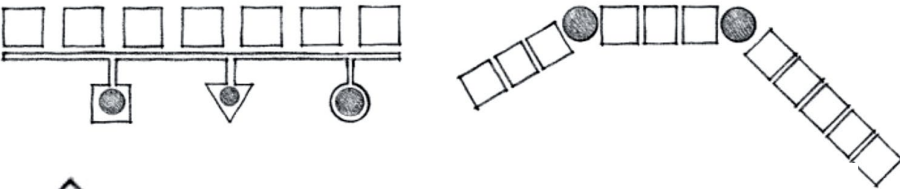
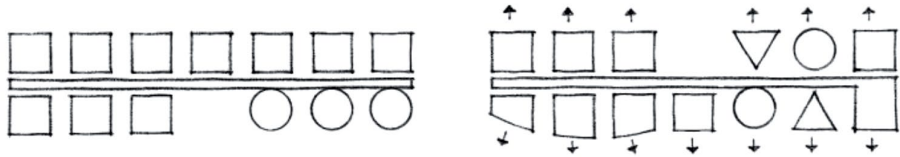


# LINEAR ORGANIZATIONS

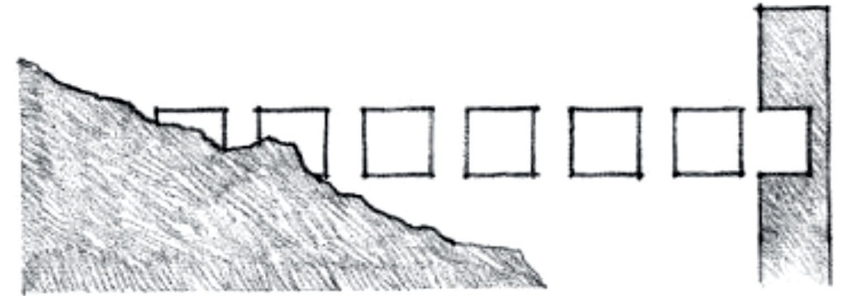
A linear organization consists essentially of a series of spaces. These spaces can either be directly related to one another or be linked through a separate and distinct linear space.



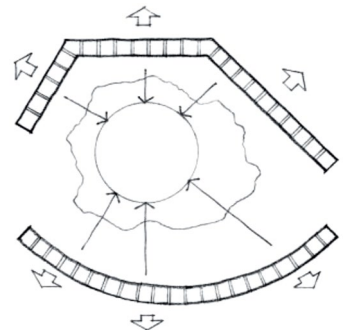
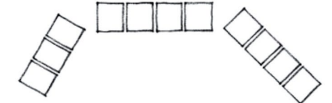
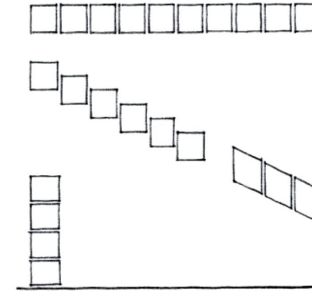
A linear organization usually consists of repetitive spaces which are alike in size, form, and function



Because of their characteristic length, linear organizations express a direction and signify movement, extension, and growth. To limit their growth, linear organizations can be terminated by a dominant space or form, by an elaborate or articulated entrance, or by merging with another building form or the topography of its site.



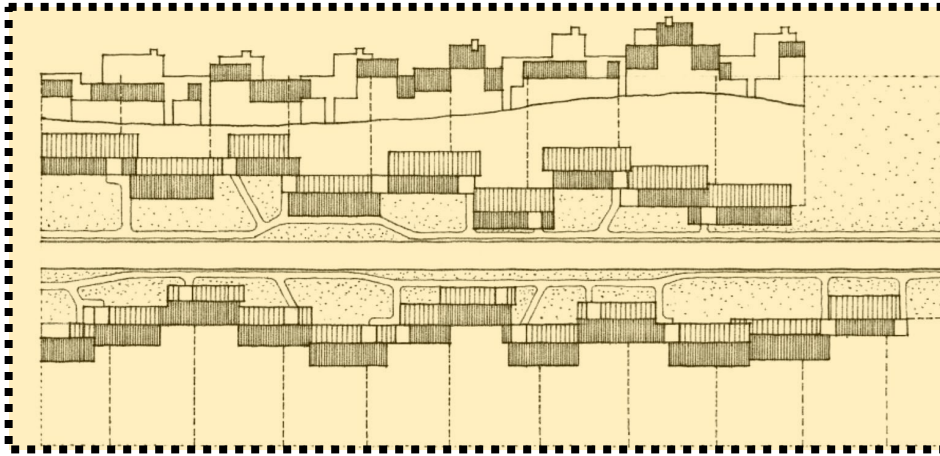
The form of a linear organization is inherently flexible and can respond readily to various conditions of its site. It can adapt to changes in topography



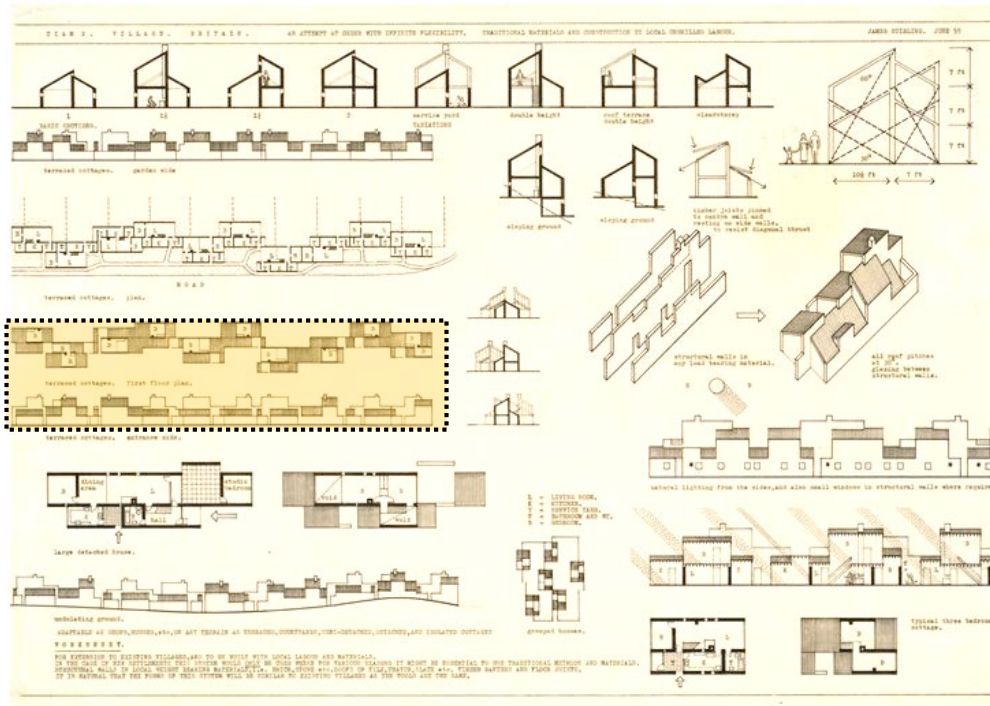
Curved and segmented forms of linear organizations enclose a field of exterior space on their concave sides and orient their spaces toward the center of the field



