

# Architectural History Thesis

## **A place for the traditional architectural ornament in contemporary architecture.**

**The revitalisation of ornaments in contemporary architecture and its benefits to mental health.**

**AR2A011 Architectural History Thesis  
MSc Architecture, Delft University of Technology**

**Sybe Heusen**

5245530  
xxx@student.tudelft.nl

**14/04/2022**

**Marcel Teunissen**

---

### **Abstract**

Ornaments have been a cornerstone of architecture since its beginning, many types of ornaments have been created as means of expression for designers and developers, transferring ideas of religion, politics, and society. But in the historic timeline of architecture, the inclusion of architectural ornaments has stagnated, and with a rapid expansion of urban sprawl ornaments have become a rare sight. With the use of psychological research, this urban environment has been adapting in many ways to increase psychological wellbeing of its inhabitants by, for example, increasing the availability of nature. Cities are adapting, but architecture which could increase wellbeing by intensifying ornamentation, struggles to break from the stagnation. However, by creating designs based on psychological research, architectural concepts that positively influence the wellbeing of city inhabitants are emerging. This paper elaborates the process of the revitalisation of ornaments in contemporary architecture and its benefits to mental health.

### **Key words**

*Ornaments, Architectural history, Biophilia, Environmental psychology, biophilic architecture*

---

## Introduction

Ornaments have been historically inseparable from architecture, as until the 20<sup>th</sup> century, depictions of people, animals, and plants have embellished buildings. These ornaments expressed ranks of owners as well as the purpose of buildings, and besides gratifying the urban space they delivered information to people about hierarchies, religious and social values, and order. With the dawn of modernism these values of architecture have changed. Architecture had to be timeless, and ornaments signified the values of a specific moment in time, making them “unbearable” with the passing of time. (Picon, 2013)

With almost a century of rapid expansion and densification of urban space, ornaments have become a rare sight in many cities, but a reappearance becomes more and more evident. There has been a calling for a new type of ornament that displays the digital age, where computers and software have made it possible to design freer than ever imagined before. Patterns, textures, colours, and topologies can make any building ‘ornamental’, without expressing the social values and hierarchies which are still taboo.

The swift expansion of cities has proven problematic for its human inhabitants, direct exposure to nature is of influence on physical activity, self-esteem, mood, and other aspects that account to a good overall health. (Salingaros, 2019) Many cities now plan to increase access to natures to enhance liveability. However, architecture seems to be lingering with modernistic rules, while research is showing that by using geometric rules of the structures of organisms will provide similar benefits to mental health. (Salingaros, 2019) (Joye, 2007)

This paper provides an historical overview regarding the evolution of the ornament, bringing together the architectural arguments around ornaments. The paper elaborates on the desire for increased nature in urban space and captures a potential ‘two-birds with one stone’ solution of re-integrating ornaments in the built environment. This will become clear while answering the question, ‘how does the revitalisation of ornaments in contemporary architecture benefit mental health?’ which will be answered in parts by ‘How did architectural ornaments develop?’, ‘Why have ornaments become less prevalent?’, ‘What is the position of ornamentation in contemporary architecture?’, ‘what are the benefits of architectural ornaments to mental health?’, and ‘How are the positive effects of ornaments optimized in contemporary architecture?’

### **The revitalisation of ornaments in contemporary architecture and its benefits to mental health.**

- *How did architectural ornaments develop?*
- *Why have ornaments become less prevalent?*
- *What is the position of ornamentation in contemporary architecture?*
- *What are the benefits of architectural ornaments to mental health?*
- *How are the positive effects of ornaments optimized in contemporary architecture?*

### **Statement:**

**Ornaments, like nature influence the wellbeing of men.**

## Table of Contents

Introduction	2
How did architectural ornaments develop?	4
Ornaments from tradition and culture	5
Establishing ornamental language	7
Ornamental expression with means to an end	8
Embracing traditional ornaments	9
Exploring ornamental meaning	10
Freedom in design and ornamentation	12
Why has the ornament become less prevalent?	15
What is the position of ornamentation in contemporary architecture?	17
What are the benefits of ornamentation for mental health?	18
How have the positive effects of ornaments been optimized in contemporary architecture?	19
Conclusion	20
Appendix	21
Discussion	21
References	22

## How did architectural ornaments develop?

To explain the development, first must be defined, what is an ornament? An ornament has been considered a cornerstone in architecture for the majority of its existence, ornaments embellish buildings and allow for expression towards men, conveying a feeling or idea, and with that has a purpose to exist, expressions that regard teaching about social, political, or spiritual/religious goals. (Picon, 2013) Therefore, columns can be ornamental, plain and not contributing to the communication, or be an addition to the ornamentality of the building. Patterns and textures in traditional ornamentation were utilised to embellish a certain area. In contemporary architecture these ornamental traits are utilised on the full façade, adding to the ornamentality of the building, for an observer would not be able to point out a single ornament. Supplementing the purpose of a singular ornament, an ornament adds to the ornamentality of a building, by emphasizing rhythm, creating unity, providing a layer of organized-complexity.

Because architecture is meant for the broad public, architectural ornamentation is required to metaphorically 'speak' to everyone, literate, and illiterate. In order to reach this goal a clear visual language is needed, where traditionally natures' familiar forms have provided the answer, resulting in ornaments that are closely related or representing the geometrical structures of plants, animal, and human forms. In societies and periods with a low personal wealth, ornamentation would be mostly applied to public or religious structures, functioning as a means to reach the people. Later with the rise of personal wealth ornaments started to portray more social goals, showing wealth and status of individuals, during the Roman empire these ornaments could even function as an investment, that was to be sold and traded with. (Picon, 2013) (Fletcher, 1994)

The development of the ornament has been gradual, ornaments have been the most important means of expression in architecture throughout its history, and almost every architectural style has either added something or created a unique twist to the existing vocabulary of the ornament. This chapter will continue with an outline of the existing ways of ornamental expression.

## Ornaments from tradition and culture

Related structures: Mainly common buildings, religious buildings, and later private buildings related to socio-economic status.

Purpose of the ornament: Expression of culture and tradition, The Greek Hellenistic period fuelled Greek ornamentation, didactic telling the story of women, men, and animals related to the function of the building, including religious stories.

Related artwork: Many vegetative references, human forms in murals and statues, animalistic representations from abstract to fictional.

The purpose of an ornament would often be linked to the purpose of the building, on the account of temples, these would often be linked with one or more of the many gods, and the temple for this god was to express the values of it. Larger ornaments could support a more static or delicate expression, where smaller ornaments could explain why this god was revered and how to, or what to offer as sacrifices to it. Other buildings might be fitted with ornaments to support ethical behaviour, inspiring fair play at games or ornaments that would provide protective of potential wrath of gods.

