

University of Biskra, Algeria
Department of Architecture

Pedagogical Handout

Critical History of Architecture 5

By ZERARI Sami, PhD

Pedagogical Handout for third-year undergraduate
students, LMD system

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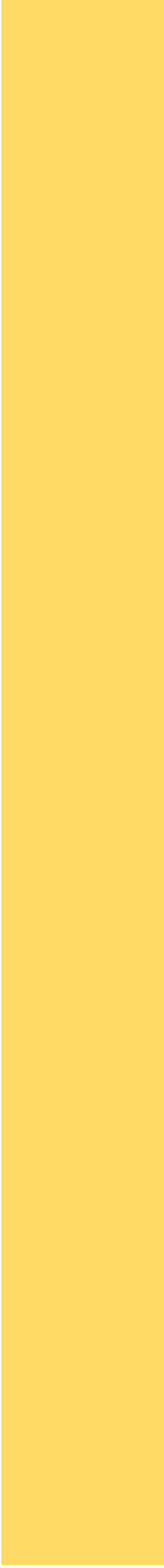


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General Introduction

General Introduction

The Notion of Style in Architecture

“Style” is an especially popular term, whose customary use often obscures its conceptual depth. It comes from the Greek word “στυλός”, which means the quill, but also the column. From “στυλός” to the Latin “*stilus*”, the word eventually transformed to “*style*” in Middle English during the 9th century and is established in Greek as a re-borrowed word, standing in for “*τεχνοτροπία*”. Yet, as deeper as we dive into its etymological roots, it seems as if style always escapes a concise definition (Theotokatou, 2021).

The emergence of the concept is traced back to the late 18th century, and up to now, it is widely discussed, going through significant transitions. Modern tradition of the early 20th century treated the concept of style with cautiousness, being synonymous with the 19th century’s intense folding around history and the past - perhaps that suspicion armed post-modernism’s opposition to modernism. Recent research confirms that stylistic analysis remains a particularly fertile field of study. Despite - or perhaps because of - the controversial nature of the concept of style, it continues to fuel theoretical and methodological debates. Style can be considered from a number of complementary or competing angles: as a tool for classifying artistic genres, enabling works to be grouped according to shared formal characteristics; as a vector of emotional expression, translating the sensitive and subjective impact that art or architecture has on the viewer; or as a criterion of aesthetic evaluation, referring

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to cultural and historical archetypes that define what is perceived as “beautiful”, “noble” or “refined” in a given period (Theotokatou, 2021; Hvattum, 2019).

Style in architecture refers to the set of visual, technical, and symbolic characteristics that define the appearance of a building or architectural ensemble. Each style reflects an era, a culture, and a vision of the world, and often reflects the technical advances and aesthetic or functional concerns of a given society (Zerari, Sriti, Pace, 2020). It manifests itself through a specific combination of forms, materials, proportions, ornamentation, and construction techniques. Each architectural style is born in a specific historical context and evolves according to the cultural, religious, political, and economic influences of its time.

Architectural styles are not static: they evolve, transform, and sometimes combine with other influences to give rise to hybrid and innovative forms. Understanding architectural styles not only offers a better understanding of urban and heritage landscapes, but also of the major cultural dynamics that have shaped our societies. In this way, architectural styles make it possible not only to identify a historical period, but also to understand the values it embodied (Zerari et al, 2024). Studying architectural styles means delving into the history of humanity through its built forms.

Distinguishing between architectural styles is based on a number of general criteria that can be used to identify the different approaches and characteristics of buildings. Firstly, the use of materials is a key indicator: the choice between stone, brick, wood, steel, glass, or concrete can

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reveal stylistic influences. Secondly, shape and structure play an important role; some styles favour straight lines and simple geometric shapes, while others opt for organic, sinuous, or asymmetrical forms. Decorative details are also essential; certain styles emphasise rich ornamentation (floral motifs, sculptures, frescoes), while others favour simplicity and an absence of decoration. Functionality and interior layout can also provide clues; some styles favour symmetry and balance, while others focus on innovative ways of organising spaces. Finally, the influence of the cultural and geographical context plays a decisive role, as architecture often adapts to local conditions, traditions, and available materials.

Objectives of the Module “Critical History of Architecture 5”

The study of the critical history of architecture is a fundamental component of the training of future architects. It is crucial to understanding how buildings and spaces have evolved over time, reflecting the cultures, ideas, and social contexts of different eras.

Considering this, the present pedagogical handout of “Critical History of Architecture 5” is addressed to third-year architecture undergraduate students enrolled in the LMD (Licence-Master-Doctorat) system. It allows students to:

- Classify architectural heritage and forms of expression according to style and typology,
- Interpret architecture as a reflection of broader socio-cultural dynamics, and

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- Promote and develop a spirit of critical analysis of the built environment.

Prerequisites

Achieving these objectives requires prior knowledge acquired in “Critical History of Architecture” modules 1, 2, 3, and 4, as well as solid general knowledge.

Structure of the Handout

The contents of this handout are structured around seven (07) themes (or chapters) as indicated in the 2017-2018 CANEVAS. These chapters are:

- The foundations of the Classical Renaissance and the birth of modern thought,
- Mannerist alternatives and Baroque,
- Neo-Classicism in architecture,
- The Industrial Revolution and illuminism in architecture,
- Historicism and eclecticism,
- The Art Nouveau, and
- The Chicago School of Architecture.

By placing architectural style at the crossroads of disciplines (art, technology, society, and culture), and through a historical, theoretical, and aesthetic approach, each of the aforementioned chapters follows a coherent structure, beginning with the general context of the birth of the architectural style in question, including its definition, the main factors that influenced its formation, as well as its historical evolution. It then highlights the essential characteristics of the style, illustrated by concrete examples highlighting its distinctive features.

Chapter I:

The Foundation of the Classical Renaissance and the Birth of Modern Thought

Chapter I: The Foundation of the Classical Renaissance and the Birth of Modern Thought

Introduction

This chapter explores the origins of the architectural revival that took place in Europe from the 14th century onwards, marking the beginning of an era of rediscovery and profound transformation. By reviving the principles of ancient architecture, particularly those formulated by Vitruvius in *De Architectura*, Renaissance architects laid the foundations for an architectural language based on proportion, symmetry, and harmony.

This chapter examines how these classical foundations were revisited in light of the humanist values of the time, giving rise to a new way of conceiving and decorating buildings that were both rational and symbolic.

I.1. General context of the birth of the Classical Renaissance and the Birth of Modern Thought

II.1.1. Definition

In the context of the Renaissance, “Classics” refers to the study and appreciation of the literature, art, and philosophy of ancient Greece and Rome. During this period, Renaissance scholars and artists turned to the works of ancient Greece and Rome for inspiration and guidance. It gradually spread to all the other countries of Europe between the early fifteenth and early seventeenth centuries (Vergara & Tomasella, 2001, pp.91-93).

I.1.2. Birth and evolution of the Classical Renaissance in architecture

The Renaissance began in the 15th century, at the end of the Middle Ages, in the Italian city of Florence. This period marked an intellectual and artistic revival during which artists and scholars rediscovered the knowledge of Antiquity, while developing a new vision of the world based on confidence in man and his abilities: humanism (Bibliothèque Nationale de France, 2012; Vergara & Tomasella, 2001, pp.91-93). Careful study of ancient buildings encouraged 15th-century designers to imagine new styles. Churches, palaces, and even private residences were inspired by ancient constructions (columns, pediments, domes, etc.). Their harmony was also based on a constant search for symmetry and a rigorous calculation of proportions. Indeed, Italian Renaissance scholars viewed antiquity as the pinnacle of artistic achievement. However,

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their goal was not to simply reproduce ancient models, but to draw inspiration from them in order to equal or even surpass them.

The Renaissance was characterised by a profound revival of interest in Antiquity, both in thought and in art and architecture. According to Cartwright (2020), two main reasons explain this return to classical sources in architecture:

- The rediscovery of ancient remains. Southern Europe, and particularly Italy, was still teeming with visible Greco-Roman ruins in the 15th century: basilicas, baths, aqueducts, amphitheatres, and temples, some of which—such as the Pantheon in Rome (circa 125 AD)—were remarkably well preserved. Renaissance architects studied these buildings in detail, taking precise measurements and carrying out rigorous surveys. Their analysis was not limited to Antiquity: they also examined Byzantine, Romanesque, and medieval buildings; they often rejected Gothic architecture, which was perceived as a "northern" intrusion that ran counter to the Italian heritage. This rejection of the Gothic style was accompanied by a desire to reconnect with an architectural tradition considered authentically Italian, without, however, completely breaking with the Middle Ages.
- The rediscovery of ancient texts. Vitruvius's *De Architectura* (c. 90–20 BC) was another major source of inspiration. Written between 30 and 20 BC, this treatise combines technical considerations, historical observations, and personal reflections. Its rediscovery in the 15th century and its first printing in Rome in 1486 profoundly influenced Renaissance architects, who found in it fundamental principles such as symmetry, mathematical proportions, and harmony of form. Some even attempted to materialise the buildings that Vitruvius had only described theoretically. Moreover, this treatise encouraged several Renaissance architects to write their own theoretical writings on architecture.

Renaissance architecture was an evolutionary movement that is, today, commonly divided into three phases (Cartwright, 2020):

- The Early Renaissance (or Quattrocento from around 1400), the first attempt to reuse classical ideas;
- The High Renaissance (around 1500), the revival of classicism;

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- Mannerism (also known as the late Renaissance, around 1520-30), when architecture became much more decorative, and the reuse of classical themes become ever more inventive.

Historians rarely agree on the exact date of these changes, which are also largely dependent on geography, both at the level of countries and individual cities.

First appearing in Florence with the innovations of Filippo Brunelleschi, the Renaissance style spread to the other city-states of the peninsula in a few short years; thanks to the Italian wars, it reached France, then Flanders, the Holy Roman Empire, the Balkans, England, and Russia, exerting an influence that varied and contrasted from one region to another.

In France, the wars in Italy led by the kings of France from the end of the 15th century led to the discovery of Italian art and, more particularly, Italian decoration. This was particularly appreciated by King François I, who attempted to bring Italian art to France. To this end, he brought back a team of Italian artists to embellish the royal residences. Leonardo da Vinci was one of the artists who made the journey to France, but he died shortly after his arrival.

In Northern Europe, the artistic Renaissance also had an impact, but the Gothic tradition remained firmly rooted in the Nordic countries. However, Flemish artists were influenced by the Italian Renaissance and began to paint more rationally and symbolically, for example, the materiality of wealth (**Figure I.1**).

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Figure I.1. Map showing the evolution and spread of the classical Renaissance in architecture. **Source :** <https://www.lhistoire.fr/portfolio/carte-la-rennaissance-xve-xvie-si%C3%A8cle>

I.1.3. Contributions of the Renaissance in 16th-century Italy to the history of architecture

The 16th century in Italy was marked by the Renaissance, an upheaval of styles and a period of artistic and scientific renewal. In architecture, this period was marked by the abandonment of Gothic structural principles (transmission of thrust through ogives and buttresses), which had never been established in Italy. The ancient methods of weight-bearing architecture were rediscovered, brought up to date, and innovated. With the death of the Gothic style, we moved from verticality to a transcendent horizontality (Samuel, 2010). To achieve this, architects became historians and theoreticians. One of these architects was Andrea Palladio (1508-1580), who collaborated on the Venetian republication of Vitruvius' *De architectura*, written in 25 BC. He also wrote his own treatise on architecture, his famous "*I quattro libri dell'Architettura*" (Samuel, 2010).

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This gives us a complete understanding of the vocabulary of antiquity (orders, proportions). However, we cannot remake ancient architecture: needs are different from those of antiquity. For the bourgeois and noble classes, the city house was the palazzo, the country house the villa (Samuel, 2010).

In the wake of Bramante (a leading figure of the High Renaissance, who died in 1514), two architectural styles emerged:

- **Academicism:** getting closer to ancient truth as suggested by Andrea Palladio, leading to Classicism, Neo-Classicism (Palladianism).
- **Mannerism:** represented by Michelangelo (1475-1564), drawing on Antiquity while breaking with the codes of representation (hence the name of this movement).

These two approaches both lead to the Baroque, a style at the crossroads of the 16th and 17th centuries.

I.1.4. Palladio's contribution to Classical Renaissance architecture

Andrea di Pietro della Gondola, known as Palladio (**Figure I.2**), born in Padua on 30 November 1508 and died in Vicenza on 19 August 1580, was the architect par excellence of the humanist and classical age (Caye, 2017).

Palladio was a learned architect, thanks to the remarkable humanist patrons, first Gian Giorgio Trissino (1478-1550) and then Daniele Barbaro (1514-1570), who trained him in Vitruvius and antiquities. In 1534, he took charge of the Villa Cricoli worksite for Count Trissino, with whom he visited Rome and its excavations on several occasions (1541, 1545, 1547, 1549). It was to Count Trissino that he owed his nickname “Palladio”, Pallas being, in Trissino's great epic poem *Italy Liberated from the Goths*, the angel who, during the siege of Ravenna, visited Belisarius, the magister equitum of the Emperor Justinian, in his dreams, to show him the plans and exits of the fortress he was besieging (Caye, 2017).

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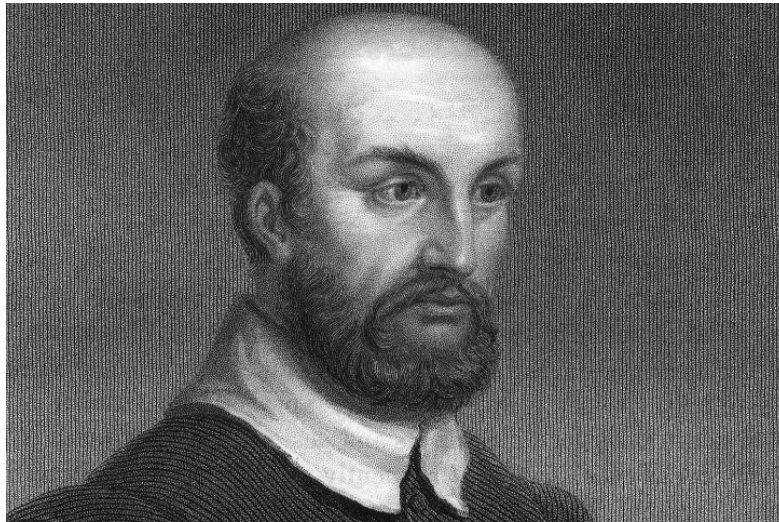


Figure I.2. Portrait of Andrea Palladio (1508-1580) engraved in the 19th century by R Woodman. Photo by The Print Collector/Hulton Archive Collection/Getty Images (cropped). **Source:** <https://www.thoughtco.com/andrea-palladio-influential-renaissance-architect-177865>

Andrea Palladio was not just an architect in the strict sense of the word: as a “sculptor of buildings”, he was capable of designing and “forging” harmoniously complex structures in relation to the surrounding space. This capacity for invention, inspired by the great models of antiquity, was accompanied, however, by an equally original attention to the concrete conditions of creation and construction. In this sense, Palladio retained his intuition as a builder and craftsman throughout his life (Pericolo, 2004). He created some of the greatest masterpieces of architecture: the Church of the Redeemer (1577) in Venice, the Villa della Rotonda (1566-1571) and the Teatro Olimpico (1580) in Vicenza, to name but a few (Caye, 2017).

In addition to the Venetian republication of Vitruvius' *De architectura*, Palladio himself wrote several illustrated books on architecture. His major work, “*I quattro libri dell'Architettura*” or “The Four Books of Architecture”, was first published in 1570 (**Figure I.3**). Immediately popular with architects, the work was translated into several other European languages, including four English editions between 1663 and 1738. The work consists of four books:

- Book I deal with materials, decoration, and the classical orders.
- Book II examines types of rural and suburban dwellings.
- Book III deals with public buildings such as basilicas, bridges, and town planning.
- Book IV deals with reconstructions of known Roman temples that were only in ruins at the time.

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The work “*I quattro libri dell'Architettura*” contributed significantly to the dissemination of Palladio's ideas on architecture. Although centred on the principles of classical architecture, Palladio frequently incorporated his own drawings to illustrate his ideas, thus blending classical theory with personal interpretation (Cartwright, 2020).

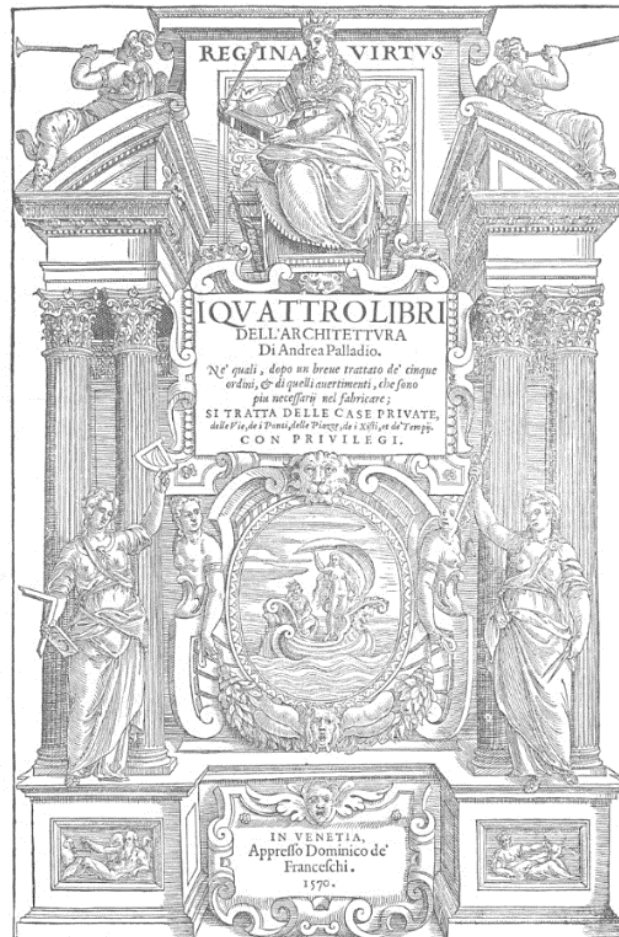


Figure I.3. *I quattro libri dell'architettura*. **Source:** <https://www.amazon.it/quattro-libri-dellarchitettura-Andrea-Palladio/dp/8820306131>

Palladio's drawings, models, and motifs had already attracted the attention of architects in Italy and abroad, with his books on architecture becoming even more popular than Serlio's similar works, which had already enjoyed great success. A notable imitator was the English architect Inigo Jones (1573-1652), who collected original drawings by Palladio after a visit to Italy and thus introduced his style to England (**Figure I.4**). Jones designed such imposing structures as the Queen's House at Greenwich and the Banqueting House at Whitehall in London, both in the second decade of the 17th century.

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Palladio's designs were also popular in Ireland and the American colonies, leading scholars to identify a distinct “Palladian movement” in architecture, often referred to as Palladianism. Perhaps Palladio's most visible contribution to world architecture remains his use of the classical façade of a temple as a covered entrance porch, which has since been copied in buildings ranging from modest country houses to large public libraries (Cartwright, 2020).



Figure I.4. Robert van Voerst, Portrait of Inigo Jones, after Anthony van Dyck, from *Icones Principum Virorum*, before 1636. **Source:** <https://smarthistory.org/banqueting-house/>

I.2. Characteristics of the Classical Renaissance Architecture

According to the Department of Education of the Canton of Berne, Office of Culture (Historic Monuments Service), Renaissance architecture represents a reaction to the overloading of Gothic architecture. The essential feature of this architecture is a return to Antiquity, both Greek and Roman, characterised using Doric, Ionic, and Corinthian columns. But they did not seek simply to imitate it, but to draw inspiration from it in order to match or even surpass it.

- Columns, pilasters, capitals;
- Use of pediments, semi-circular arches, and domes;
- Sumptuously decorated facades;
- Facades structured by plastic elements (horizontally and vertically);

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- Juxtaposition of clear geometric shapes (circle, square, and rectangle in the plan → sphere, hemisphere, cube, parallelepiped, and cylinder in the volume).
- Numerous buildings with a centred, regular plan (right-angle connections “obtuse or acute angles were outlawed”);
- Symmetrical plan;
- The symmetry, proportion, regularity, and balance of patterns;

I.3. Examples of Renaissance architecture

I.3.1. The Farnese Palace, Rome, Italy

The Farnese Palace best expresses the ambitions of a middle-class noble family from Lazio to rise to the level of the ancient Roman dynasties (Colonna, Savelli, Caetani), to rub shoulders with the European courts, and to create a hereditary state (Extermann, 2019).

This palace is the perfect expression of High Renaissance architecture: mastery of proportions, ancient inspiration, grandeur without excessive ostentation, and innovation within tradition (**Figure I.5**). It also marks the transition to Mannerism, thanks in particular to the work of Michelangelo. The façades of this palace are characterised by :

- The main facade is symmetrical and imposing, spanning three storeys.
- Discreet rustication on the ground floor, giving an effect of solidity without heaviness.
- The round-headed windows are framed by alternating triangular and arched pediments, typical of the Mannerist aesthetic.
- A spectacular cornice (added by Michelangelo) completes the building: it is one of the largest and most elegant cornices of the Renaissance (Extermann, 2019).

As for the spatial organisation of the palace, it is organised around a columned portico on three levels, reminiscent of Roman atriums. It introduces the classical order: Doric columns at the bottom, Ionic columns in the middle, and Corinthian columns at the top. This system of superimposed orders directly evokes ancient architecture, in a spirit of mathematical balance. The palace was decorated by great artists such as Annibale Carracci, who created the famous Farnese Gallery, a masterpiece of early Baroque painting. The rooms are rich in stucco, frescoes, marble, and precious woodwork.

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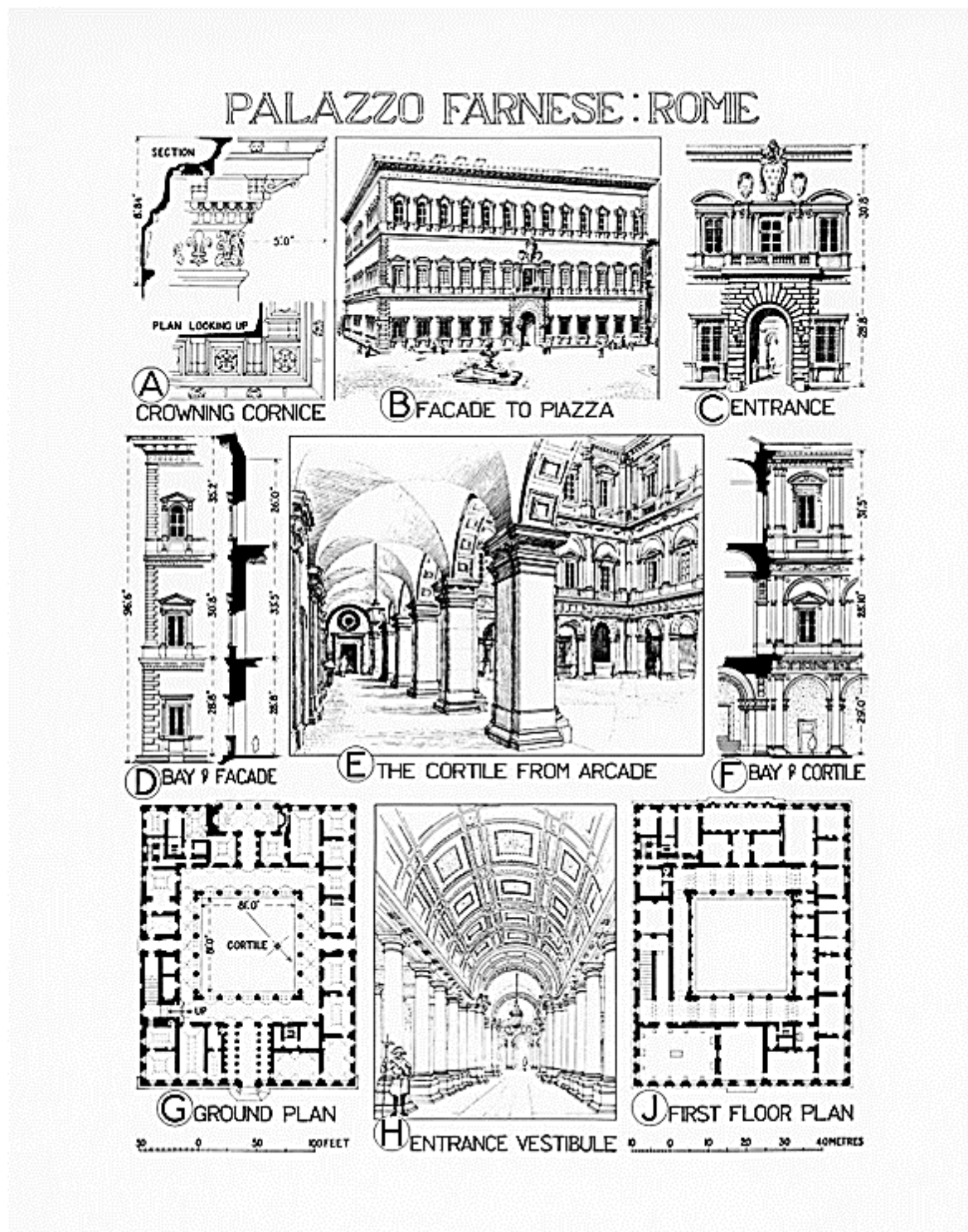


Figure I.5. Farnese Palace: plan, façade, and details. **Source :** https://www.ribapix.com/palazzo-farnese-rome-plans-elevations-perspectives-and-details_riba100935

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I.3.2. Villa Rotonda near Vicenza, Italy

Villa Rotonda was originally called “Villa Almerico”, after Paolo Almerico, a canon in the service of the Pope. It was designed by the architect Andrea Palladio. The first plans were drawn up in 1566, and construction was more or less completed in 1569.