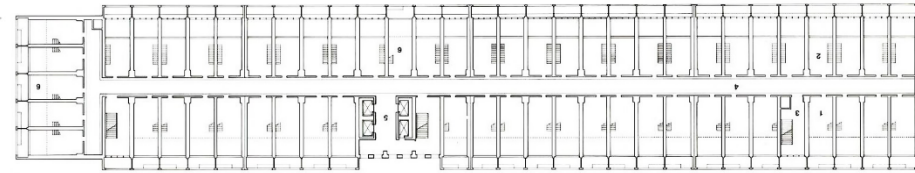
# LINEAR ORGANIZATIONS



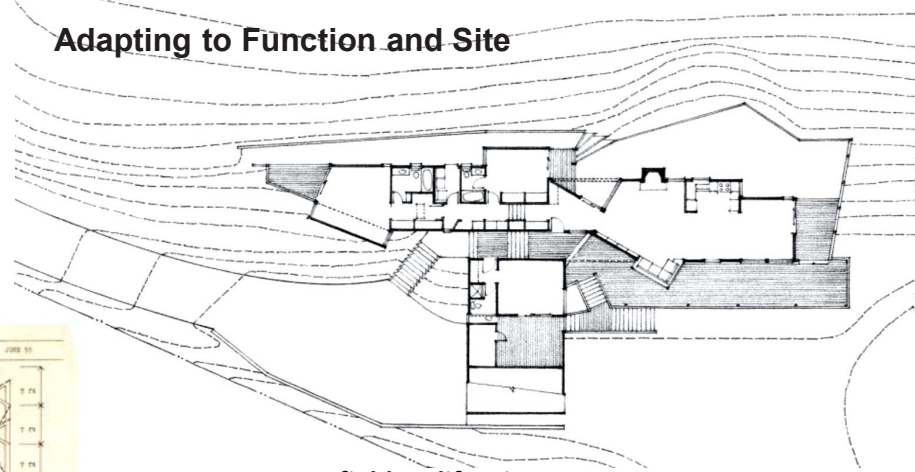
Terraced Housing Fronting a Village Street, Village Project, 1955, James Stirling (Team X)