### Assyrian Architecture

Ornamentation of the Assyrians was of advanced craftsmanship, sculptures that represent animals (including *fictional*) and plant representation including in columns, whom first were carved out of wood, but later *sculpted* (figure 1) in stone. Notables are sculptured slabs and that the *columns* with *capitals* have early Ionic and Corinthian forms, also the honeysuckle was already present in the representations. (Fletcher, 1994)

### Egyptian architecture

Ornaments were used to symbolise important elements, such as the sun, earth, or their symbol of protection, which was a vulture with outspread wings, also *patterns* (figure 2), spirals and feathers where often used. The sacred beetle, scarab was the symbol of Egyptian religion and applied at holy sites. Egyptians where skilled painters too, using mostly red, yellow, and blue *decorated* their ornaments and *walls*, picturing natural objects as the lotus plants, palm trees, papaya reeds and others. The plants returned in *columns* (figure 3), the columns were made to represent the stalks, on intervals tied by bands and capitals representing the lotus plant, and in some instances godlike figures. (Fletcher, 1994)

### Greek Architecture

Besides the column orders, the Greeks started to use *mouldings* (figure 4) to provide more architectural expression, mouldings were meant to add delicacy of contour and refine a building, utilising several natural forms to enhance expression, forms derived from, the honeysuckle, waterlily, egg-like forms, bird's-beaks, and many more, fruit, flowers and foliage would often be expressed in *festoons* (figure 5). The leaf and scroll play important roles in Greek ornaments, leaves as acanthus- spinosis and mollis, often used in the Corinthian capital, the scroll accompanies the leave and acted as a stalk. Palmette, anthemion and honeysuckle have been favoured in ornamentation by the Greeks, and often used in moulding decoration as a string course, around the necks of columns, covering joints of construction

*Sculpture* has also been very important, sculptures can be divided in (1) 'sculpture appertaining to buildings'; including *friezes* (figure 6), which are little metopes (pictures) alternated by triglyphs (three parted space) that tell a story, (2) '*Sculptured reliefs*'; like on a funeral stele, (3) '*free-standing statuary*' these are singular or groups of figures, that might be placed in front of an entrance, in a *pediment* (figure 7), or on roofs, still embellishing the architecture, often consisting of more humanoid or animalistic representations. (Fletcher, 1994) Sculpture would be applied with different

purposes, multiple metopes could tell stories about cultural habits or religion, for example a moral story that would express that cheating does not end well, on the wall of a building dedicated to cultural games, a statue of Zeus which they had vowed to, to play fair, to remind them of this, the ornament would be commanding not to cheat.

## Roman Architecture

The Romans borrowed many things from the Greeks, Greek artists were often employed to create sculptures or paintings, to make artworks that were praised and copied. For ornamentation Romans utilised many *mosaics* (figure 8), to show the importance of space, walls and floors where richly inlaid with marble. The roman friezes were also frequently carved, containing ox-heads with foliage, these ox-heads became so important that real skulls were hung as decoration.

Romans added many column orders to the ones the Greeks had established, important to note is that the Greek column was purely a structural necessity, as the Romans started to use domes, columns and beams gradually got more decorative, creating the architectural ornament '*pilaster*' (figure 9). (Fletcher, 1994) By using aedicula the roman architecture would create additional emphasis on an important statue, just like the utilisation of contrast in a *niche* (figure 10), where a semi-dome wall cavity would create space for a sculpture.



Figure 1 , sculpture

Figure 2 , pattern

Figure 3 , column

Figure 4 , moulding

Figure 5 , festoon



Figure 6 , freize

Figure 7 , pediment

Figure 8 , mosaics

Figure 9 , pilaster

Figure 10 , niche

## Establishing ornamental language

Related structures: Religious buildings.

Purpose of the ornament: Embellishment, didactic.

Related artwork: Many vegetative references.

During earlier Christian and Byzantine (orthodox Christian) architecture, the purpose of its architectural ornaments can be argued to be the spread of the Christian religion, supporting the stories that would be told orally about their belief, for many of its followers were not able to read, however still not possessing the money and craftsmanship to show the story to its full extend in works of art.

### Byzantine architecture

Finding their architectural heritage in Roman and Greek architecture, strictly structural columns were used and richly decorated, including capitals with basket like patterns. Many of the Romans decorative mouldings were left behind, *blind arches* (figure 11) were introduced, and mosaics and patterns embraced, often composed to represent groups of saints or a peafowl, a symbol of immortal life and of great importance. Greek technique was also adapted for carvings, often displaying the acanthus leaf, but also displaying other natural appearances like birds and other plants. (Fletcher, 1994)

### Early Christian architecture

Early Christian structures, inspired by mausoleums and basilicas applied many of the Romans ornamental language. Not being all too experienced crafters, applied columns were often different in size and design, sometimes directly taken from dilapidated roman structures. Being coarsely copied, mouldings were superficial, over time commonly displaying acanthuses. However, to portray the Christian religion, expression was heavily craved, colours became the trademark adding richness to interiors, expressing angels, saints, and their god utilising mosaics, friezes, and *decorated parapets* (figure 12). (Fletcher, 1994)



Figure 11 , blind arches

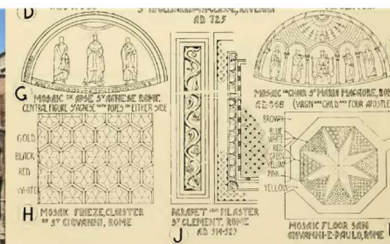


Figure 12 , decorated parapets

## Ornamental expression with means to an end

Related structures: Religious buildings.

Purpose of the ornament: Expression of religion, didactic, telling the story of Christ.

Related artwork: Religious works, vegetational forms, fictional forms.

