DOI: 10.23817/2024.defarch.5-6

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DIRECTING SENSORY EXPERIENCE IN ARCHITECTURAL DESIGN

REŻYSERIA DOZNAŃ ZMYSŁOWYCH W PROJEKTOWANIU ARCHITEKTONICZNYM

Abstract

Architectural design, whether as a creative process, the transmission of a message, the author's idea or a record of a future architectural work, has always used, consciously or unconsciously, the senses of the viewer. However, contemporary artists use sensuality on many architectural levels, also as a commercial aspect of architecture, which becomes both a commodity but also a space for interaction with the user. This article aims, on the basis of a literature review, observation and logical analysis and interpretation of architectural realisations, to present the possibilities of using the phenomenon of the creation of sensory experiences in architecture and the effects of such a perception of space. Multisensoriality is becoming a commodity, but also a new design tool, a language of communication with the contemporary user of architecture.

Keywords: experiencing space, sensory experiences, perception of architecture, senses

Streszczenie

Projektowanie architektoniczne – zarówno jako proces twórczy, przekaz komunikatu, idei autora, jak i zapis przyszłego dzieła architektonicznego – zawsze wykorzystywało świadomie lub nieświadomie zmysły odbiorcy. Jednak współcześni twórcy wykorzystują zmysłowość na wielu płaszczyznach architektonicznych, również jako komercyjny aspekt architektury, który staje się towarem, a także przestrzenią interakcji z odbiorcą. Artykuł ma na celu, na podstawie przeglądu literatury, obserwacji i analizy logicznej oraz interpretacji realizacji architektonicznych, przedstawić możliwości wykorzystania zjawiska kreacji doznań zmysłowych w architekturze oraz skutki takiego postrzegania przestrzeni. Wielozmysłowość staje się towarem, a także nowym narzędziem projektowym, językiem porozumienia z współczesnym użytkownikiem architektury.

Słowa kluczowe: doświadczanie przestrzeni, doznania zmysłowe, percepcja architektury, zmysły

1. INTRODUCTION

The perception of architecture in the past and today is mainly based on sight. However, both the form and the space it confines or contains are perceived by humans with all their senses. Based on one's own experience and descriptions in the literature, professional studies and descriptions of visitors' impressions, it can be said that being in the operation area of buildings such as: Pantheon, Colosseum, Notre-Dame Cathedral or Cologne Cathedral still evokes intense emotions and acts on many senses. These buildings had a different function and the

multi-sensory impact on the user was only to support it and raise the profile of the building or was sometimes an unconscious result of proper design work. The right proportions of space, choice of materials, form and function, all have an impact on the stimuli sent out by architecture as perceived by the sense receptors of sight, smell, hearing, touch and even taste. But it was not until the second half of the twentieth century and the last twenty-four years that designers, reaching for a variety of tools, shifted the scales of importance of multisensory perception to the main focus of design. The boundary of architectural perception is blurring, which can stimulate interesting design solutions. The use of modern technology increases the quality of use, but the haphazard introduction of technology threatens to lower the quality and stature of architecture, and in the long term, can also negatively affect the comfort and health of the user. Like other activities in the field of visual arts, architectural design mainly uses light, colour and form. However, the 21st century is different from previous ones because people's sensitivity has changed. The amount of stimuli that modern people are currently exposed to is much greater and the message is more intense than ever. The combination of light and colour and the advent of neon signs was a breakthrough in the field of visual communication, but it was overshadowed by the combination of light with colour and movement. However, it is not only the technology and tools used in art and communication that have changed people's sensibilities, it is the intense frequency and volume of communication in everyday life that has made it more difficult for artists to reach their audience. Architecture, if it wants to be considered part of the art world, also has to face the difficulties posed by the changing lifestyle and perception of its user.

2. SEARCH FOR SENSORY EXPERIENCES IN LINKING ARCHITECTURE AND NATURE

Modern man has a lifestyle based on change, intense emotions, therefore designers, in order to exist in the life of the city and in the memory of its inhabitants, race to satisfy the needs of emotional experience. One of the current developments in design is the use of multisensory means of expression by architecture. Designers use variation, gradation and intensity to affect the senses and, borrowing a term from the art world, 'direct sensations'. The selection of appropriate means of expression and appropriate architectural solutions is based on knowledge of human biological and behavioural conditions and the psychology of perception. Exploring and perceiving architectural space with multiple senses is referred to as 'experiencing'. Michael Benedikt, describes in his textbook 'Architecture beyond experience'[1] two attitudes of the designer towards experiencing architectural space. The first trend in design was articulated in the 1970s and was based on the architect's feelings and intuition. One's own baggage of experience translates into the design process, building and then into being in and around the building. This way of thinking about the reception of architecture is still popular today and is based on the phenomenological views of philosophers such as Edmund Husserl, Henri Bergson, Martin Heidegger and Maurice Merleau-Ponty. There have been many works on the architectural theory that developed the themes of the philosophers mentioned above, including: work of John Dewey on experience as an imperative in the architectural design process, Steen Eiler Rasmussen and Rudolf

[1] M. Benedikt, *Architecture beyond experience*, Applied Research and Design, San Francisco 2020, p. 20.

