

# The Industrial Period

In the 18<sup>th</sup> & 19<sup>th</sup> Centuries

ARCH 1121

History of Architectural Technology

Department of Architectural Technology  
New York City College of Technology, CUNY

3 Reasons for change in Architecture:

- Introduction of new materials and techniques
- Demand for new types of Buildings to meet social needs
- Changes in Cultural climate and sources of Patronage

# 18<sup>th</sup> & 19<sup>th</sup> Century

Steam Engine used to move Rail Cars 1804

Fulton invents the Steamboat 1807

First Passenger railroad in England 1825

Morse sends 1<sup>st</sup> telegraph message 1844

Invention of sewing machine, refrigerator, telephone, film,  
automobile, phonograph 1845-95

Otis invents the elevator 1852

Edison invents electric light 1879

Large scale production of rolled steel 1880s

Reinforced concrete perfected 1892

# Industrial Revolution

Started in England in last quarter of the 18<sup>th</sup> Century and spread during the 19<sup>th</sup> Century through Europe and America

There were new types of buildings for transport and industry

New techniques were created with new materials

Iron was used in “progressive” buildings

# Industrial Revolution

Engineers were used to design buildings

Buildings were straight forward, simple, functional buildings

Building types included:

Viaducts, dockyards, textile mills & railway stations

Hospitals, stores and offices (Social and Commercial development)

This is the 1<sup>st</sup> time new Architecture was predominantly civic not religious

# Industrial Revolution

Previously the design trend was set by the aristocrats

Now Architects and Engineers looked to Ancient Models:

Greek and Gothic Architecture

Many styles were revived throughout Europe and America

Greek Revival

Venetian Gothic

Gothic Revival

Flemish

Neo-Roman

Byzantine

Neo-Baroque

# Schauspielhaus, Berlin, Germany 1819-21

Karl Friedrich Schinkel (1781-1841)



# Brandenburg Gate, Berlin, Germany 1784-93, C.G. Langens & Friedrich Gilly



BRANDENBURG GATE, BERLIN, 1789-93

# The British Museum 1823-47

London, England

Sir Robert Smirke

Built to house England's Collection of Antiquities

Art & Knowledge were extremely important and so  
Museums were treated like temples





# Trinity Church 1846

New York City, NY

Richard Upjohn

Best known Neo-Gothic  
Building in America



# Victor Emmanuel II Monument 1884-1922

Rome, Italy

Giuseppe Sacconi

Vast Platform with a terrace that holds a large statue of the king on a horse.

Blocks view to the Ancient Roman Forum Ruins



# Industrial Revolution (emerged in England by 1750)

Architecture linked to Transportation

Canal Structures: Waterways, Aqueducts & warehouses

Road Structures: Roads & Bridges

Railroad Structures: Terminal structures

Ocean Trade: Enlarged harbors, warehouses



# Menai Suspension Bridge 1826

A suspension bridge between the island of Anglesey and mainland Wales

Designed by Thomas Telford



# Menai Suspension Bridge 1826

Construction consisted of:

- concrete towers on both sides of the strait.

- sixteen huge chain cables, each made of 935 iron bars that support the 176 meter span.

To avoid rusting, each cable was first soaked in linseed oil.