More than just a house, the villa served as a country residence and a place for relaxation and receptions. It is built on a hill and comprises three levels: the ground floor (with annexes, kitchen, and staff bedrooms), the upper floor (ceremonial rooms), and an attic floor containing the bedrooms.

The villa was built on a Greek cross plan (**Figure I.6**). Wide front staircases lead up to the main floor (**Figure I.7**). Palladio said regarding the Villa Rotonda:

« Etant avantagée de tous les côtés de très belles vues, les unes bornées, quelques-unes plus loin-taines, et d'autres encore qui sont à perte de vue, on lui a donné des loges à toutes les quatre faces, sous le plan desquelles et de la salle, on a pratiqué des chambres pour l'usage et pour la commodité de ceux du logis. La salle est ronde et dans le milieu du bâtiment, et reçoit le jour d'en haut. Les cabinets ont des mezzanines... A l'extrémité des piédestaux qui servent d'appui aux escaliers des quatre loges, il y a des statues de Maître Lorenzo Vicentino, sculpteur excellent. » (The Four Books of Architecture, book II, Chapter 3).

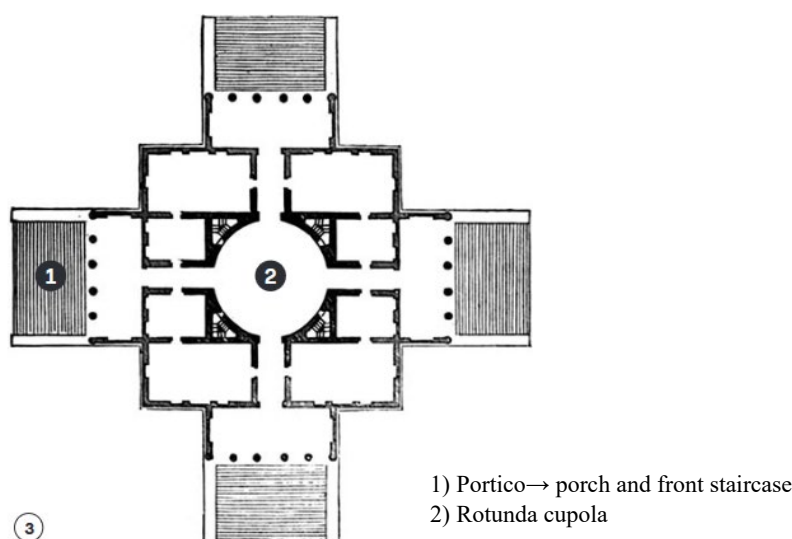


Figure I.6. Plan of the Villa Rotonda, Andrea Palladio, 1570. **Source :** Direction de l’instruction publique du canton de Berne

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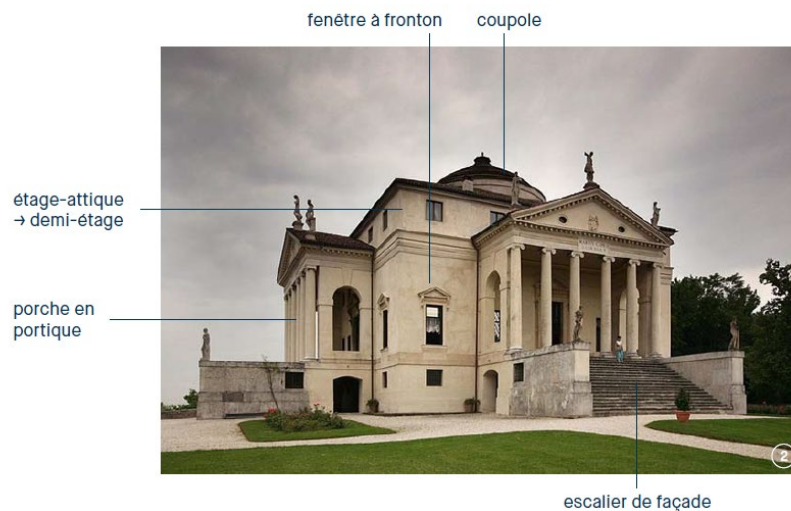


Figure I.7. View of the Villa Rotonda. **Source :** Direction de l’instruction publique du canton de Berne

I.3.3. Pitti Palace in Florence, Italy

The Pitti Palace is located in Florence, Italy. It was built in the Oltrarno district (west bank of the River Arno), not far from the Ponte Vecchio. The heart of the present palace dates from 1458 and was originally the residence of Luca Pitti, an ambitious Florentine banker (**Figure I.8**).

The Palazzo Pitti embodies the monumental sobriety of early Renaissance architecture in Florence. When it was first built in the 15th century, it broke with Gothic extravagance to return to an aesthetic inspired by classical antiquity, typical of the Renaissance.

According to Vasari, the Palazzo Pitti was designed by Brunelleschi, although there is no proof of this. This imposing building was constructed in the second half of the 15th century. The work was commissioned by the Florentine merchant Luca Pitti, a friend and ally of Cosimo de' Medici, and carried out by Brunelleschi's apprentice Luca Fancelli. Luca Pitti wanted his residence to be the most majestic in the city. Pitti bought all the houses between his new Palazzo and the hill path to build the Boboli Garden.

The main facade is massive, made up of three levels with rusticated stonework (large blocks of stone left rough or only slightly carved). The symmetrical arrangement of the bays (round-headed windows) reinforces the classical rigour.

No superfluous ornamentation. The effect of grandeur comes from the very structure of the building and the interplay of shadows between the stone blocks. Rustication is the main

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decorative technique used in the Palazzo. It is a decorative technique that gives a raw, imposing texture to stone. This treatment gives an impression of power and solidity, in line with the Pitti family's political ambitions.

The Palazzo Pitti bears classical influence. It is inspired by Roman models, with the use of arches, invisible columns, and a regular rhythm. The tripartite elevation of the building recalls the classical division of the wall into base, middle and top, with an effect of balance and order.

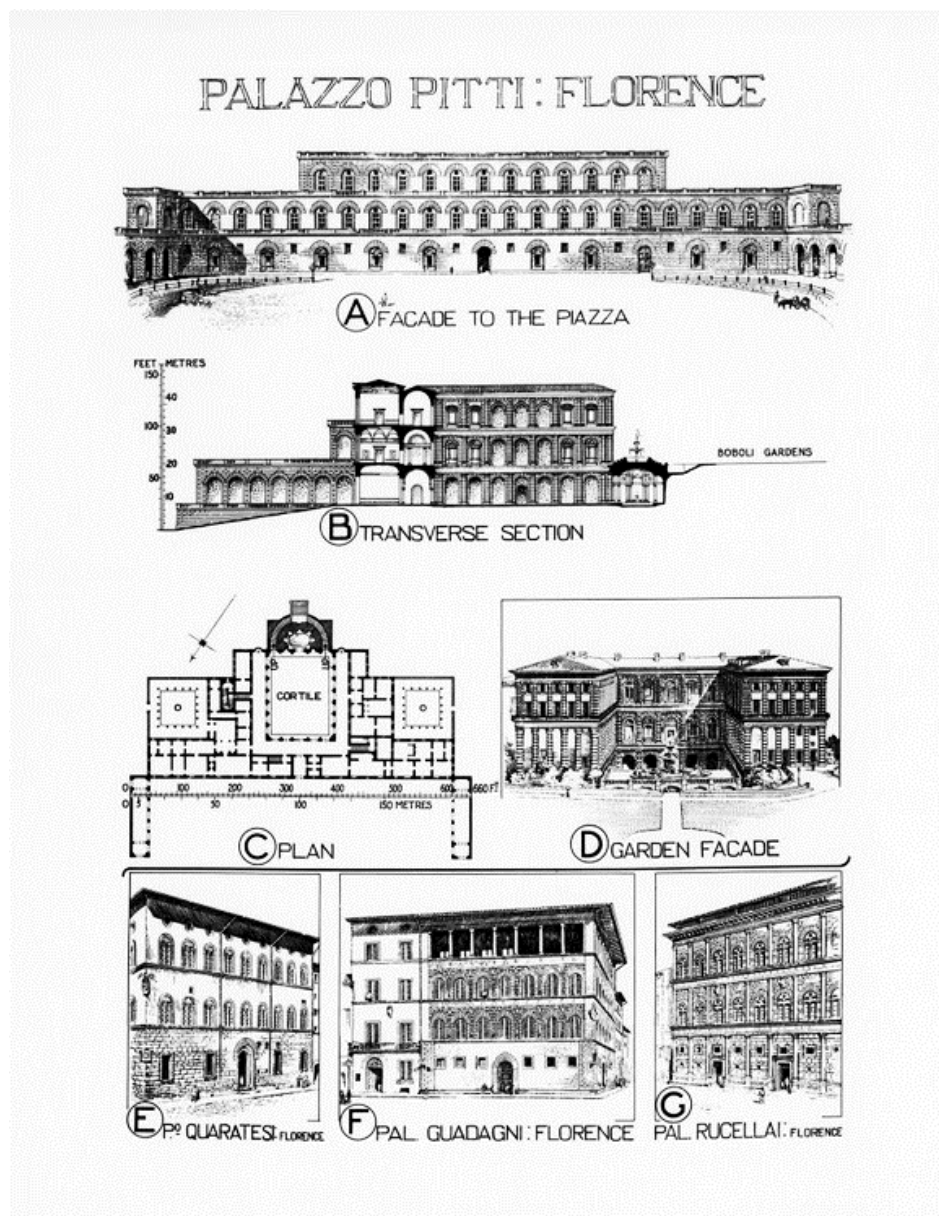
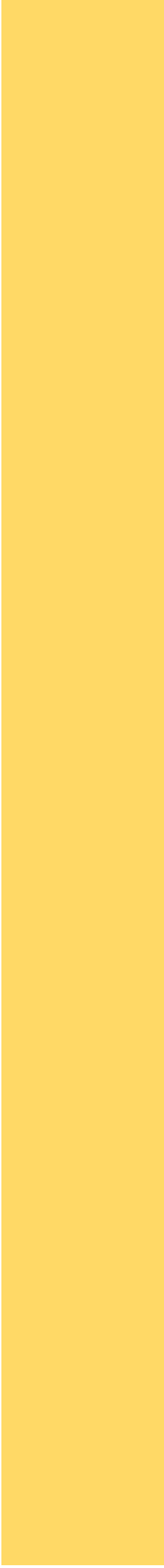


Figure I.8. Pitti Palace in Florence, Italy. **Source :** https://www.ribapix.com/palazzo-pitti-florence-a-d-palazzo-quaratesi-florence-c-palazzo-guadagni-florence-f-palazzo-rucellai-florence-g-plan-section-and-perspectives_riba100925

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Conclusion

This chapter revealed the fundamental roots of a major turning point in European cultural and artistic history: the Classical Renaissance, through the prism of architecture. This period was marked by the rediscovery of the architectural principles of Greco-Roman antiquity, particularly those of Vitruvius, which profoundly influenced the way space, form, and proportion were conceived. By placing man at the heart of architectural composition, Renaissance architects initiated a revival based on symmetry, harmony, and rationality, thus breaking with medieval conventions.

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Chapter II:

Mannerist Alternatives and Baroque

Introduction

After the Classical Renaissance., major stylistic transformations emerged, reflecting architectural shifts driven by changing cultural, philosophical, and artistic priorities across Europe. While the Classical Renaissance sought balance, clarity and harmony based on models from Antiquity, a new generation of architects gradually introduced freer, more complex, and expressive forms. Moving away from rigid rules and geometric perfection, these creators began to play with conventions, exaggerating certain elements or disrupting the expected order, thus expressing more tension, movement, and individuality in their works. This evolution paved the way for Baroque architecture, recognisable for its dynamism, stark contrasts, use of light effects and strong emotional charge.

This chapter presents how this stylistic transition reflects a desire for formal renewal in a context of profound cultural, spiritual, and political change, marking a new stage in the history of European architectural language.

II.1. General context of the birth of Baroque art

II.1.1. Definition

Admittedly, the word baroque carries a pejorative connotation. Its origin is uncertain: it could come from the Latin *verruca* (wart), from the Portuguese *barroco* (irregularly shaped pearl), or even from Greek *βαρος*, with roots meaning weight, heaviness, or from *Παράνομος*, which corresponds to mad, delirious. We do not know who first applied the term to the arts. However, it appeared as early as the 17th century in Italy as a philosophical concept. It was not until the following century that it really entered the vocabulary of art, with definitions such as: “*A pretentious and eccentric style which came into vogue at the end of the 16th and lasted throughout the 18th century;*” or “*a capricious style prevalent in Italy from 1580 to about 1760*”, or again “*the style which for two centuries heaped together all the products of the three kingdoms of nature*” (Ricci, 1912, p. VI).

II.1.2. Origins/ birth of Baroque art

The birth of Baroque art was strongly linked to the religious atmosphere of the Counter-Reformation and absolutism: the Catholic Church wanted to assert its omnipotence and counteract the influence of the Protestant Reformation, which was challenging its principles.

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This battle (of the Counter-Reformation) was also fought on an artistic level in Rome, the capital of Catholicism, as the popes and the great Italian families launched major works. Churches, palaces, and fountains had to capture the imagination, arouse the emotions of the faithful and exalt their piety. Like the Renaissance, which Baroque art followed, it originated in Michelangelo's Italy, then spread to southern Germany and Flanders, becoming the first universal style. This art found its expression in princely and religious buildings. Names like Rubens, Van Dyck, Hals, Rembrandt, Vermeer, Ruysdael, Vélasquez, Zurbaran, Murillo, Calderón, Bernini, Corelli and Van de Velde evoke the Golden Age of the Baroque (Peçanha, 2008).

Artists and public alike turned to Baroque art because it suited their tastes. They sometimes pushed its principles to excess, but neither of them ever considered radically questioning its foundations. (Ricci, 1912, p. V)

II.2. Characteristics of Baroque art

In contrast to the rigour of classicism, baroque is a style that favours excess, movement, sensitivity, curves, the spectacular and so on. This style aims to produce drama, exuberance, and grandeur (Vergara & Tomasella, 2001, pp.123-124; p.133).

The use of the chiaroscuro technique. This technique refers to the interplay between light and darkness and is often used in paintings of dimly lit scenes to produce a dramatic, high-contrast atmosphere.

Baroque art provokes astonishment through the size and complexity of its forms and the richness of its materials. Baroque sculpture and painting aim to create a real spectacle through “dizzying effects of perspective” and “trompe-l'oeil” (**Figure II.1**). It is worth noting that the trompe-l'œil is a pictorial genre designed to play on the confusion of perception of the viewer who, knowing that he is looking at a painting, a flat painted surface, is nevertheless deceived about the means of obtaining this illusion.

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Figure II.1. Trompe-l'œil technique: : 1) Pietro da Cortona (1596-1669) Triumph of Divine Providence, Palazzo Barberini, Rome; 2) Andrea Pozzo (1642-1709) – Apoteose de Santo Inacio; 3) Andrea Pozzo (1642-1709) – Jesuit Church Vienna, Fresco with Trompe l'oeil (1703). **Source:** <https://domenicoscarlatti.wordpress.com/r-d/trompe-loeil/>

Baroque works covered a wide range of subjects, including religion, nudes, history, and portraiture. The artists sought dramatic and emotional effects by showing, for example, the figures of saints in martyrdom or ecstasy. This style of painting emphasises the emotion and passion of an act, rather than its rational side.

The primary aim of Baroque painting was to bring the faithful closer to God by arousing strong emotions. It is an artistic movement that aims to appeal to the viewer's senses, and above all to the eye, pictorially.

- The movement, dynamism, and exuberance of the forms, in contrast to the pyramidal and symmetrical concepts of pictorial space inherited from the Renaissance.
- Major contrasts and interplays of colour and luminosity are made possible, in particular, by the chiaroscuro technique.
- A certain decorative exuberance and a taste for ostentation.
- Dramatisation of the narrative, the depiction of moments taken from life, whether in the representation of scenes from everyday life (still lifes) or religious scenes (Virgin Mary, saints, baby Jesus, biblical scenes). Artists sought dramatic and emotional effects by showing examples of saints in martyrdom or ecstasy.
- The expression of the feelings and emotions of the characters, the expression of passions that sometimes go as far as a certain violence in the paintings.

- The favourite themes of Baroque painting: inconstancy, change, instability, permanent metamorphosis, illusion, dreams, duplicity, and theatricality.

II.3. Examples of Baroque art: sculptures, paintings, and architecture

The Baroque architecture is characterised by the intense attention to detail. The Baroque architects are remarkable not just for their ability to design grand, impressive buildings, but also for the almost obsessive care they took to ensure that even the smallest elements—such as decorations, furnishings, and ornaments—matched and enhanced the overall magnificence and drama of the structure. Their approach reflects a deep desire for unity and cohesion in their artistic vision, where no part of the design was treated as insignificant or separate from the whole. Altars, confessionals, ciboriums, fonts, organs and desks, altar-frontals and reliquaries, candelabra, canopies, and banners, all are treated with equal richness, all are the objects of an equal effort (Ricci, 1912, p.V).

Baroque art manifested itself in painting, sculpture, architecture, literature, dance, and music. Among the artists who best illustrate this style are Bernini and Rubens (Ricci, 1912):

- Bernini (1598-1680) was an Italian architect and sculptor who created the Baldachin of St Peter's Basilica in Rome (1627-1632), the Ecstasy of St Teresa (1646) and the Fountain of the Four Rivers in Piazza Navona (1651).
- Rubens (1577-1640), a Flemish painter who produced large-scale religious, mythological, and historical compositions for European sovereigns, for example, he produced a gallery of 24 canvases allegorically depicting the life of Marie de Médicis (1575-1642).

Other important Baroque painters include Caravaggio (1571-1610) (considered a precursor of the movement and known for his works characterised by close-up action and pronounced diagonals) and Rembrandt (1606-7/1669).

II.3.1. Bernini (1598-1680)

a. The baldachin at St Peter's Basilica in Rome (1627-1632)

The gigantic, twisted columns are one of the most impressive parts of the baldachin at St Peter's (**Figure II.2**). Each of the columns is 20 metres high and decorated with olive and laurel branches. Bernini had also sculpted intertwined cherubs into the design. The sculpture was designed to give maximum depth to the altar, for which the artist retained the look of the

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portable fabric awnings with the design. It is made of pure bronze, but the design has made it possible to do away with the bulkiness of metal.

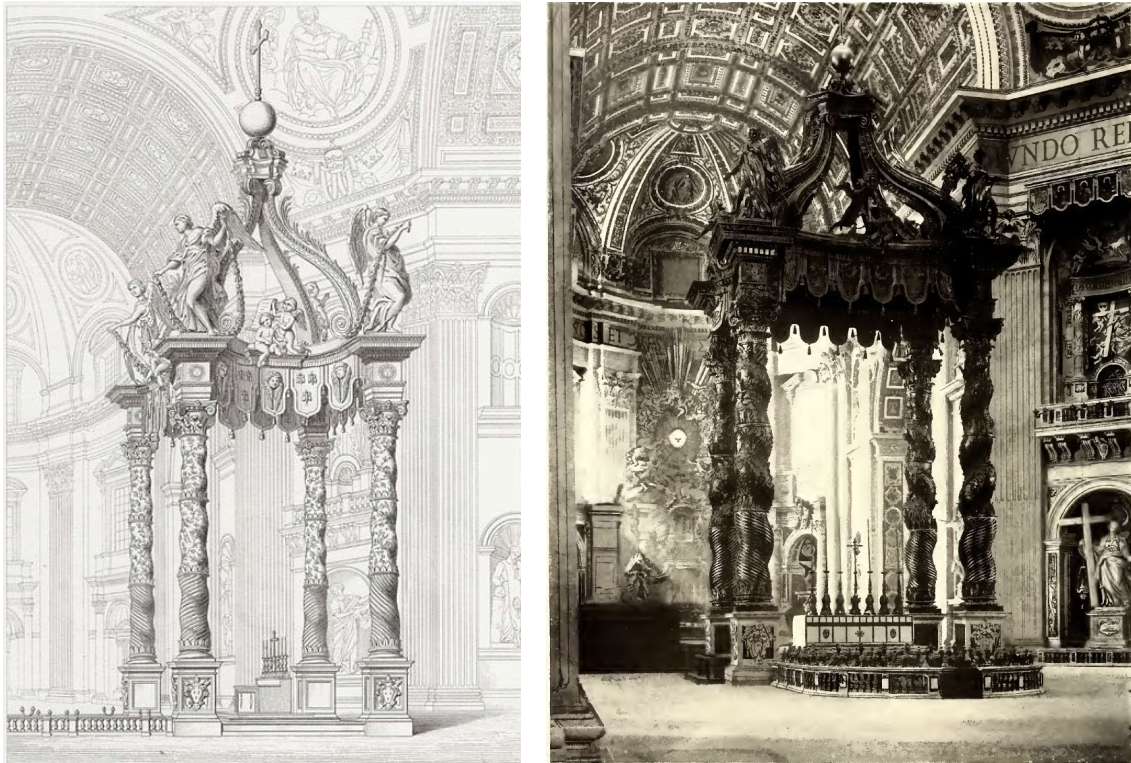


Figure II.2. (Left) Rome, St Peter's Basilica, Balanchin by Bernini. Drawing Published in "Monuments Anciens et Moderne" by Jules Gailhabaud, Paris, 1853. **Source:** <https://britton-images.com/product/rome-st-peters-basilica-balanchin-pulpit/>; (Right) View of St. Peter's. Balanchin. **Source:** Ricci, 1912, p.82

At the top of St Peter's baldachin, four angels remind the public that they support the massive, twisted columns. The statues are almost life-size and blend into the cornice, which houses the cherubs holding the papal tiara and the keys of Saint Peter. On the same installation, Bernini incorporated a sliding cross on a globe to represent the role of Christianity in the redemption of the earth (**Figure II.2**).

b. L'Extase de Sainte Thérèse (1646) à Rome

Bernini was first and foremost a sculptor of genius. His most striking work is the Ecstasy of Saint Teresa, one of the most striking Baroque sculptures ever created. This sculpture can be found in a chapel in the Roman church of Santa Maria della Vittoria. The group evokes the mystical vision of Saint Teresa of Avila, struck in the heart by an angel's arrow. The white marble ensemble is highlighted by the gilding of rays falling from the sky, and contrasts with the different shades of marble that surround it (**Figure II.3**).



Figure II.3. Rome. S. Maria della Vittoria. Altar and St. Theresa (1646) by Lorenzo Bernini. **Source:** Ricci, 1912, p.83

c. The Fountain of the Four Rivers (1651)

The Fountain of the Four Rivers, or Fontana dei Quattro Fiumi in Italian, is located in the Piazza Navona and was inaugurated in 1651. Pope Innocent X (1574-1655) commissioned the fountain. The fountain was built with money from a tax on meat, salt, and bread, which was very unpopular with the Romans. The special feature of this fountain is the four large statues representing four of the world's rivers: the Danube, the Nile, the Ganges, and the Rio de la Plata. The four statues also represent the four continents that were known at the time (**Figure II.4**).



Figure II.4. The Fountain of the Four Rivers in Piazza Navona, Rome. **Source :** Norberg-Schulz, 1979, pp. 24-

25

Alongside the giants are representations of the flora and fauna of each continent. The four statues were created by Bernini's disciples. The master himself created some of the figures, such as the lion, the palm tree, and the sea creatures.

The Danube, symbolising Europe, was created by Antonio Raggi. The statue is accompanied by a horse and a pigeon holding an olive branch in its beak. The statue of the Ganges, symbolising Asia, was created by Claude Poussin. A boat represents the navigability of the river, and a snake stands next to the giant. The Nile, personifying Africa and accompanied by a lion, was created by Giacomo Antonio Fancelli. Note that the face of this statue is covered by a veil, symbolising that the source of the Nile had not yet been discovered at the time.

Finally, Francesco Baratta created the statue of the Rio de la Plata, symbolising America with an armadillo. Two coins symbolise the rich mineral discoveries on this continent.

In the middle of the four giants stands a 16-metre-high obelisk. This obelisk was originally located in the Circus of Maxentius. It is of Egyptian origin (probably 1st century), but the hieroglyphs were commissioned by the Emperor Domitian. At the top of the obelisk is a dove, the symbol of the Pamphili family, of which Pope Innocent X, who commissioned the fountain, was a member. The obelisk, at the centre of the fountain and resting on the vault of a grotto, puts the city of Rome at the centre of the world.

II.3.2. Rubens (1577-1640)

Une galerie de 24 toiles : Cycle de Marie de Médicis

The Galerie Médicis is home to one of the largest painted décors to come out of a Parisian palace. This vast room was specially designed to house the immense paintings by Rubens that make up the “Marie de Médicis Cycle”. It recreates the splendours of the ceremonial gallery that the queen set up in her Luxembourg Palace on her return from exile. The chiaroscuro technique can be seen in the painting The Massacre of the Innocents (**Figure II.5**).