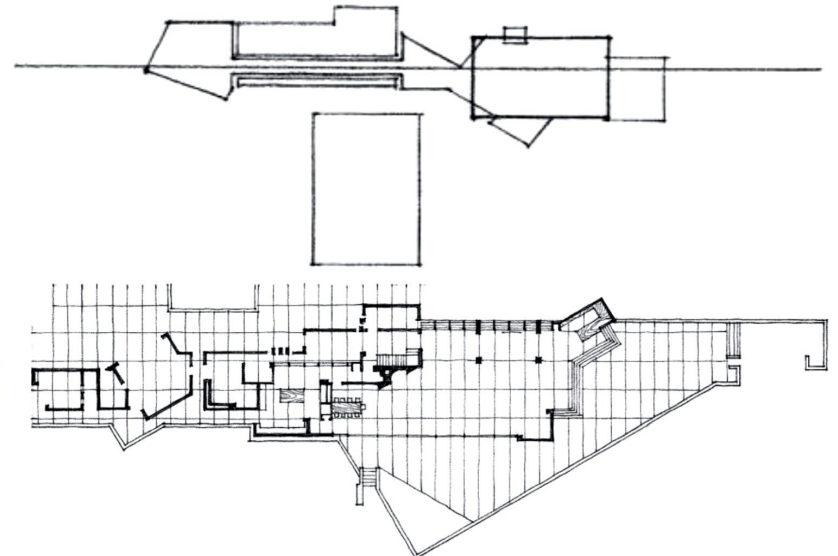
## Linear Sequences of Spaces



## Adapting to Function and Site



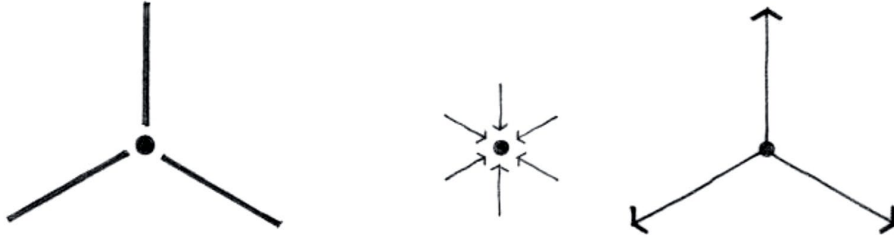
Romano House, Kentfield, California



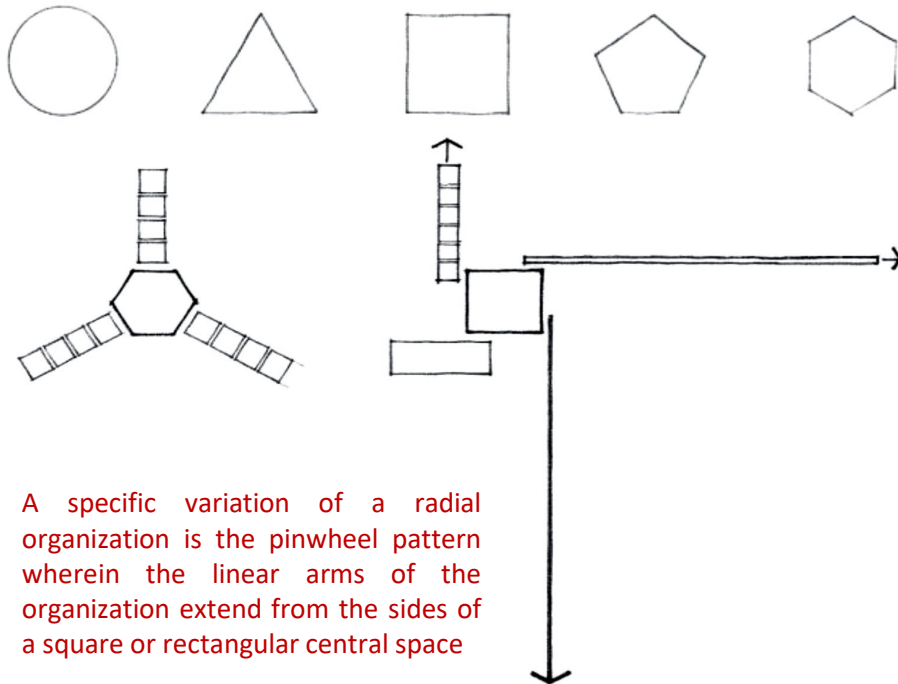


# RADIAL ORGANIZATIONS

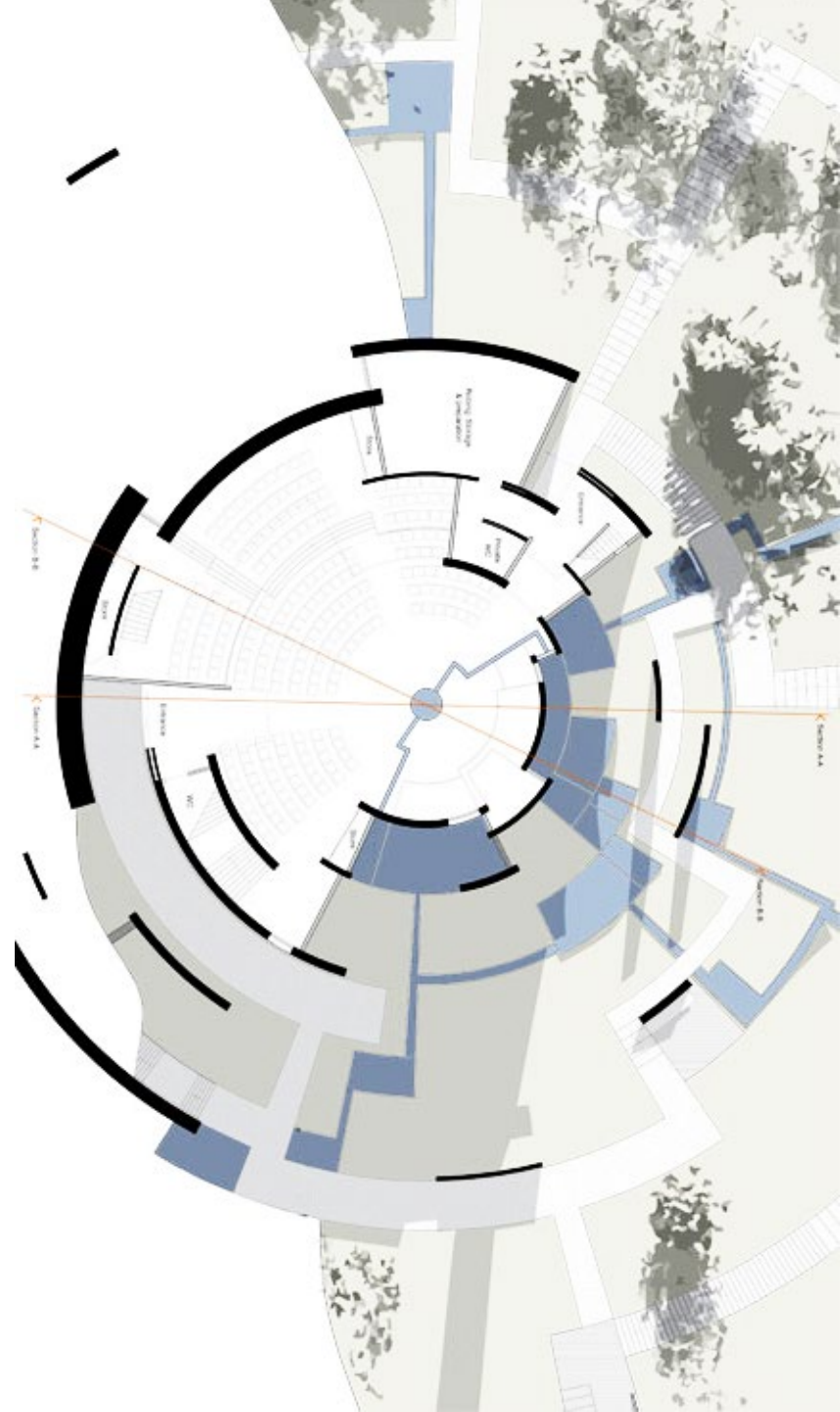
A radial organization of space combines elements of both centralized and linear organizations. It consists of a dominant central space from which a number of linear organizations extend in a radial manner. Whereas a centralized organization is an introverted scheme that focuses inward on its central space, a radial organization is an extroverted plan that reaches out to its context. With its linear arms, it can extend and attach itself to specific elements or features of its site.



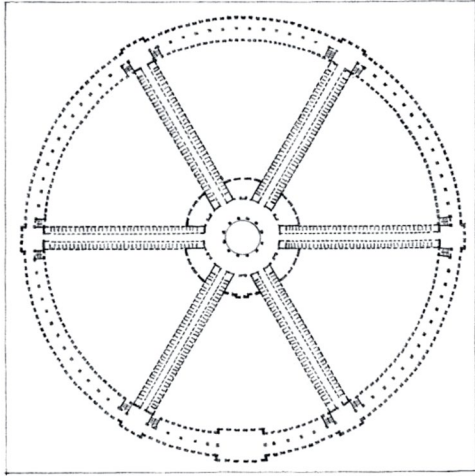
As with centralized organizations, the central space of a radial organization is generally regular in form.



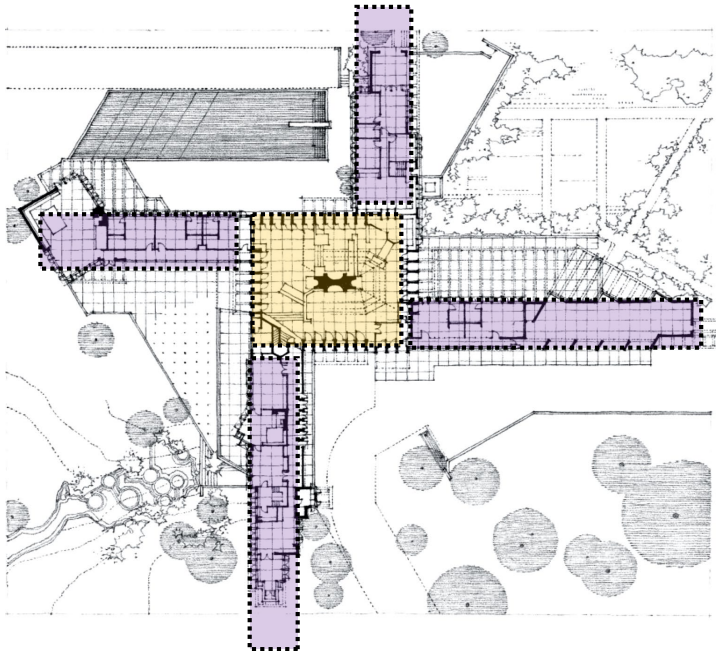
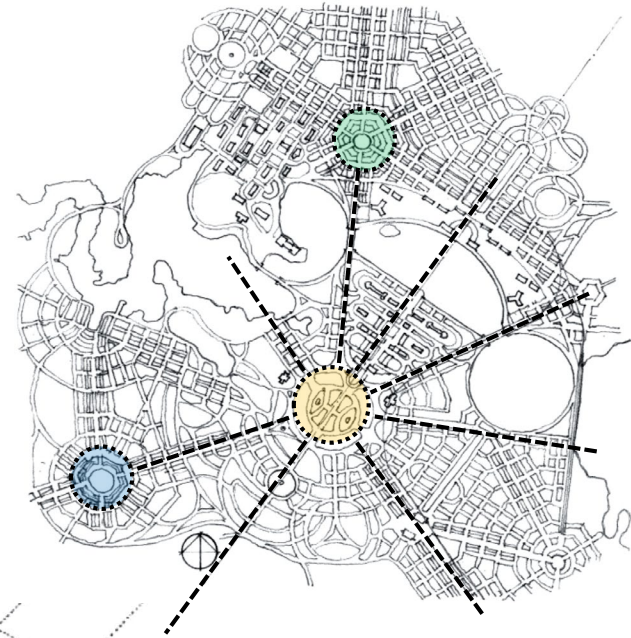
A specific variation of a radial organization is the pinwheel pattern wherein the linear arms of the organization extend from the sides of a square or rectangular central space