Chain suspension bridge with gravity anchored



# Clifton Suspension Bridge 1836-64

I.K. Brunel

Spans 702' across the Aron Gorge new Bristol



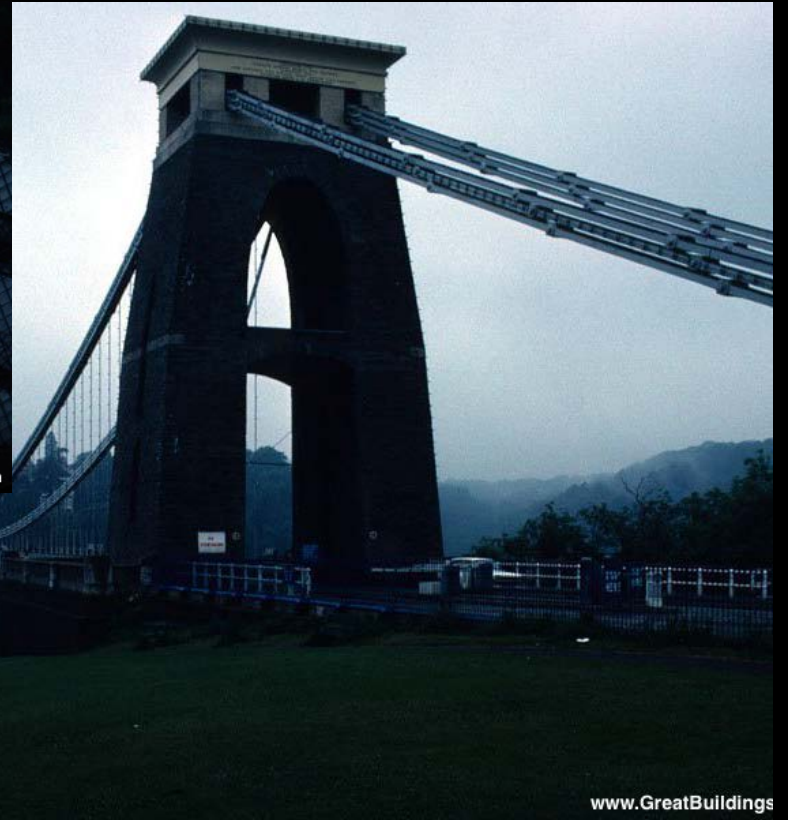
# Clifton Suspension Bridge 1836-64



# Clifton Suspension Bridge 1836-64



[www.GreatBuildings.com](http://www.GreatBuildings.com)



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# Central Railroad Station @ New Castle