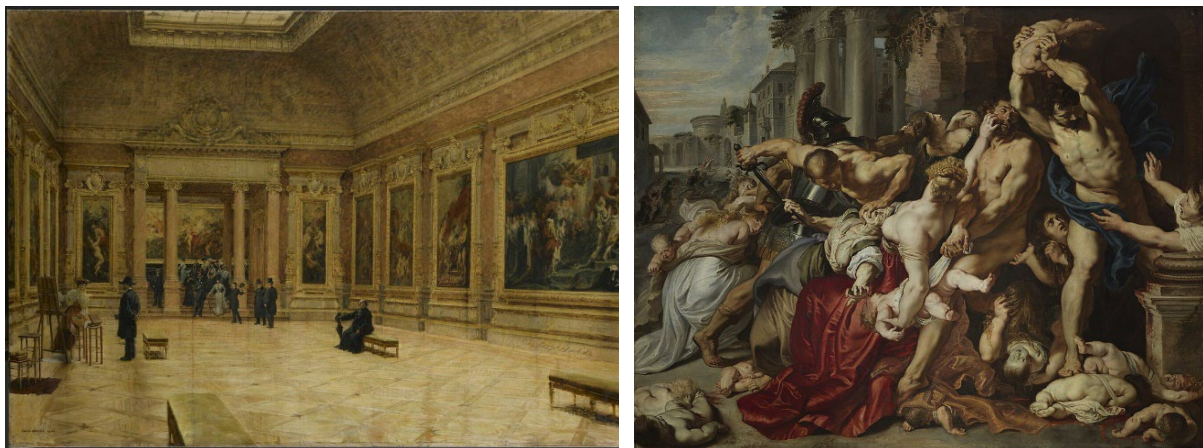


Figure II.5. (Left) The Galerie Médicis; (Right) The Massacre of the Innocents by Peter Paul Rubens. **Source :**
[https://human-libretexts-org.translate.goog/Bookshelves/Art/Art_History_\(Boundless\)/21%3A_The_Baroque_Period/21.01%3A_The_Baroque_Period?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=fr&_x_tr_pto=rq](https://human-libretexts-org.translate.goog/Bookshelves/Art/Art_History_(Boundless)/21%3A_The_Baroque_Period/21.01%3A_The_Baroque_Period?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=fr&_x_tr_pto=rq)

II.3.3. The Jesuit church in Rome

Built from 1568 for the Society of Jesus, this emblematic building of Jesuit art, one of the most remarkable architectural manifestations of the Counter-Reformation movement, served as a model for many other churches of the order. The remarkable church is the mother church of the Society of Jesus, the Jesuits. It is one of the most interesting churches in Rome's historic centre.

The church is covered by a barrel vault, with each side flanked by three side chapels, a chancel, and a dome above the transept crossing (**Figure II.6**). Its style is a blend of Classicism, Mannerism and Baroque.

The vault features an impressive central fresco with a unique perspective effect, illustrating the Triumph of the Name of Jesus, painted by Giovan Battista Gaulli between 1676 and 1679

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(Figure II.6). The point in the nave from which the work is best viewed is indicated on the floor by the letters IHS (the first letters of the name of Jesus in Greek). The same artist painted the fresco on the dome.



Figure II.6. Church of Jesus Rome, 1665, Gravure à l'Eau-Forte. **Source :** <https://www.pamono.fr/giambattista-falda-church-of-jesus-rome-1665-gravure-a-l-39-eau-forte>



Figure II.7. Fresco with Trompe l'oeil, vault of Church of Jesus in Rome. **Source :** <https://www.atlasobscura.com/places/dome-illusion>

II.3.4. Baroque urbanism:

The foci of the urban totality may also be defined in purely spatial terms, that is, as piazze or squares. The square, of course, has a long tradition as the real core of the city, but while its function usually was of a public and civic nature, the Baroque Age made it become part of the general ideological system. This is particularly evident in the French place royale, where the

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space is symmetrically centred upon a statue of the sovereign. The prototype was created by Henry IV in the Place Dauphine (1605). The greatest of all “*ideological*” squares, however, is the Piazza S. Pietro in Rome (**Figure II.8**), where Bernini, using colonnades accompanying the oval space on both sides, wanted to symbolise the “*open and embracing arms*” of the Church. *Because of its particular meaning and its particular shape, the piazza thus forms a complement to the dome of the church behind it, whose symbolic vault is transformed into a functional container covered by the natural dome of the sky.*” The creation of monumental squares became imperative to all Baroque cities, usually in relation to the main buildings of the system (Norberg-Schulz, 1979, p. 12).

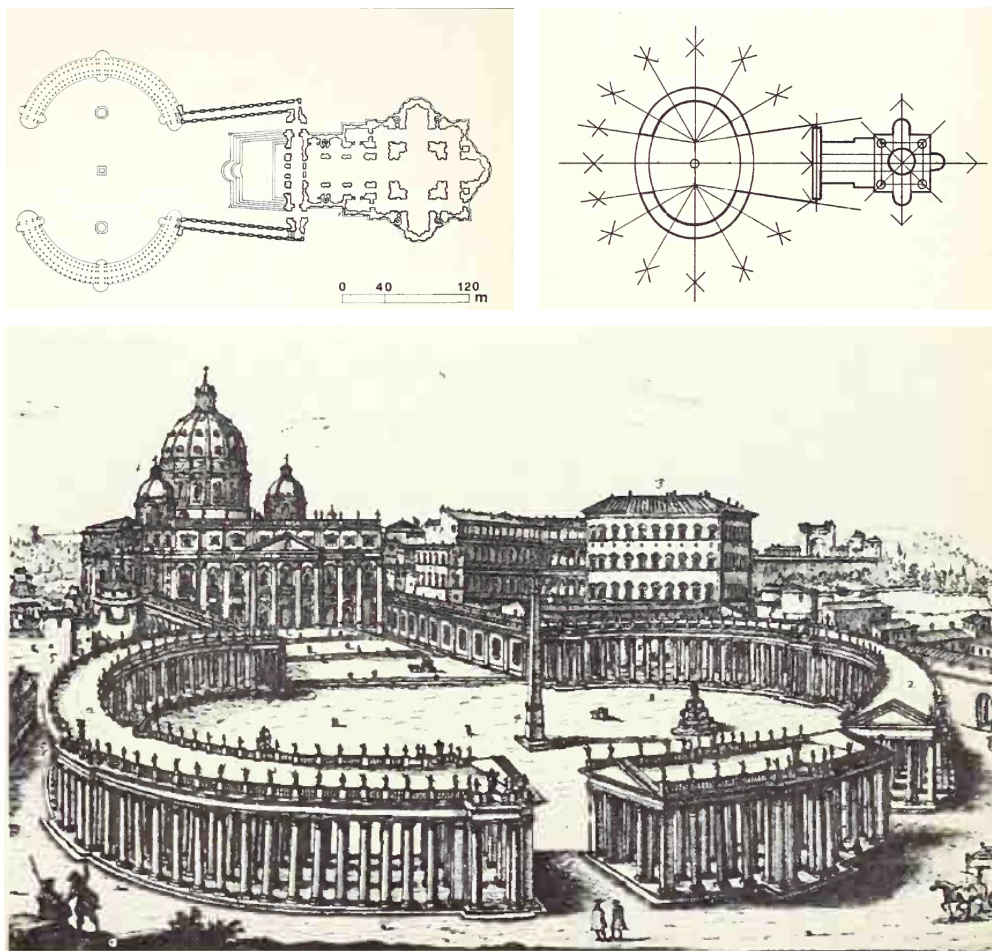


Figure II.8. The Piazza S. Pietro in Rome. **Source:** Norberg-Schulz, 1979, p.27

The structure of the Baroque city consists thus of foci (monumental buildings and squares) which are interconnected by straight and regular streets. The buildings are integrated with the pattern of movements defined by the streets, so that a new interaction between inside and outside is achieved. An analogous interaction is also established between the city and its surroundings. Between the main streets, districts were formed which were given a certain

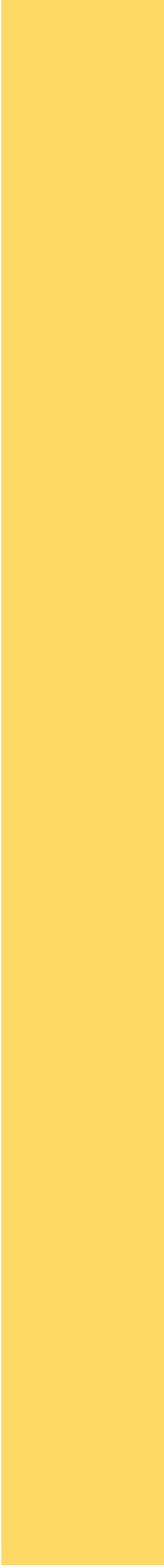
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uniformity so as not to interfere with the main properties of the system (Norberg-Schulz, 1979, p. 12).

Conclusion

This chapter highlighted the evolution of European architecture following the Classical Renaissance, focusing on the emergence of Baroque art, which was characterised by a conscious departure from the strict rules of harmony and proportion inherited from Antiquity. During this period of transformation, architects began to explore new formal freedoms, introducing more complex compositions, surprise effects, and a certain intentional imbalance into their creations. This search for novelty gradually led to the emergence of the Baroque style, characterised by movement, contrast, spatial dynamism and emotional intensity.

More than just a style, Baroque represents a way of thinking about architecture as a total art form, capable of capturing attention, moving people, and glorifying religious or political powers.

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Chapter III:

The

Neoclassicism

in Architecture

Introduction

At the end of the 18th century, Europe was swept by the ideas of the Enlightenment, a questioning of traditions, and political revolutions that redefined the relationship between the individual, society, and power. In this climate of rationality, order, and a return to founding values, architects drew on Greco-Roman antiquity as a source of stability and universality. Neoclassicism thus became a response to the perceived excesses of previous styles, but above all an expression of a new ideal, in which architecture reflected the cultural, moral, and intellectual aspirations of its time.

This chapter explores the fundamental principles of the neoclassical style, its theoretical sources, and its main achievements in Europe and beyond. It shows how Neoclassicism, far more than a simple return to ancient forms, embodies a modernised vision of architecture based on order, measure and the ideal of permanence.

III.1. General context of Neoclassicism in architecture

III.1.1. Definition

Neoclassicism is a Western cultural movement in the decorative and visual arts, literature, theatre, music, and architecture. Neoclassicism originated in Rome largely through the writings of Winckelmann Johann Joachim (1717-1768), at the time of the rediscovery of Pompeii and Herculaneum (Klenze, 1830), but its popularity spread throughout Europe as a generation of European art students completed their grand tour and returned from Italy to their home countries with newly rediscovered Greek-Roman ideals.

Neo-classicism was linked to a taste for archaeology at the time. In Italy, the two Roman cities buried after the eruption of Mount Vesuvius in 79 AD, Herculaneum and Pompeii, were unearthed (**Figure III.1-3**). Their excavations were the most important of the 18th century. The two cities fascinated visitors and rekindled a taste for antiquity (Klenze, 1830).



Figure III.1. General view of the archaeological site of Pompeii, Italy. **Source :** https://carnet-dhistoire.fr/anecdotes/pompei/#google_vignette



Figure III.2. View of the famous “stone bodies” of Pompeii, Italy. **Source :** <https://sciencepost.fr/corps-de-pierre-pompei-ne-sont-pas-ce-que-vous-pensez/>

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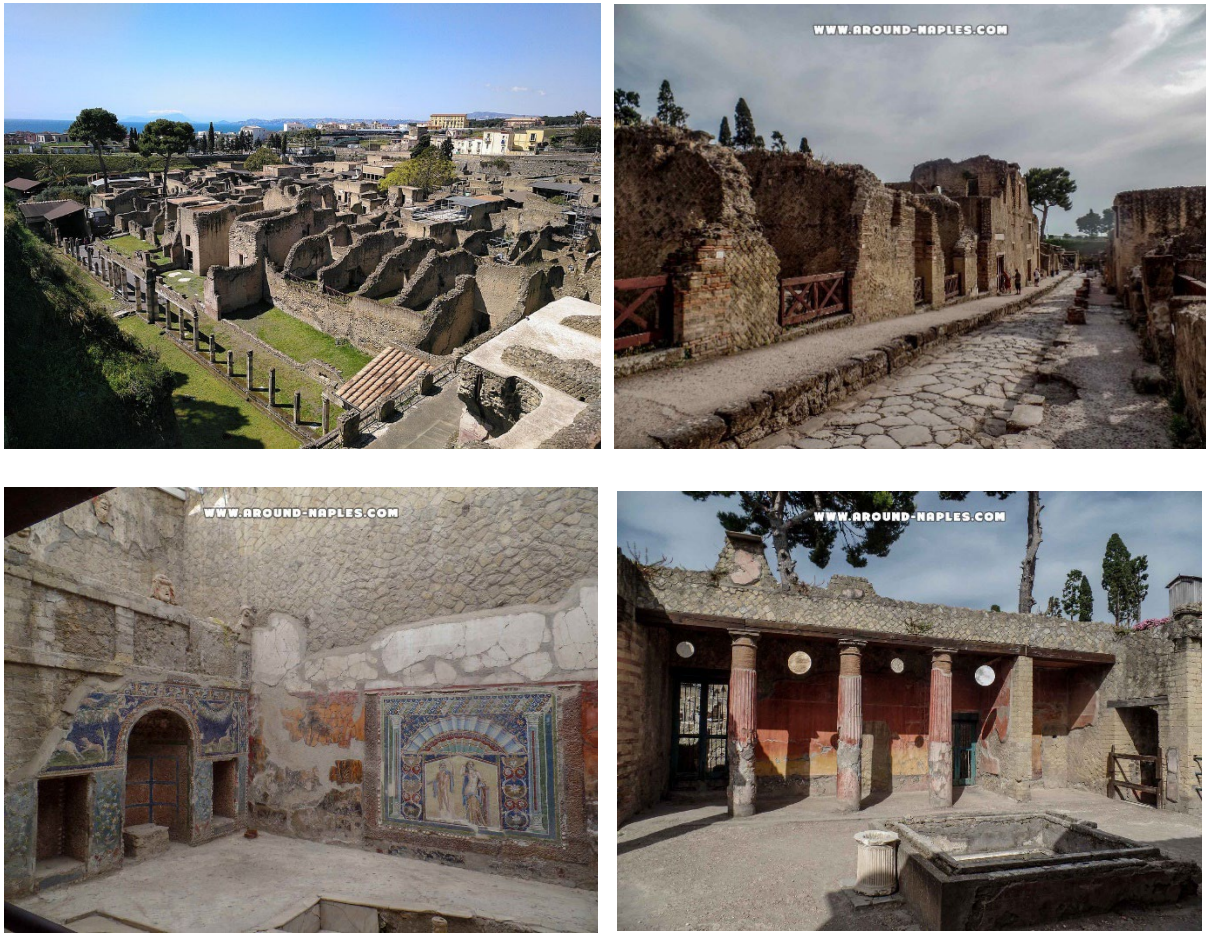


Figure III.3. Archaeological ruins of Herculaneum City, Italy: (Above-Left) General view of Herculaneum; (Above-Right) The alleys of Herculaneum: Cardo V; (Below-Left) The tablinum of the House of Neptune and Amphitrite; (Below-Right) Herculaneum and the house of the relief of Telephus. **Source:** <https://www.around-naples.com/fr/herculanum.html>

Between the 18th and late 19th centuries, Neoclassicism dominated European art and architecture. Neoclassicism gained popularity in France and England before spreading to Sweden. It incorporated traditional themes of bravery and nationalism.

III.1.2. Birth and expansion of Neoclassicism

Neoclassicism was in part a reaction against the fantasy and excesses of the Baroque and Rococo styles (Vergara and Tomasella, 2001, p.135; Klenze, 1830). Neoclassical architects and artists once again drew inspiration from Antiquity, aiming to revive classical Greco-Roman art forms and seek to preserve the “purity” of art. Neoclassical architects and artists wanted to educate the viewer, preferring noble subjects that inspired “moral values” such as honour and courage. This was possible by the contribution of Winckelmann Johann-Joachim (**Figure III.4**).

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Winckelmann Johann-Joachim (1717-1768) was a famous German archaeologist. Born into a poor family, he studied theology, then history, medicine, and mathematics. He became a tutor and then secretary to the Count of Bunau (1748-53) in Nöthenitz near Dresden. There he acquired a taste for works of art and, in order to be able to travel to Rome and find a job there, converted to Catholicism.

In 1756, he published his first book *Gedanken über die Nachahmung der griechischen Werke in der Malerei und Bildhauerkunst* (or Reflections on the imitation of Greek works in sculpture and painting), which profoundly renewed the approach to Greek art and, more generally, reflection on art (**Figure III.4**). Composed of three volumes, this is the first of his major works, and it contains the seeds of his ideas.

He was granted a pension of 200 thalers to go to Rome, where he soon became librarian to Cardinal Archinto (former nuncio to Saxony) and made friends with Raphaël Mengs and Cardinal Passionei. In 1758, he entered the house of Cardinal Albani, the most famous collector of the time, of whom he was a librarian and friend.

Winckelmann described the excavations at Herculaneum in several memoirs or letters (1762-64) and published his masterpiece *Gesch. der Kunst des Altertums* (or History of antiquity art), in 1764, by Dresden. This is composed of 2 vols. in-4 (**Figure III.4**).



Figure III.4. (Left) Portrait de Johann Joachim Winckelmann. **Source:**

<http://winckelmann.expositions.inha.fr/introduction.html> ; (Middle and Right) Title pages of Winckelmann's two books. **Source:** Winckelmann (1756, 1764)

Winckelmann professes that the goal of art is beauty, the expression of the ideal and not of reality. This is achieved by drawing a type from nature, characterised by normal proportions,

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like those of Polyclitus' Canon (a Greek sculptor), simple nobility, calm grandeur in movement, where nothing must alter the contours of the whole. Winckelmann (1756) affirmed his famous thesis on beauty; he said: “Beauty is like the clearest water, drawn from a pure source and all the more salubrious for having less taste”.

According to this expression, true beauty is associated with clarity, simplicity, and purity. Winckelmann admired Greek art for its sobriety and perfect balance, far from excessive ornamentation. Pure water is healthier when it is neutral, with no pronounced flavour. In the same way, Winckelmann's ideal beauty is sober and harmonious, devoid of extravagance or excess. Beauty that is too marked by artificial elements would lose its value and universality.

III.1.3. Evolution and spread of Neoclassical architecture

Although the ancient remains of Italy and Greece were a major source of inspiration for neoclassical artists, these two countries were not the main centres of the neoclassical style. Greece, in particular, was rarely visited, even by travellers on the Grand Tour. It was perceived as a remote, rugged, and underdeveloped region, at odds with the grandeur of its classical time.

Instead, it was English and French architects and artists, inspired by the ancient monuments seen in Italy, who played a leading role in the birth and spread of Neoclassicism. Their influence was felt not only in architecture, but also in the decorative arts, interiors, and painting. According to Mayfair Gallery Guides (2018), this development was partly due to the growing prestige of London and Paris in the 18th century, which became the main capitals of the neoclassical style. Gradually, this aesthetic trend spread to the east of the continent. In Germany, for example, Munich was largely rebuilt in this style.

At the same time, the Russian Empire, engaged in a process of “westernisation” designed to bring it closer to the English and French models, enthusiastically adopted the style dominant in Western Europe. This culminated in the creation of St Petersburg, a new capital designed entirely according to neoclassical principles.

The impact of neoclassicism in Europe was so profound that it eventually spread far beyond the continent, becoming a worldwide artistic movement. It left its mark on Spanish-ruled Latin America, the new European colonies of Australia and New Zealand, and the newly independent United States at the end of the 18th century.

III.2. Characteristics of Neoclassical architecture

Gone are the free forms and exuberant decorations of the Baroque, and the architects of Neoclassicism drew their inspiration from the forms of Greek temples (**Figure III.5**), characterised by simplicity and rigour of line, with harmonious proportions and perfect symmetry. They adopted the columns emblematic of Greek architecture (Vergara and Tomasella, 2001, pp.18-28), often using the Doric, Ionic and Corinthian orders, and incorporated triangular pediments, often adorned with sculptures. The use of mathematical proportions, such as the golden ratio, is essential to ensure the balance and harmony of the buildings.

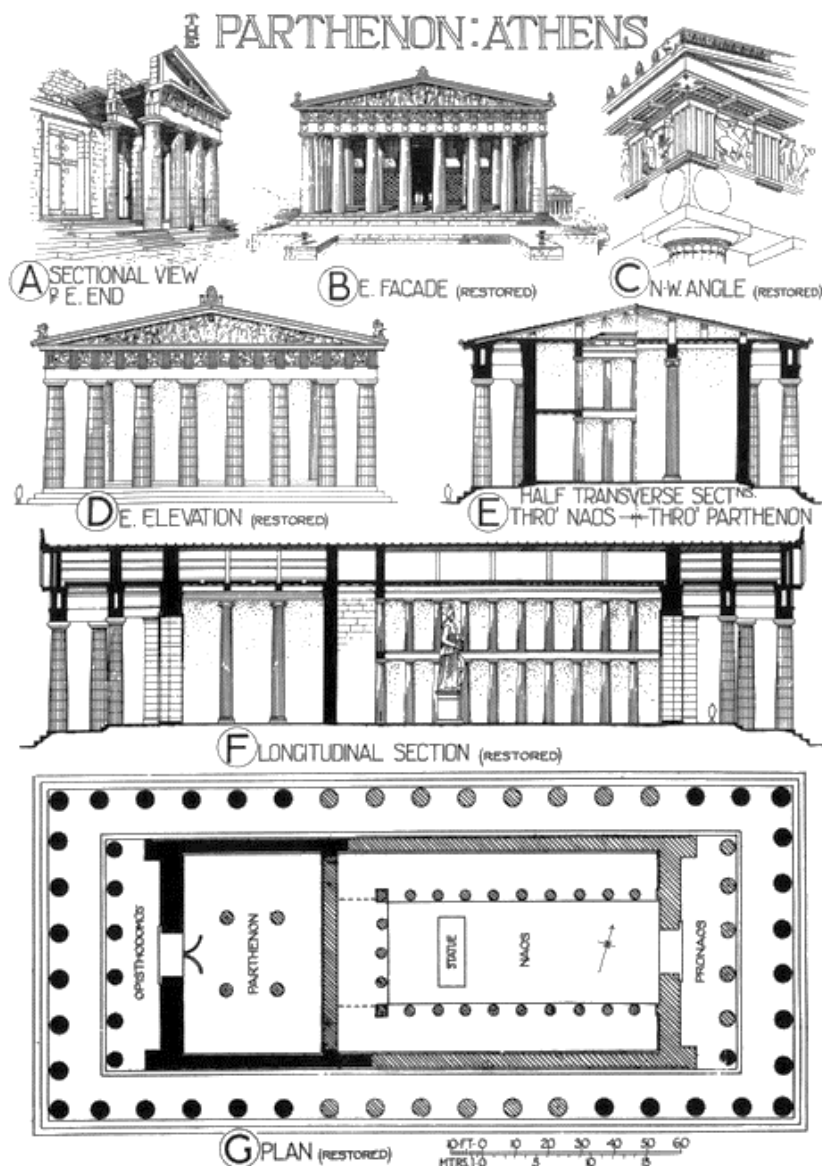


Figure III.5. The Pantheon of Athens, plan, façades and section. **Source :** https://www.ribapix.com/parthenon-athens-plans-sections-and-elevations_riba100816

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During the Neoclassical period, fewer churches and palaces were built, but more public buildings: schools, theatres, and museums. Neoclassical buildings expressed a desire to break away from the Baroque and Rococo styles of the previous period (Klenze, 1830). Their main characteristics can be summarised as follows:

- Geometry of the plan and simplicity of the building's volumes. Neoclassical architecture is based on the principles of simplicity and symmetry, which were considered virtues of the arts of Rome and ancient Greece;
- Refinement of the distribution of interior volumes;
- Harmony of proportions;
- Predilection for columns and pediments;
- Use of sculpted ornaments inspired by Antiquity: friezes of Greeks, posts, scrolls, festoons, palmettes, etc.;
- Highlighting of the building's mineral surface, whether the wall is bare or treated with rustication;
- Integration of the building into a landscape or urban space.

III.3. Examples of neoclassical architecture

Neoclassicism gained popularity in France and England before spreading to Sweden. It incorporated the traditional themes of bravery and nationalism (**Figure III. 6-9**).