Arnheim's on perceiving architecture with the senses, Siegfried Giedion's on architecture in space and time, Christian Norberg-Shulz's quandaries on the architectural message, Kevin Lynch's on the written message in function and form, Juhanin Pallasmaa and Peter Zumthor's on the sensory perception of architecture. The second trend that is currently developing is the idea that the experience of architecture does not only come from the designer, but, above all, is to be a response to the experience of the future viewer. Hence, the design process has been extended to include attempts to identify feelings, preparing profiles of the users' mental, emotional, social and physical needs and conditions, individual approach to the viewer, social participation, etc.

Human biological conditions have not changed, but attention to external stimuli is mainly limited to what we see. Technology has influenced our vision of the surrounding reality, which we perceive in a fragmented way, in between virtual lives. Our gaze focuses on what is different, and the work of designers is to strive for originality and otherness. The search for sensual experience has ones again drawn some designers towards what is the foundation of architecture, namely inspiration from the rich and sensual natural world. With technological progress, man is moving away from nature. Cities have become a place of life, or even the natural environment for most people. Their structures are comprehensible in their massage and influence the behaviour and development of their inhabitants. Nature, although providing sensory stimuli in a harmonious way, has become inaccessible, unnoticeable and incomprehensible from the perspective of a few or a dozen storey buildings. This is why some architects, seeking to influence all the senses, find inspiration in natural forms and phenomena. Examples of sensory stimuli that affect all the senses are rain, snow, wind, sunlight and shadow. Atmospheric phenomena, once the subject of literary painting and an element of life, are currently being pushed away from man, also by architecture. Buildings with a closed, centripetal form, with no open space on the border between interior and exterior, described by Jan Gehl as a 'hard edge'[2], without details such as eaves, arcades, curtains, etc., provide security and comfort for users, but isolate them from external stimuli. Traditional architecture used eaves, gargoyles and gutter chains to protect the façade and entrances from rain, while also providing a visual and auditory experience. The extended roof is a distinctive element in the traditional architecture of many countries and regions around the world. The work of architect Kengo Kuma draws inspiration from historical Japanese buildings and implies elements of tradition into contemporary architecture, as exemplified by the Nezu Museum in Tokyo (Ill. 1).

Japanese culture is distinguished by architecture that is sensually linked to its surroundings. Designers treat the elements such as sun, wind and rain with devotion and use them as inspirations for architectural ideas. Architect Shigeru Bana is particularly fond of the wind. His architectural solutions in the form of curtain walls, partitions made of curtain fabrics (Ill. 2, 3) use the characteristic features of the wind, giving the architecture an impression of lightness and visual transience. The building does not cut itself off from nature, but rather invites it into the building, so that we can perceive the building also through touch, hearing and smell.

The ability of light, wind and rain to penetrate a building brings man closer to nature. This approach is not new; a prime example of nature's link to space and architectural form is the oculus in the Roman Pantheon (Ill. 4), through which rain, snow and sunlight enter.

[2] J. Gehl, *Miasta dla ludzi*, Wydawnictwo RAM, Kraków 2017, p. 79.

Once a year, instead of raindrops, a 'rain' of rose petals falls into the interior (Ill. 5). The oculus and its properties, were used in a contemporary way by designers Ryue Nishizawa of SANAA and Rei Naito when designing the Art Museum on the Japanese island of Teshima. Holes (Ill. 6) in the upper part of the thin shell allow nature to interfere with the experience of the users inside. Perceiving the play of light and shadow or the sound of rain with the senses of sight and hearing, the person is a viewer, an observer of this spectacle. It is the cool or warmth, humidity, contact with the skin and smell that make us an integral part of the building environment. The oculus provides contact with the environment and at the same time frames the view, metaphorically stopping it for a moment, drawing the viewer's attention to the beauty of nature. The architectural form of the museum is an implication of the shape of a raindrop (Ill. 7), which we perceive not only through sight, but also through touch and hearing, due to the acoustic qualities of the interior of the 'drop'. Sound in space, according to J. Pallasmaa, provides us with '…a temporal continuum in which visual impressions are embedded'[3]. The multi-sensory experience described by Bachelard as a 'polyphony of the senses'[4] within the limits set by the architectural form heightens the sense of reality, of being here and now at a specific time.