1846 and 1850

John Dobson

Neo-Classical Front Façade

Iron and Glass arched roof



# Central Railroad Station @ New Castle



# Crystal Palace 1851

John Paxton

Designed for the Great Exhibition in Hyde Park, London, England

Standardized Prefab parts

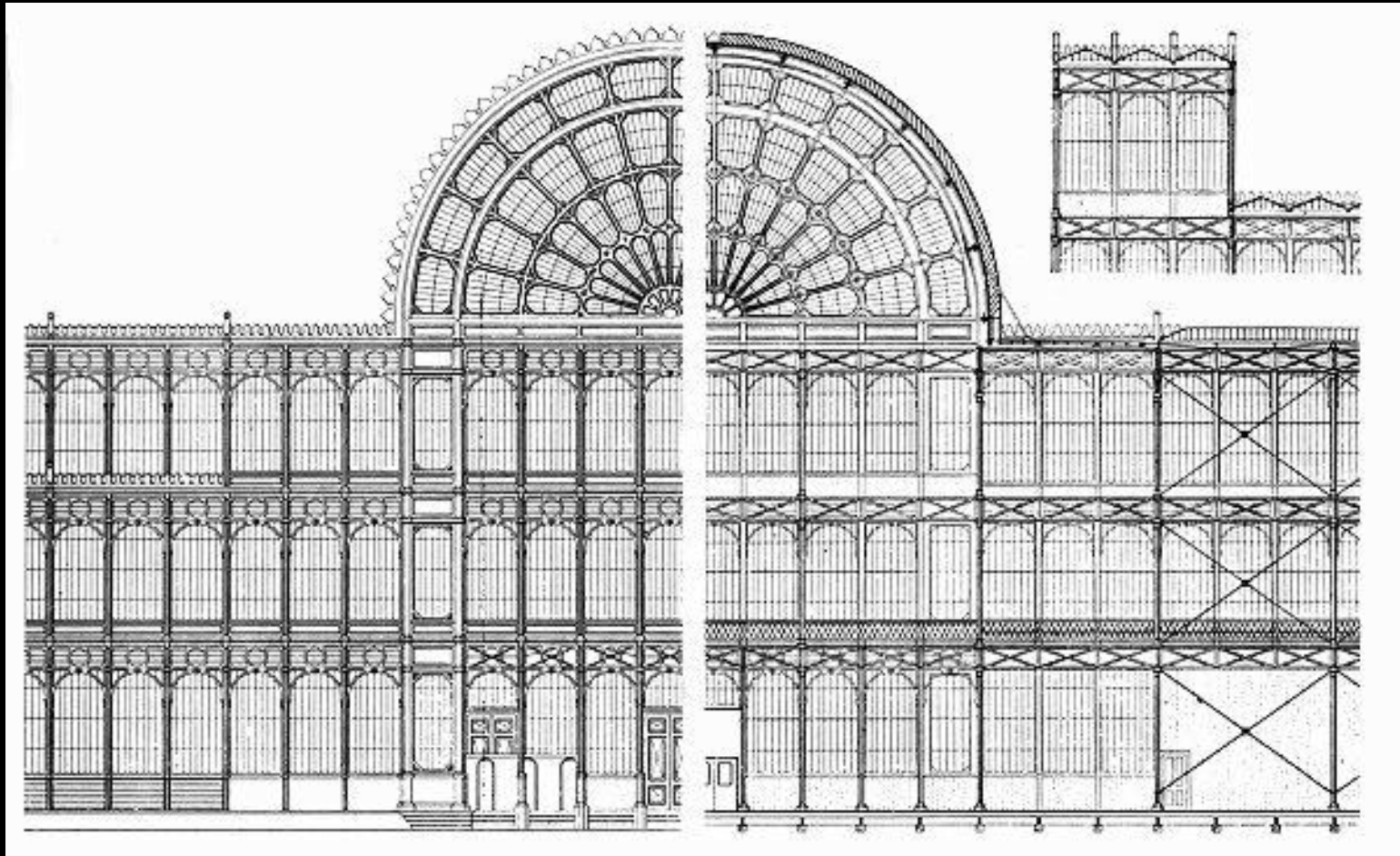


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# Crystal Palace 1851

Iron Frame in sections

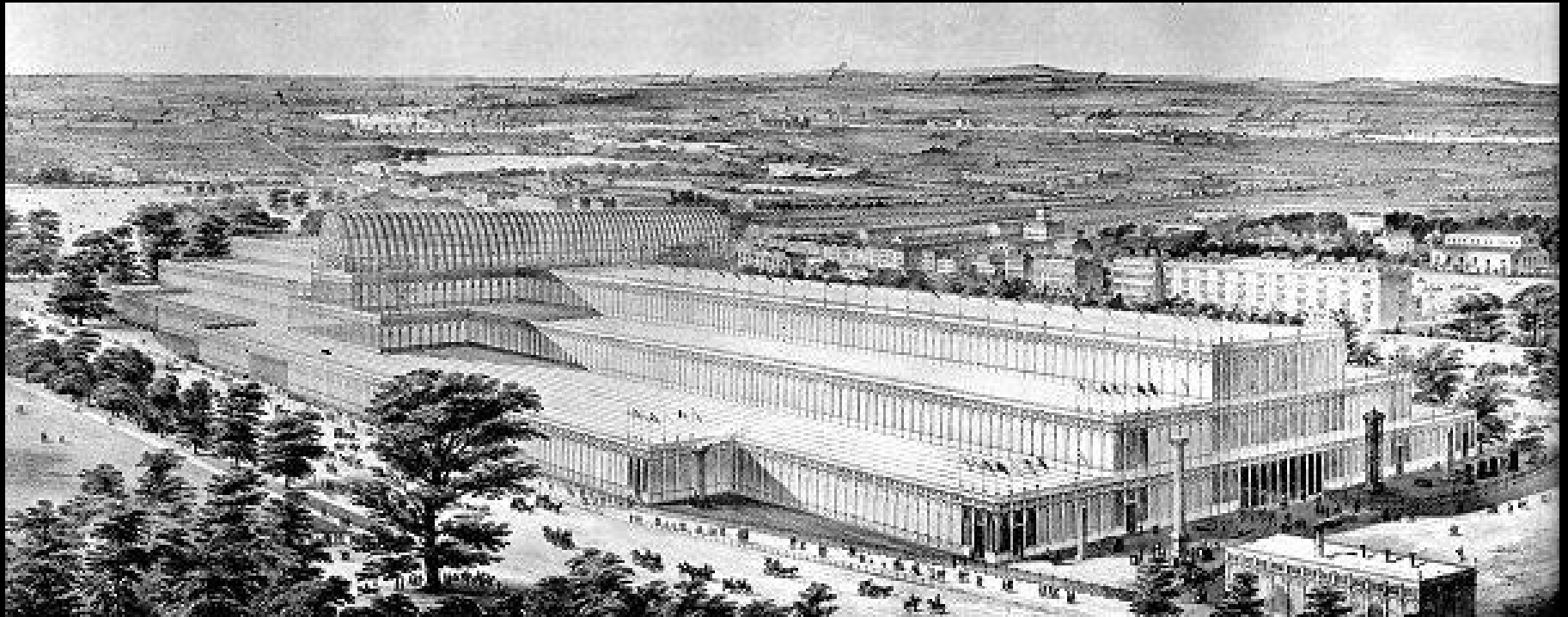
Glass Panels set in wood sashbars in 4' length