Figure III.6. View of Mauperthuis Castle, 1763 (demolished). **Source :**
<https://ita.archinform.net/projekte/13104.htm>

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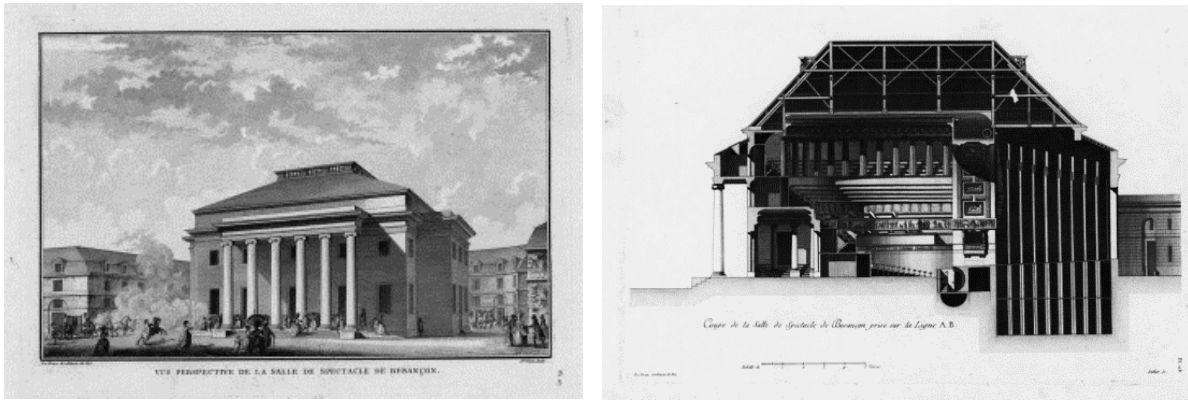


Figure III.7. Besançon Theater, 1784. **Source :** <https://memoirevive.besancon.fr/page/le-theatre-de-besancon-i-le-theatre-au-xviiiie-siecle>

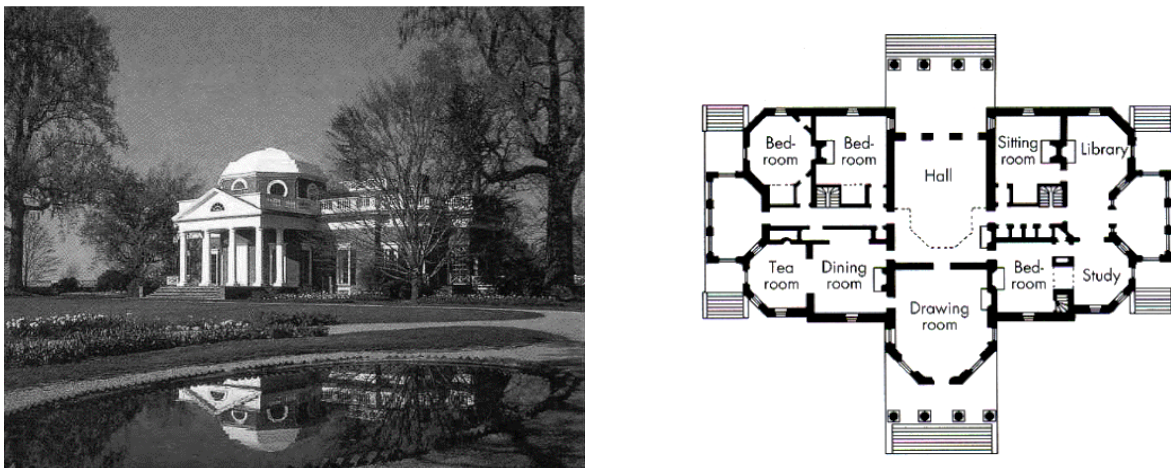


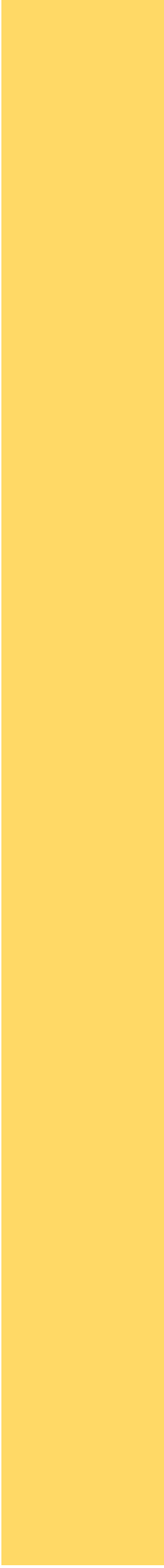
Figure III.8. Monticello House (1796), by Thomas Jefferson Charlottesville, Virginia: (Left) View of the rear facade; (Right) Plan of Monticello. **Source:** Klenze, 1830



Figure III.9. Chiswick House near London (started in 1725), by Lord Burlington and William Kent: (Left) View of the facade; (Right) Plan of Chiswick. **Source:** Klenze, 1830

Conclusion

This chapter examined the emergence and development of Neoclassicism in architecture, a movement that emerged at the end of the 18th century in reaction to the decorative excesses of the Baroque and Rococo styles. Directly inspired by Greco-Roman antiquity, Neoclassicism sought to rediscover the purity of lines, geometric rigour, and clarity of form, considered to be the timeless foundations of architecture. In a context marked by the Enlightenment, political revolutions and a quest for rationality, neoclassical architects saw in ancient models not only an ideal aesthetic, but also a moral and civic language.

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Chapter IV:

The Industrial Revolution and Illuminism in Architecture

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Introduction

The rise of science, the development of machinery and the transformation of production methods radically changed society's needs, while opening up new possibilities for construction. Architecture adapted to these upheavals by incorporating new materials such as cast iron, iron, and glass, and by responding to new functions related to urbanisation, infrastructure, and public buildings. At the same time, a new conception of rationality, utility and progress guided aesthetic and structural choices.

This chapter examines the influence of the Industrial Revolution on architecture, in a context of profound social, technical, and cultural changes at the end of the 18th and 19th centuries. It explores how architecture became a mirror of the profound changes that redefined cities, techniques, and human relationships with the built environment.

IV.1. General context of the Industrial Revolution and illuminism in architecture

IV.1.1. Definition

The industrial revolution was the most important single development in human history over the past three centuries. The expression “industrial revolution” refers to the process of rapid change in industry that profoundly altered agriculture, the economy, and society. This “revolution” began in England at the end of the 18th century and spread to continental Europe and the United States during the 19th century. By definition, the Industrial Revolution is the transition from an economy traditionally based on agriculture to one based on mechanised production (Stearns, 2013). According to Menga (2022), the “industrial revolution” period was characterised by a strong modernisation of countries with:

- The use of steam as a source of energy (The birth of industry);
- The invention of increasingly efficient machines (Technical progress);
- The development of means of transport, in particular steam-powered shipping and rail networks (Improved means of transport).

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IV.1.2. Birth and expansion of Industrial Revolution in Europe

Two mistakes in dealing with the Industrial Revolution are particularly common, though understandable. First, the phenomenon is too often pinned to a single time period—the late eighteenth and early nineteenth centuries—as though because it began at that point it somehow ended then as well. In fact, the Industrial Revolution has surged forward in three major chronological phases—the first, when it began and spread directly only within the West; the second, when it matured and began to exceed Western boundaries; and the third, when it became effectively global. Our lives today are being shaped by this ongoing third phase. And, in each phase, industrial chronology cut across more conventional historical divisions, such as the French Revolution or World War I. Industrial history has its own chronology, and it must be seen as an ongoing process (Stearns, 2013, pp.14-15).

The second common error involves geography. Because industrialisation began in the West, its treatment is often limited to Western history. But, in fact, the Industrial Revolution arose in a global context, had quick global consequences, and has now become a global phenomenon. Only the world history scale can capture it correctly (Stearns, 2013, pp.14-15).

Although the Industrial Revolution evolved out of antecedents that occurred over a long period of time, historians generally agree that it had its beginnings in Britain in the second half of the eighteenth century. By 1850, the Industrial Revolution had made Great Britain the wealthiest country in the world; by that time, it had also spread to the European continent and the New World. By the end of the 19th century, both Germany and the United States would surpass Britain in industrial production.

Beginning first in Great Britain, industrialisation spread to the continental countries of Europe and the United States at different times and speeds during the 20th century. First to be industrialised on the Continent were Belgium, France, and the German states and in North America, the new nation of the United States. Not until after 1850 did the Industrial Revolution spread to the rest of Europe and other parts of the world (**Figure IV.1**).

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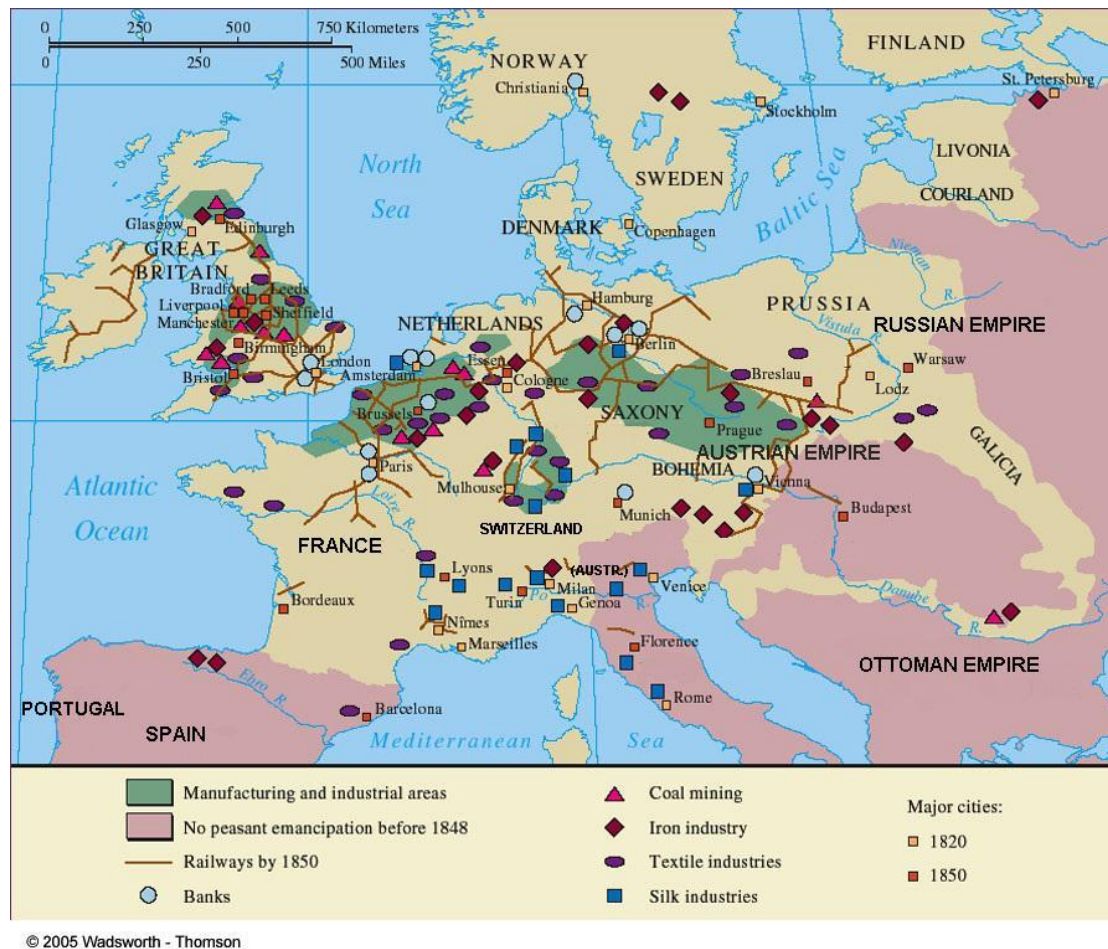


Figure IV.1. The Industrialisation of Europe by 1850. **Source:**

https://www.reddit.com/r/MapPorn/comments/czlu4m/industrialization_in_europe_until_1850/?rdt=41097

IV.1.3. The different phases of the Industrial Revolution

Rifkin (2014), an economist who analyses the impact of new technologies on the economy and new societies in his various books, names three (03) phase grades of the Industrial Revolution and has identified the combination between a new form of energy, a new form of communication and a new form of transport as the common element between all industrial revolutions. These phases are:

- The first industrial revolution, which began at the end of the 18th century, was marked by the steam press, the telegraph, coal, and the locomotive;
- The second industrial revolution, which began in 1870, was marked by oil and centralised electricity, as well as the telephone, radio, television and the internal combustion engine, expressways, and cars;
- The third industrial revolution, underpinned by electronics and computer technologies, is a revolution in automated production and digital technology that began around 1970

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with the invention of the microprocessor, the desktop computer, consumer software, printers, networks, and the Internet. It was also an information revolution: the Internet opened up a whole new world of possibilities. In particular, it has enabled the digitisation of information and the inter-connectivity of connected mobile devices.

In addition to these three phases, there is now a fourth industrial revolution, according to Schwab (2017). It stems from the 3rd revolution and is linked to the introduction of new technologies: the Internet of Things, artificial intelligence, the Cloud, Big Data, and cyber-physical systems (**Figure IV.2**). New modes of transport are emerging: electric bikes, drones, flying men.

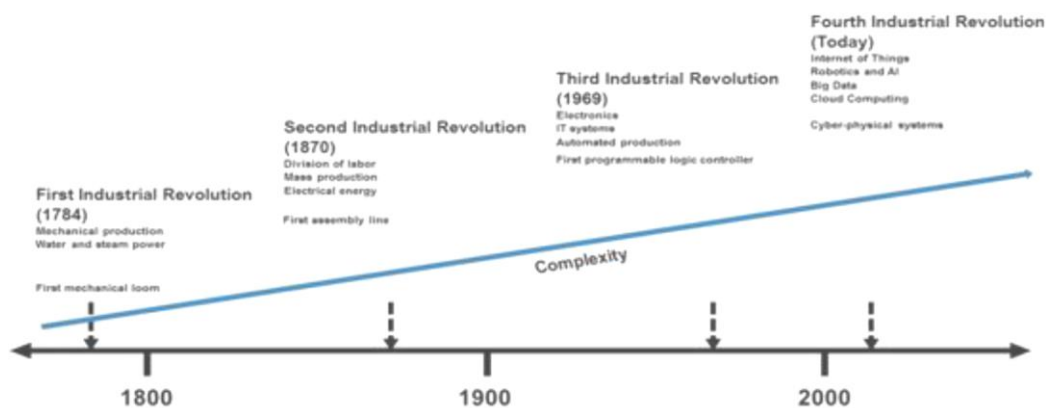


Figure IV.2. Chronological chart of the periods of the Industrial Revolution. **Source:** Sharma and Singh, 2020

IV.1.4. The consequences of the Industrial Revolution

Industry is gradually replacing agriculture as the main economic driver. According to Menga (2022) and Mohajan & Haradhan (2019), this transformation will lead to profound social upheaval:

- Development of large-scale factories;
- Rural exodus: industrial advances and the growth of trade led to the gradual decline of medieval towns and encouraged the emergence of an urban working class (**Figure IV.3**). To meet the labour needs of the new large factories, industrialists recruited massively from the rural poor, leading to a major shift from the countryside to the towns;
- The emergence of a proletariat and an industrial bourgeoisie independent of the state;
- Industrial and chemical pollution: despite technical progress, living conditions for the working classes remained precarious. Overcrowded cities faced housing shortages, insalubrity, disease, and misery. Burning coal to fuel factories and heat homes had a

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serious impact on air quality. Waste from dyeing plants and other industrial activities contaminates rivers. In addition, the repetitive, unrecognised assembly-line work alienated the workers.

In addition to its social and economic repercussions, the Industrial Revolution also profoundly transformed architecture and urban planning, with both positive and negative effects. The introduction of machines into the production process gave rise to the notion of mass production and standardisation (**Figure IV.4**). Work became progressively specialised, with each worker carrying out a precise and repetitive task, while the products manufactured were standardised in order to guarantee consistent quality.



Figure IV.3. A region dominated by the working class during the Industrial Revolution. **Source:** Menga, 2022

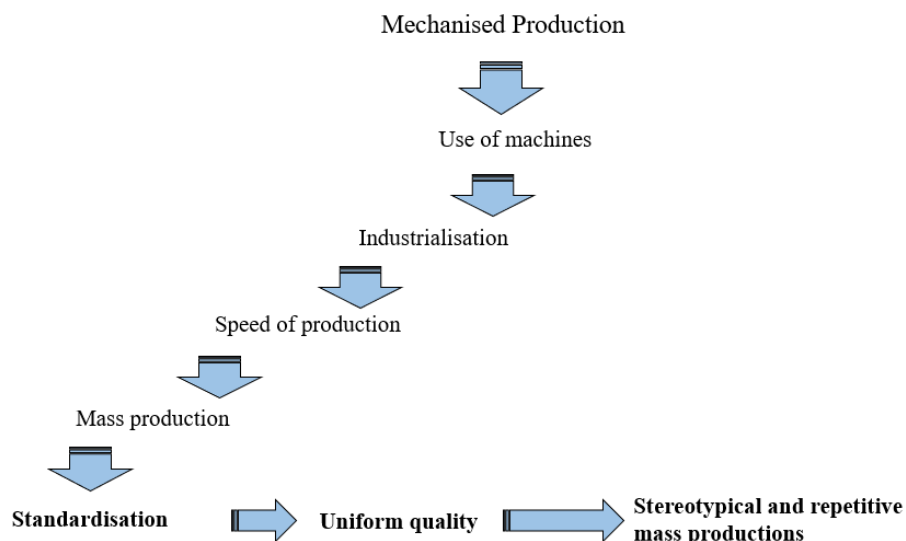


Figure IV.4. Diagram showing concepts related to industrialised production. **Source:** developed by author

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The Industrial Revolution had a profound impact on architecture, introducing new materials such as iron, steel, and glass, which allowed architects to experiment with new forms and scales of construction.

The iron and steel industry had grown dramatically during the Industrial Revolution. In 1750, iron production in Britain was just 28,000 tonnes, but by 1805 it had risen to 250,000. At that time, most of the iron used in Britain came from Sweden and Russia (Mohajan, 2019).

In 1709, Abraham Darby (1678-1717), an English ironmaster, used coke to fire the blast furnaces at Coalbrookdale. The cast iron he produced was used in the construction of several bridges and engineering structures. Henry Cort (1740-1800), also an English ironmaster, developed two key processes in the manufacture of iron: the rolling of wrought iron in 1783 and puddling in 1784. Rolling, which replaced hammering, made it possible to combine wrought iron while expelling some of the slag, offering production 15 times faster than traditional hammering with a rocking hammer. Puddling, on the other hand, produced iron of high structural quality at a relatively low cost. In 1828, James Beaumont Neilson (1792-1865), a Scottish inventor, patented the hot-blowing process, a method that saved energy in the manufacture of pig iron. In 1855, Henry Bessemer (1813-1898), an English inventor, patented the Bessemer process, enabling steel to be made from iron, which led to cheaper and better-quality steel and iron being produced (Mohajan, 2019).

The use of metal in architecture and civil engineering began at the end of the eighteenth century, and its development paralleled that of the Industrial Revolution, which shaped the production and market for iron and cast iron. It developed more rapidly in England than in the rest of Europe and was slowed down by the Napoleonic wars (Mohajan, 2019). Initially used for technical reasons, metal architecture was used for market halls, railway stations, bridges, covered passageways, the large pavilions at World Fairs, and all transit buildings. The main quality of iron and its derivatives is their resistance to fire. From 1830 onwards, because of the risk of fire associated with candlelight and later gas lighting, all the roofs of Parisian theatres were made of iron. Iron was far more resistant than wood or stone. It made it possible to increase the spans, or to lighten and open the buildings and install large skylights. A cast-iron column suffices where a thick masonry trumeau would have been needed (Mohajan and Haradhan, 2019).

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According to Passerelles-BnF, it was with the discovery of the puddling process that the design of floors, beams, girders, loft spaces, and double T-beams became possible. This new industry of metal framing gradually replaced wooden framing.

When it came to structural work, metal carpenters were now competing with wood carpenters. While timber carpenters went on a long strike in 1845, contractors turned to metal, and the skills of locksmiths, to complete ongoing projects. This industrial dispute is thought to have helped accelerate the use of metal for carpentry and led to the acceptance of the trade of metal carpenter.

IV.2. Characteristics of glass and metal architecture

The Industrial Revolution and illuminism in architecture lead us to talk about glass and metal architecture. This architecture in glass and metal, which emerged mainly in the 19th century, embodies a revolution in the design and construction of buildings, marking a decisive turning point in the history of architecture. This architecture is characterised by :

- The immense size of the projects;
- High-rise, multi-storey construction;
- The use of metal and glass: iron framing, columns supporting the assembly of beams and joists;
- Façades dominated by glass, allowing natural light to penetrate;
- Free, flexible interior spaces thanks to long-span roofing (long-span trusses);
- Lightweight architecture that can be built in a short time (the use of prefabricated products significantly speeds up construction times);
- Demountable architecture (possibility of project relocation);
- Prefabrication and standardisation (possibility of mass production);

IV.2.1. Cast iron, iron, and steel

According to Gent (1984), the Industrial Revolution cannot be explained without a reminder of the technical and economic conditions that underlie its origins. Industrial iron is never pure. Its carbon content allows for the different states to be distinguished.

- Cast iron, the raw product of the blast furnace (the ancient method of the low furnace allowed iron to be obtained directly, but in small quantities), emerges from the crucible as a liquid; it can be cast into molds. Thanks to its high compressive strength, sixty times

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greater than that of limestone, it can be used for supports: pillars, columns; it is also used for decorative elements, as it is easily molded.

- Iron, obtained by decarburizing cast iron in a puddle furnace, is malleable and has good tensile strength. It will therefore replace wood in roof frames or floors (**Figure IV.5**).
- Steel, obtained through a special refining process, is more homogeneous than iron, and its tensile strength is twice as great, three times that of cast steel. In all cases where structural lightening was necessary, steel gradually replaced iron by the end of the 19th century.

The assembly of metal elements, difficult to achieve with wrought iron, was industrialised in the mid-19th century by hot riveting rolled sheets and angles; this technique would be replaced a century later by welding.

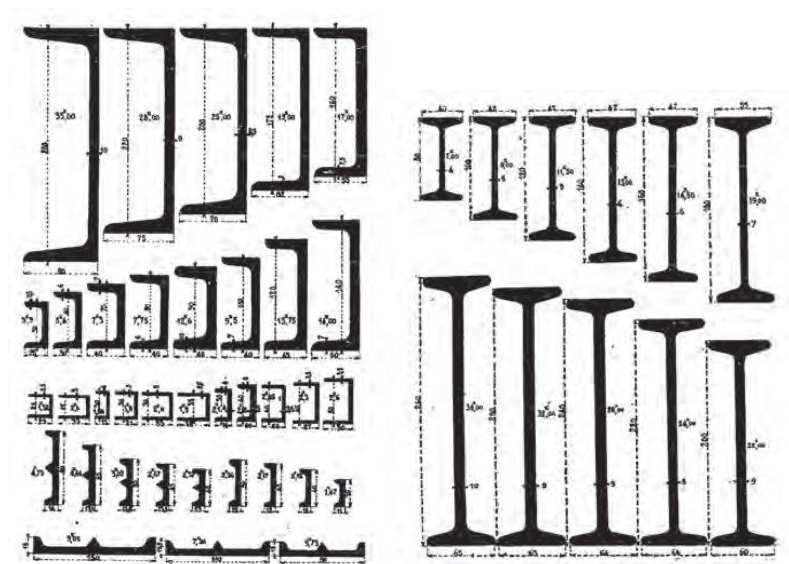


Figure IV.5. Structural personalisation. Wrought iron profiles of different sizes and thicknesses available at the end of the 19th century. **Source:** Garrido, 2023, p.71

IV.2.2. Innovations in glass

Alongside advances in ironmaking techniques, the 19th century also saw major developments in glassmaking. Like other technological sectors of the time, the evolution of glass production was not so much based on one-off revolutions as on a series of small technical improvements - what Joel Mokyr describes as “micro inventions”. The repeal, in 1845, of a British tax imposed by weight on pieces of glass, which until then had held back the production of large glass surfaces, enabled the glass industry to really take off (Garrido, 2023, p. 74).

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Innovations such as mechanical polishing, which appeared around 1800, and the Rolled Plate method in 1847, made it possible to mass-produce large sheets of flat glass. This new availability of glass surfaces became essential for the construction of iconic buildings such as London's Crystal Palace (1850) and Munich's Glaspalast (1853) (**Figure IV.6-7**). Although other advances, such as the early automatisisation of certain processes and the development of float glass by Henry Bessemer, also marked this period, they remained marginal at the time because of their complexity and high cost (Garrido, 2023, p. 74).

The development of industrial manufacturing techniques in the early 19th century had a profound influence on greenhouse architecture. Innovative figures such as John Loudon introduced the use of prefabricated elements, curvilinear forms, and complex roofs. His architectural achievements, as well as his publications, have had a significant influence on garden and greenhouse designers (Garrido, 2023, p. 74).

The rationalisation and industrialisation of architectural elements, which began in France, spread rapidly across Europe, gaining in popularity. This dynamic is part of a wider context of growing interest in construction technologies and the creation of new types of spaces. As a result, greenhouses have evolved beyond their original function of botanical preservation to become, in Ulrich Pfammater's words, “cultural event spaces”. Emblematic structures such as Decimus Burton's Great Palm House at Kew and Joseph Paxton's Crystal Palace embody this transition. These new types of building, both technical and symbolic, marked the integration of industrial architecture into the social and cultural sphere (Garrido, 2023, p. 74).



Figure IV.6. One of the technical enablers of the open space. Glass Roof of the Crystal Palace. **Source:** Garrido, 2023, p.75

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Figure IV.7. The building innovative materials and construction technology demanded equally innovative tools for its assembly. **Source:** Garrido, 2023, p.75

IV.3. Examples of glass and metal architecture

IV.3.1. London's Crystal Palace

The building was built in 9 months in Hyde Park for the Universal Exhibition in London, and was inaugurated on May 1, 1851, by Queen Victoria. It then offered more than 92,000 m² of surface area and 524 m in length (**Figure IV.8**). The exhibition lasted six months and presented exhibitors from 25 countries. It welcomed more than 6 million visitors and was a real success since the city of Paris subsequently took over and this type of exhibition still exists today.

