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PAGE NO. 6  
ST. PANCRAS  
STATION, LONDON  
(1864-68)



GALLERIA VITTORIO  
1865-67, GIUSEPPE MENGONI

## EMERGENCE OF MODERN ARCH.

### Modern Architecture:-

- Modern architecture is a term applied to an period in architectural <sup>history</sup> during the 20th century, with its exact definition and scope varying widely.
- When compared to that which preceded it, modernism in architecture is broadly characterized by simplification of form and subtraction of ornament from the structure and theme of the building.

### Characteristics :-

- Common theme of modern architecture included,
- "Form follows function", meaning that the result of design should derive directly from its purposes.
- Simplicity and clarity of forms and elimination of "unnecessary detail".
- Literal expression of structure (as opposed to the hiding of structural elements)
- Use of industrially-produced materials  
adoption of the machine aesthetic.

## ARCHITECT WALTER GORPIUS

### General Introduction:-

Walter Gropius Full name, George Walter Adolf Gropius Born in Berlin on 18 May 1883. Was a German American architect and an educator.

He was an influential proponent of Modern Design and furthered his architectural works and his long years of teaching at Harvard. He was taught by his father.

He took 7 month study in Spain and met Peter Behrens in 1908 and worked under him. In 1934, he moved to U.K. London, where he was the controller of Design.

### Psychology of his thoughts:-

Gropius was not only an architect but an educator. Too, his psychology was influenced by the constant process of learning and imparting that knowledge around himself. His instructional methods were diff. in the teaching at Harvard university. His design has full command of the elements of architecture.

His programme was written to encourage collaborative efforts with landscape architecture and planning dept. Harvard graduate center, Cambridge, Massachusetts it was built at Cambridge. Harvard graduate center, Cambridge, Massachusetts Alazed Tolvanide, Massachusetts, 1949 Design: Fagus Factory, Alford, Germany it was built at Alford An-De-Lain in 1911.

### Design factory:-

The modular Fagus Building was the first. To Extract simplicity is repeated in the full aesthetically revolutionary interior impact from the structural development.



### Postmodernism:

- Architects explored Postmodern architecture which offered a blend of some pre-modern elements and deliberately sought to move away from rectilinear designs, towards more eclectic styles.
- High postmodern aesthetics lacked traction and by the mid-1990s, a new surge of modern architecture once again established international pre-eminence.

### Analysis:-

- In Ancient Architecture there was use of natural resources or readily available material like stone, sand etc.
- But emergence of modern Architecture we started the use and different types of material like steel, cement etc started.
- As the emergence started the way and techniques of designing also started changing time to time.

### ARCHITECT LE CORBUSIER AND HIS WORKS

Le Corbusier was a Swiss-born French architect who belonged to the first generation, he chiefly built the with steel and reinforced concrete and worked with elemental geometric forms.

After designing his first house in 1907 at the age 20, Le Corbusier called "my master" and later referred to him as his only teacher. Le Corbusier took tips through central Europe and the Mediterranean, including apprenticeships with various architects.

Le Corbusier born on 6th Oct 1897 At La-Chaux-de-Fonds in Swiss mountains 40km from French border. He started working under contractor parent, Le Corbusier so-called master. He as a child prepared himself for a manual occupation. He left his school at the age of 13 1/2 years and joined an art school.

During the four years of work in Paris. he was in Switzerland, he

- planning is done
- Chandigarh planning was done in an manner that everything was easily clear about the Routes and sectors
- JVs Road system is used.
- The Roads are classified as V1, V2, ... V7.

These main principles and main features of this edict are as follows,

- 1) Human scale
- 2) felt sufficient sectors
- 3) Road system
- 4) Areas of special interest.

## MODERN ARCHITECTURE (CONSTRUCTION MATERIAL)

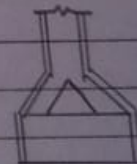
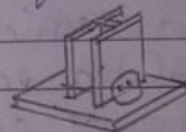
### Construction Material:

- Stone
- Mud
- Brick
- Timber
- Steel
- Glass
- Concrete
- Fabric

**STEEL**:- There are many types of metals used for building.

Steel is a metal alloy whose major components is iron and it is the usual choice of metal.