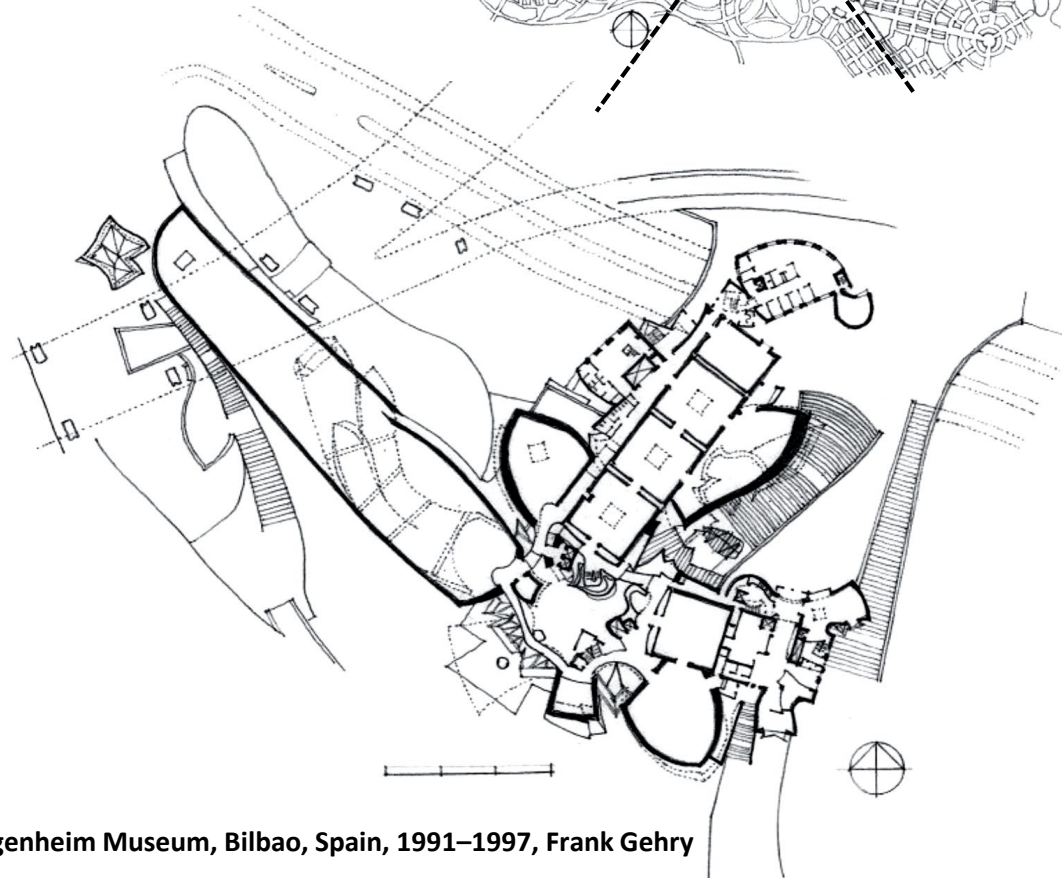
# RADIAL ORGANIZATIONS



Hôtel Dieu (Hospital)

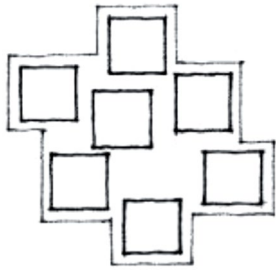


Herbert F. Johnson House (Wingspread)

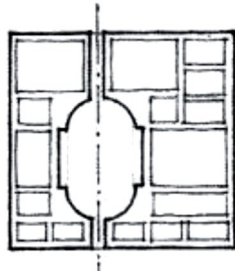


Guggenheim Museum, Bilbao, Spain, 1991–1997, Frank Gehry

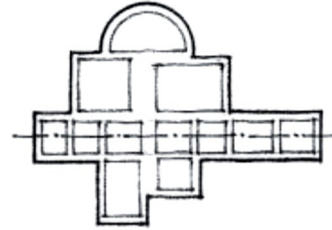
# CLUSTERED ORGANIZATIONS



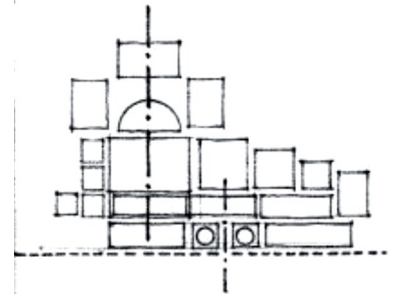
**Repetitive spaces**



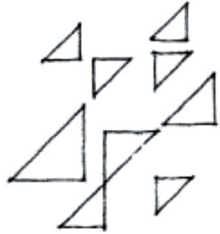
**Symmetrical condition**



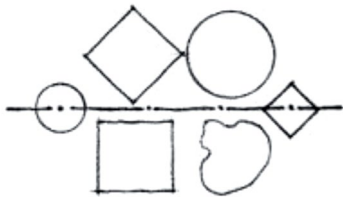
**Axial condition**



**Axial conditions**

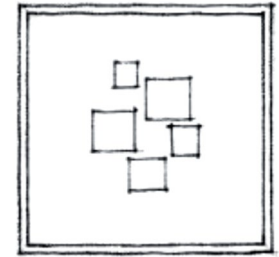


**Sharing a common shape**



**Organized by an axis**

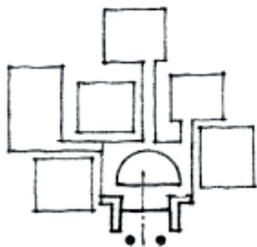
A clustered organization relies on physical proximity to relate its spaces to one another. It often consists of repetitive, cellular spaces that have similar functions and share a common visual trait such as shape or orientation. A clustered organization can also accept within its composition spaces that are dissimilar in size, form, and function, but related to one another by proximity or a visual ordering device such as symmetry or an axis. Because its pattern does not originate from a rigid geometrical concept, the form of a clustered organization is flexible and can accept growth and change readily without affecting its character