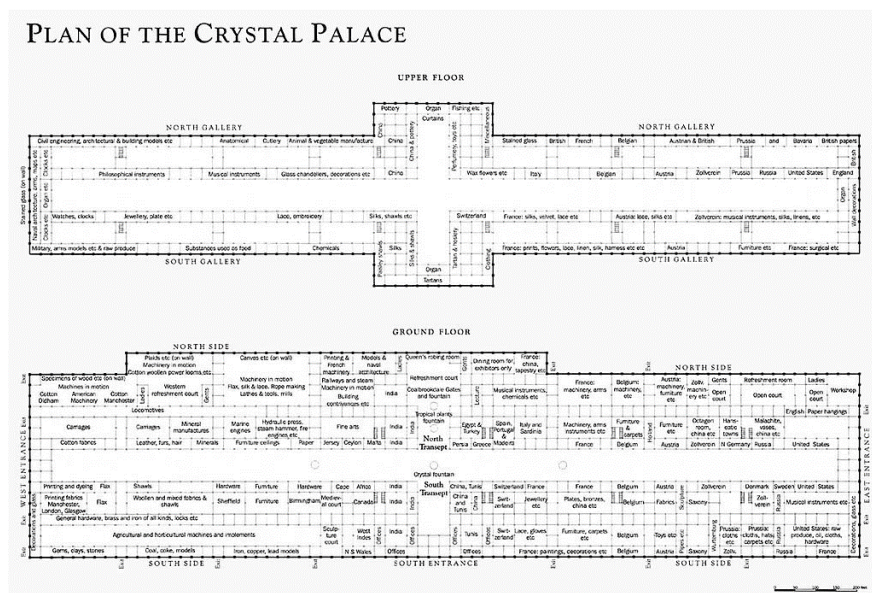


Figure IV.8. Plan of the Crystal Palace. **Source :** <https://labalancoiredefragonard.wordpress.com/2016/11/08/le-crystal-palace-de-londres/>

Once the World exhibition was over, the Crystal Palace was dismantled, not destroyed as originally planned, and rebuilt south of London atop Sydenham Hill. It was used for various

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events, including festivals, exhibitions, and concerts, over the years that followed. It was then used as a British Navy base during the First World War and would eventually be used as the home of the Imperial Wars Museum after the conflict (**Figure IV.9**).

On the evening of November 30, 1936, a fire ravaged the palace. The cast iron structure and large number of windows made the terrain difficult for firefighters called to the rescue (**Figure IV.10**). The palace was eventually abandoned to the flames, representing, as Winston Churchill later described it, “the end of an era.”

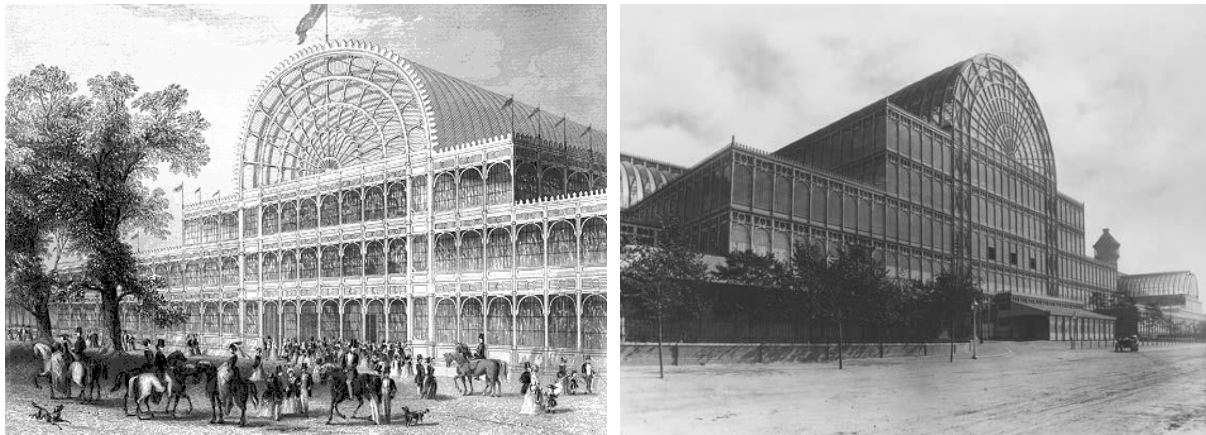


Figure IV.9. (Left) The entrance to the Crystal Palace in Hyde Park; (Right) The Crystal Palace on Sydenham Hill. **Source :** <https://labalancoiredefragonard.wordpress.com/2016/11/08/le-crystal-palace-de-londres/>



Figure IV.10. (Left) The fire of November 30, 1936; (Right) The ruins of the Crystal Palace after fire. **Source :** <https://labalancoiredefragonard.wordpress.com/2016/11/08/le-crystal-palace-de-londres/>

IV.3.2. The bon marché : La cathédrale du commerce moderne, Paris, France

Le Bon Marché in Paris was built in 1852. It was one of the world's first department stores, founded by Aristide Boucicaut. The building was designed by architect Louis-Charles Boileau and has been extended several times over the years. It is now a listed historic monument and is regarded as a symbol of luxury commerce in Paris.

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Spanning almost 20 years, the construction of Le Bon Marché was marked by a number of major architectural innovations, as described in Passerelles-BnF website.

The underground levels are on two levels. On the lower level, the machine rooms for heating and electricity are housed in large metal tanks. This protects them from the rising waters of the Seine.

At the four corners of the building, four rotundas topped by a dome make the building more spectacular. The glass ceilings, supported by a metal frame, provide overhead lighting that highlights the merchandise. The iron framework also reduces the risk of fire.

At the centre of the Le Bon Marché, the grand central staircase, with its perfect symmetry, became an essential part of the décor (**Figure IV.11-13**). It became the emblem of Le Bon Marché. Served by the grand staircase, the galleries supported by cast-iron columns housed the various departments.

The new iron and glass architecture was a perfect response to the needs of department stores: to increase the number of departments, showcase products, and encourage customers to move around. All while reducing the ever-dreaded risk of fire. Metal beams and columns reduce the footprint of the load-bearing structures, creating vast open-plan floors throughout and galleries leading onto the central hall.

Lightweight walkways make it easy to move around. A large wrought iron staircase links the floors. This frees up as much space as possible for goods and customers.

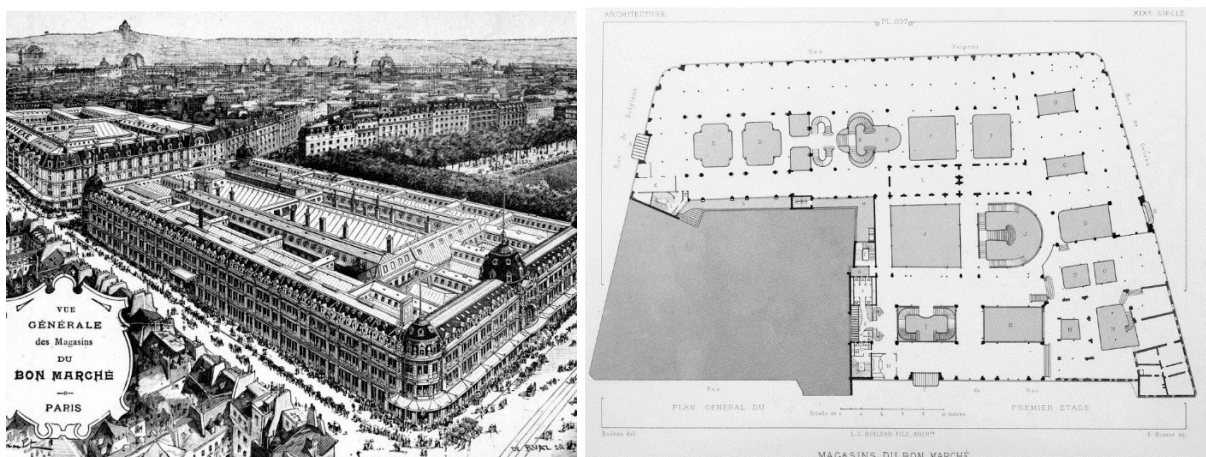


Figure IV.11. General view of Le Bon Marché. **Source:** Zola, 1883; General plan of Le Bon Marché. **Source:** <https://archimaps.tumblr.com/post/175961551802/floor-plan-of-the-bon-marche-department-store>

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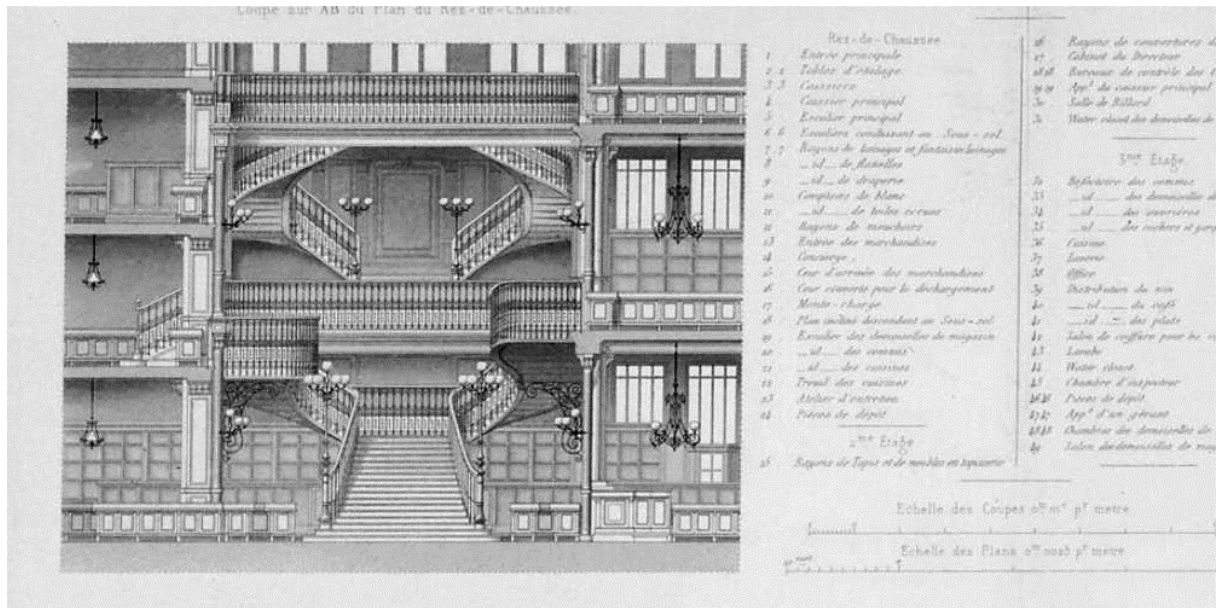


Figure IV.12. Cross-section of the staircase, Le Bon Marché department stores. **Source :** <https://passerelles.essentiels.bnf.fr/fr/image/8a5e7704-0a55-47f4-a125-7f6618b9989f-coupe-longitudinale-sur-escalier-et-galerias-magasins-bon-marche-2>

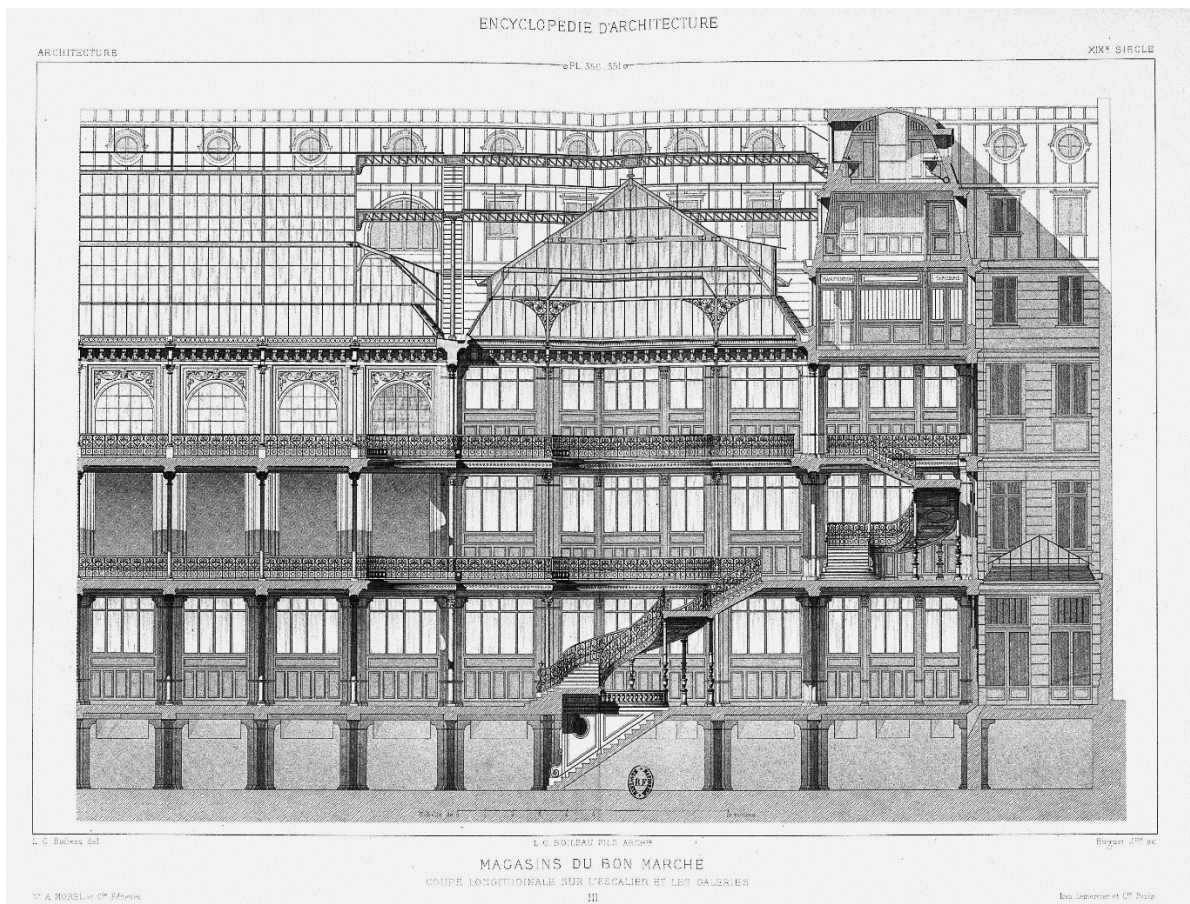


Figure IV.13. Longitudinal cross-section of the staircase and galleries. Le Bon Marché department shops. **Source :** <https://passerelles.essentiels.bnf.fr/fr/image/8a5e7704-0a55-47f4-a125-7f6618b9989f-coupe-longitudinale-sur-escalier-et-galerias-magasins-bon-marche-2>

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The famous writer Émile Zola visited and described this building, which revolutionised the world of commercialisation in Paris, France. He wrote :

« L'architecte, par hasard intelligent, un jeune homme amoureux des temps nouveaux, ne s'était servi de la pierre que pour les sous-sols et les piles d'angles, puis avait monté toute l'ossature en fer, des colonnes supportant l'assemblage des poutres et des solives. Les voutains des planchers, les cloisons des distributions intérieures étaient en brique. Partout on avait gagné de l'espace, l'air et la lumière entraient librement, le public circulait à l'aise, sous le jet hardi des fermes à longue portée ; C'était la cathédrale du commerce moderne, solide et légère faite pour un peuple de clientes (...) ; C'était comme une nef de gare, entourée par les rampes de deux étages, coupée d'escaliers suspendus, traversée de ponts volants (...) ; Et tout ce fer mettait là, sous la lumière blanche des vitrages, une architecture légère, une dentelle compliquée où passait le jour, la réalisation moderne d'un palais du rêve, d'une Babel entassant des étages, élargissant des salles, ouvrant des échappées sur d'autres étages et d'autres salles à l'infini ».
(Zola, 1890, pp.489-521)

In this passage, Émile Zola adopts an admiring stance towards this architecture. Zola seems to be impressed by the architect's ingenuity in using materials such as iron to create a structure that is both solid and light, marking a break with traditional stone buildings. This innovative approach enabled him to create open spaces, bathed in light and air, and to make it easier for the public to move around inside.

Zola compared the building to a “*cathédrale du commerce moderne*”, reflecting his admiration for the scale and majesty of the architecture. He also emphasised the technological element of the building, in particular the use of iron and metal elements such as columns, beams, and joists, evoking a modernity and technical advance over previous styles.

The author also evokes the feeling of lightness in the structure, with the metaphor of “*dentelle compliquée*” that lets the light through, and an architecture that seems fluid and airy, in contrast to the massive, closed buildings of the past. The comparison with a “*nef de gare*” and a “*Babel entassant des étages*” evokes the grandeur and complexity of the space, suggesting a kind of urban profusion, an expanding world opening up to new possibilities.

Le Bon Marché in Paris, opened in 1852, marked a revolution not only in architecture but also in retailing, with innovations that profoundly changed the way business was done at the time. It was one of the first to introduce the concept of “department stores”, where a wide range of products

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were presented under one roof. This centralised approach meant that consumers could find everything in one place, making shopping easier and increasing footfall. In addition, Le Bon Marché introduced a system of fixed prices, as opposed to the common practice of negotiating with shopkeepers. This policy made prices clearer and more accessible, while making shopping simpler and less stressful for customers. It has had a considerable impact on the way consumers perceive the value of products and has reinforced the notion of fair prices (**Figure IV.14-15**).

One of Le Bon Marché's most striking innovations was its home delivery service, which was unheard of at the time. By offering the possibility of having purchases delivered directly to customers' homes, the shop not only made life easier for consumers, but also extended its customer base beyond Paris. Women, for example, could now do their shopping without having to leave their homes, a real advance in a society where mobility was often limited, particularly for the lower social classes or people with family commitments.

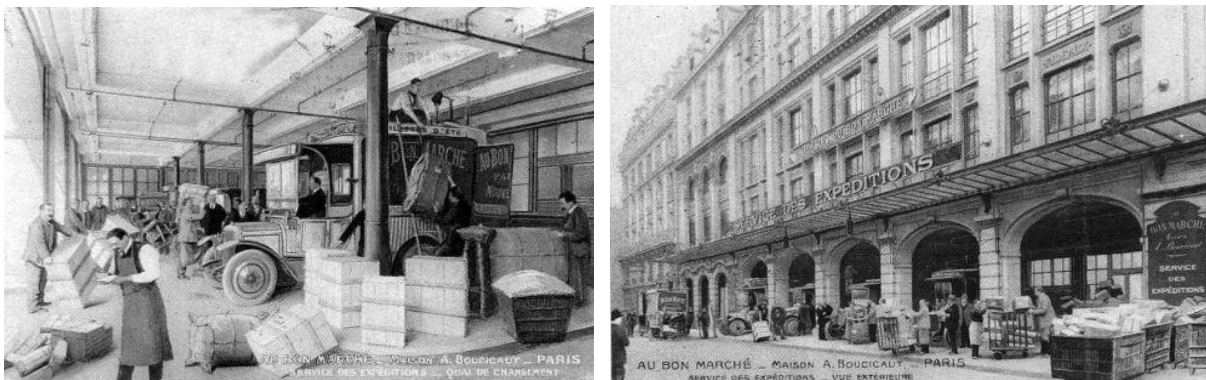


Figure IV.14. Shipping services. **Source:**

https://paris1900.lartnouveau.com/paris00/gds_magasins/le_bon_marche_1900.htm

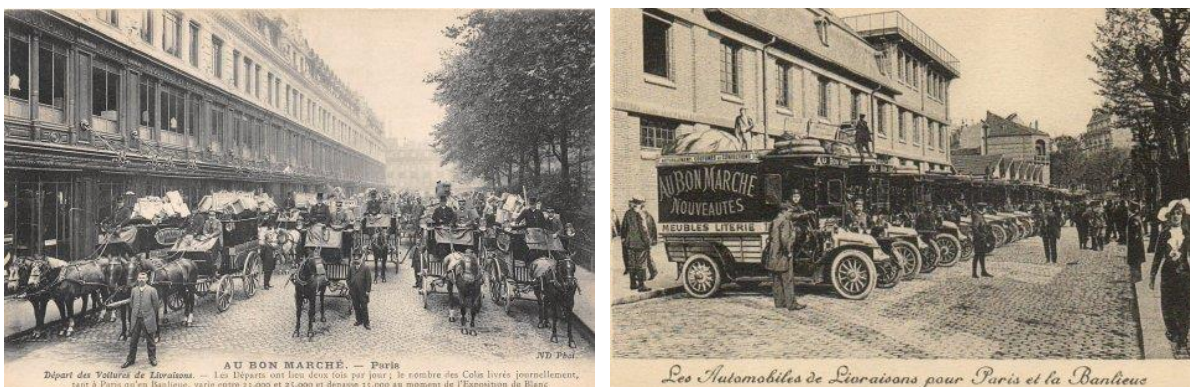


Figure IV.15. (Left) Horse-drawn deliveries from Le Bon Marché; (Right) Le Bon Marché delivery cars.

Source: https://paris1900.lartnouveau.com/paris00/gds_magasins/le_bon_marche_1900.htm

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Le Bon Marché also played a pioneering role in advertising, using modern techniques to attract customers, such as product catalogues and promotions. This not only made the shop famous, but also created a real craze for mass consumption.

IV.3.2. The Sainte-Geneviève Library, Paris, France

The Sainte-Geneviève Library is an inter-university public library located at 10, place du Panthéon, in the 5th arrondissement of Paris. It occupies a building constructed in 1851 by the architect Henri Labrouste on the site of the former Collège de Montaigu, which has since been enlarged and listed, with its original fittings and decor, as a historic monument (Taricat, 2003, pp.241-247).

The Sainte-Geneviève library had to accommodate a large number of students in a relatively small space. To meet this need, architect Henri Labrouste devoted the entire surface area available on the first floor to the reading room (85 x 21 m). In the centre, 18 slender cast-iron columns share the weight of the roof with the side walls, which are composed of openwork cast-iron arches. The use of cast iron also has an obvious advantage in a library: it reduces the risk of fire.

The interior is not partitioned and forms a rectangular space 80 metres long and 17 metres wide, offering a large volume with a height of 15 metres. The room is flooded with light thanks to the forty or so large windows that run the length of the room (**Figure IV.16-17**).

Running along the central length of the room is a row of eighteen slender fluted cast-iron columns supporting the vault, each column resting on a two-metre-high sculpted masonry base.

Semi-circular arches with columns are used for decoration and cladding, while the ceiling is formed by two vaults supported by relieving arches that rest on load-bearing stone columns built into the walls and on cast-iron columns that themselves transfer their weight to the ground-floor pillars.

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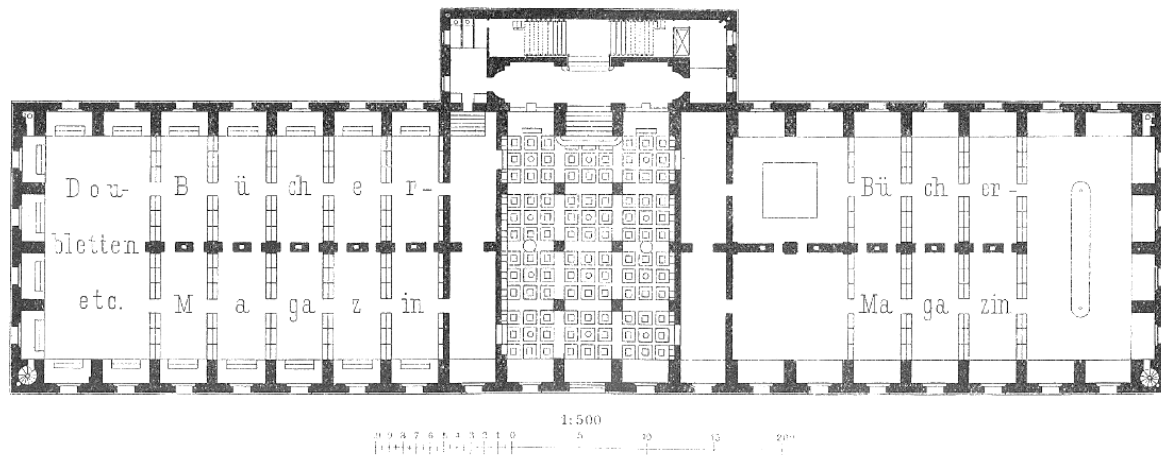


Figure IV.16. Plan of the ground floor of the Sainte-Geneviève Library. **Source:** Taricat, 2003, p.244

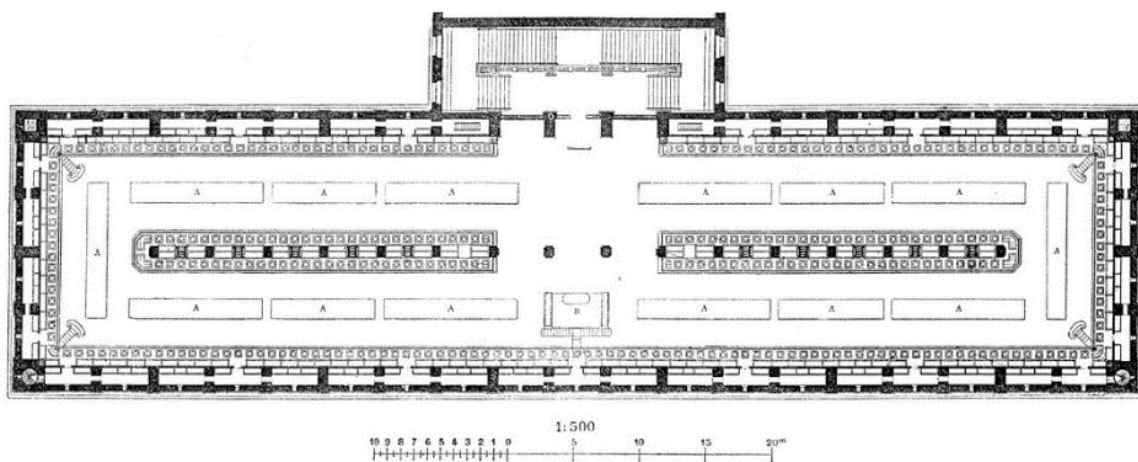


Figure IV.17. Plan of the reading space with its layout as it existed until 1930. **Source:** Taricat, 2003, p.244

Henri Labrouste created a building combining stone and cast iron from the industrial revolution. He chose stone for the facade, the exterior supporting columns and the walls, echoing the materials used in the surrounding buildings,

To enhance the penetration of light, which was largely provided by 41 windows, he decided to build a cast-iron structure on columns, initially supporting a flat ceiling in broken sections decorated with caissons, then finally a vault. These were installed in 1840. He left the structure completely visible. This was a novelty for the time for a so-called noble building, as visible iron structures were reserved for industrial buildings or market halls.