# Crystal Palace 1851

Re-erected, but was accidentally destroyed by fire in 1936

In 1851, it was the largest building ever constructed 700,000 sf



# Paris Exhibition of 1889

Exhibitions showcased great Architecture and Technical Accomplishments

Most buildings at the Exhibition were quite ordinary, except for 2:

Machine Hall  
Eiffel Tower



# Machine Hall

Paris Exhibition of 1889

Engineering Masterpiece

Engineer Contamint and Architect Ferdinand Dutert



# Machine Hall

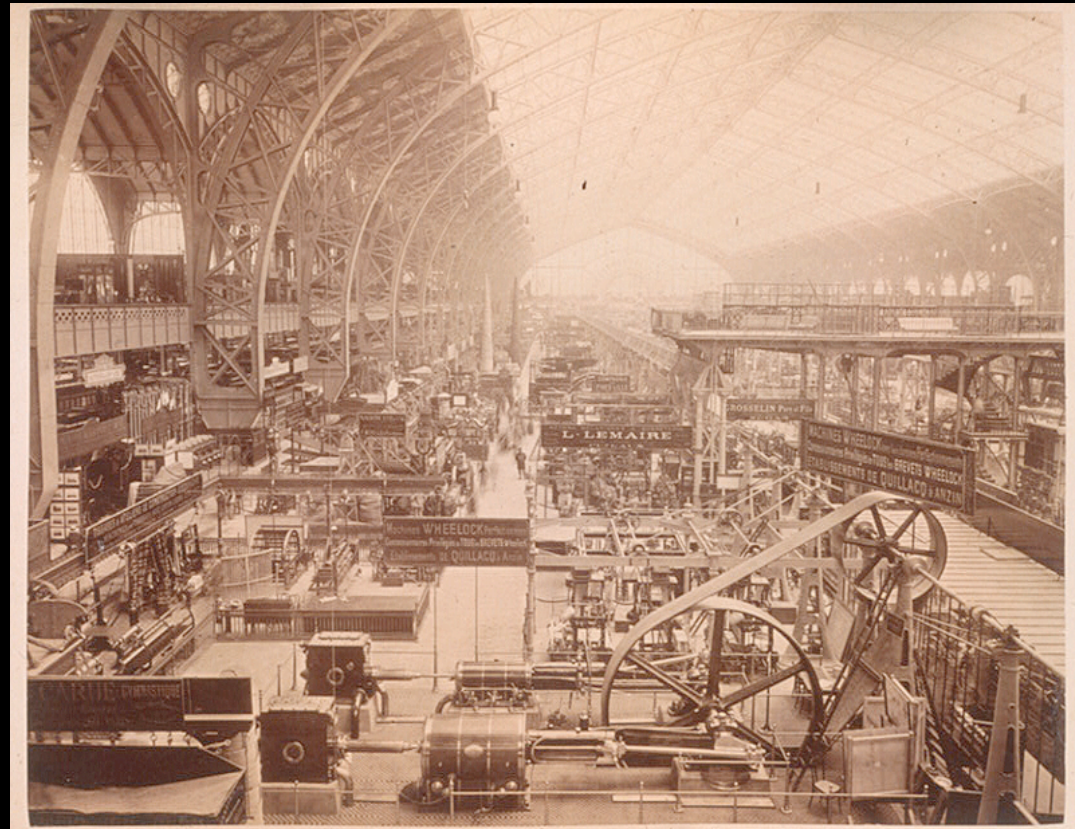
Vast Open Space to display Industrial Machinery