John Ruskin, fascinated by Gothic architecture, argued that the ornament is within the core of architecture rather than it being an addition to it, 'the ornament reveals directly the relationship of men with god' and reflects the beauty of architecture. (Sağlam, 2014) By showing through ornamentation, Christ's birth, judgement and ascension, the church itself becomes the bible for the illiterate. (Roth, 2013)

### Romanesque Architecture

Romanesque architecture was, on the matter of ornamentation very connected with natural appearances. Many carvings were derived from animal or vegetational form, sometimes referring to the origin story of Adam and Eve in the garden of Eden. This was recognizable in expressive mouldings, including *hoodmoulds*, *pinnacles*, (figure 13), including *finials*, and cornices that started to include *corbels* (figure 14) that were frequently plain but not uncommonly excessively carved to represent the heads of animals, humans, or imaginary beast. Exterior and interior ornaments, mosaics, *Lombard bands* (figure 15), *stained glass* (figure 16), and blind arches, which the Byzantines had used before. Columns started to appear more in fully sculpted shafts, and in cubic shapes. Specifically, in English Romanesque, mouldings functioned as one of the most important decorative elements, starting to show geometrical forms and *three-dimensional patterns* (figure 17), whilst still applying flower and animal representations in some of them. Wall arches are also characteristic traits of this architecture style in addition to a later implementation of stained glass. (Fletcher, 1994)

### Gothic architecture

With clustered columns and often moulded *buttresses*, highly decorated *pinnacles*, and pointed arches, the gothic architecture creates a unique sight as well as the application of stained glass in a mosaic manner. High gothic architecture included many naturalistic ornamentations, containing oak, vine leaves, seaweed, ivy, and the tablet flower, applied to mouldings, capitols, *spandrels*, *archivolts*, and *grotesques* (figure 18) on roofs, corners of buildings, and others. Later flowers also involved the fleur-de-lis, Tudor rose, and portcullis, mostly applied in *square panels*. The French gothic architecture distinguishes itself with sculpture, which was their most important ornament, the skill of their artwork is visible in both the large and small sculptures, in *bosses* (ornamental keystones) and in archivolt doorways which were sometimes equipped with carvings that would feature characters from the bible, showing the life of Christ. At the same time German Gothic architecture developed, using more brickwork, and applying *gargoyles* (figure 19) for water removal. Italy kept their roman mouldings and columns as a basis for their gothic architecture, while paintwork and mosaics were elevated in importance, big ceiling paintings picturing the story of their god were important means to endorse belief. Veneered mosaics on facades made the Italian gothic style additionally impressive. The Spanish style distinguishes itself with the use of *reredos*, sculpted and highlighted with paint and gilding. Next to the reredos sculptures were of great importance with naturalistic, live-size, and expressive traits. (figure 20) (Fletcher, 1994) (Roth, 2013)



Figure 13, pinnacles

Figure 14, corbels

Figure 15, lombard

Figure 16, stained glass

Figure 18, grotesques

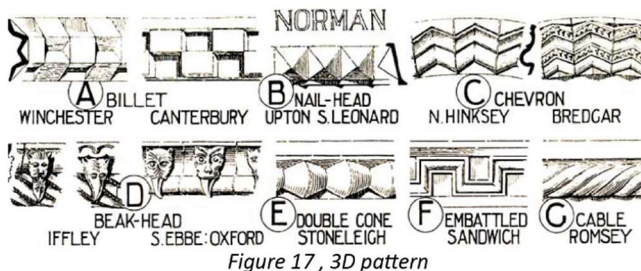


Figure 17, 3D pattern



Figure 19, gargoyles



Figure 20, gothic

## Embracing traditional ornaments

Structures: Religious buildings, Common & Private buildings related to social hierarchy and order.

Purpose of the ornament: fortifying established hierarchy, religious and royal.

Related artwork: sculpture, two-dimensional works of art, many others.

Realising the churches power and seeing the impact of its architecture the churches' architects were increasingly commissioned by royalty to fortify the social hierarchy, building palaces with similar statute as churches. Later in the period, to counter the reformation of the roman catholic faith, the church was tried reasserting its supremacy by elevating their use of iconography and religious art that served as ornaments in churches.

## Renaissance architecture

The renaissance revitalised the roman pilasters, using columns decoratively in facades, embellished with pictures of bands of foliage, fruit or twisted in form. This reference to classic origins is also visible in mouldings, archivolts, and cornices, balconies are utilised to create horizontal lines on the façades. In contrast to its predecessor that used to measure by the standards of human scale the renaissance sculptor did not. Renaissance sculptors started creating works of art to gods ideal, depicting the human form as divine, powerful, and even erotic, creating a heightened state of realism as muscles, genitalia, and curves where emphasized. Embracing humanity in art included not only depicting rulers and gods, but also contemporary people like scholars. (Roman applications twisted to mix with gothic architecture, like *grotesques*) (figure 21,22, figure 23: villa) (Fletcher, 1994)

## Baroque architecture

Founded on classical and renaissance principles, Baroque architecture focusses on dramatic and graphic expression, blurring lines between painting, sculpture, and architecture utilising ornamentation for expression in interiors as well as in exterior facades. Large expressive paintings on ceilings and walls, large free-standing statuary and reliefs that sometimes would work together in the creation of a dynamic spatial illusions. Pilasters and columns equipped with cornices would extend through multiple stories, to elevate this feeling of greatness even more accents would be clad in gold. Spires reach for heavenly places and a decorative keystone would appear above any opening in the façade, including blind windows (a window with no opening) that were meant to

retain a buildings repetitional order. Under specific Spanish / Latin American influences ceilings would be enriched with countless muqarnas forms, reminding of stalactite vaulting. Ornaments were commonly decorated with scrolls, foliage, and other derivatives from classic ornamental language, although deployed in an overwhelming manner, to the extent that a columns shaft would be transforming into a singular ornament. In the later developed Rococo style, interiors were fully embellished, interior mouldings were applied and symmetry was rejected with embellishments like foliage and natural references of men and animals. (figure 24; palace, figure 25; church) (Hopkins, 2014)



Figure 21 , renaissance



Figure 22 , renaissance



Figure 23 , villa



Figure 24 , palace



Figure 25 , church

### Exploring ornamental meaning

Structures: Commercial buildings (mostly new building types), religious buildings, common and private buildings related to social hierarchy and order.

Purpose of the ornament: Embellishing, referencing.

Related artwork: Traditional with new interpretations.