Structural application. Structurally a building can either be a steel or a steel framed building.



CONNECTING STEEL COLUMNS TO FORM COLUMN BASE

### Modular Steel construction:-

- Modular construction uses light steel



Types and uses:- The basic glazing material used for external envelope is the glass pane, which may be clear white, body tinted, photosensitive, or photo chromatic. Thermally toughened glass, (tempered glass) fractures into small pieces and thereby reduces sustn in the case of glass breakage, such glass is referred as 'safety glass'.

Further developed systems:-

- Bolted corner plate fixing points.
- The counter sunk 'Pillar' fixing system
- The bolted fixing system with steel joints (RFR system)

CONCRETE :- Typical properties of normal strength.

portland cement concrete are indicated below:

- Density : 2240-2400 kg/m<sup>3</sup>
- Compressive strength : 20-40 MPA
- Flexural strength : 3-5 MPA
- Tensile strength : 2-5 MPA
- Modulus of elasticity : 14000-21000 MPA

The initial setting time of concrete is 30 min and the final setting time is 600 min

- Grades of concrete  
 M-15 = 1:2:4 (Cement:Sand:Stand)  
 M-20 = 1:5:3 ( " " " )  
 M-25 = 1:1:2 ( " " " )

Grade of concrete	Cement content in kg per cum of concrete
M15	250 to 300
M20	290 to 330
M25	310 to 360
M30	340 to 390
M35	380 to 420
M40	380 to 450
M45 to M55	400 to 450

Construction Method:-

Pumping method:- A concrete pump is a machine used for transferring liquid concrete by pumping. There are two types of concrete pumping.

- Trailer-mounted boom concrete pump
- Truck-mounted concrete pump

waited architectural architectural studies using modern techniques. Among these was his project Pomino House (1914-1915). This model proposed an open floor plan consisting of concrete slabs supported by minimal numbers of thin, reinforced concrete columns around the edges.

### Villa Savoye:-

Villa Savoye his theoretical studies soon advanced into several different single-family house models. The Villa Savoye is probably Corbusier's best known building 1920s, it had enormous influence on international modernism. It was designed addressing aesthetic his emblematic "five points", the basic tenets in his new architectural aesthetic.

### Center Le-Corbusier:

The Center Le-Corbusier or Heidi Weber Museum is an art museum in Switzerland, Center of Le-Corbusier. It is the last building designed by him. He made intensive use of prefabricated steel elements combined with multi-colored. He designed a 'free floating' roof

to keep the house protected from the rain and the sun.

He also designed United Nations Headquarters.

### Le-Corbusier in INDIA:-

"Today I am accused of being a revolutionist, yet, I confess of having had only one master, the past; And only one discipline - the study of the past." When Le-Corbusier went to India in 1928 to design the new city of Chandigarh, he was faced with the problem of cultural and political. India had just won independence from the British and was still recovering. Chandigarh was center in drama because it was to be the new capital of Punjab, a state which had been sliced in two.

### Master plan:-

- In Chandigarh <sup>neighbourhood</sup> unit known as a sector has worked very well.
- All the houses open up inside. Grid



### Origins:

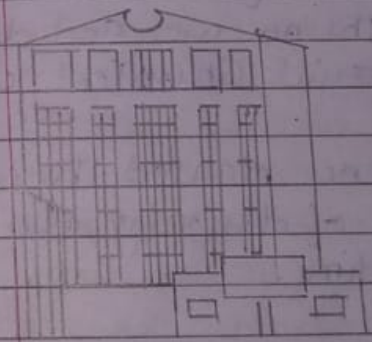
- There are multiple lenses through which the evolution of modern architecture may be viewed.
- Some historians see it as a social matter, closely tied to the project of Modernity and the Enlightenment.
- Others see Modern architecture as primarily driven by technological and engineering development.
- Still other historians regard modernism as a matter of taste, the least stylistic excesses of architecture.