Spans 380' wide and a height of 150'

Mainly Steel and Glass

Outside walls did not  
between girders =  
Curtain Walls

Decorative Glass Panels





# Eiffel Tower

Paris Exhibition of 1889

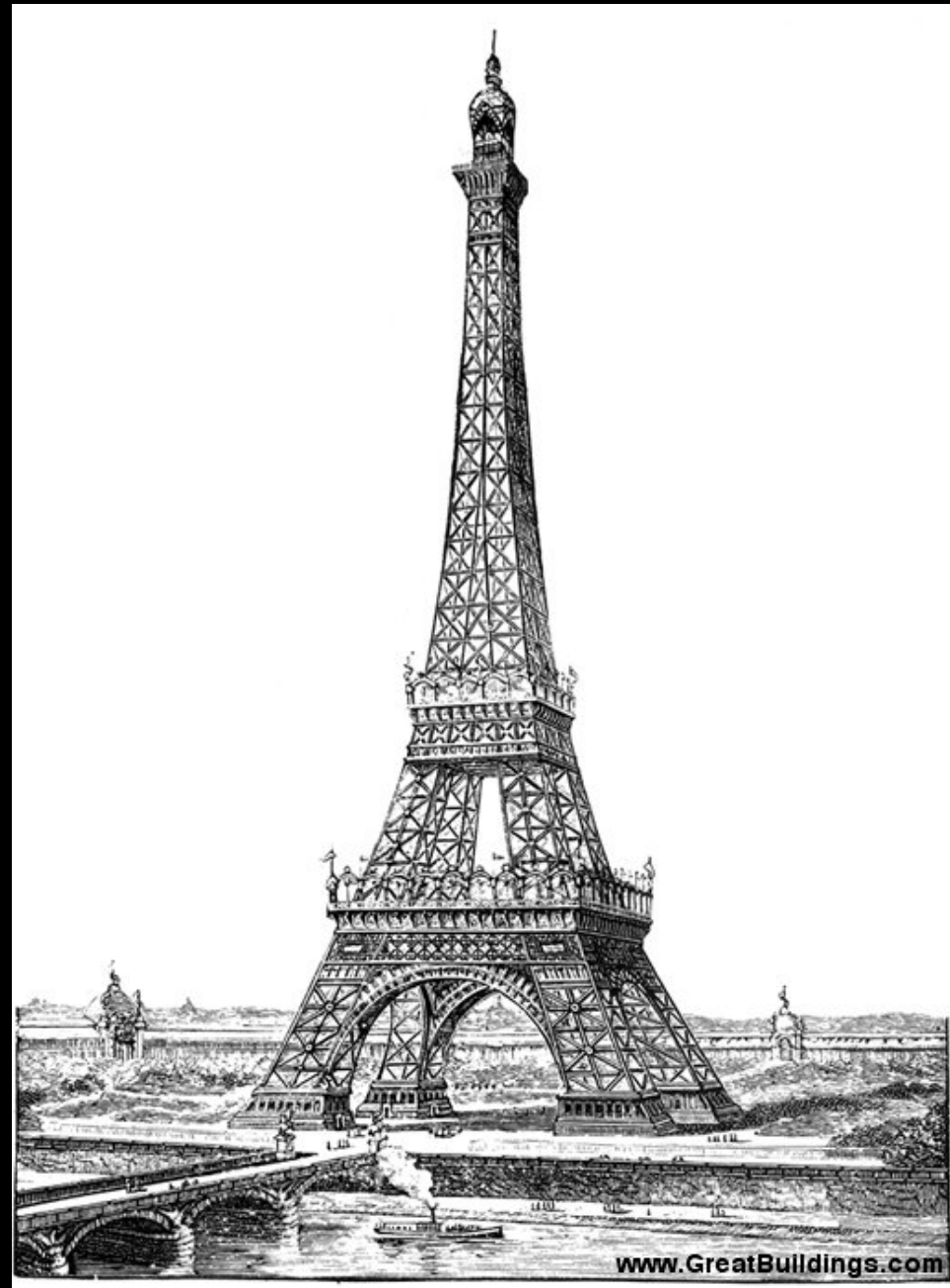
Alexandre Gustave Eiffel

1000' tall – tallest structure  
of its time

Rests on 4 pylons