To support the floor of the first floor, the architect created a partly visible iron structure as illustrated in **Figure IV.18**.

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Figure IV.18. Views of the roof and steel structure of the Sainte-Geneviève Library, Paris, France. **Source :** <https://videenville.paris/galleries/la-bibliotheque-ste-genevieve/>

IV.3.4. The Halle au blé, Paris, France

The Halle au blé was built between 1763 and 1767 to plans by Nicolas Le Camus de Mézières (1721-1789), on the site of the Hôtel de Soissons, built between 1573 and 1578 for Catherine de Médicis (Hôtel de la Reine), of which the Astrologue column still remains. Its central courtyard was covered by a wooden dome in 1782-1783 (Legrand and Molinos), rebuilt in iron after a fire in 1802 (Brunet and Bélanger, 1806-1811). Due to a lack of business, it closed in 1873. The building was almost entirely rebuilt in 1887-1889 by architect Henri Blondel (1821-1897) to house the Bourse de Commerce (F.Lazare and L.Lazare, 1855).

The Halle au blé is a circular building, 68 m in diameter overall. Its interior was surrounded by an arcade of 25 arches. Two remarkably well-built staircases lead up to a gallery where small grains are stored in vaulted brick corridors (**Figure IV.19**).

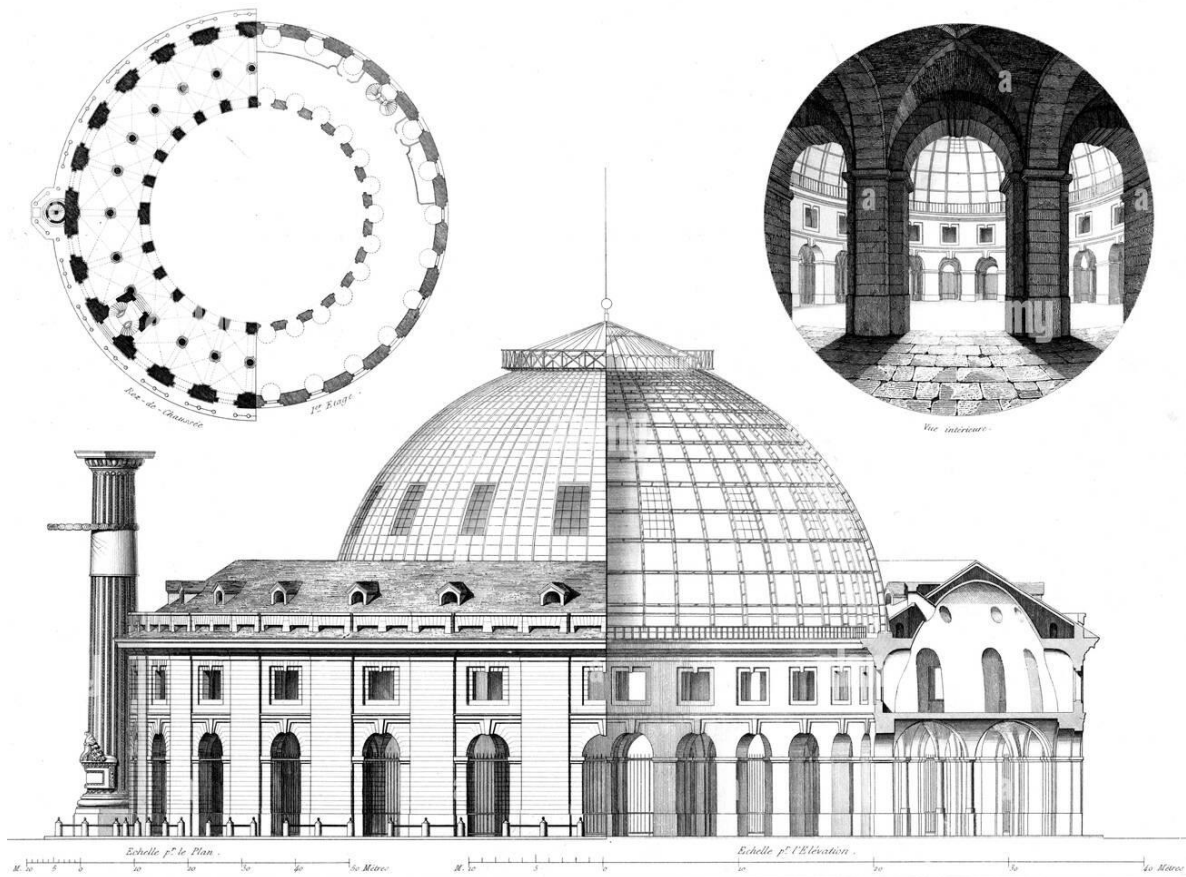


Figure V.19. Plan, section, and view of the Halle au blé, Paris, France. **Source :**

<https://www.alamyimages.fr/photo-image-paris-france-halle-au-ble-105344142.html>

IV.3.5. The Moulin Saulnier, Noisiel, France

The Moulin Saulnier is a former industrial mill located in Noisiel, in the department of Seine-et-Marne, in France (**Figure IV.20**). Built in 1872, it stands on the banks of the Marne and was designed to harness the river's hydraulic energy. The mill played a central role in the former Menier factory, famous for its chocolate production. In particular, it was used to grind cocoa beans, an essential stage in the chocolate-making process.

Jules Saulnier, a pioneering architect of modern industrial architecture, designed the building. It is often considered to be one of the first buildings in the world to have an exposed metal frame, foreshadowing reinforced concrete architecture. The building was engineered by Armand Moisant, a renowned engineer who contributed to the design of the innovative metal structure.

Today, the Moulin Saulnier is an emblematic symbol of France's industrial heritage and of the boom in the agri-food industry in the 19th century. It has also been listed as a historic monument since 1992.

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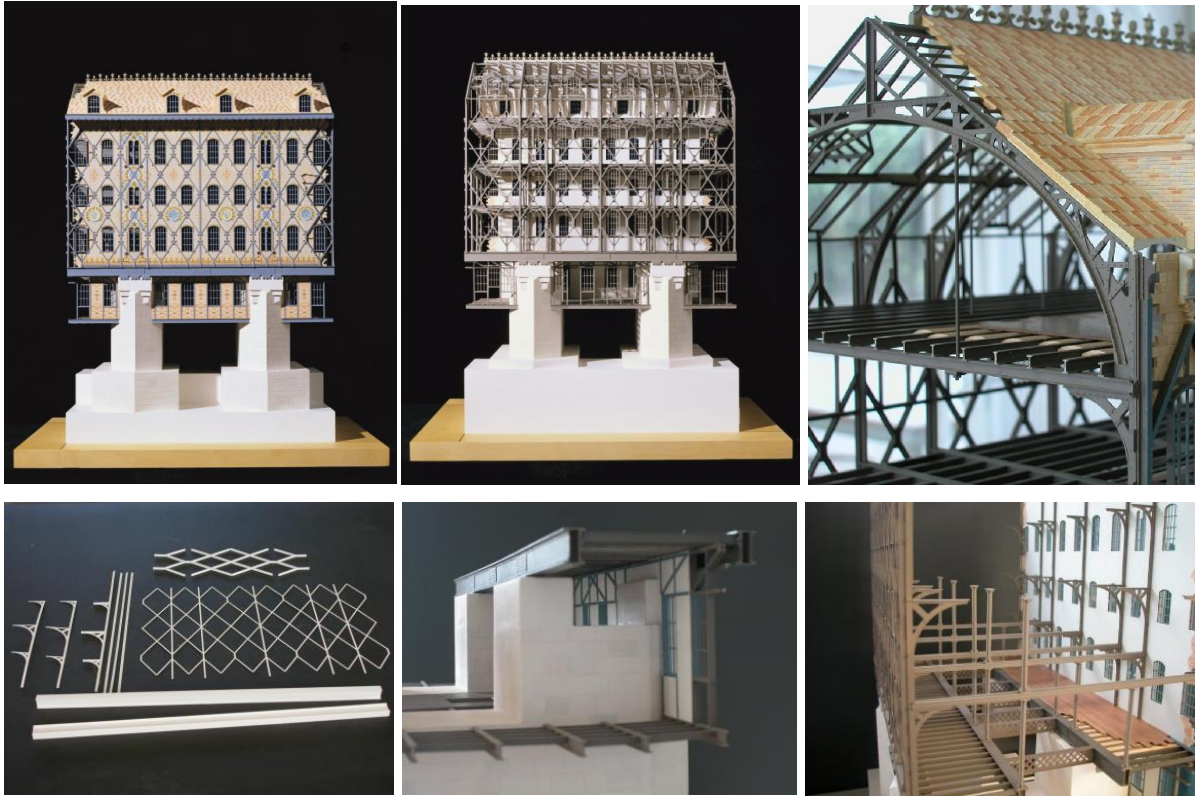


Figure IV.20. Model showing the structure of the Menier Chocolate Factory Mill, Noisiel, France. **Source :** <https://www.citedelarchitecture.fr/fr/collection/la-maquette-analytique-un-heritage/maquette-du-moulin-de-la-chocolaterie-menier-noisiel>

IV.3.6. The Galerie des Machines, 1889 Universal Exhibition, Paris

The Galerie des Machines was built by architect Ferdinand Dutert and engineer Victor Contamin between 1887 and 1889. Although it has since been demolished, visitors were thrilled to see it. Its proportions were gigantic: 430 metres long, 115 metres wide with no supports, and arches rising to a height of 45 metres. The entire structure was covered in six months.

The Galerie des machines was the largest single-span structure in the world when it was built for the World's Fair on the Champ de Mars in Paris in 1889. Designed by Ferdinand Dutert, a Beaux-Arts trained architect, and the engineer Victor Contamin, the building was so vast (spanning 364 ft) it made some visitors to the exhibition hall uneasy (**Figure IV.21**). The Galerie was entered through a Grand Vestibule, a domed structure also designed by Dutert.

The Galerie was reused in the exhibition of 1900 (with its interior altered by a huge internal rotunda called the Salle des Fetes) and was destroyed in 1909-10. Its companion in the 1889 Exposition, the Eiffel Tower, fared better, and remains on the Paris skyline today.

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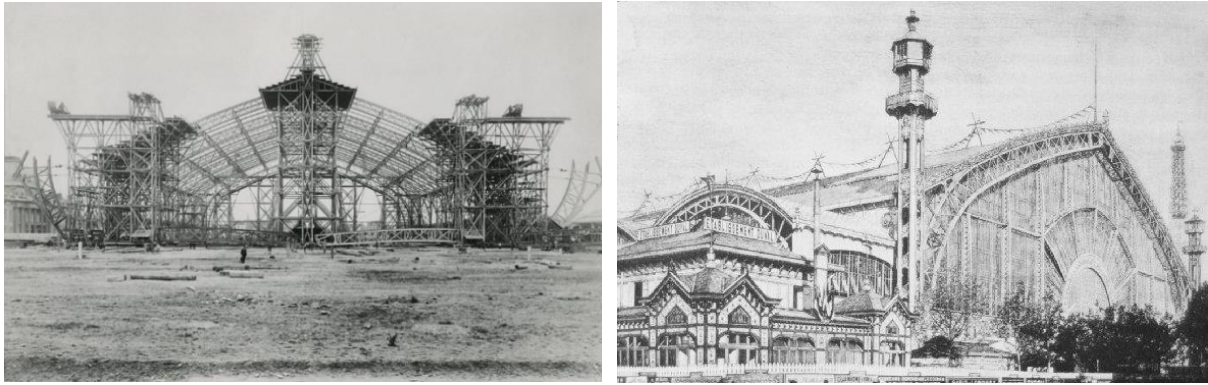


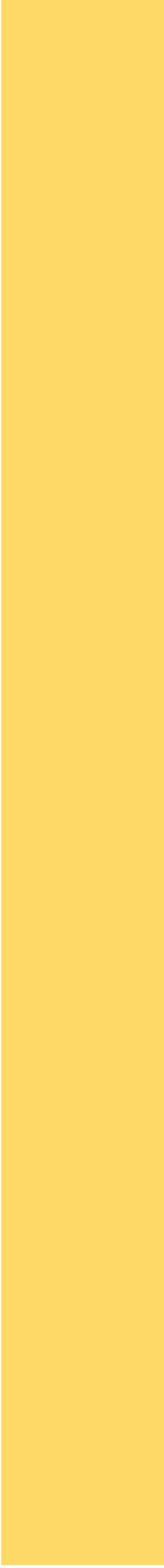
Figure IV.21. (Left) Construction of the Galerie des Machines for the Universal Exhibition of 1889, Paris.

Source : <https://www.meisterdrucke.ie/fine-art-prints/French-Photographer/491960/Construction-of-the-Galerie-des-Machines-for-the-Exposition-Universelle-of-1889.html>; (Right) The Galerie des Machines, the Universal Exhibition of 1889, Paris. **Source:** <https://structurae.net/fr/ouvrages/galerie-des-machines>

Conclusion

This chapter showed that the Industrial Revolution marked a decisive turning point in the history of architecture, introducing not only new materials and construction techniques, but also new ways of thinking about space, function, and society.

The introduction of new materials such as cast iron and glass, and the invention of standardised production techniques, led to the design of structures of unprecedented scale and functionality: railway stations, industrial halls, metal bridges, greenhouses, workers' housing, and institutional buildings adapted to modern society. This period also marked a profound reflection on constructive rationality, the legibility of forms and the relationship between architecture and utility.

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Chapter V:

Historicism

and Eclecticism

Introduction

During the 19th century, European architecture was deeply marked by a constant dialogue between the memory of the past and the demand for modernity. Against a backdrop of unprecedented political, social, and industrial change, architects were looking for new ways to express emerging identities. Historicism emerged as a response to this need: it consisted of reinterpreting the styles of the past, whether Gothic, Romanesque or classical, by attributing cultural, national, or institutional meanings to them. At the same time, eclecticism is developing as a freer practice, combining several historical languages in a single work to serve varied and often symbolic functions.

This chapter explores these two complementary trends, examining how they helped shape 19th-century urban landscapes. It also provides the historical context of their emergence and identifies the key factors that influenced their development.

V.1. General context of historicism and eclecticism in architecture

V.1.1. Definition of historicism and eclecticism in architecture

According to the French dictionary “L’internaute”, historicism in history means a doctrine that draws truths (moral, religious, etc.) from history without seeking to study them. In architecture, historicism is a tendency to imitate styles of the past.

The term “historicism” was first introduced into architectural discourse by the German art historian Herman Beenken, in his book “*Historismus in der Baukunst*”, published in 1938. Originally, Beenken used the term neutrally, without value judgements, to refer to 19th-century German architecture. However, under the influence of the first modernist critics, architectural historiography gradually gave the concept of historicism a marked definition: that of an eclectic use of styles, forms, and elements borrowed from the architectural traditions of the past (Mađanović, 2020, p. 34).

The term “historicism” refers to the movement which, from 1850 onwards, led to the revival of various architectural and artistic styles. This movement led to the appearance of styles known as “neo-styles”, such as neo-Romanesque, neo-Gothic, neo-Renaissance, and neo-Baroque Meyer (2015). When these styles are blended, it can be referred to as “eclecticism” or “stylistic pluralism” (the use of several styles at the same time).

The entire 19th century of architecture could be said to be eclectic if references to the art of the past are accepted as its mainspring. While some design professionals, known as “revivalists”, seek to faithfully reproduce the styles of the past, eclecticism is characterised by a desire to create rather than a nostalgic attachment. It is an approach in which originality takes precedence, guided by invention rather than reminiscence (Hamlin, 1952).

As for the principle of eclecticism, Claude Mignot (1983, p.100) distinguishes two modes of operation in his book “*L'Architecture au XIXe siècle*” :

- Typological eclecticism, which seeks to match, according to an expressed convention or “convenience”, a particular programme to a particular historical style, which will then be adapted and modified according to need.
- Synthetic eclecticism, which draws on past architectural experience to combine principles, solutions, and motifs from different periods in new ways. The result is a succession of ‘cut and paste’ operations.

V.1.2. Origins/ birth of historicism and eclecticism

Eclecticism is often associated with the period of historicism and considered one of its aspects. In his article “Historicism”, Meyer (2015) distinguished four (04) main factors behind historicism in architecture.

V.1.2.1. The question of the “good style”

The origins of historicism can be traced back to the fact that, around 1800, two styles coexisted (neoclassicism and neogothicism), with architecture and art being conceived for the first time as a series of different stylistic developments. As a corollary of this phenomenon, the question of “good style” was debated throughout Europe from 1820 onwards. Many writers, artists, and architects criticised the styles of the past. Thus, many points of view have been expressed regarding the choice of construction style. **Table V.1** shows some of the authors' opinions.

Chapter V: Historicism and Eclecticism

Table V.1. Some of the authors' opinions regarding the style of construction. **Source:** Developed by author based on Meyer (2015)

Figures	Brief identification	Opinions
 Heinrich Hübsch (1795–1863)	He was German architect and writer	He is in favour of a style with semi-circular arches (<i>Rundbogenstil</i>), based on early Christian, Byzantine, and Romanesque architecture.
 Christian Ludwig Stieglitz (1756-1836)	He was a German lawyer, building researcher, councillor in Leipzig and cathedral provost in Wurzen.	He favours the Greek and Gothic styles.
 Georg Wilhelm Friedrich Hegel (1770-1831)	He est un philosophe allemand.	He saw the history of art as a series of styles of equal value.
 Thomas Hope (1769-1831)	He was a Dutch-British interior and Regency designer, traveller, author, philosopher, art collector, and partner in the banking firm Hope & Co.	He asserted that the English national style found its answer in an eclecticism based on rationality.

V.1.2.2. Chromatism in architecture (the polychrome quarrel)

Alongside the question of styles, there was also the question of chromatism in architecture (the polychrome quarrel). Discovered through archaeology, chromaticism became the instrument of criticism of neoclassicism around 1820. Two eminent figures championed it:

- Jacques Ignace Hittorff (1792-1867) published “*De l'architecture polychrome chez les Grecs*” in 1830.
- Gottfried Semper published the book “*Vorläufige Bemerkungen über bemalte Architectur und Plastik bei den Alten*” (Preliminary remarks on painted architecture and sculpture among the ancients) in 1834. Gottfried identified the new style of the 19th century in the relationship between historicism and chromatism.

V.1.2.3. Romanticism

Historicism has its origins in Romanticism, the birth of national consciousness and a growing interest in the Middle Ages, as well as in the quest for affirmation of nationalism in the 19th century. This romanticism led designers to revisit the styles of the past to create new or “neo” styles.

Figure V.1 presents a synthesis diagram showing the relationship between historicism and eclecticism.

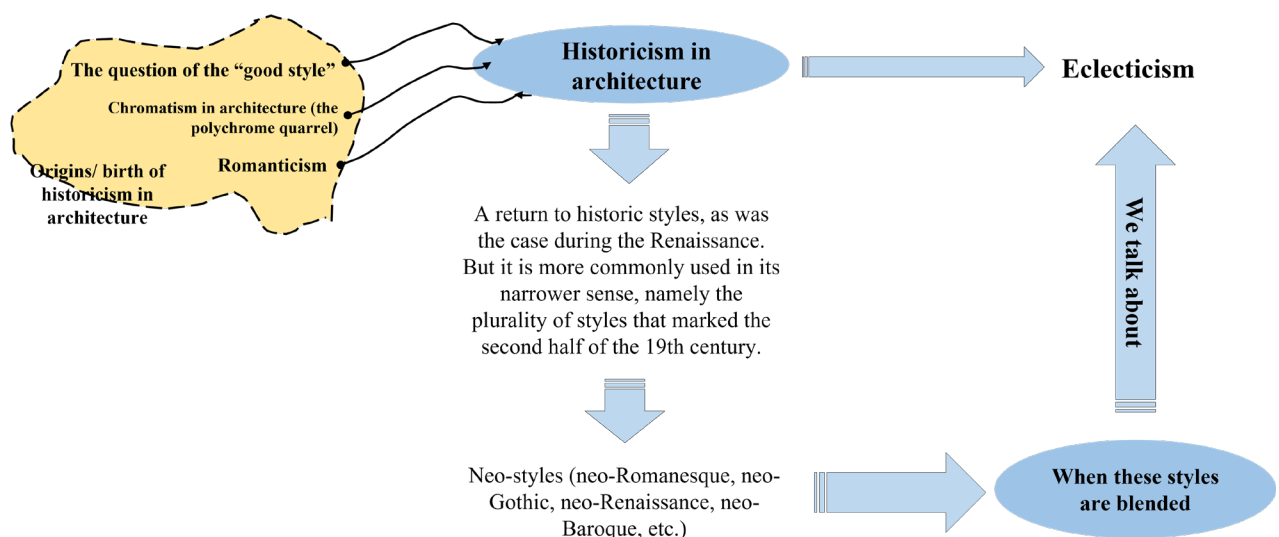


Figure V.1. Synthetic diagram showing the relationship between historicism and eclecticism. **Source:** Developed by the author

V.2. Characteristics of historicism in architecture

Historicism in architecture is characterised by several elements that illustrate an approach inspired by the past.

- Historicism is characterised by the borrowing of past architectural styles, such as Gothic, Romanesque, Baroque and Renaissance. Rather than creating entirely new designs, historicist architects were inspired by the forms, motifs and construction techniques of these periods and reinterpreted them in a modern context.
- Eclecticism is a major aspect of historicism. This trend often favours a combination of several styles in the same building. Eclecticism, or the simultaneous use of elements from different periods and regions, allowed architects to select the features deemed most appropriate or aesthetically pleasing for each project.
- Historicist buildings often sought to evoke a specific national or regional identity, reinforcing feelings of cultural belonging. For example, in nineteenth-century Europe, medieval styles such as neo-Gothic were often associated with national history and used for public buildings to symbolise traditional values and historical continuity.
- Under the influence of figures such as Eugène Viollet-le-Duc in France, historicism also took an interest in the restoration of historic monuments. However, the aim was not simply to conserve, but sometimes to “correct” or even rebuild buildings to reflect what the architect believed to be their original form, even if this meant adding elements that had not existed.
- Historicist architects favoured details and decorations inspired by earlier architecture. For example, neo-Gothic buildings often feature spires, pinnacles, rosettes and pointed arches reminiscent of medieval cathedrals.

V.3. Examples of historicist architecture

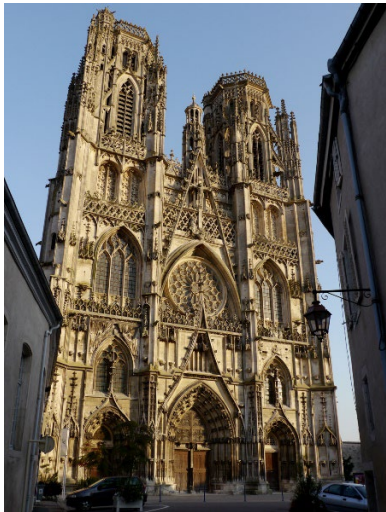
The fundamental principle of historicism is the imitation of architectural styles from past eras. A historicist building may refer to specific periods of architecture, such as the Gothic period, the Renaissance, the Baroque, or others.

- **Gothic:** pointed arches, mullioned windows, pinnacles, coloured stained glass, and ornamental details such as gargoyles may be present.
- **Renaissance:** Use of pilasters, low-arched windows, and decorated cornices.

- **Baroque:** Undulating façades, highly ornate decorations, pronounced curves, and often plays of light and shadow on the façades.

By knowing these styles, an observer can recognise the precise influences in a historicist building. For example, a building with Ionic columns and simple decorations might be inspired by the Neoclassical period, while another with pointed arches and stained-glass windows might indicate a Gothic influence. Indeed, to detect a historicist style in architecture, it is essential to have a good knowledge of past architectural styles, since the historicist style is based precisely on the imitation or reinterpretation of these styles. This understanding not only makes it possible to recognise the specific elements of each period, but also to differentiate a true historicist style from other less faithful movements or styles (**Table V.2**).

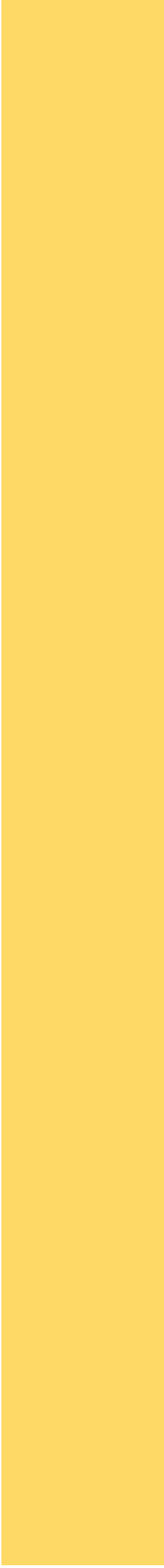
Table V.2. Examples of historicist architecture with Source of inspiration models. **Source:** developed by author

Neo-styles	Examples	Stylistic reference
Neo-Gothic	 St John the Baptist Catholic Cathedral, Norwich, England, United Kingdom. The cathedral was built between 1882 and 1910 to designs by George Gilbert Scott, as a parish church dedicated to Saint John the Baptist.	 Cathédrale Saint-Étienne de Toul, 15th-century façade (flamboyant Gothic).