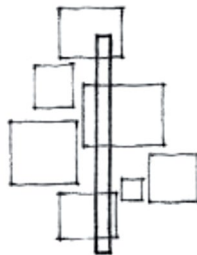
**Contained within a space**



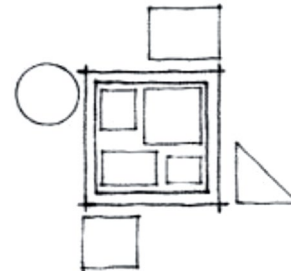
**Clustered pattern**



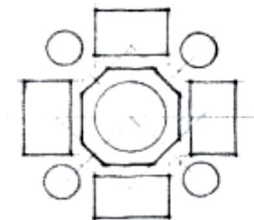
**Clustered about an entry**



**Grouped along a path**



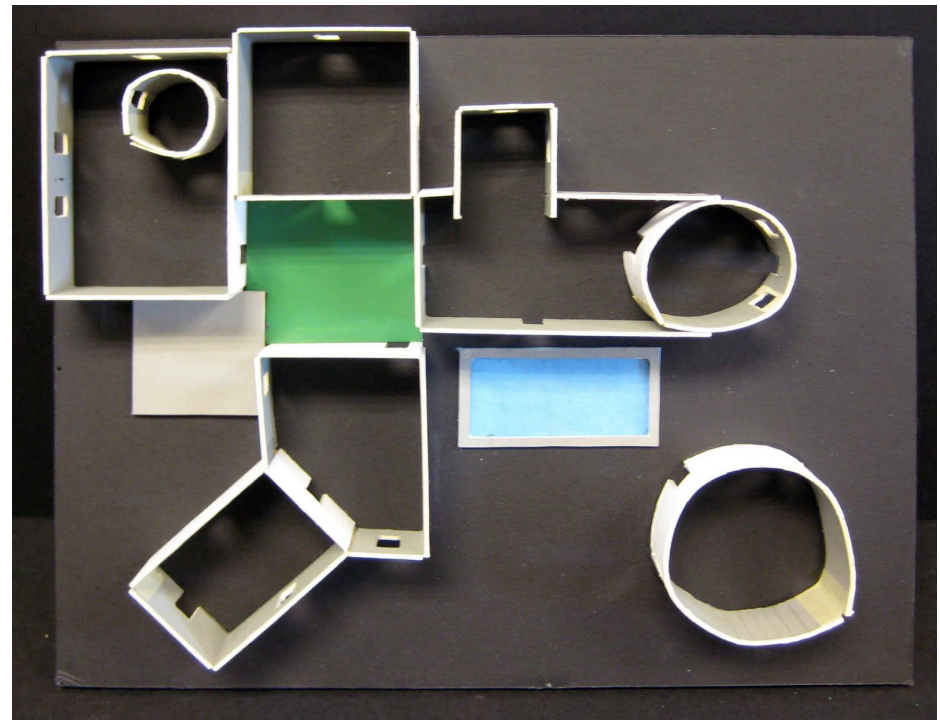
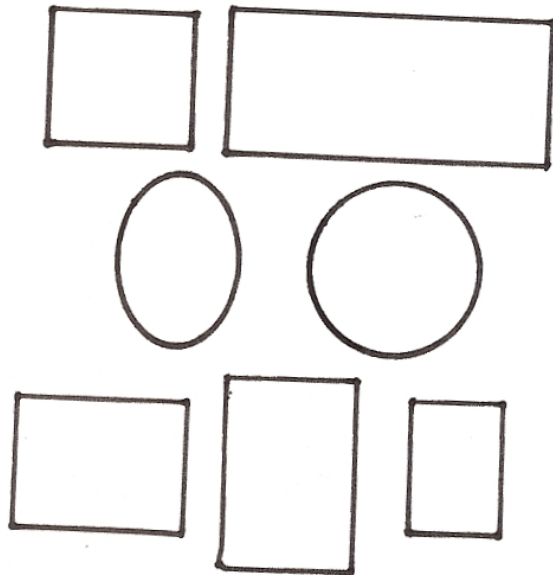
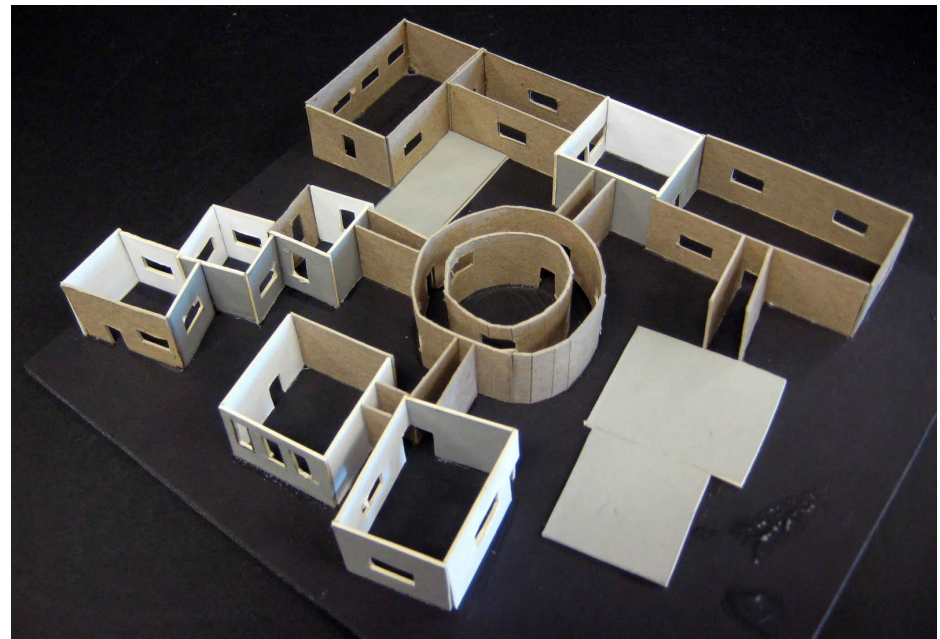
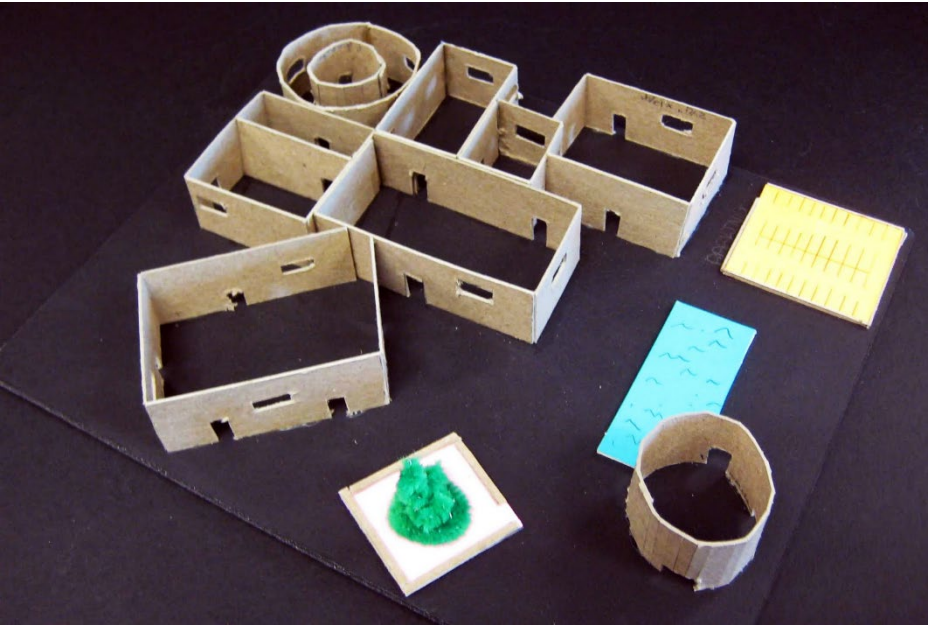
**A loop path**



**Centralized pattern**

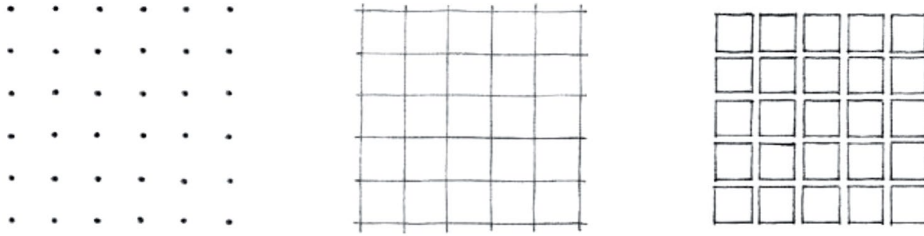


# CLUSTERED ORGANIZATIONS

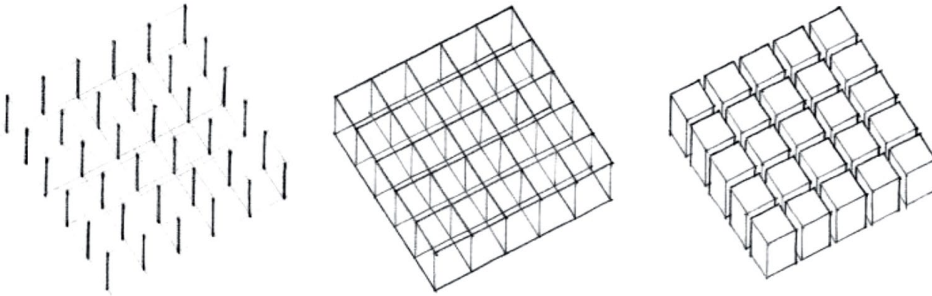


# GRID ORGANIZATIONS

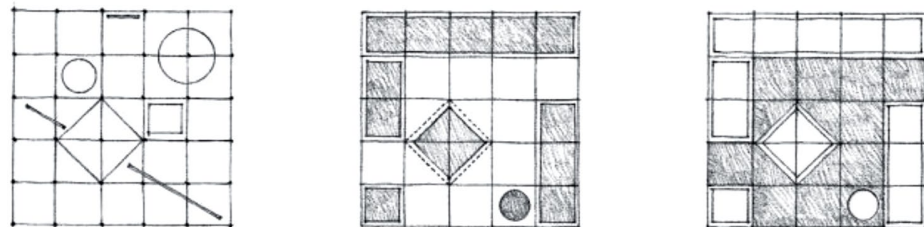
A grid organization consists of forms and spaces whose positions in space and relationships with one another are regulated by a three-dimensional grid pattern or field.