Symbol of Modern Paris

Steel structure

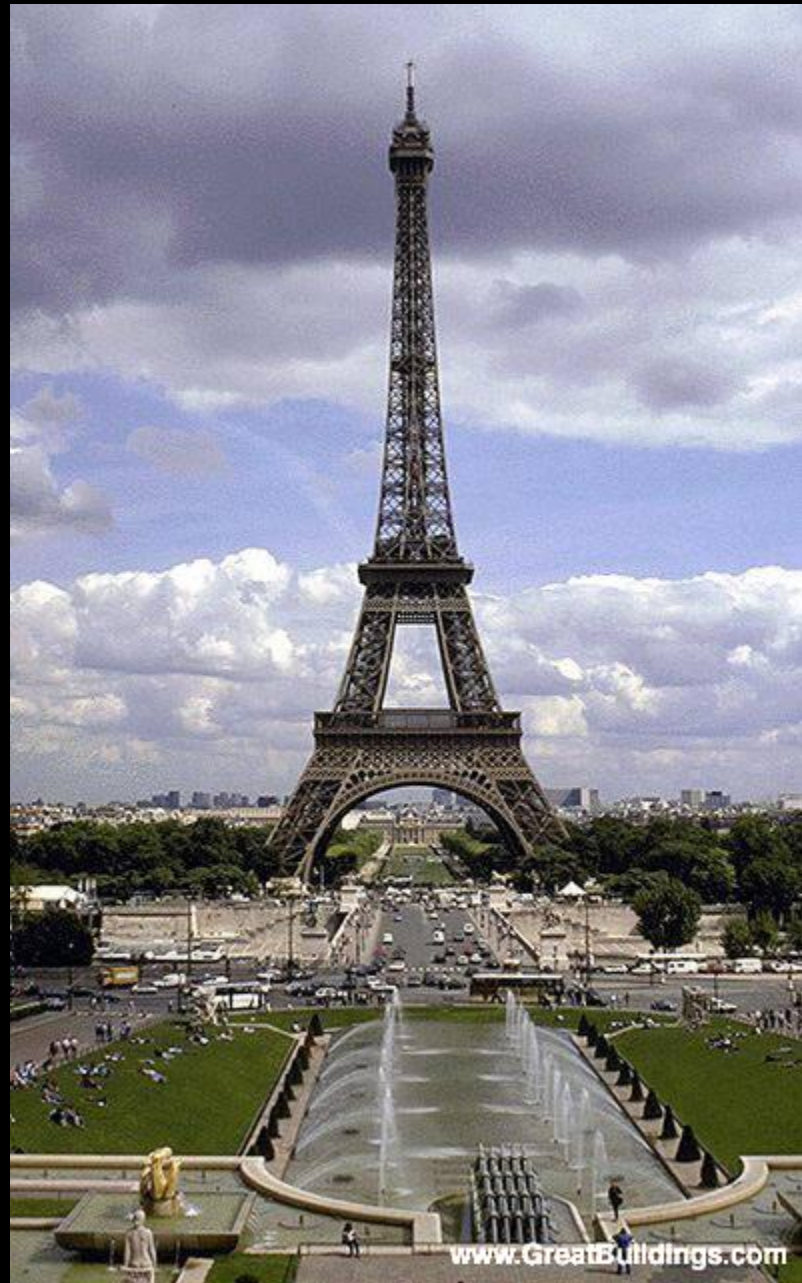


# Eiffel Tower



Rests on 4 pylons

# Eiffel Tower



# Galleria Vittorio Emanuele

## Emanuele 1865-1877

Milan, Italy

Giuseppe Mengoni

Cruciform plan with a large octagonal dome over the crossing

Vast Arcade that covered shops and cafes.