### Urban design and mass housing:

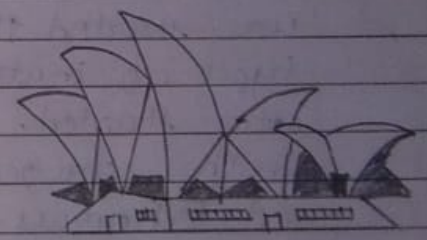
- The Congress International d'Architecture Moderne (CIAM) would be a force in the shaping of Modernist urban planning, and consequently the design of cities and the structure within, from 1928 to 1959.
- In the Eastern Bloc, mass housing would take the form of prefabricated panel building, such as the Plattenbau of Eastern Germany, Khrushchyovka of Russia and the Panelak of Czechoslovakia.

### New structures, new forms:

- Tube architecture: -  
"a three dimensional space structure composed of three, four or possibly more frames bound together at their walls, joined at or near their edges to form a vertical tube like structural system capable of resisting lateral forces in any direction by cantilevering from the foundation.
- The first building to apply the tube-frame construction was the De Witt-Chestnut Apartment Building which Frank Lloyd Wright designed and was completed in Chicago by 1963.



Former building, New York City, 1984



SYDNEY OPERA  
BY JOAN UZON

## INDUSTRIAL REVOLUTION OF ARCH.

- Q. What is Industrial revolution?
- The process of change from an agrarian handicraft economy to one dominated by industry and machines manufacture.
- The industrial revolution began in England about 1760
  - Radical changes at every level of civilization through out the world.
  - The revolution in human thought.

### Industrial Revolution

(1750 - 1900)

- Mechanization
- low farm wages
- Demand for product
- Utilization
- Science
- The Enlightenment
- Migration of cities

### Industrial revolution and arch.:

- Material
- Social
- Cultural



- At the second half of the 19th century dislocations brought about the industrial revolution became overwhelming.
- For the new modes of transportation, canals, tunnels, bridges and railroads, station architects were employed only to provide a cultural veneer.

### Industrial revolution and City

#### City and factory town:-

- The steam railroad extended its rails from raw product to the factory, and to the cities of consumers all over the land.
- Railroads and ships joined at the factories and the waterfront became the industrial core of the city.

#### Public and Safety in city:-

- But extensive street paving permitted effective cleaning and strong sewers augmented the sanitary equipment.
- Common use in city street lamps. Electricity use in city replace gas for street lighting.

#### The Iron Railroad station:

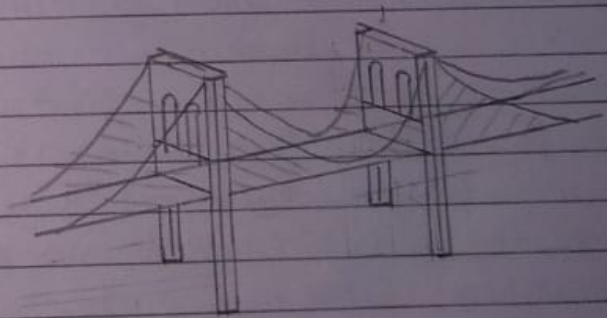
- eg. - Central Railroad Station, England
- St. Pancras Station, London designed by William Henry Barlow and started in 1863.

#### The Iron Market Place:

- eg. - Coward Market, Berlin 1865-1866
- City Market Hall, Paris
- Galleria Vittorio Emanuele II, Milan
- Designed by Giuseppe Mengoni between 1865 and 1877.

#### The Iron Commercial Building:-

- eg. - Mahler Factory, Noisiel-sur-marne
- Babbury Building, Los Angeles, California
- Commodities Exchange, Amsterdam
- Designed by George H. Wyman built in 1893.



IRON BRIDGES

His programme was written to encourage collaborative efforts with landscape architecture and planning dept. Harvard graduate center, Cambridge, Massachusetts. It was built at Cambridge, Harvard graduate center, Cambridge, Massachusetts. Glazed Toluamide, Massachusetts, 1949. Design: Fagus Factory, Alford, Germany. It was built at Alford An-De-Lain in 1911.