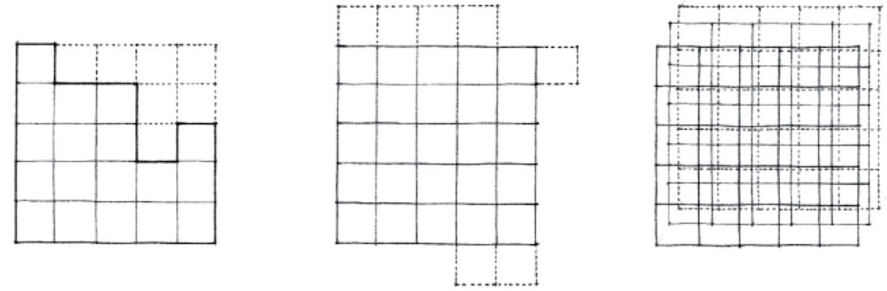
A grid is created by two, usually perpendicular, sets of parallel lines that establish a regular pattern of points at their intersections. Projected into the third dimension, the grid pattern is transformed into a set of repetitive, modular units of space.



A grid is established in architecture most often by a skeletal structural system of columns and beams. Within the field of this grid, spaces can occur as isolated events or as repetitions of the grid module.

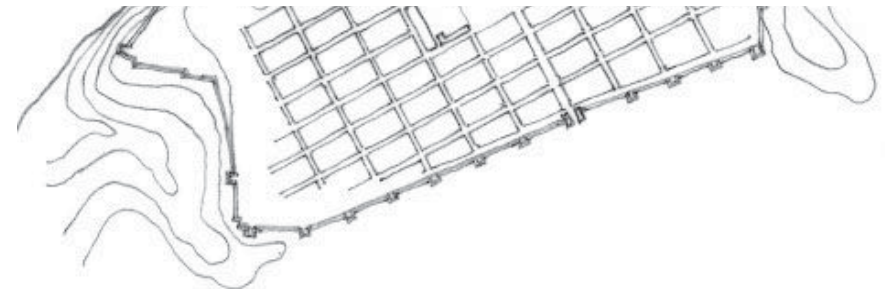
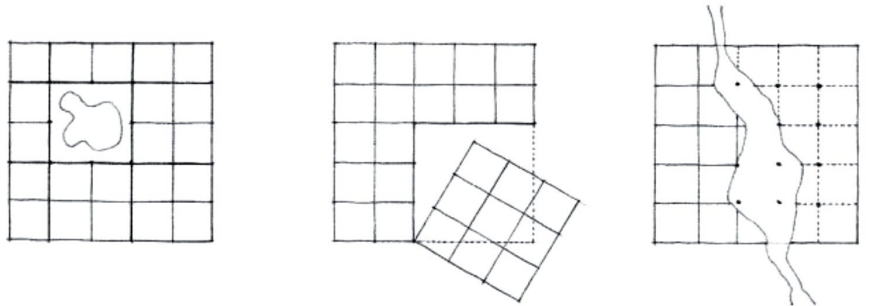


Since a three-dimensional grid consists of repetitive, modular units of space, it can be subtracted from, added to, or layered, and still maintain its identity as a grid with the ability to organize spaces. These formal manipulations can be used to adapt a grid form to its site, to define an entrance or outdoor space, or to allow for its growth and expansion.



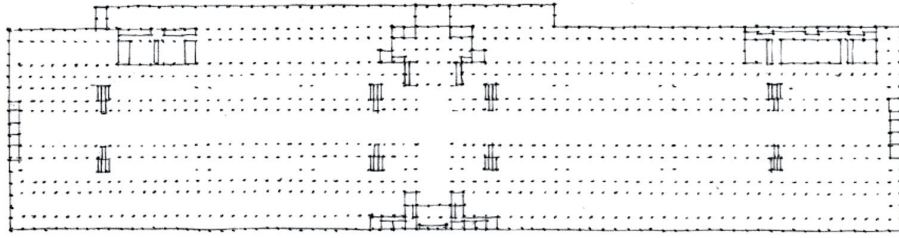
A grid pattern can be interrupted to define a major space or accommodate a natural feature of its site.

A portion of the grid can be dislocated and rotated about a point in the basic pattern. Across its field, a grid can transform its image from a pattern of points to lines, to planes, and finally, to volumes.

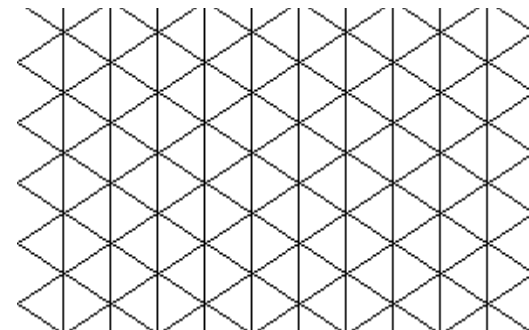
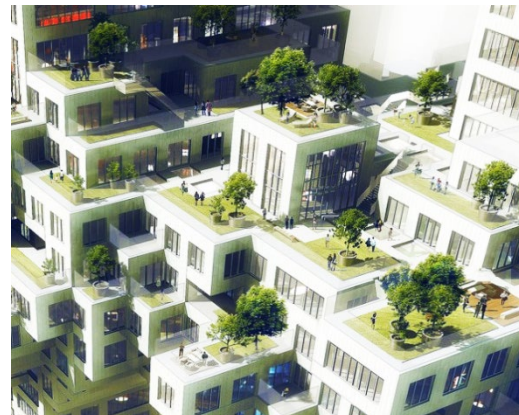
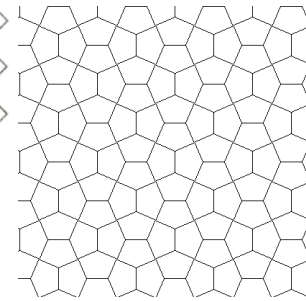
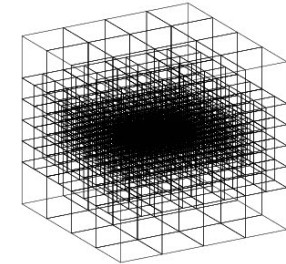
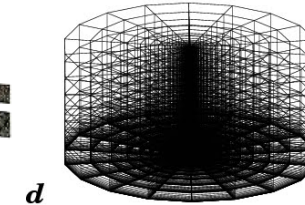
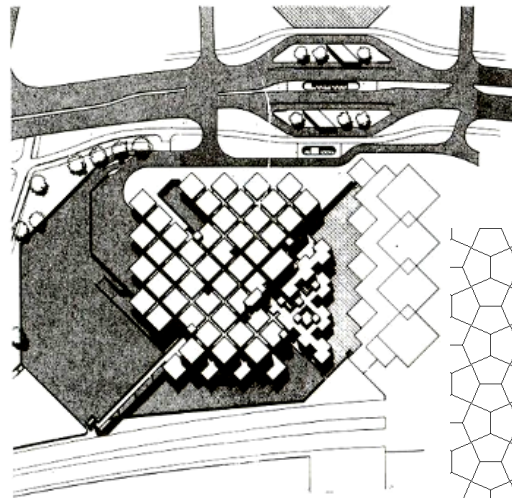
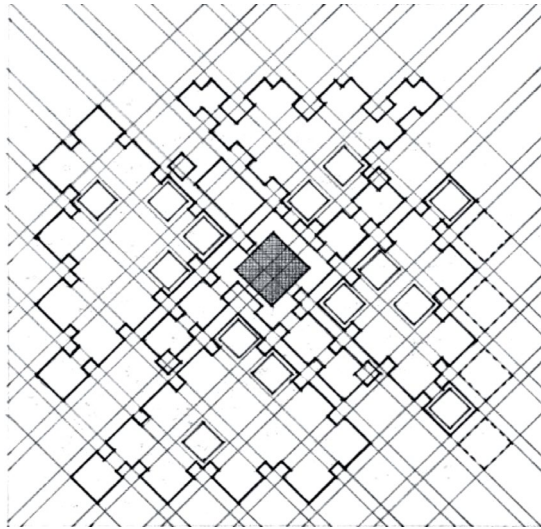
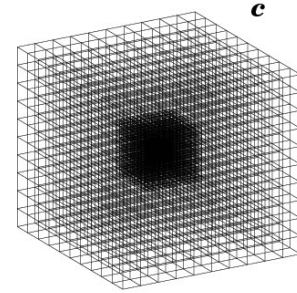
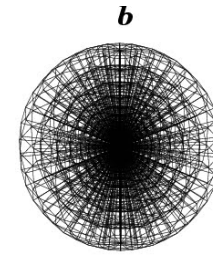
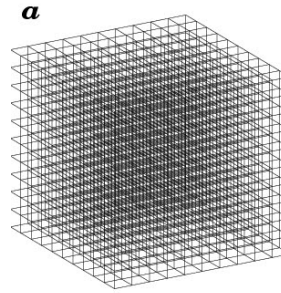