After making great works of art for royalty and local rulers, and building methods changing due to the industrial revolution, disparity of wealth in the public, and companies having the opportunity to set up their own empires, the application of architecture and ornamentation spiked. Due to the growing knowledge of history, interest in the ingenuity of Roman and Greek structures, admiration for the impressive Christian architecture, and the freedom to apply all this art while experimenting with new materials that were available architectural ornamentation was applied on a larger scale than ever before. It is in the middle of the nineteenth century that Gottfried Semper wrote about ornamentation, that the ornament is not about the geometrical shapes it is consisting of, but about the influence the ornament has on space and time. For Semper the ornament is not a flat disembodied pattern, ornaments are to have mass, direction, and movement, a function for it influences the physical, cultural, social, and political world humans live in. (Papapetros, 2010) With the rise of industry, utilisation of steel skeletons and iron cast ornaments became possible. Skeleton structures were in the beginning primarily used for warehouses which were scarcely decorated. Their classical moulding, floriated friezes, Corinthian capitals, and delicate rosettes came later, the iron skeleton was, as an embellishment, first admired by itself. Iron cast decoration, first copied from renaissance, baroque, and classical motives were topped with marble dust, sand, paint,

or a stone texture making it hard to distinguish an ornament erected of stone or cast in iron.  
(Reynolds, 1992)

### **Neoclassicism architecture**

Neoclassicism started with the testing of applicability of antique forms to modern building needs. This resulted in the revival of the Roman and Greek architecture, applying the classical order in 'modern' ways. If classical orders would prove inadequate new types were free to be applied. Re-appearance of ornaments as friezes, cornices, keystones, mouldings, and statues in all its former forms. In comparison to earlier styles, mouldings were applied in more geometric shapes, replacing some of the decorative curves. The French Neoclassical style included gothic imports to the style with decorated keystones, archivolts, spandrels, and corbel tables with metal balustrades.

Neoclassicism was supported by functional purposes, men's attraction to pleasure and the rejection of pain. Professor, architectural theorist, and engineer Jean-Nicolas-Louis Durand reasoned that architecture is 'made by man, for man,' where success was measured with how well a building fitted the purpose for which it was designed, including the emphasis on making building pleasing for the eye with embellishments. (figure 26) (Reynolds, 1992)

### **Gothic Revival architecture**

The later stage of the style was characterised by details that would show how a building was erected, showing the medieval building methods and its relation to their modern-day functionalism. Unlike the earlier Gothic style, not only churches would be built in this way, hotels, stations, and other functions as well would be embellished by this picturesque style. Close attention was paid to interior design too, studying and applying the polychromatic effects of murals, stained glass, marquetry with a large variety of materials, extending to the exterior with colourful tiled patterns. (figure 27) (Reynolds, 1992)

### **Beaux-arts architecture**

Beaux-arts applied many types of ornaments to embellish their buildings. In facades these style utilised structural and decorative columns, mouldings, friezes, balconies supported with decorative corbels, macaroons and reliefs which were carved sculptures with a solid background used to both decorate the exterior and interior of the building. Interiors were further embellished with murals, mosaic, and polychromic works of art, which was often connected to the purpose of the building. As well as the in steel or stone erected festoons, cartouches, and fences.

Many of these ornaments would refer to types that had been applied by earlier architecture styles, combined. But where festoons and macaroons used to be part of other decorations like friezes and keystones in the beaux-arts movement these embellishments were granted their own independent placement on a façade. (figure 28)



Figure 26 , Neoclassicism



Figure 27 , gothic revival



Figure 28 , beaux-arts

## Freedom in design and ornamentation

Structures: any type of building with enough funding.

Purpose of the ornament: embellishment, portrayal of wealth and status, political action.

Related artwork: Free in form and meaning.

The purpose of the ornament shifts in this period. People become more educated and, more literate. Stories are told by the letter and picture, in papers or books, radio and eventually TV. The ornament loses to be the means of communication of ideas, and with that the purpose that it served to public buildings. However, in reverse there is more freedom in design. As ornaments needed to be recognisable for the people to read their meaning, now it could be alien. Any geometric shape is accepted in art, and it could be applied anywhere, for as long as someone would pay for it.

## Arts and crafts movement

The Arts and crafts movement was a reaction on the rise of modernity, reinstating idealistic aesthetics in everyday crafts, and having this available for everyone. Characterized by romantic historicism in a rural lifestyle, apart from the crowded, modern, industrial cities. Arts and crafts architecture focussed on family houses, that would display individual identity and social communities of towns. While there does not seem to be a focus on ornamentation, the ornament is not being avoided, expressed by moulded arcs, or modest archivolt, quoins, small cupolas, ornamented railings, and portico's that are sometimes supported by columns. (figure 29) (Hopkins, 2014)

## Art Nouveau architecture

During the industrial revolution new technologies gave way to new designs. The arts and crafts movement applied this creating technologically to advanced arts. As thick load bearing walls gave way for thin metal skeletons it created more space for decorative styling, *moulded fences* (figure 30), paintings, stained glass, mosaics, grotesques, sculptures, and architecture all followed the geometrical rules for the structures of organisms. Even staircases would be constructed in a way to embellish the rooms that it would occupy. (figure 31) (Reynolds, 1992)

## The Amsterdam School

Building facades primarily in non-structural brickwork, the Amsterdam school indulged in the creation of new *brickwork ornamentation* (figure 32), showing advanced craftsmanship, embellishments on facades would be constructed by having bricks protrude from the façade in various kinds of forms and arrangements. Ornaments made from brick would not only be erected with the use of rectangle bricks, but also be specially crafted to more familiar types of ornaments like human reliefs and decorated corbels. Other embellishments like wrought iron fences, mouldings, and all kind of sculpture in stone are not unfamiliar to the style. (figure 33) (Cohen, 2012) (Bagelaar, 2012)

## Art Deco architecture

An architectural style that was able to distinguish itself with ornamentation from what has been done before is Art Deco, in which fluid by nature inspired forms were combined with straight lines, rectangular designs, and mathematic geometries lead to new interpretations. The movement was not limited to architecture and influenced all kinds of designs of the new era, related to motorised or electrical advancements. Embellishments on buildings would include many types of motives which could be incorporated in for example mouldings, often executed in geometrical like forms, like, zigzags, chevrons, ziggurats, lozenges, and parallel straight lines, but not excluding abstracted floral

and celestial forms. Art Deco expressed itself with many colours. Within architectural ornaments they would be found in glazed bricks, mosaics, pigmented (structural) glass and was not unfamiliar to statues, often as a relief on a façade.