### Design factory:-

The modular Fagus Building was the first. To Extract simplicity is repeated in the full aesthetically revolutionary interior impact from the structural development. Walls are no longer supports of the building but simple curtains projected against increment weather. It was domination of voids over solids, Plan surfaces predominate in this factory.

Gropius House:- Aincaln, Massachusetts  
Gropius house - garden elevation - Living and dining Room exterior view from below  
Glazed 3-storied' • Workshop Block  
• Teaching Block  
• Social areas  
• Bauhaus, Dessau



## ARCHITECT LOUIS SULLIVAN

<sup>Henry</sup>  
Louis Sullivan (Sept. 3, 1856 - April 14, 1924), an American architect, called the "father of skyscrapers". An influential architect and critic of the Chicago School. A mentor to Frank Lloyd Wright, and an inspiration to the Chicago group of. He received the AIA Gold Medal in 1954, born in Irish and Swedish immigrants in 1856. Grew up at grandparents farm learning things about them. Studied architecture at Massachusetts Institute of Technology. He went to Chicago, where he worked with the father of the skyscraper, William N. Barrer. Went to Paris in 1874, returned to Chicago in 1875 got a job as a draftsman in the office of Joseph S. Johnson and John Edelman.

## Philately:

Louis Sullivan coined the phrase "form ever follows function". The credo, which placed the demand of practical use above aesthetic would later be taken by influential designers to imply superfluous in modern buildings.

Probably the most famous example of the curving given in ironwork that covers the entrance canopies of the Carson Pirie Scott store on South State Street. Sullivan employed such arches throughout his career -

- in shaping entrances,
- in framing windows at,
- as interior design

All of these elements are widely admired by Sullivan.

## Auditorium Buildings 1-

Location: 430 E. Michigan Avenue Chicago Illinois 60605 United States  
Coordinates:  $41^{\circ}52'34''$  N  $87^{\circ}37'31''$  W  
Coordinates:  $41^{\circ}52'34''$  N  $87^{\circ}37'31''$  W. Built 1889. Architect: Dankmar Adler, Louis Sullivan. Architectural style: Late 19th and early 20th century American movements. Governing body: Private. Significant dates: Added to NRHP April 7, 1970, Designated NHL: May 11, 1975.

## Origin and purpose:-

Ferdinand Peck, a Chicago businessman, incorporated the Chicago Auditorium Association in Dec 1888

to develop what he wanted to be the world's largest, grandest, most expensive theater that would rival such institutions as the Metropolitan Opera House in New York City.

He was said to have wanted to make high culture accessible to the working classes of Chicago.

He also designed following buildings:

- Wainwright building, St. Louis, Missouri
- Guaranty building, 20 Church Street, Buffalo, New York, United States.
- The Carson Pirie Scott building, Chicago, Illinois.
- St. Paul's Church, Cedar Rapids, Iowa
- Holy Trinity Orthodox Cathedral, Desigraied a Chicago, Land mark
- Barber House, Riverside, Illinois.

### ARCHITECT LUDWIG MIES VAN DER ROE

#### Description:-

Ludwig Mies van der Rohe was a German-American architect. He was commonly referred to as Mies, his surname, along with Alvaro Siza, Le Corbusier, Walter Gropius and Frank Lloyd Wright, he is regarded as one of the pioneers of modernist architecture.

Born: 27, March 1896, Aachen, Germany  
Died: 17 August 1969, Chicago, Illinois, US

Awards: AIA Gold Medal, Royal Gold Medal, Presidential medal of Freedom, 25 year Award.

Influenced by: Le Corbusier, Frank Lloyd Wright, Peter Behrens

#### Quotes!

Architecture starts when you carefully put two bricks together there it begins.

Architecture is the will of an epoch translated into space.

A chair is a very difficult object. A skyscraper is almost easier.

That's why Chippendale is famous.