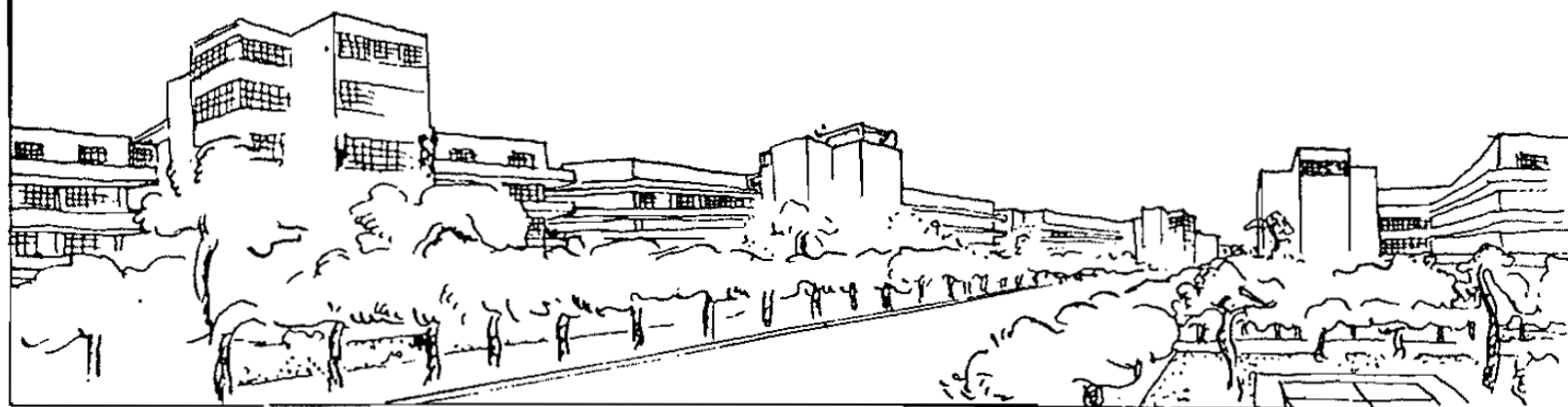
# GRID ORGANIZATIONS



Crystal Palace, London, England, Great Exhibition

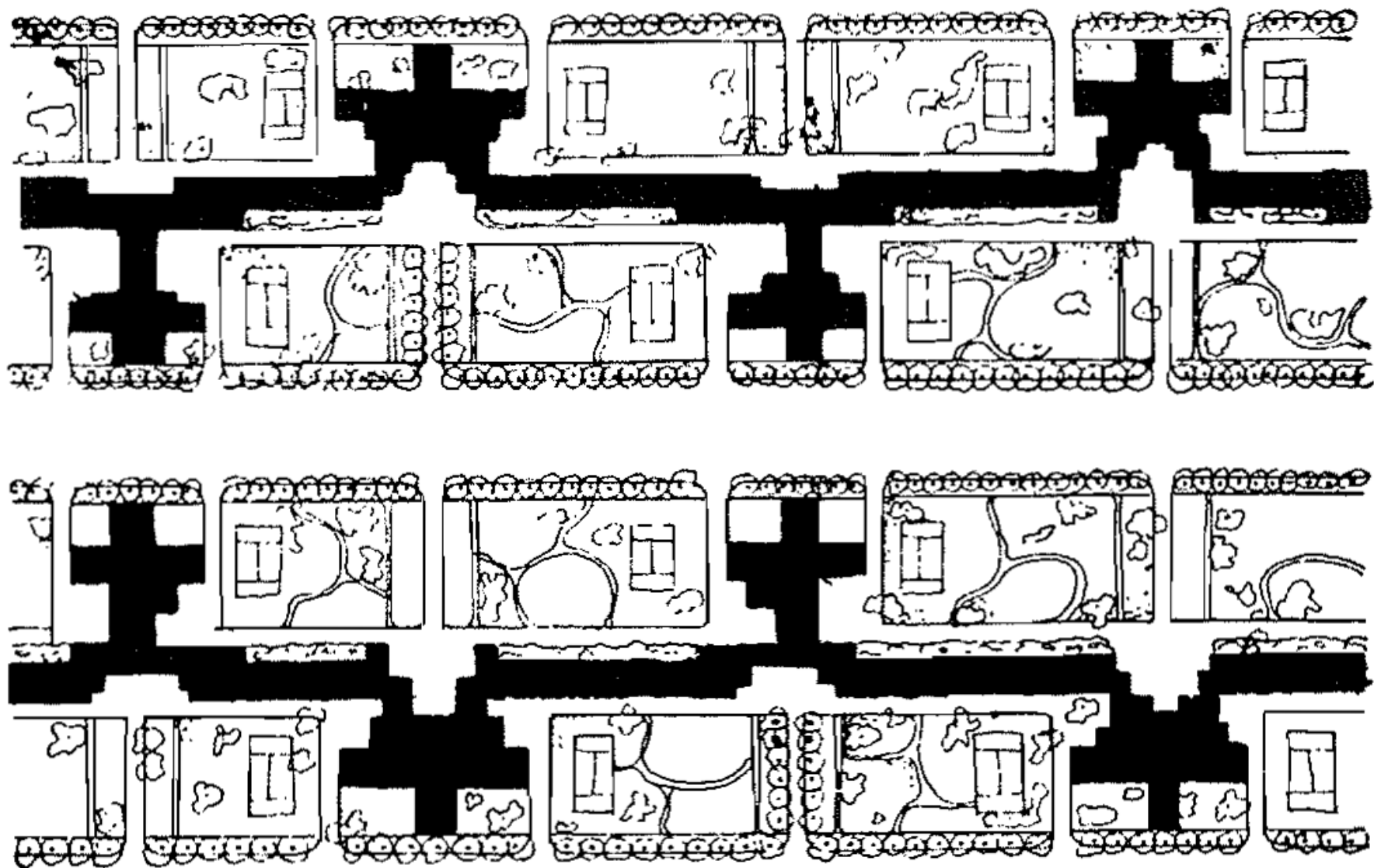






LE CORBUSIER, 1920. STREETS WITH SET-BACKS

*Vast airy and sunlit spaces on which all windows would open. Gardens and playgrounds around the buildings. Simple façades with immense bays. The successive projections give play of light and shade, and a feeling of richness is achieved by the scale of the main lines of the design and by the vegetation seen against the geometrical background of the façades. Obviously we have here, as in the case of the City of Towers, a question of enterprise on a huge financial scale, capable of undertaking the construction of entire quarters. A street such as this would be designed by a single architect to obtain unity, grandeur, dignity and economy.*