	 Inspired by Westminster in London, the Budapest Parliament, built between 1884 and 1902, was the largest building of its time and a symbol of Hungary's economic power at the beginning of the last century.	
Neo-Byzantine	 Saint Alexander Nevsky Cathedral is a neo-Byzantine Orthodox cathedral in Sofia, serving as the cathedral church of the Patriarch of Bulgaria. Planned since 1880, its construction began in 1882 after the laying of the foundation stone but was spread out between 1904 and 1912.	 A representation of the Church of the Holy Apostles in Constantinople (now disappeared). Homilies of James of Kokkinobaphos, circa 1150.

Conclusion

Historicism and eclecticism, although often opposed, were both born of the same need: to give meaning to architecture in a changing world. Historicism seeks meaning in fidelity to the past, while eclecticism seeks meaning in reinterpretation of the past. These two approaches bear witness to an era when architecture oscillated between tradition and innovation, before the radical breakthroughs of modern architecture in the twentieth century.

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Chapter VI:

The Art Nouveau

Introduction

At the end of the 19th century, a revival was sweeping through European architecture. Faced with the saturation of historicist styles and the uniformity produced by industrialisation, an emerging movement sought to reconcile art, modernity, and everyday life: Art Nouveau. With its avant-garde ambitions, this movement was characterised by a desire to break with traditional models, proposing fluid, decorative architecture that was deeply rooted in natural forms. Innovative in its materials, lines and relationship with craftsmanship, Art Nouveau reflects a quest for unity between aesthetics and function.

This chapter aims to help students understand the aesthetic, cultural, and technical foundations of Art Nouveau as an avant-garde movement that marked a break with the standardised production and historicist styles of the 19th century.

VI.1. What is meant by avant-garde architecture?

The term “avant-garde” in architecture and art refers to innovative, experimental, or radical ideas and practices that challenge established norms and conventions. It originated in the context of military terminology, where “avant-garde” referred to the front-line troops leading an attack, metaphorically suggesting that these artists and architects were at the forefront of pushing boundaries and exploring new territory.

In recent decades, the concept of the avant-garde has been theorised more rigorously, notably by Peter Bürger in “Theory of the Avant-Garde” (1974). Bürger makes a clear distinction between the avant-garde and modernism, emphasising that the former is limited to a more restricted field of currents and ideas. In his view, the fundamental aim of avant-garde movements in the visual arts and literature was to challenge the autonomy of art as an institution. The avant-garde sought to abolish the separation between art and everyday life, challenging the notion of art as an autonomous sphere, disconnected from the real social fabric.

From this perspective, the avant-garde aimed to create a new praxis of life - a form of existence rooted in artistic principles - that would offer an alternative to the established order. This alternative would no longer be based on economic rationality or bourgeois norms, but on the aesthetic sensibilities and creative capacities of each individual (Sennott, 2004).

In architecture, this could manifest in the use of new forms, materials, or spatial arrangements that challenge traditional design ideas. Movements like Futurism, Constructivism, De Stijl,

Brutalism, Art Nouveau, and the Chicago School of Architecture are all examples of avant-garde approaches in architecture.

This chapter focuses specifically on Art Nouveau, examining its key characteristics, historical contexts, and contributions to the history of architecture, while the Chicago School of Architecture will be discussed in the following chapter (Chapter VII).

VI.2. General context of the Art Nouveau

VI.2.1. Definition of Art Nouveau

Art Nouveau is a style that developed in Europe and America between 1890 and 1905 (Bevilacqua, 1994). The term “Art Nouveau” first appeared in 1884 in the Belgian literary magazine “L'Art Moderne” to designate those who repudiated historicism. At first, the term was used to describe realist painters who rejected academicism, before becoming more specialised and restricting themselves to objects and architecture. The aesthetic of Art Nouveau is a style whose name was conceived and promoted not by a group of artists but by a genius dealer, Siegfried Bing, whose eponymous gallery (**Figure VI.1**), opened in Paris in 1895, set out to transcend genres, from architecture to everyday objects. The term “Art Nouveau” derives from the name of this gallery (Lingenheim, 2021).

In a period of artistic ferment, Bing devoted part of his gallery to contemporary European art, where stained glass windows by Toulouse-Lautrec, Vuillard, Bonnard, and Sérusier were exhibited. Later, objects of art took pride of place: Galle glass, Lalique jewellery, and Rodin sculptures were displayed alongside posters by Beardsley, paintings by Carrière, and stained glass by Tiffany (Bevilacqua, 1994).



Figure VI.1. Façade of Siegfried Bing's gallery, Paris. **Source:** Lingenheim, 2021

Living at the end of the Industrial Revolution, the artists of this movement wanted to reconnect with nature. They are famous for their posters, their curvaceous architecture, and their furniture and decorative objects (lamps, beds, vases, etc.) (Valorplast, 2017).

The movement went by different names in different regions. In France, for example, its opponents called Art Nouveau “the noodle style”, or “the metro style”, after the Paris metro stations designed by Hector Guimard in 1900 (Valorplast, 2017) (**Figure VI.2**).



Figure VI.2. Hector Guimard and the Paris metro, typical of Art Nouveau. **Source:**

<https://www.madmoizelle.com/art-nouveau-61884>

According to Vergara and Tomasella (2001, p. 145) and a teaching document published by the National Gallery of Art, Washington, what is commonly referred to as “Art Nouveau” in English actually goes by different names in different countries. In Germany, it is known as *Jugendstil*, in Austria as *Sezessionstil*, in Catalonia as the *Modernista movement*, while in Italy it is known as *stile Liberty* (after the London retailer). This diversity of names, although not exhaustive, testifies to both the international scope of the movement and its stylistic richness. It is important to note that Art Nouveau is not simply a visual aesthetic: it combines organic forms with controlled geometric ones. While its roots lie in the decorative arts, its influence has spread far beyond, affecting painting and architecture in particular.

In the United States, the Tiffany style originated with the artist Louis Comfort Tiffany (born in New York in 1848). He developed an incredible talent for working with glass, and in particular, his famous Tiffany methods, which gave his name to a style that is still known today (**Figure VI.3**). He created Tiffany lamps as part of the Art Nouveau movement, with a strong taste for

floral motifs. In fact, Tiffany-style lamps are all made of stained glass that has been cut by hand and then joined together with a tin joint (lead at the time).

Louis Comfort Tiffany's philosophy opposed the stereotypes and repetitions of industrialised production and insisted on artisanal production, seeking the unique character of each piece. His work with glass, in particular his original stained-glass technology, revolutionised the art of glass.



Figure VI.3. Une lampe Tiffany. **Source :** https://cdn.shopifycdn.net/s/files/1/0573/7919/3011/files/Tiffany-Lamps-2_480x480.webp?v=1695797816

VI.2.2. Birth and spread of Art Nouveau

Chronologically, Art Nouveau came after the Industrial Revolution and the period of historicism. It was born as a reaction against the excesses of industrialisation and the reproduction of old styles (Neo-styles). It was a sudden and rapid movement that developed internationally.

On the one hand, the emergence of Art Nouveau took place against the backdrop of the industrial revolution at the end of the 19th century, a period marked by technical progress and increasing mechanisation. The industrial revolution and the new demands of the international market caused major upheavals in the socio-cultural habits of the new society. Modern capitalism radically impacted cultural profiles by forcing rationalised productivity to the detriment of personalised work. The individual was reduced to simple, specialised functions, and individual ties were reduced to functional relationships. Any work produced, stripped of its specificity, became a simple product for commercial exchange. Society, imbued with productivism, took little notice of this destabilisation of individual morality and the suppression

of private initiatives and freedoms already acquired (Bevilacqua, 1994). The erosion of human vision and community ties led to the disappearance of crafts.

On the other hand, the supporters of Art Nouveau detested both the almond-shaped Renaissance monuments and the Neo-Gothic style. They sought to move away from the fixed and excessively ornate forms of the styles of the past and focus on a more functional aesthetic, fluid and integrated into everyday life, and put forward the ideals of Art Nouveau, which valued proportion, adaptation to needs, and practical utility (Lingenheim, 2021; Vergara and Tomasella, 2001, p.145).

The teaching document published by the National Gallery of Art in Washington offers a comprehensive overview of the birth and development of the Art Nouveau movement. It points out that it is difficult to date the birth of this movement precisely. Many date its emergence to 1895, with the opening of the L'Art Nouveau gallery in Paris, founded by Siegfried Bing, a fervent promoter of the style. His shop quickly became an essential meeting place for artists and collectors alike. However, some emblematic works of Art Nouveau appeared earlier.

As early as 1893, the first issue of the magazine “The Studio”¹ published a striking illustration by the English artist Aubrey Beardsley (1872-1898), created for “Oscar Wilde's play Salome”² (**Figure VI.4**). His sinuous, bold line, strikingly clear in black and white, and his strong interest in the figure of the femme fatale, were to have a decisive influence on the Art Nouveau aesthetic. Some critics even consider this print to be one of the first manifestations of the style.

Magazines such as The Studio played a central role in disseminating the new visual language. Similarly, exhibitions organised by avant-garde groups across Europe enabled artists to discover and exchange innovative ideas. Among these groups, Les XX, based in Brussels, was one of the most dynamic. Brussels occupied a strategic geographical and cultural position, at the crossroads of the English “arts and crafts movement” and French symbolism. In 1893, the year Beardsley's print was published, the architect Victor Horta designed a radically innovative townhouse for his friend Émile Tassel. Although it is unlikely that Horta was aware of Beardsley's work, the fluid ornamentation throughout the house, with its curved lines

¹ The Studio is an illustrated magazine of fine and applied art. For more information on the first issue, consult <https://archive.studiointernational.com/TheStudio/TS1893/april/The-Studio-Vol1-No1-April-1893.html>

² Oscar Wilde's *Salomé* is a one-act play written in French in 1891 and later translated into English by Wilde himself. It explores the biblical story of Salome, the stepdaughter of King Herod, who famously asks for the head of John the Baptist (Jokanaan) on a silver platter. The play focuses on themes of desire, power, and sensuality, with Salome's obsession with Jokanaan being a central part of the drama.

reminiscent of plant tendrils, expresses a similar spirit of decorative unity and formal innovation.



Figure VI.4. (Left) The Studio magazine. **Source:** <https://www.studiointernational.com/the-studio-vol1-no1-april-1893> ; (Right) Illustration by Aubrey Beardsley for Oscar Wilde's Salome, the peacock dress, 1893. **Source :** <https://www.openculture.com/2015/09/oscar-wildes-scandalous-play-salome-illustrated-by-aubrey-beardsley-in-a-striking-gothic-aesthetic-1894.html>

VI.2.2.1. The Art Nouveau style in Brussels

Many cities could lay claim to being the European capital of Art Nouveau. Brussels is probably one of the European cities where the Art Nouveau style is best represented; it is where the first buildings were constructed. However, after the Second World War (1939/1945), Brussels saw some of the masterpieces of innovators such as Victor Horta and Paul Hankar disappear or become distorted, as well as many works by lesser-known architects. Fortunately, over the years, Art Nouveau has gradually been rediscovered (Dubois, 2016, p.7).

VI.2.2.2. The Art Nouveau style in England

According to Mongrain and Dubois in their "*Répertoire des courants architecturaux de Saint-Lambert n° 7*", Art Nouveau has its roots in the English "Arts and Crafts movement," which emerged in the 1860s. The Arts and Crafts movement developed in the United Kingdom

between 1860 and 1910, as traditional society was transformed by industrialisation. Founded by 2 major figures, William Morris and John Ruskin, the movement covered architecture, the decorative arts, painting, and sculpture.

Several factors led to the birth of the “Arts and Crafts movement.” In the 1850s, the British Empire ruled the world: the English colonies were numerous, and the country benefited greatly from the Industrial Revolution. However, the industrial revolution was not always perceived as beneficial to the English people, because working conditions were poor, living standards did not rise in proportion to economic progress, and consumer products were of poorer quality.

Some thinkers, like John and William (**Figure VI.5**), despaired of these negative findings. They actively defended workers and initiated the Arts and Crafts movement.

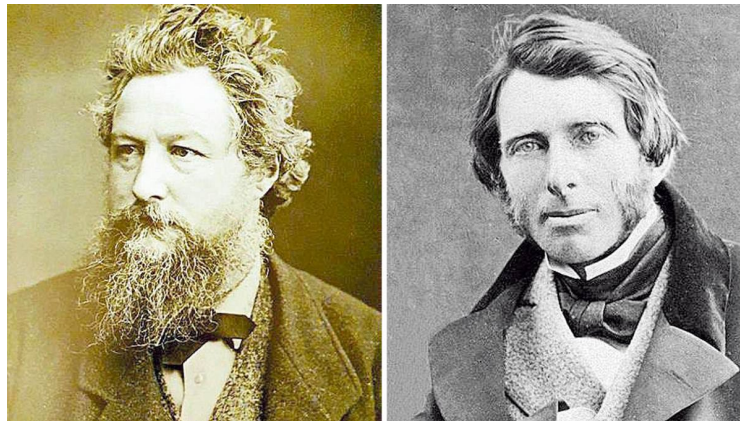


Figure VI.5. Portraits of William Morris and John Ruskin. **Source :**

<https://www.laopiniondemalaga.es/opinion/2021/06/27/ruskin-morris-cementerio-ingles-54352516.html>

According to Nicolas Trembley, art critic and independent curator of the art fair “ART PARIS” 04-07 April 2024 (**Figure VI.6**), the “Arts and Crafts” movement was born in reaction to the industrialisation and mass production of the Victorian era. The movement believed that to create beautiful work, it was necessary to work in a healthy and pleasant environment. The group of artists who formed this movement sought to restore the quality of craftsmanship and promote the artistic value of manual work, while seeking to abolish the distinction between fine and applied arts. They believed that a craftsman can only be happy if he participates in every stage of the creation of his product, from design to finishing. Another idea underlying this reform movement was the integration of art into all aspects of everyday life, from functional objects to furniture, interior decoration, clothing, and jewellery, while promoting the use of materials that respected nature, such as wood, glass, wool, and earth (Trembley, 2024, p.4).



Figure VI.6. Poster of the 26th edition of “Art Paris”. **Source :** <https://www.museumtv.art/artnews/specials/art-paris-2024/>

VI.2.2.3. The Art Nouveau style in France

In France, Art Nouveau took off thanks to Siegfried Bing (1838-1905). Siegfried Bing, also known as Samuel Bing, was a German-born French art dealer, collector, critic, and patron.

Siegfried contributed to the development of Art Nouveau by opening a gallery in Paris, the Maison de l'Art Nouveau, in 1895. Siegfried introduced Parisians to art objects from Japan and China, sources of inspiration for artists. This was the birth of Japonism, which revolutionised interior decoration and came to an end with the outbreak of the First World War (1914-1918).

It should be mentioned that in the arts, Japonism is an artistic movement that goes back to Impressionism and Art Nouveau, in which the influence of Japanese art (**Figure VI.7-9**) on artists, first French and then Western, is felt. It is characterised by freedom of composition, colour and motif, a lack of perspective and strong lines.



Figure VI.7. (Left) Mizuno Toshikata, ‘Tea Ceremony’, 1896; (Middle) Kosode with motifs of famous views, mid-18th century, Matsuzakaya Collection; (Right) Kosode with motifs of waterfalls and fans, second half of the 18th century, Matsuzakaya Collection. **Source :** <https://www.riseart.com/fr/article/2681/japonisme-quand-le-japon-inspire-l-art-occidental>



Figure VI.8. (Left) Fuji from Gotenyama at Shinagawa on the Tōkaidō (Tōkaidō Shinagawa Gotenyama no Fuji), from the series Thirty-six Views of Mount Fuji (Fugaku sanjūrokkei), by Katsushika Hokusai, 1831-1833;
(Right) Caprice in Purple and Gold: The Golden Screen, by James Abbott MacNeil Whistler, 1864.

Source : <https://www.riseart.com/fr/article/2681/japonisme-quand-le-japon-inspire-l-art-occidental>



Figure VI.9. Pair of Japanese porcelain vases, around 1900. **Source :** <https://www.lacredence.com/objets-arts/paire-de-vases-en-porcelaine-japonaise-vers-1900/>

The French architect Hector Guimard, one of the unmistakable representatives of this new movement, designed the famous metro stations in Paris. With his highly curved, plant-like lines, he created the Guimard style. Hector Guimard found this inspiration during a trip to Brussels in 1895 to admire the works of architect Victor Horta, including the Horta house, his private residence.

Glassmaker Émile Gallé (1846-1904) founded a school in Nancy in 1901, where he advocated art accessible to all. In his school, Émile Gallé developed an artistic laboratory (in French:

Laboratoire Artistique) to create new, simple, and harmonious forms, inspired by flora, Japanese culture, and the marine world.

By the time Siegfried Bing's gallery opened in Paris in 1895, Art Nouveau was flourishing in many cities across Europe and North America. From Chicago to New York, from Glasgow to Brussels, via Vienna, Munich, Barcelona, Helsinki, Prague, and Paris, the style adapted to local contexts and acquired its own identity in each city.

This international dynamic was reinforced at the 1900 Universal Exhibition in Paris, where many artists defended and celebrated this new artistic language, contributing to its recognition and widespread dissemination.

VI.2.3. Evolution of Art Nouveau: the major periods

In his book “*Art Nouveau, un défi*”, British art historian Greenhalgh (2000) identified three (03) periods in the evolution of Art Nouveau:

- **Beginnings of Art Nouveau (1890-1895):** a very short period of appearance to the general public, between 1893 and 1895,
- **Development (1895-1900):** a period during which the movement spread rapidly and took hold in all cultural circles,
- **Ruptures and decline (1900-1920):** a time when the movement stabilised, began to take stock of itself and was severely criticised, before fading away during the First World War.

At the same time, Greenhalgh discusses how Art Nouveau was perceived and criticised at the time, and how it was gradually replaced by Art Deco. The book thus offers a critical reflection on the challenges posed by this innovative movement, both in terms of artistic production and reception in a rapidly changing social and economic context.

VI.3. Characteristics of Art Nouveau

Depending on the country, Art Nouveau adopted popular traditions and is applied to architecture, furniture, ceramics, street furniture and art objects. However, this artistic movement is defined by a number of common characteristics (Lingenheim, 2021; Lingenheim, 2021; Valorplast, 2017; Bevilacqua, 1994):

- The use of colour and floral or plant motifs;

- The diversity of materials used, with a mastery of wrought iron, brick and earthenware;
- Lots of curved lines, and the virtual elimination of straight lines;
- Numerous details, precise ornamentation and decoration;
- Importance of natural light, many large stained-glass windows.

The Art Nouveau artist attempted to introduce harmonious objects into everyday life. Émile Gallé, a major figure in the Art Nouveau movement, was a fervent advocate of the democratisation of art and its integration into all aspects of everyday life. He asserted that “*L’art pour tous, et l’art dans tout !*”, underlining his ideal of art accessible to all and present in all everyday objects, whether furniture, glassware, or architectural decoration. His approach reflects a vision according to which art should not be reserved for an elite, but should permeate all areas, making beauty accessible to all social classes.

As for the source of inspiration, Art Nouveau artists adopted many themes (Trembley, 2024):

- The sensuality of slender women with long flowing hair;
- Much inspiration from nature, including the plant and animal world;
- Inspiration from Japanese art (Japonisme).

VI.4. Examples of Art Nouveau

VI.4.1. The major houses by Victor Horta in Brussels

Among the most emblematic examples of innovative architecture at the end of the 19th century are four grand Brussels residences designed by Victor Horta, one of the pioneers of Art Nouveau: the Hôtel Tassel (1893), the Hôtel Solvay (1894), the Hôtel van Eetvelde (1895) and the architect's own studio house. These buildings embody a veritable stylistic revolution, marked by the introduction of the open plan, a refined use of natural light and harmony between architectural structure and ornamentation, particularly through the use of curved lines organically integrated into the design of the building itself (**Figure VI.10**). Architectural historians generally recognise the Hôtel Tassel as the very first building to be built entirely in the Art Nouveau style.

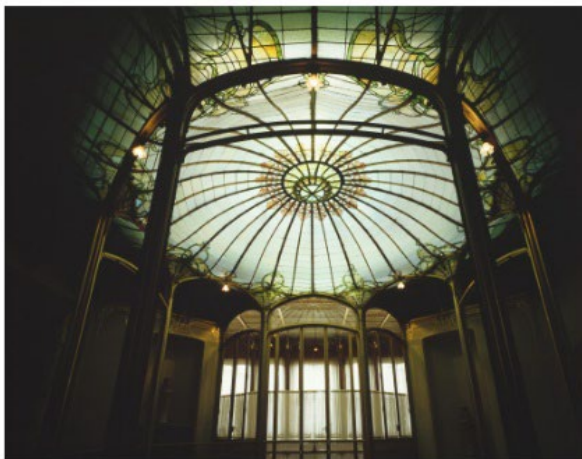
These major houses by the architect Victor Horta are a UNESCO World Heritage Site. UNESCO considered them to be of outstanding universal value.



Hôtel Tassel



Maison et atelier de Victor Horta.



Hôtel Van Eetvelde



Hôtel Solvay

Figure VI.10. Victor Horta's major houses in Brussels. **Source :**

<https://patrimoine.brussels/decouvrir/patrimoine-international-a-bruxelles/les-habitations-majeures-de-victor-horta>

VI.4.2. Barcelona's Park Güell, by Antoni Gaudí

Parc Güell, built between 1900 and 1914, represents an ambitious attempt at urban development integrated with nature. Antoni Gaudí applied all his architectural knowledge in this project, while fully expressing his singular vision of urban planning. There are no straight lines; everything is undulating or winding. The hypostyle hall, the market area, supports an impressive terrace open to the four winds. Jujol's remarkable contribution to the creation of the park's balustrade bench cannot be overlooked.

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Natural bricks, carved stone columns and the landscape are used to give the park a natural feel. To make the benches attractive and comfortable, he used mosaics, ceramic shards, iron, balustrades, and coloured tiles.

Gaudí was strongly influenced by nature. His love of nature is evident in all his works and is particularly evident in the various animal creations placed in Park Güell (Figure VI.11).

- **The dragon:** one of Park Güell's most popular attractions is El Drac.
- **The snake:** located on the same staircase as the dragon, the snake is a cute little creature surrounded by the Catalan flag. The snake is thought to represent Nejustan, the serpent on Moses' staff.
- **The lion:** there is a line of lion heads along the outside balcony. This was added to act as a drainage system for the balcony.
- **Octopus:** In the centre of the hypostyle hall, there is a huge octopus on the ceiling.



Figure VI.11. Barcelona's Park Güell: (Above-left) General view; (Above-Right) El Drac; (Below) The hypostyle hall. **Source:** <https://www.barcelona-tickets.com/fr/park-guell/inside/>

VI.4.3. Casa milla, by Antonie Gaudi

Casa Milà, also known as La Pedrera, is a masterpiece by architect Antoni Gaudí, located in Barcelona, Spain. Built between 1906 and 1912, this emblematic residence perfectly reflects the principles of Catalan Modernism and Art Nouveau. Gaudí experimented with bold shapes, breaking with traditional straight lines to create an undulating stone façade inspired by the movements of nature. With its organically patterned wrought-iron balconies, luminous interior courtyards and sculptural roof terrace populated by fantastic chimneys, Casa Milà embodies a unique architectural approach that is at once functional, aesthetic, and symbolic (**Figure VI.12**). A visionary work for its time, it is now a UNESCO World Heritage Site.



Figure VI.12. Casa milla, by Antonie Gaudi. **Source :** <https://www.dosde.com/fr/la-pedrera-casa-mila-residence-visuelle.html>

Conclusion

This chapter explored the origins, principles, and key figures of the Art Nouveau movement. Emerging at the turn of the 20th century as a reaction against academic historicism and industrial standardisation. By breaking with the stylistic conventions of the past and proposing an aesthetic based on curves, nature, and the unity of the arts, Art Nouveau paved the way for the reinvention of architecture with new stylistic tastes. Led by iconic figures such as Victor Horta, Hector Guimard and Antoni Gaudí, Art Nouveau combined formal innovation, exploration of materials and social ambition.

Although short-lived, this movement had a profound influence on subsequent avant-gardes, laying the foundations for expressive architecture that was free of academic dogma. Today, it remains a key reference for understanding the transition between historicism and modernity and continues to inspire contemporary architectural research through its sensitivity to art, craft, and the built environment.

Chapter VII:

The Chicago School of Architecture

Introduction

The Chicago School of Architecture represents a pivotal moment in the emergence of modern architecture at the end of the 19th century and the beginning of the 20th century. Born in the context of rapid industrialisation, urban expansion, and the reconstruction of Chicago following the Great Fire of 1871, this movement introduced ground-breaking architectural concepts that challenged traditional forms and laid the groundwork for vertical construction and functional design.

This chapter aims to explore the historical context, technological innovations, formal characteristics, and key figures of the Chicago School, highlighting its role as a foundational movement in the history of avant-garde architecture and its lasting impact on the global architectural landscape.

VII.1. General context of the Chicago School of architecture

VII.1.1. Definition of the Chicago School of Architecture

The Chicago School is an architectural movement that developed in Chicago, in the United States, from the 1870s onwards. This movement is closely linked to the reconstruction of the city after the Great Fire of 1871, which destroyed much of the city. It gave rise to a new approach to construction and to innovations that have shaped modern architecture (Moon, 2018).