Due to its socio-economic drive, art deco embodied luxury, stylizing (abstractions) of exotic plants and animals in ornaments, using chrome, silver, and gold inlaid surfaces. (figure 34,35)

### De Stijl

Working primarily with lines, surfaces, and colours ornaments are hard to distinguish. Surfaces that extrude from the façade in different colours and function as embellishment, make it difficult to differentiate between an ornament or an ornamental façade. However, a single-coloured roof extrusion might not be moulded in a way that is traditional, it does provide a frame, and with that a canvas that is to be filled with colours and lines. A clear font design, and the transference of purpose of the building by written text might be the closest related piece to the purpose of a traditional ornament in this style (figure 36)

### Bauhaus architecture

Erected to unite fine arts, like painting and sculpting with applied arts, like industrial design and building design, the Bauhaus movement founded a new type of architecture that was to be functional, beautiful, and fit for mass-production. Focusing on abstract and functional shapes, simple colours, and materials as glass, steel, and concrete to come together in a holistic work of art. Where the integration of art and new materials in art nouveau yielded many new ornamental interpretations, Bauhaus's abstraction, functionality, and mass producible holistic designs had the opposite effects. (figure 37)



Figure 29, arts and crafts



Figure 30, art nouveau

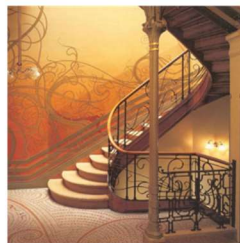


Figure 31, staircase



Figure 33, amsterdam school



Figure 32, amsterdam school ornaments, last; brickwork relief



Figure 34, art deco



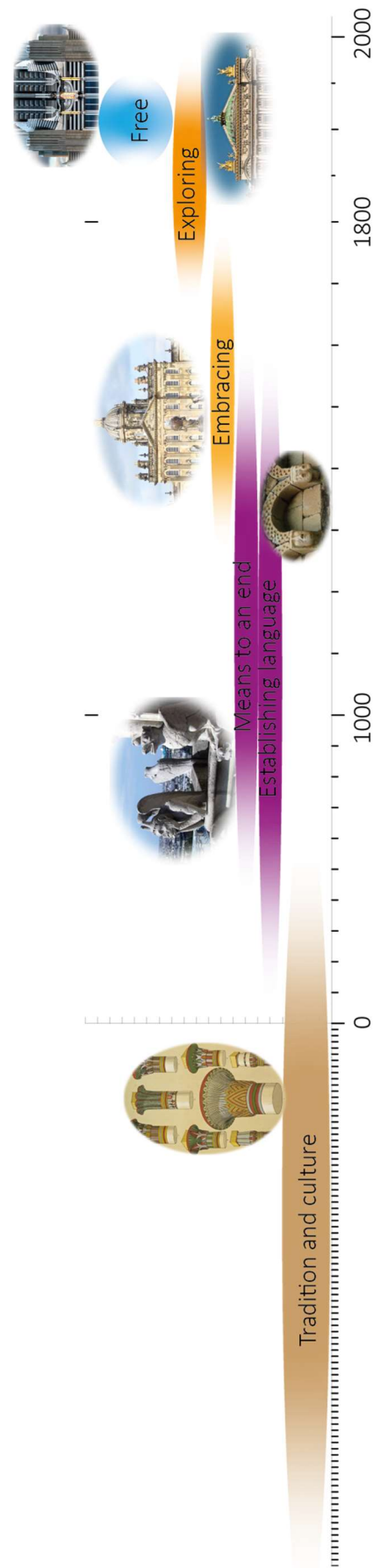
Figure 36, art deco



Figure 37, de stijl



Figure 38, bauhaus



## Why has the ornament become less prevalent?

Since the 19<sup>th</sup> century attempts had been made to create a new style for the industrial age as ornaments had always been shaped by social context and politics. However, the age of industry started with political and social division and failed to be represented by a coherent style. (Picon, 2013) This uncertainty of expression might have led to the manifest Adolf Loos wrote about 'ornaments and crime', which was very influential in the modernist architectural movement.

Adolf Loos wrote in 1908 that art is erotic, a way to get rid of surplus energy, but in the modern day responding to an inner urge is degenerate. He writes "The evolution of culture is synonymous with the removal of ornament from utilitarian objects." 'Men has gone too far, the ornament does no longer arouse feelings of pleasure, a man will now take pleasure in a plain cigarette case, and refuses to buy the ornamented case, even if it was the same price.' (Loos, 1908)

Loos expresses himself: "'ornament does not heighten my joy in life or the joy in life of any cultivated person.'" The ornament has become a waste of material, labour, and money. A woodcarver or turner works long hours for little wage and cannot keep up with the modern industrial processes. Where an office worker earns similar to an exploited labour force, they work only for eight hours, without its accompanied health risks, keeping the trade alive diminishes the peoples purchasing power and the national budget.' (Loos, 1908)

'The modern man will grow wealthy because he likes plain cutlery, plain plates, and furniture. It does not rely on decoration that grows out of style like in the past centuries. The ornament is no longer a natural product of culture and holding on to it is a sign of backwardness or degeneration. The artist that is an ornamenter used to stand full of vigour and health, but is now reduced to a straggler, selling wares that take three times as long to make, with the similar raw materials for half the price of a smooth object. The modern ornament is free, it has no past and no future, and refuses to be a waste of material.' (Loos, 1908)

'If objects would last as long physically as they last aesthetically the worker can earn more money in less hours. Free of the tyranny of ornament there will be no distinction between good and bad craftsmanship, everyone will pay the true value. Free of ornamentation means equality, no person that lives on our cultural level can commit to this work anymore.' (Loos, 1908)

The above elaborated manifest found its impact through many facets of architectural and urban development, from the small detail of the ornament to full urban plans that might have suggested to flatten the centre of the city of Paris and replace it with sky high "living machines", highways, and parks (figure 39). This plan for Paris has never been executed, but the manifest and design have inspired many, in a period with rural to urban migration and immigration, housing in cities were scarce and large urban expansion needed to be realised.



Figure 39 , plan voisin

A reason why the architectural modernist movement claimed its grip on architecture and the urban environment, was by offering a solution for rapid urban expansion, by allowing architects to design sleeker and build in a more simplified manner with structures out of steel frames and reinforced concrete, creating the aesthetic language based on needs and opportunity. The design style was embodied in the phrase 'form follows function' where designs would result into buildings that were perfect for their intended use, excluded from any unnecessary detail or decoration. After the style had made its mark, architectural historian and critic Henry-Russel Hitchcock and Philip Johnson re-

branded the architecture style as “International Style” defined by the three cornerstones, which were replacing symmetry with balance, feeling of rhythm, and rejecting the classic tradition. These ideas are embodied by choosing prismatic volumes over articulated mass, rejecting the massive appearance of load bearing walls and creating slim constructions with large amounts of glass close to the outer surface of its openings, rejecting embellishments to rather focussing on the beauty of material itself. The international Style was meant to bring equality in everyone’s home disregarding any cultural, social, or climatic situation, and bringing “light and air” to the houses of the masses. In short, the style would make the world a better place. (Spasoff, 2012)

As modernism became mainstream, architects that launched this ground-breaking movement started to defend its prestige by stating that in less capable hands buildings would seem dull and banal, since the modernist style was deceptively simple and easy to copy, because critics complained that cities were losing their personal character because they came to look too much alike. By the 1950s modernist architects started to stray from the hard rules of the international style, creating other architectural styles, still inspired by international modernism. (Spasoff, 2012)