# Galleria Vittorio Emanuele 1865-1877

Milan, Italy



# The Reliance Building 1890

Chicago, Illinois

Daniel H. Burnham and John W. Root

Ancestor of the Modern Skyscraper



# The Reliance Building 1890

Chicago, Illinois

Four-Storeyed Structure was completed in 1890

Extended to 13 Floors in 1894



# The Reliance Building 1890

Chicago, Illinois

Designed based on Proportions

Steel Frame faced with Terracotta





# The Paris Opera House 1874

Paris, France

Won by competition – Charles Garnier

Tight Site – Carriage Ramp, Approach Steps



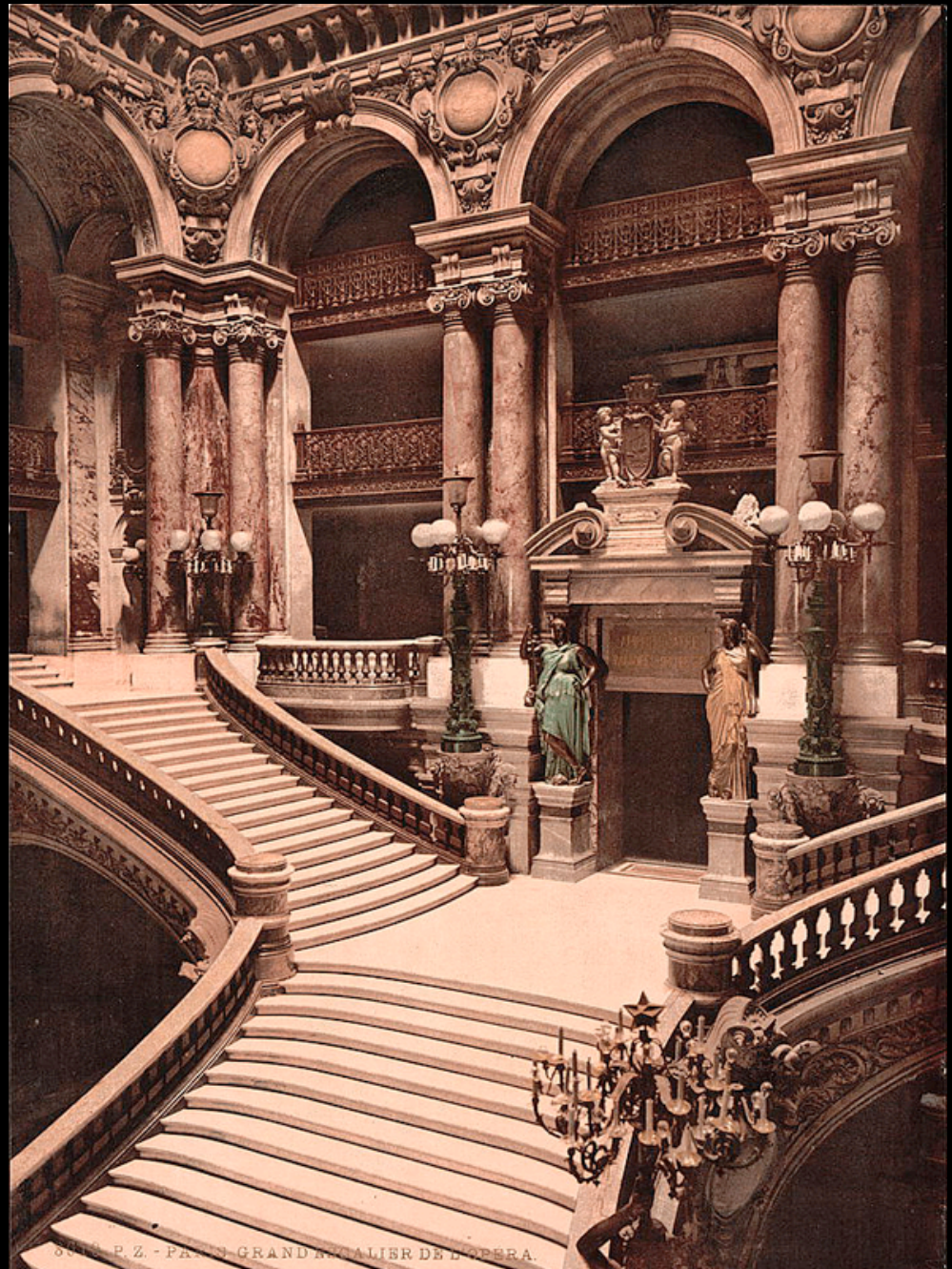
# The Paris Opera

House 1874

Paris, France

Monumental and much ornament – multicolored marble and elaborate statuary

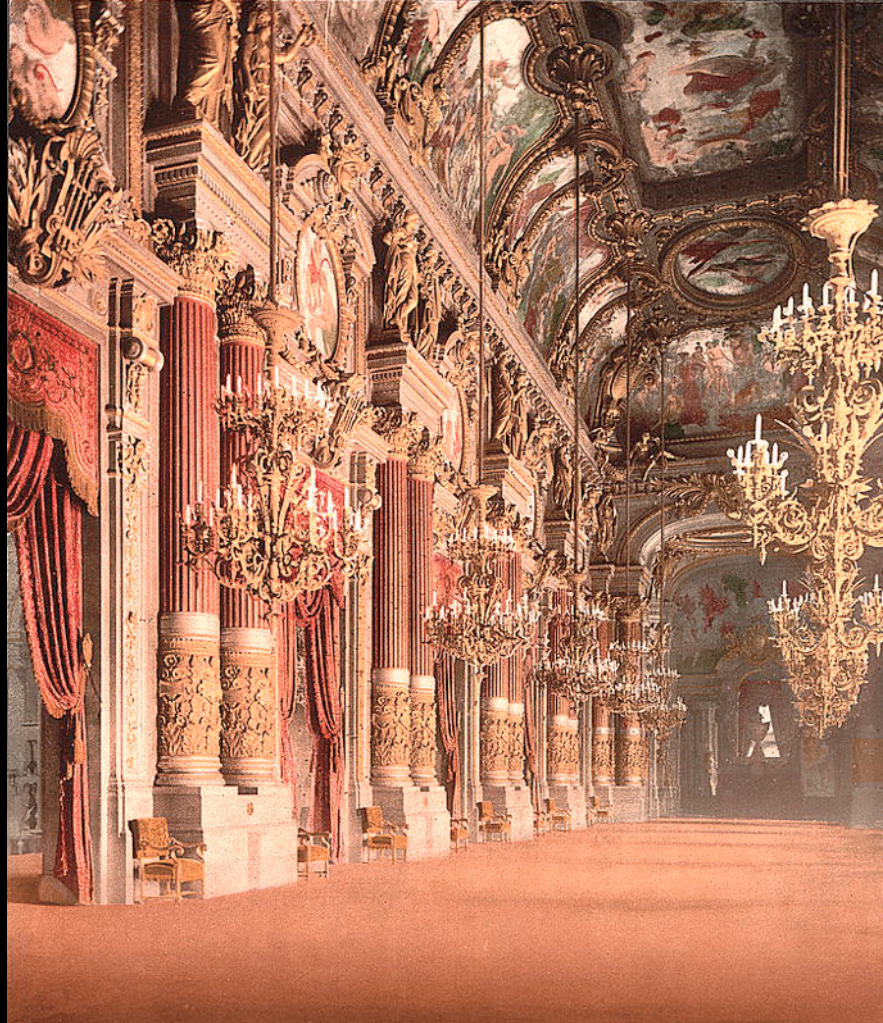
A place to be seen – large staircase and balconies



# The Paris Opera House 1874

Paris, France

The marble ornament was not structural, but hung from a steel frame



# The Paris Opera House 1874

Paris, France

Arranged around a central horseshoe auditorium