VII.1.2 Birth/origin of the Chicago School of Architecture

In the years following the fire of 1871, Chicago created distinctive urban forms that permitted new high-density use in the city core. The development of the skyscraper made vertical growth possible. Innovations in mass transit moved people out from the city core and accelerated the city's horizontal expansion. New towns and new housing styles were developed. These new forms were the physical response to the stimulus of Chicago's booming activity in manufacturing, railroading, and commerce (Hugh, 1973, p.V). The main factors behind the birth of the Chicago School of Architecture can be summarised as follows:

- **Great Chicago Fire (1871):** This event wiped out around 10 km² of the city. Reconstruction provided an opportunity to rethink urban planning and architecture.

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- **Urban growth:** Chicago's demographic explosion necessitated the rapid and efficient construction of high-rise buildings.
- **Industrialisation:** The rise of industry and technology led to the development of new materials such as steel and reinforced concrete.

As for the great Chicago fire, it is linked to the popular legend of Catherine O'Leary's cow (Figure VII.1). During milking on a Sunday in October 1871, this cow kicked a candle with her hoof. It was a hot day, the wind was blowing, and that was the start of the great Chicago fire. It would blow up the canals and rivers and destroy the city in less than two days. Residents tried to flee by boat across the lake as burning embers fell (Figure VII.2). The toll: 300 dead, more than 17,000 buildings reduced to smoke, 200 million dollars of damage (Figure VII.3).



Figure VII.1. Kate O'Leary with her cow knocking over a lantern, the mythic start of the Chicago Fire of 1871, c.1872. **Source :** <https://www.meisterdrucke.fr/fine-art-prints/American-School/601305/Kate-O%27Leary-avec-sa-vache-renversant-une-lanterne,-le-d%C3%A9but-mythique-du-grand-incendie-de-Chicago-de-1871.html>



Figure VII.2. Map showing the location of Chicago. **Source :** Hugh, 1973, p.2

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Figure VII.3. View of Chicago City after the Fire of 1871. **Source :** https://www.lemonde.fr/series-d-ete/article/2022/08/10/a-chicago-l-architecture-a-l-epreuve-du-feu_6137633_3451060.html

The Chicago School of architecture, often linked to figures like H.H. Richardson, Louis Sullivan, and Frank Lloyd Wright, was not solely shaped by them but evolved from a variety of sources and individual contributions. William Le Baron Jenney is credited as a key figure in the movement, particularly for introducing radical architectural ideas, including the skeleton frame for skyscrapers, inspired by French thinkers like J.N.L. Durand and Viollet-le-Duc. Jenney's office became a hub for future Chicago School leaders, such as Sullivan, Wright, and Burnham. Other influential figures included John Root, Joseph Silsbee, and Dwight Perkins, who contributed to the development of new architectural forms and theories (Hugh, 1973, pp.8-9) (**Figure VII.4**).

The movement was defined by a rejection of mindless eclecticism and embraced functionalism, with Sullivan's mantra “form follows function” becoming a central tenet. The Chicago School architects created a diverse range of original designs, including buildings and urban plans. Despite their influence, the movement struggled for recognition in the East and faced a decline after World War I, as the country shifted back to eclecticism. However, the Chicago School's impact spread internationally, especially in Europe and Australia, where Wright and Griffin gained significant recognition. Although largely overlooked in the U.S. during the interwar period, the Chicago School's innovative principles eventually became a cornerstone of global architecture, with its legacy now acknowledged as one of the most important developments in architectural history (Hugh, 1973, p.V).

Chapter VII: The Chicago School of Architecture

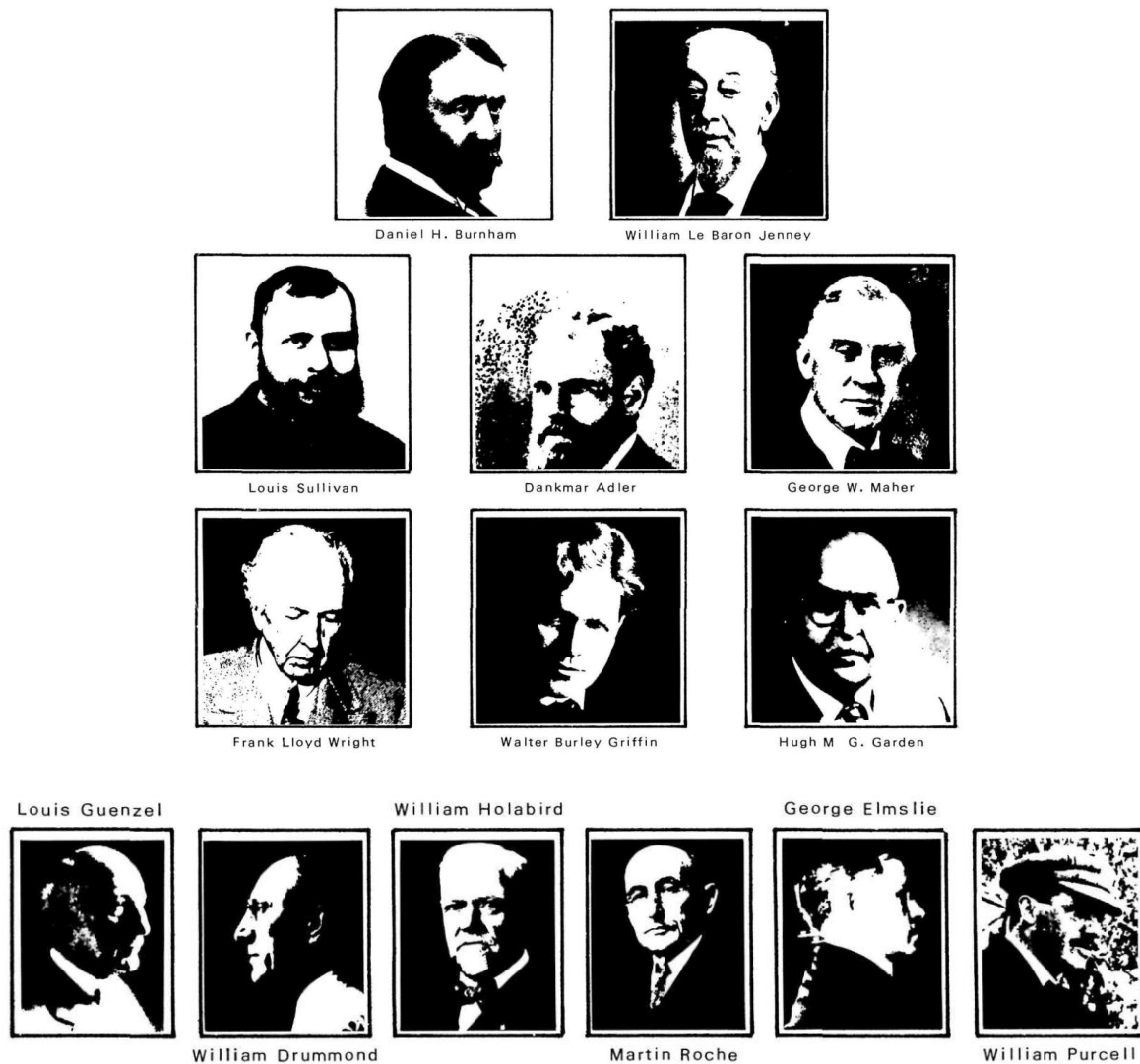


Figure VII.4. Funders of the Chicago School of architecture. **Source:** Hugh, 1973, p.36

VII.2. Characteristics of the Chicago School of Architecture

The emergence of a new architecture reflects the social and economic transformations that profoundly altered the fundamental forms and objectives of construction compared to the previous period. As a result, new structural and decorative systems were developed. A new relationship with space emerged, accompanied by a variety of symbolism better adapted to the expectations of a clientele representative of this changing society (Hugh, 1973, p.1).

Developments in Chicago at the end of the nineteenth century had as major an impact on world cultural history as those in twelfth-century France, which gave rise to Gothic architecture, and fifteenth-century Italy, which saw the emergence of Renaissance architecture. Of these three key moments in Western history, only the consequences of the Chicago School have had a truly global influence (Hugh, 1973, p.1).

Chapter VII: The Chicago School of Architecture

VII.2.1. Use of new materials

The buildings of the Chicago school are supported by a metal frame, which increases their height while reducing the weight of the walls. The use of reinforced concrete to strengthen the structures has also helped to reduce construction costs. In addition, the façades incorporate vast expanses of glass, encouraging the entry of natural light and giving rise to the famous “Chicago window”, an emblematic feature of this architectural style.

Focusing on the “Chicago Window”, it is a three-part window with a central large glass panel with two smaller double-hung sash windows on two sides (**Figures VII.5-6**). This configuration improved indoor spaces in terms of a better view, light, and ventilation. When the middle single large pane was fixed, two surrounding panes were operable. Rectangular grid pattern facades and large windows were popular in early skyscrapers in Chicago. There are bay, oriel, or rectangular windows with vertical piers on exterior walls. Especially large plate windows were used for stores on lower stories and street levels. By taking advantage of technology, windows were prefabricated and produced in standard sizes and large pieces. Also, opalescent glass was used in some buildings to emphasise the entrance (Şahin, 2024, p.496).

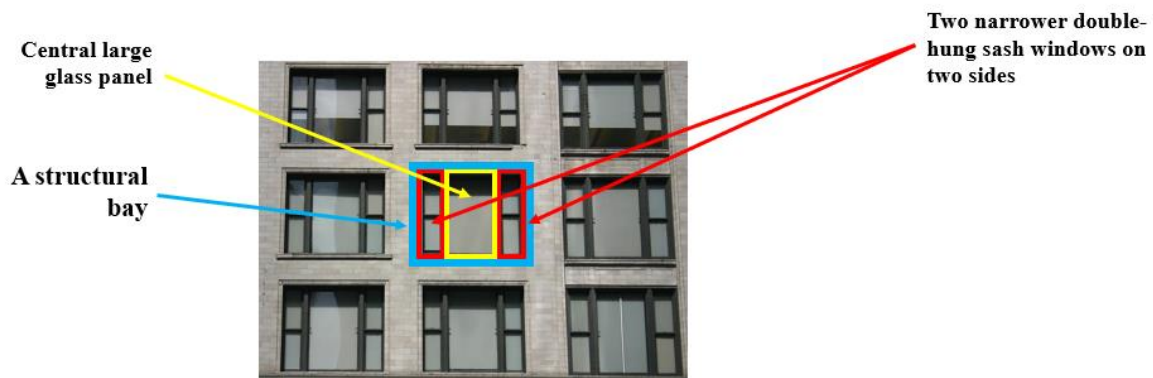


Figure VII.5. Three parts of the Chicago window. **Source:** Author



Figure VII.6. Horizontal Chicago-style windows. **Source:** Şahin, 2024, p.496

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VII.2.2. Technical Innovations

The Chicago School is closely linked to the emergence of skyscrapers, an advance made possible by the invention of lifts, which made these buildings practical and accessible. At the same time, major innovations were made in fire prevention and management, with the incorporation of modern extinguishing systems to ensure the safety of occupants. In addition, the technology used to manufacture steel frames has made it possible to create lighter, stronger structures, opening up new architectural possibilities and transforming the urban landscape over the long term. Similarly, the production of large-area glass has had an impact on the urban façade.

VII.2.3. Functional aesthetics

The architects of the Chicago School gave priority to functionality and sobriety. Ornamentation was reduced to the essentials, giving way to clean lines that emphasised the structure of the building itself. The colours of the buildings were usually derived from the materials used for the façade. The façades were characterised by their verticality, regularity, and simplicity, qualities reinforced by the arrangement of windows and pillars. On the ground floor, large bay windows were designed to display products, while on the upper floors, smaller windows were arranged in a grid. The entrances were generally imposing, often accentuated by an arch. The buildings were crowned by flat roofs or prominent, decorative cornices (Harwood et al., 2008). It was also common practice to structure facades according to the three parts of a classical column - base, shaft, and capital (**Figure VII.7**). The renowned architect Louis Henry Sullivan widely adopted this organisation in his iconic office buildings, such as the Wainwright Building, the Guaranty Building and the Carson, Pirie, Scott, and Company Building, in order to create a marked visual coherence.



Figure VII.7. Façade composition of Sullivan's buildings: Wainwright Building, Guaranty Building, and Carson, Pirie, Scott, and Company Building. **Source:** Şahin, 2024, p.496

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VII.3. Example of the Chicago school of architecture:

The Home Insurance Building of 1885 in Chicago, designed by William Le Baron Jenny, is generally considered the first skyscraper by many because it was the first multistorey office building structured mostly with iron/steel frames. It was the first ten-story office building constructed with skeletal structures for its significant portion, including its street front perimeter walls. While the original height was 42.1 m, two more stories were added in 1891, and its height was increased to 54.9 m (**Figures VII.8-9**) (Moon, 2018).

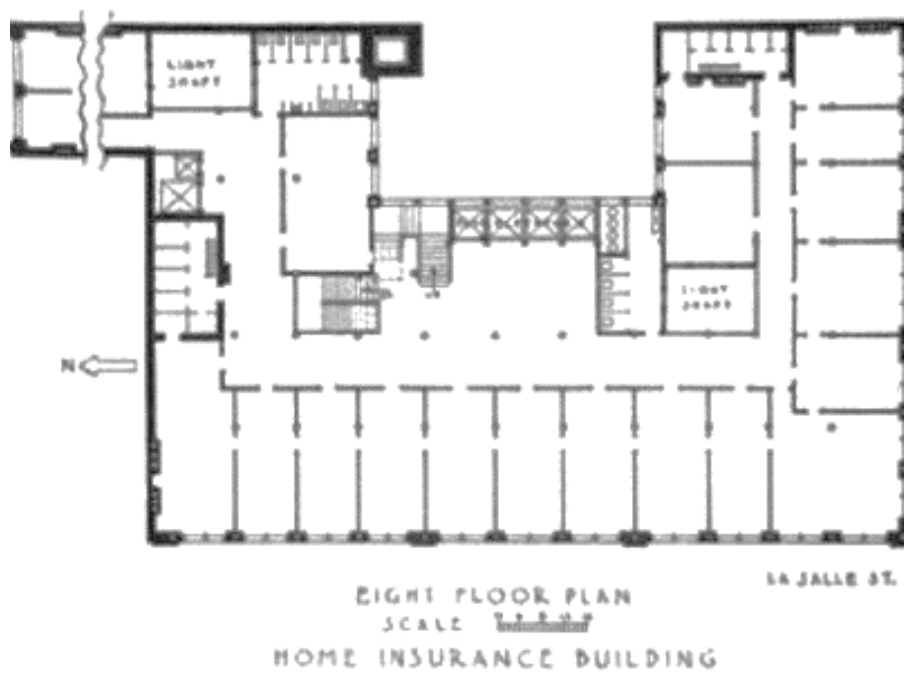


Figure VII.8. Home Insurance Building and its ground floor plan. **Source:** Moon, 2018

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The Wainwright Building in St. Louis, a ten-storey building designed by Louis Sullivan, was completed in 1891, six years after the Home Insurance Building (**Figure VII.10**). During this period, the innovative concept of skeletal structures and curtain walls underwent major refinements. While the Home Insurance Building was already based on a metal frame, its masonry walls, which encased the façade columns, still played only a partial role in supporting vertical loads. The Wainwright Building, on the other hand, marks a significant advance: all the loads are borne entirely by the steel structure, while the masonry walls, which enclose the columns, act as true curtain walls, supported by the framework (Moon, 2018).

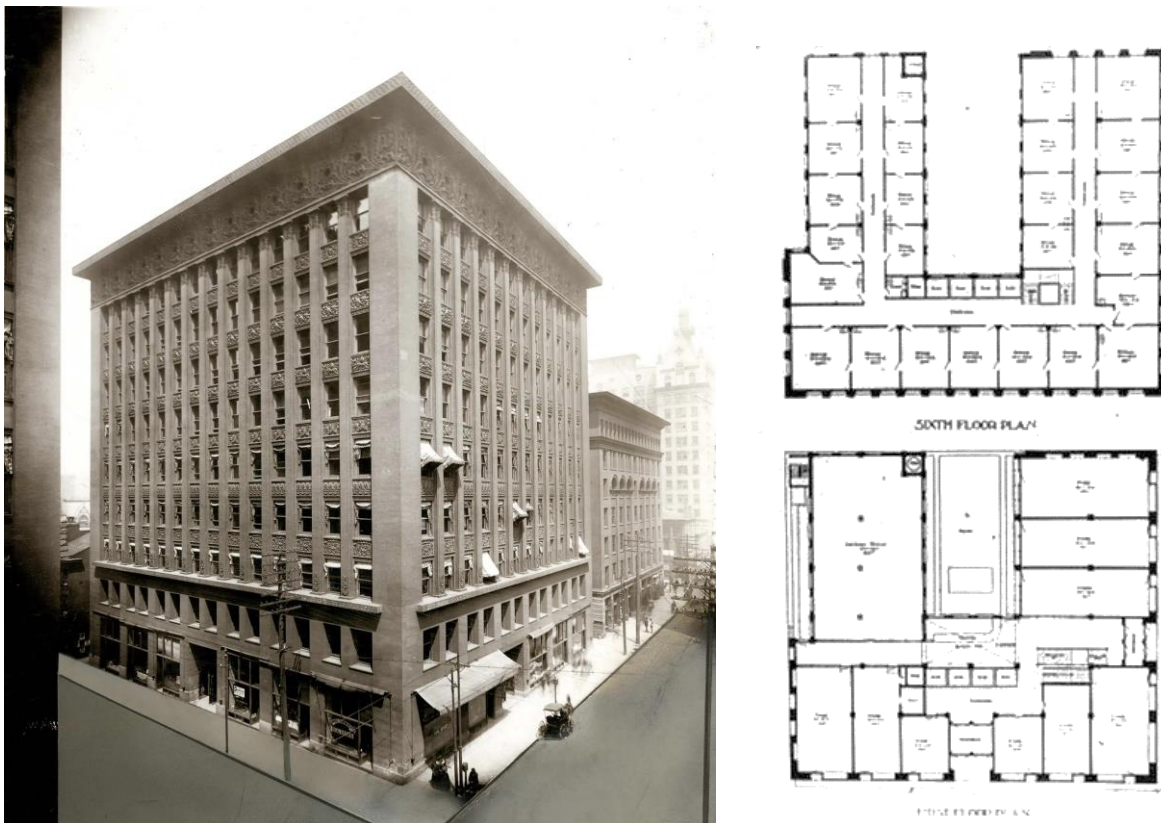


Figure VII.10. The Wainwright Building in Saint Louis. **Source :**

<https://www.archinform.net/projekte/5394.htm>

The Auditorium Building is another emblematic example of the Chicago School of Architecture. Built in granite and limestone, this ten-storey building is topped by a seventeen-storey tower (**Figures VII.11-12**). When it was completed in 1889 by Dankmar Adler and Louis Sullivan, it was the tallest and most expensive building in Chicago. Its imposing size and sophisticated architecture enabled it to accommodate several functions: a hotel, offices - including Sullivan's own for two decades - and a theatre. The latter, the Auditorium Theatre, was originally intended to host shows, but soon became a major centre of the city's musical,

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cultural, and social life. It hosted the first performances of the Chicago Civic Opera and the Chicago Symphony Orchestra. The hall had 4,200 seats, with a modular capacity that could range from 3,000 to 7,000 depending on requirements. In 1947, Roosevelt University acquired the building. It was documented by the Historic American Buildings Survey in August 1963, then listed in the National Register of Historic Places on 17 April 1970. The Auditorium Building was designated a National Historic Landmark on 15 May 1975, before being designated a City of Chicago Historic Landmark on 15 September 1976. As such, the City of Chicago is recognised as a certified local government.



Figure VII.11. The Auditorium Building at Roosevelt College, Chicago, 1933. **Source :** <https://www.nps.gov/places/auditorium-roosevelt-u-il.htm>

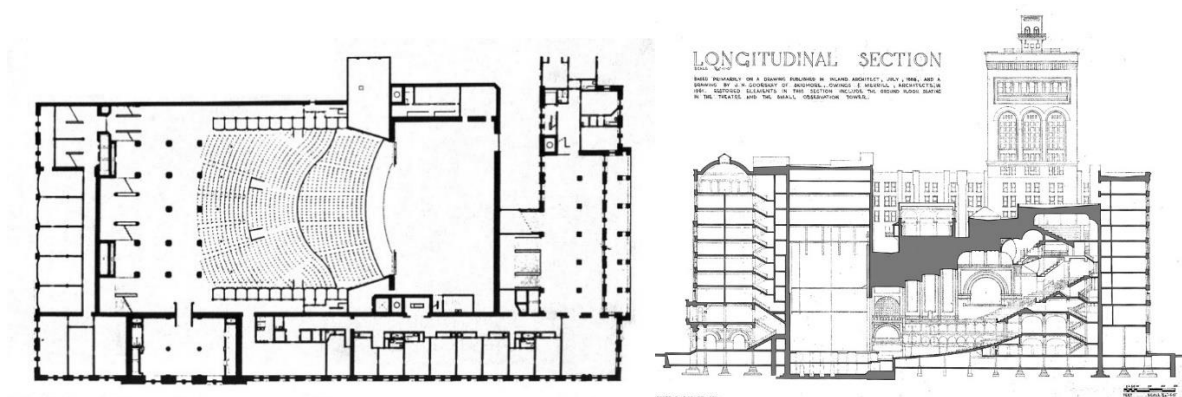


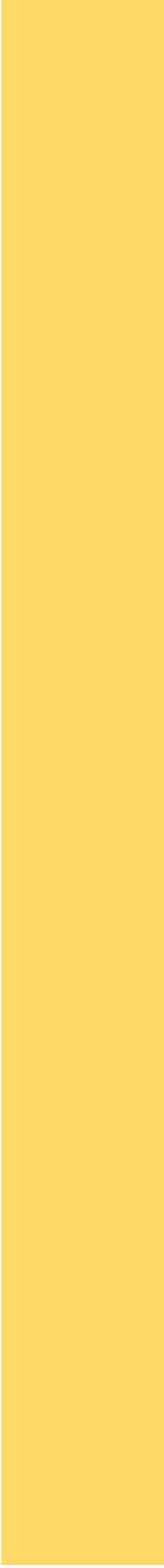
Figure VII.12. Plan and section of the Auditorium Building. **Source:** <https://www.archiweb.cz/en/b/auditorium-building-auditorium-theatre-of-roosevelt-university>

Conclusion

This chapter examined the emergence and significance of the Chicago School of Architecture as a foundational moment in the transition toward modern architectural thinking. In response to the demands of a rapidly industrialising society and the challenges of urban reconstruction, the architects of this movement pioneered structural and conceptual innovations that redefined the possibilities of the built environment.

Through the development of steel-frame construction, functional design principles, and a new urban aesthetic, figures such as Louis Sullivan and his contemporaries laid the groundwork for the modern skyscraper and influenced architectural thought far beyond the borders of the United States. The Chicago School not only embodied the spirit of architectural avant-garde in its time but also set the stage for the emergence of modernism in the 20th century.

Ultimately, the legacy of the Chicago School serves as a testament to how architecture can respond creatively and pragmatically to social, technological, and economic transformations—making it a key reference point in the history of modern architecture.



General Conclusion

General Conclusion

Structured in alignment with the 2017–2018 CANEVAS, this pedagogical handout offers students a chronological and thematic exploration of pivotal periods in architectural history. It traces the evolution of architectural thought from the foundations of the Classical Renaissance, through the transformations of Mannerism and Baroque, the revival of Neo-Classicism, the impact of the Industrial Revolution, Historicism and Eclecticism, and finally the avant-garde movements such as Art Nouveau and the Chicago School of Architecture.

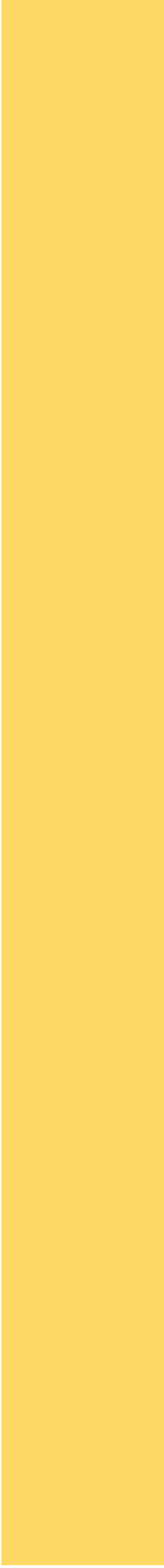
Through these themes, an overall synthesis and common thread can be revealed:

- Each movement/style was born partly as a reaction to the previous one. From Renaissance humanism to the avant-garde movements, each period/style is marked by a decisive intellectual contribution that shapes the architectural project: the quest for proportion, the spiritual dimension, reason, and then techno-social optimism.
- The innovation of new materials and processes (steel, glass, reinforced concrete) profoundly altered the conception of space. The Industrial Revolution gave rise to metal halls, suspension bridges and skyscrapers, paving the way for modern architecture.
- Art Nouveau and the Chicago School were, in their own way, the precursors of modern architecture:

General Conclusion

one by reinventing the language of ornamentation in reaction to standardisation and neo-styles, the other by asserting the primacy of structure and function. They embodied the idea that architecture should be both an artistic expression and a pragmatic response to urban and industrial needs.

From the Renaissance to the avant-garde, architecture has undergone continuous evolution, oscillating between returns to its roots and creative breaks with tradition. Each period engages in dialogue with the past while adapting to the challenges of its time: philosophical, technical, social, and/or artistic. Ultimately, this pedagogical handout encouraged students to question architectural evolution not merely as a succession of styles, but as the reflection of broader cultural, intellectual, and technological shifts.

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