From and opposed to the international modernism movement, the following architectural styles developed: brutalism, corporate modernism, popular modernism, post modernism, and new formalism. Brutalism took the emphasis on rhythm and material and went with it, concrete being their trademark, leaving it raw as it came it created many modern fortress-like structures. Corporate modernism aimed to dominate the skies with large modernist glass facades, hard to distinguish from international modernism but freer in form and geometry. Popular modernism formed itself to a combination of the Art Deco style and international modernism, focusing on recreational or small commercial buildings that might act as advertisement itself, characterised by bright colours, outstanding graphics, unique roofs, and organic curves also referred to as ‘googie’ or ‘space age’ modernism. Post modernism shares its bright colours and unusual shapes with popular modernism but did not limit itself to commercial buildings, rejecting rules of international modernism this style was utilising ornamental embellishments, in some cases magnifying them in order to place them out of context, creating modernist structures with colours, a sense of place, and considering architectural history. New Formalism places itself in contrast with the masses of brutalism, retaining its ‘light and air’ with many windows and a light feeling, but rejecting international modernism guidelines by adding ornaments, specifically classical or gothic accents, and re-applying cornices, creating an elegant style that remains modest with its white cladding as is known from international modernism.(figures 40 – 45) (Spasoff, 2012)



Figure 40 , brutalism



Figure 42 , populair modernism/googie



Figure 43 , post modernism



Figure 44 , new formalism



Figure 41 , corporate modernism

## What is the position of ornamentation in contemporary architecture?

The traditional ornament is no longer what it used to be, social, political, and religious goals have surpassed architecture. Writing and media is now its convector to the people. The task has not only been taken over, but the medium, of architecture has surpassed. Architecture can be long lasting and an ornament can transfer the same idea for hundreds of years, while in this fast and ever-changing society, 'nothing is set in stone'. This is still in line with Adolf Loos' influence on architecture, embellishment that has survived, are commonly patterns, textures, and topologies, which with the digital technology have incredible liberties in design.

The new type of ornament expresses itself in human senses and materiality, intriguing with the main senses of touch and sight, giving the impression of interacting with all sensory connections. Many new ornamental facades invite to be touched, like the braille façade of Herzog & de Meuron's De Young Museum, or play perceptual games, where a specific point of view paints an all-encompassing picture. It can also be the opposite, where perspective does not matter at all. (Picon, 2013) Perceptual games are also executed in different ways, accentuating forces of nature with folding, twisting, and bending actions, demonstrating flows, forces, fields, and gradients in almost optical illusion kinds of ways, as seen in the (figures 46 – 48).

Application of ornamentation throughout history has been very dependent on the function of the building. Typically, public buildings would rely on heavier ornamentation, connected to the social, political, or religious goals the building would be linked to. This is still the case when public buildings are equipped with more embellishments. However, this is reliant on the available funding, in contemporary architecture a social housing project can be equipped with similar patterns and textures as the public buildings for as long as the budget allows it. (Picon, 2013)

Despite the new interpretation of ornamentation, some architects still apply traditional ornaments. These ornaments are in practice linked to functional elements, like columns or mouldings. Some are linked to historical context, location, or nature, like how the pillar supporting the canopy in (figure 49) represents the stork in the coat of arms of The Hague. Different examples can be given with more direct copies of nature, including the representation of trees as seen in (figure 50).

While functional ornaments, ornaments with historical context, linked to location and nature are accepted in contemporary architecture, ornaments that directly relate to humanly emotions, as would traditionally be common, are still rare. Recent developments of emojis in writing have simplified emotional expression to an abstract level, Attika architects saw this as an opportunity to re-integrate macaroons in contemporary architecture (figure 51).



Figure 46 , optical illusion



Figure 47 , fluffy feeling



Figure 48 , surface tension



Figure 50 , columns

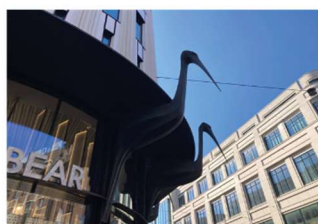


Figure 49 , stork pillar



Figure 51 , 'macaroon'

## What are the benefits of ornamentation for mental health?

The environment people find themselves in often impacts their mental state of mind. Slightly or significantly, witnessing the sunrise for example helps regulating the bodies circadian rhythm which stimulates waking up, and start producing energy for the day. It can be different for every person whenever they are conscious of it, or not, but the brain works this way (Wirz-Justice, Skene, & Münch., 2021). Studies that attempted to discover more of the influence that the environment has on people, concluded that there is a lack of nature in the urban environment. Stimulating more nature in cities has proven to have positive effects on mental health. Health effects of increased nature in the urban environment include the reduction of stress, restoration of focus, and stimulate more physical exercise because people enjoyed being outside more. (Joye, 2007) (Ulrich, et al., 1991)

Large scale city plans have been implemented to give nature an impulse, including more parks and more biodiversity. This process is to be cheered on because the mental health of inhabitants will benefit from this. However, there is more that can be done. Similar studies to the effect that the sunrise influences the human body are now concluding that nature does not need to be 'living'. Studies conducted with depictions of nature have similar stress reducing and focus restoring effects. This made some researchers conclude that it is the mere geometrical structure of nature that is to be emulated for this effect. (Nanda, Pati, Ghamari, & Bajema, 2013) (Joye, 2007)

Until the late 19<sup>th</sup> century, nature has been a cornerstone in architectural inspiration, with depictions of plant, animal, human, fictional nature, and characters as building embellishments. (Picon, 2013) (Salingaros, 2019) These nature-inspired ornaments have shown to stimulate a part of the human brain that causes people to have an improved mood, reduced stress, improved concentration and working memory, higher self-esteem, increased feelings of energy and vitality, and over all self-perceived health. Views of nature have even shown to reduce criminal behaviour, and improve recovery from surgery. (Coburn, et al., 2019) Improving the built environment with more nature is a good step, but the embellishment of buildings with naturalistic ornaments achieves this as well.