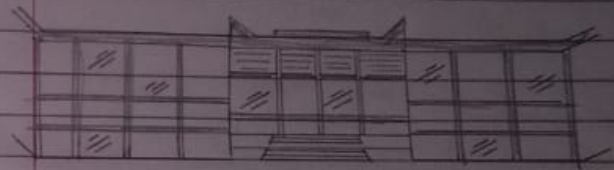
It's difficult to imagine what the skyline of Chicago might look like without architect Ludwig Mies van der Rohe. Mies did not design buildings with a particular style in mind. For him, the philosophy came first. How a building looked was purely an expression of its era and its materials. As he explained, "I am not interested in the history of civilization. I am interested in our civilization we are living it. Because I really believe after a long time and thinking and studying that architecture ... can only express the civilization we are in and nothing else."

Crown Hall :- The cap<sup>m</sup> was revolutionary at that time, and it perfectly expressed Mies' design principles and "less is more" approach.

Six beautiful buildings designed by Ludwig Mies - Van der Rohe :-

- Barcelona Pavilion (1929), (1928-1931)
- Willa Tugendhat, Brno, Czech Republic
- S.R. Crown Hall, (1956) Chicago
- Martin Luther King, Jr. Memorial Library, Washington D.C.

- Farnsworth House (1945-51), Fox Lake, south of Plano city, Illinois
- IBM Building Chicago



S.R. CROWN HALL

with career spanning over 70 years, American architect Frank Lloyd Wright changed the course of American architecture.

During his career, he designed more than 1,000 structures, with 532 being complete. As an architect, interior designer, writer and educator, he was incredibly prolific.

In fact, in 1991, the American Institute of Architects named him "the greatest American architect of all time", and many of his buildings have been nominated as UNESCO World Heritage sites.

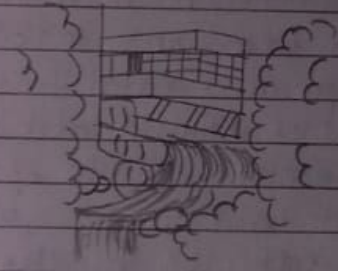
The buildings and structures made by Lloyd are, • Unity temple (1905-1908, Oak Park), • Ennis House, 1924, Los Felix, CA, • Interior, Rosenbaum house, 1940, Florence, AL, • Falling water (1936-1939), Mill Run, PA etc.

Fallingwater in the mill Run, PA is perhaps Wright's most famous example of organic architecture. "A building should appear to grow easily from its site and be shaped to harmonize with its surrounding if nature is manifest there. This is achieved

through repeating patterns based on nature throughout the building as well as the use of natural material.

He also designed :-

- Interior, Robbin House
- Prairie style glass farm Frank Lloyd Wright's house in Oak Park.
- Solomon R. Guggenheim Museum, completed 1959, New York city.



FALLING WATER IN MILL RUN, PA



### Ground floor plan:-

View of the complex in which the elevations show the linear nature of individual structure. The complex is divided into three main wings. The student apartments are connected by auditorium, canteen, kitchens and gymnasium to first floor plan. The long narrow.

- 1) Workshop
- 2) Dining hall the wing on left
- 3) Studio workshop
- 4) Administrative office crafts, wing on the right.

### ARCHITECT FRANK LLOYD WRIGHT

#### Description:-

Frank Lloyd Wright was an American architect, interior designer, writer and educator whose creative period spanned more than 70 years, designing more than 1,000 structures of which 532 were completed.

Born: 8 June 1867, Richland Center, Wisconsin, United States.

Died: 9 April, 1959, Emergency Room - St. Joseph's Hospital, Phoenix, Arizona, United States.

Projects: 'Usonian houses, Broadacre city  
Spouse: Olgive Lloyd Wright (m. 1928-1959)  
Structures: Fallingwater, Frank Lloyd Wright home and studio.

#### Quotes:

Less is only more where more is good  
The mother art is architecture. Without an architecture of our own, have no soul of our own civilization.

The longer I live, the more beautiful life become.