LE CORBUSIER, 1920. STREETS WITH SET-BACKS

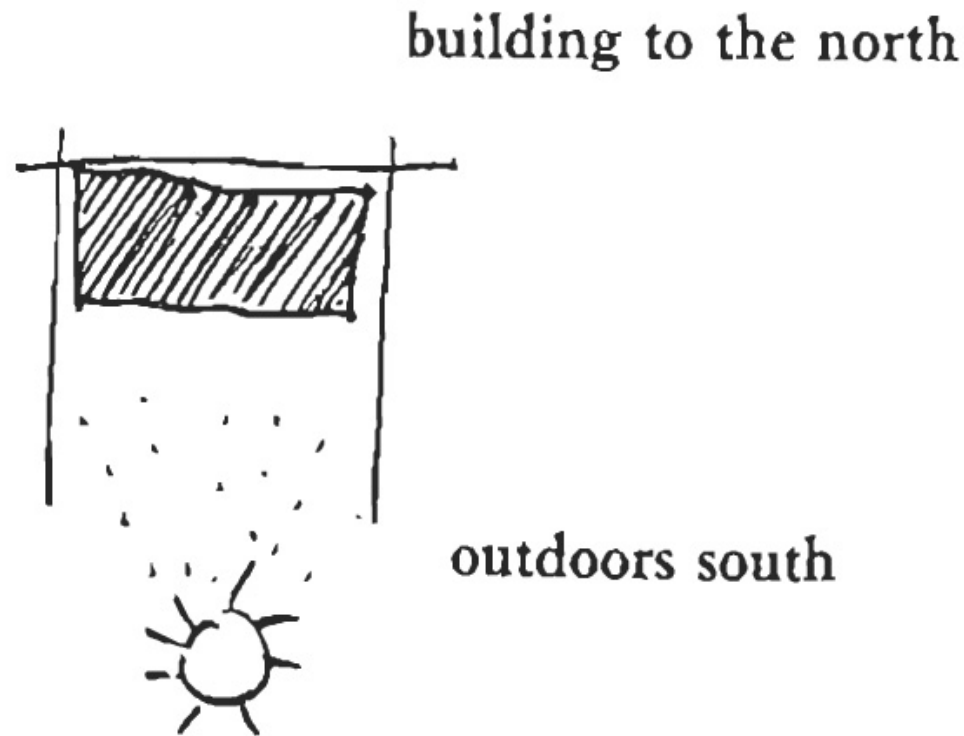
When a public building complex cannot be completely served by outdoor pedestrian streets, a new form of indoor street, quite different from the conventional corridor, is needed.



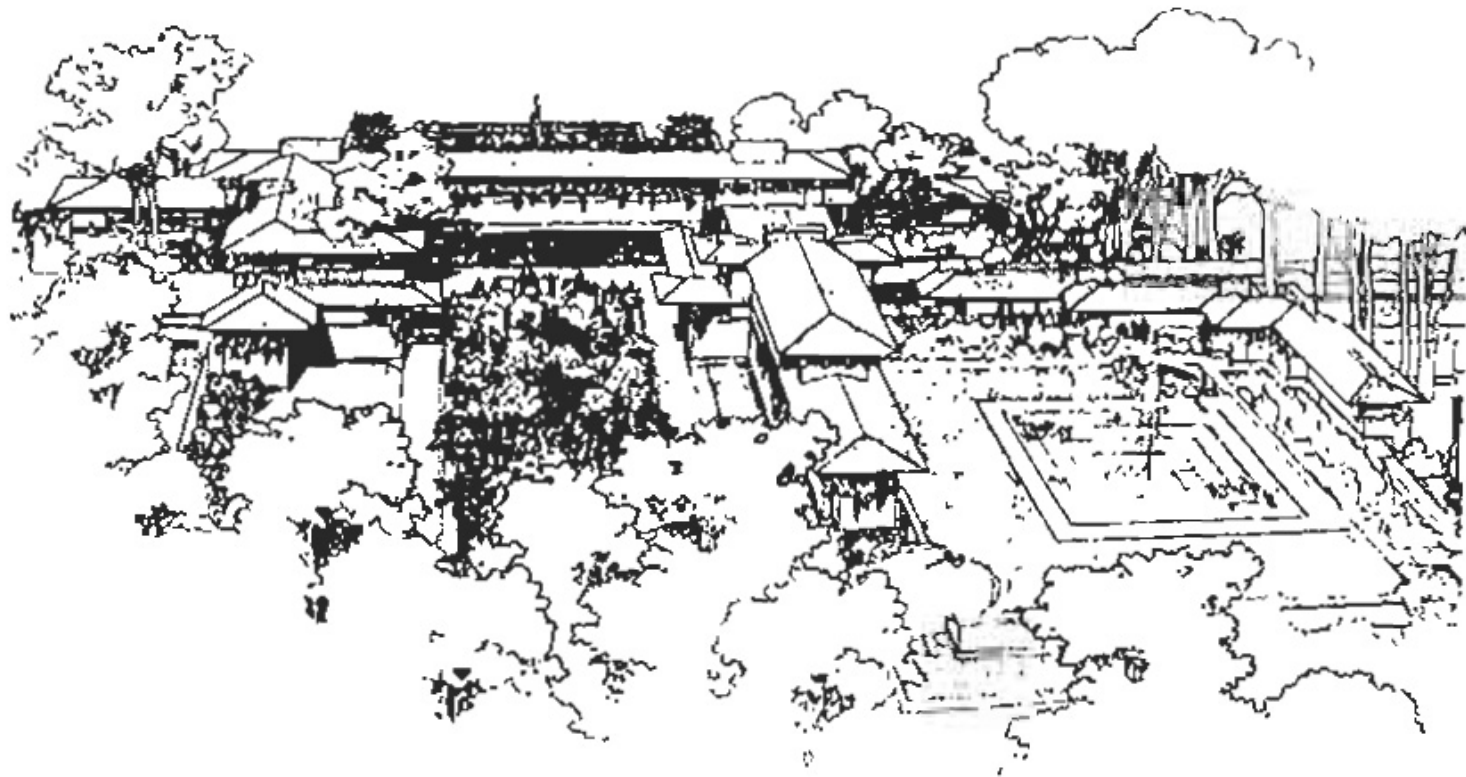
*An indoor street.*



Always place buildings to the north of the outdoor spaces that go with them, and keep the outdoor spaces to the south. Never leave a deep band of shade between the building and the sunny part of the outdoors.



same pattern? We don't know. But we suspect that there is some deeper essence behind the apparent coincidence. We leave the pattern intact in the hope that someone else will understand its meaning.



*A sketch of Frank Lloyd Wright's.*