Exact implementations are recorded and studied by researchers in field of environmental psychology. Kellert and Wilson identified two influential factors in which the environment impacts people's mental health:

- I. "Proximity and visual contact with plants, animals, and other people, and
  - II. Response to artificial creations that follow geometrical rules of the structures of organism"
- (Salingaros, 2019)

There are several definitions for the architectural ornament, W. Koch and G. Kotting describe it as a decorative element that follows either I. Geometrical and II. forms deducted from plant- animal figures, including these in designs in architecture in a stylistic or naturalistic manner used to embellish sections, accentuate rhythm, or guide the eye. (Koch & Kotting, 1971)

In an attempt to predict healing effects of the built environment, Salingaros describes a checklist of ten points that should be taken into account for creating an environment with positive effects on people's mental health. This checklist includes sunlight, colour, gravity, fractals, curves, detail, water, life, representations of nature, and organized-complexity. Where life is referring to the actual living nature and biodiversity that people can encounter in their surroundings, representations of nature are a category that focusses on the image of it. Animals, people, and plants as inanimate object to be portrayed in two dimensions like paintings or photographs or three dimensional as a sculpture,

including western traditional ornamentation. Traditional ornamentation is also specifically named for the last topic, organized-complexity, referring to deliberately complicated designed patterns that still hold their organization. They are traditionally found in abstract architectural ornaments of the Islamic world. (Salingaros, 2019)

## How have the positive effects of ornaments been optimized in contemporary architecture?

For a few decades architecture has been moving towards a more human-inclusive design. This way of designing is based on psychological research of the connection between nature, human biology, and the built environment, with as goal to predict the effects designs have on people. In that way positive effects could be optimised. It has been proven that this biophilic design causes a reduction in stress, improves physical healing, creativity, clarity of thought, and over all improves human well-being. Biophilic design taps into many aspects of architecture, some new, some old, and explains why certain designs work as they do. Many architects apply guidelines that are now being confirmed by empirical research, such as optimising incoming sunlight and attempting to have sunlight from at least two sides. Research into the optimisation of sunlight has proven to improve productivity in workspaces, increase sales in daylit stores, improve performance of children in classrooms, visual comfort and regulates circadian system functioning. For architects in contemporary architecture it has been standard practice to optimise this whenever possible. However, this is not the case for all aspects, in '14 Patterns of Biophilic design' the main aspects get elaborated on. (Browning, Ryan, & Clancy, 2014)

Browning, Ryan & Clancy created a literature review in 2014, and identified 14 aspects which influence can be qualified as either 'nature in space', 'natural analogues', or 'nature of the space'; and have positive effects on one or more categories of 'stress reduction', 'cognitive performance' and, 'emotion, mood & preference'. (1) A visual connection with nature, (2) Non-visual connection with nature, (3) Non-rhythmic sensory stimuli, (4) thermal & airflow variability, (5) Presence of water, (6) Dynamic & diffuse light, (7) Connection with natural systems, (8) Biomorphic forms & patterns, (9) Material connection with nature, (10) Complexity & order, (11) Prospect, (12) Refuge, (13) Mystery, (14) Risk/peril. Some of these aspects are already commonly applied, but ornaments cover some of these aspects and create a better suited environment for humankind.

Ornaments are utilised to create 'a view to elements of nature' as described in (1) Visual connection with nature, as has been traditionally implemented in architectural. Besides the visual connection with actual natural imitations, in (8) biomorphic forms & patterns, ornaments utilise the geometrical structures of nature in symbolic references to contoured, textured, patterned or numerical arrangements, the numerical arrangement can be found in Fibonacci's from nature derived 'Golden mean' (figure 52) and an example for the contours in architecture Calatrava's Milwaukee art museum (figure 53) or sculptures like the conceptual ornament from MFGA architects (figure 54). The 9<sup>th</sup> aspect, 'material connection with nature' is triggered by implementing flat ornamentation, using raw materials in veneer, mosaics, or murals with natural colours (particularly green) serves to this purpose. (figure 55) Since the implementation, ornaments have been utilised to create order, as apparent in for example, blind arches, that only function to keep the repetition of the façade in place, fitting with the 10<sup>th</sup> aspect, complexity & order. In aspect 13, mystery, ornaments and artworks utilised in a less prominent way, by creating unexpected surprises in the construction a bystander can be teased, offering a sense of reward, compelling to investigate the space. That effect is for example created with niches and statues. For example, walking by a façade containing a niche, a statue will only reveal itself on passing. Eventually utilising (14) risk and peril in an ornament might

seem reverse for the purpose of a relaxed feeling but feeds the human need for sensation. Creating designs that seem to defy gravity, have infinity edges, or perceive the risk of getting wet utilises this aspect and involves people in architecture. Aswell as ornaments that portray images or statues of threatening animals.

The design process is a complex one, influenced by many factors. The guidelines of biophilic design help to create a better human-inclusive design. Contemporary biophilic design does not cover all aspects of it, nor does it need to, similar to sustainable buildings which rarely score fully on LEED, or any other type of point system to measure durability. The Australian firm Koichi Takada Architects inspired themselves by a local forest to construct their Shanghai marketplace design (figure 56) and continued their design keeping biophilic guidelines in mind, producing a design that for the visitor creates a feeling of connectivity with nature.

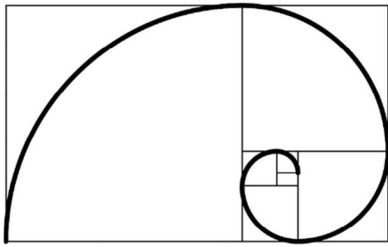


Figure 52 , golden mean



Figure 53 , calatrava



Figure 54 , MFGA concept



Figure 55 , wall art



Figure 56 , biophilic design



Figure 57 , 3D print ornament prototypes

## Conclusion

The ornament, a functional embellishment, evolved as such throughout time, a cornerstone in architecture, teller of stories, educator of cultural habits, rules, and hierarchy, embodiment of power has a history, and a future with contemporary architecture.

### How did architectural ornaments develop?

The ornament started its development together with architecture., where it began as an expression of culture and traditions. Explaining to the literate and illiterate population how to behave, whom to appreciate, whom to fear, how to offer, whom of the many gods the offer was meant for and provide a sense of protection from the unknown.

After this period, the ornament gained more of a singular purpose, the connection to one god, telling its complete story step by step using ornaments for people that did not read, and embodying the connection to god for the people who did.

The churches expression of status through ornamentation became appealing to rulers of kingdoms, and started commissioning the churches architects, creating ornamental works of art for palaces and royalty, and when the Greek and Romans were re-discovered combined with their architectural works aspiring to the greatness of the roman empire and Greek culture.

The period transitioned in a time where companies started their own empires of trade, inspired by the statue of architecture and seeing what money can buy, architects were employed to build for

them works of art, inspired by, the ingenuity of Romans and Greeks, the greatness of Christian architecture, and experimental new materials that came available.

With the new disparity of wealth, the availability of materials, and great craftsmanship, architecture and ornaments were available to the broader public. However, having lost its purpose of transitioning knowledge, which found new ways through papers, radio, and TV, ornaments gained artistic expression. No longer needing to abide by rules of familiar expression, any geometrical shape was now allowed.

**Why have ornaments become less prevalent?**

Fuelled by the lack of expressional in a social, religious, or political purpose, the raising price, and the bad work conditions for artists, the ornament got less prevalent, and in the modernist movement almost non-existent. The modernist movement simplified building and design enough to provide the outcome for rapid urban expansion which eventually had the movement grow 'mainstream' and due to its essence had critics against it, for cities grew too much alike and were losing their character and cultural expression, whereafter some architectural movements split off and experimented again with some ornaments, however still without a clear purpose.

**What is the position of ornamentation in contemporary architecture?**

**What are the benefits of architectural ornaments to mental health?**

**How are the positive effects of ornaments optimized in contemporary architecture?**

Contemporary architecture has found some purpose again, linking the few ornaments to location, experience, history, the digital age, and sometimes nature. Some of these ornaments are fuelled by psychological research, since the rapid expansion of the urban environment mans' connection with nature has diminished, resulting in mental health issues of residents. This research which is already inspiring city planners to include more nature in the built environment is aspiring human inclusive design in architecture. Multiple papers have been publicised with multiple-step design adjustments that can improve human inclusive design, with some steps already commonly applied in all contemporary architecture. One of the research projects was publicised in 2014, in the paper of Browning, Ryan & Clancy, 14 aspects had been named that prove beneficiary to the occupant's mental health, where of 6 could involve architectural ornaments to create the intended effect.

As John Ruskin wrote, 'the ornament reveals directly the relationship of men with god' and in contemporary cities, where mankind is too disconnected with nature, applying naturalistic ornaments might strengthen the relationship between men and nature.

## Appendix

### Discussion

However, the psychological research proofs that ornaments with natural geometries improves mental health, there is discourse about how big the impact actually is, for environmental psychology is a study with its focus on the health of the general public and every individual has many factors that influence their mental health. Studies that provide more concrete proof of the influence of nature on health are studies on patients recovering from surgery, in a room with plants versus a standard hospital room. Since the conditions around these patients is more controlled, data is more conclusive. Multiple studies show a 'significant' improvement, reducing pain, anxiety, fatigue, blood pressure, heart rate, and with that less pain medication and a quicker recovery, (American Society for Horticultural Science, 2008) however it is showing that there is a connection, a study on the public leaves more room for speculation.

In recent history architects have traditionally been against any additional rules and regulations for they might temper with their freedom of design, however this paper is not advocating that every design should contain an ornament, it does not, however arguments named in this paper can be used as the justification for the application of ornaments in a design, for who wants.

Required craftsmanship to create an ornament, the ornament has left the architectural design partially because the craftsman was making a bad living and ornaments still being expensive, socio-economically it made sense to have complicated ornaments removed. Improvements in contemporary building on for example casting concrete allows for complex forms in structural elements, a frieze or pattern would not be that far off in production, also recent 3D printing machines allow for moulding all kinds of materials in complex designs, the machines that produce these works of arts work with 3D data files that can be derived from the standard modelling programs architects commonly work with.

Sources used for this thesis are not all encompassing, inclusion on non-western ornamentation would have proven beneficial for the strength of arguments and the ornamental vocabulary that is presented. Unfortunately, this would require its own research and with that divert the focus of the paper, the choice was made to conduct this paper with available literate sources.

## References

- American Society for Horticultural Science. (2008, December 30). *Flowering Plants Speed Post-surgery Recovery*. Retrieved from ScienceDaily:  
[www.sciencedaily.com/releases/2008/12/081229104700.htm](http://www.sciencedaily.com/releases/2008/12/081229104700.htm)
- Baggelaar, S. (2012, December 28). *Het Scheepvaarthus. Het decoratieprogramma aan de buitenkant*. Retrieved from spqa-am.blogspot.com: <http://spqa-am.blogspot.com/2012/03/het-scheepvaarthus-het.html>
- Browning, W. D., Ryan, C. O., & Clancy, J. O. (2014). *14 Patterns of Biophilic Design*. New York: Terrapin Bright Green llc.
- Coburn, A., Kardan, O., Kotabe, H., Steinberg, J., Hout, M. C., Robbins, A., . . . Berman, M. G. (2019). Psychological responses to natural patterns in architecture. *Journal of Environmental Psychology*, 62, 133-145.
- Cohen, J.-L. (2012). *The Future of Architecture since 1889*. London: Phaidon Press Limited.
- Fletcher, B. F. (1994). *A History of Architecture on the comparative method (fifth edition)*. London: Bradbury, Agnew, & Co. LD., Printers, London and Tonbridge.
- Hopkins, O. (2014). *Architectural styles: a visual guide*. London: Laurence King Publishing, limited,.
- Joye, Y. (2007). Architectural Lessons From Environmental Psychology: The Case of Biophilic Architecture . *Review of General Psychology*, 305-328.
- Koch, W., & Kotting, G. (1971). *Termen en begrippen in de bouwkunst*. Amsterdam : Kosmos.
- Loos, A. (1908). Ornament and crime. In U. Conrads, *Programs and manifestoes on 20th-century architecture* (pp. 19-24). Cambridge: MIT.
- Nanda, U., Pati, D., Ghamari, H., & Bajema, R. (2013). Lessons from neuroscience: form follows function, emotions follow form. *Intelligent Buildings International*, 61-78.

- Papapetros, S. (2010). World ornament: The legacy of Gottfried Semper's 1856 lecture on adornment. *Res: Anthropology and aesthetics*, 309 - 329.
- Picon, A. (2013). *Ornament*. John Wiley & zonen.
- Reynolds, D. M. (1992). *Nineteenth-Century Architecture (Cambridge Introduction to the History of Art)*. Cambridge: Cambridge University Press.
- Roth, L. M. (2013). *Understanding Architecture: Its Elements, History, and Meaning*. Routledge.
- Sağlam, H. (2014). Re-thinking the Concept of "Ornament" in Architectural Design. *Procedia - Social and Behavioral Sciences*, 126-133.
- Salingaros, N. A. (2019). The Biophilic Index Predicts Healing Effects of the Built Environment. *JBU - Journal of Biourbanis*, volume 8, No.1.
- Spasoff, N. (2012). *Modern Architecture in Manitoba An Overview*. Winnipeg: Manitoba, Culture, Heritage and Tourism.
- Ulrich, R. S., Simons, R. F., Losito, B. D., Fiorito, E., Miles, M. A., & Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of Environmental Psychology*, 203 - 230.
- Wirz-Justice, A., Skene, D. J., & Münch., M. (2021). The relevance of daylight for humans. *Biochemical Pharmacology*, volume 191.