3. NATURE AS A SOURCE OF INSPIRATION FOR THE CREATION OF MULTI-SENSORY EXPERIENCES IN ARCHITECTURE

Designers imitate natural phenomena and artificially interfere with the intensity of the sensations they evoke in the viewer**.** Such architectural interventions are not uncommon. Architect Kawasaki Kiyoshi, in designing the Miyako Messe Exhibition Center building (Ill. 8), used the effect of a wall of rain, which occurs naturally in Japan during the rainy season, known as 'tsuyu'. Contact with water in the form of both sound and sensory qualities is a factor that strongly influences the perception of architecture. Architects are not only inspired by nature, but they use it to create new experiences that arise at the interface of nature with architectural form and technology. In 2005, the spatial installation Sea Organ was created in Zadar, which is difficult to clearly define as an architectural form, as it also functions as a musical instrument. It is an organ enclosed in the form of a seventy-metre-long staircase, which plays music when it comes into contact with waves. The sounds depend not only on the polyethylene pipes hidden in the staircase, but also on the geometry and length of the waves. The installation is an auditory experience, but at the same time there is an architectural narrative[5], the form of the staircase has many meanings, and the direction of descent down can be interpreted, for example, as a symbolic immersion into the world of the senses, nature or music. The reception of meanings and symbols in architecture on a philosophical level depends on the knowledge, preparation and predisposition of the user.

In their search for sensory experiences, artists attempt to astonish the viewers and their attention. Exhibited at the Barbican in London and at MoMA in New York, the Rain Room project (Ill. 9) by Hannes Koch and Florian Ortkrass, blurs the boundaries between the real

[3] J. Pallasmaa, *Oczy skóry. Architektura i zmysły*, Instytut Architektury, Kraków 2012, p. 61.
[4] G. Bachelard, *Poetyka marzenia*, Słowo/obraz terytoria, Gdańsk 1998, p. 14 [after:] *ibidem*.
[5] According to A. Niezabitowski, considerations of architectural narrative arising from architectural form, cf.: A. Niezabitowski, *Narracja architektoniczna – interpretacje, spekulacje czy fakty empiryczne?*, "Kwartalnik Architektury i Urbanistyki" 2016, no. 1, pp. 5–17.

and the virtual world. The audience can hear and see the rain, but cannot feel it. The elimination of stimuli that affect the sense of touch is intended to stimulate the involvement of other senses. The visitor does not get wet, but feels the temperature and humidity of the air. Moving through the installation space, he can simultaneously become a creator and interact with the work and other users.

Sensory experience has become a popular language of communication in art and architecture. Emotion and feeling have become the main theme and the main function for which individual objects are designed. Designers convey information about a subject not through spoken or written information, but by simulating the conditions of places, evoking sensation and natural metabolic processes. An example of such creation of space using knowledge from biology and neuroscience is the exhibition entitled 'Hormonorium' in the Swiss pavilion at the Venice Architecture Biennale in 2022. The project is based on knowledge of how the human body reacts under certain conditions, in this case similar to the Alpine climate, triggering a sequence of physico-chemical reactions. Controlling temperature, UV radiation, which affects hormones, vitamin D production, increasing nitrogen and decreasing oxygen, causes changes in the behaviour of people visiting this space. According to the authors, staying in this space for a longer period of time causes euphoria, increased sexual desire, reduced fatigue, improves overall wellbeing and body performance. This proposal to change the way we think about public space was based on maximum isolation from the outside world and minimising visual stimuli. This interesting solution can bring many benefits to the design world, but it can also be the beginning of far-reaching interventions in the human body, which until now have been a rather gentle reaction to adverse conditions in the form of light therapy, air purifiers and temperature-regulating air-conditioning systems.

The sensory experience of art and space is heightened by the movement of the viewer, who, by moving around, perceives the performance more as a participant than a spectator. An example of this kind of action in art is the performance by Poznan The Eighth Day Theatre entitled 'Time of Mothers' (Ill. 10, 11), which was realised as part of the FETA festival on the grounds of the Gdansk Shipyard. The play was staged sequentially on and between several stages. The audience moved with the actors, and the architecture and infrastructure of the Gdansk Shipyard provided the background. Changing spaces and views requires not only a script for the play, but also a script for the architectural background. In recent years, a multimedia multi-format exhibition[6] has become popular, applying well-known works from the field of painting to multimedia installations expanded with sound and image movement. The multisensory exhibition of impressionist paintings entitled: 'Immersive Monet & The Impressionists' (Ill. 12) transfers movement from the viewer to the exhibition, but through the format it takes and the way it is displayed, the viewer can still feel like a participant in the event.

Consciously or unconsciously, architects have always used movement to create tension in architecture and urban planning. The design of the foreground in front of the building, followed by the vestibule, the entrance area, introduces gradation and creates a psychological buffer before the essential function of the building. However, nowadays people need more than movement and a change of space to feel the atmosphere of a place. An often overlooked but important sensation for the experience and perception of architecture is smell, because

[6] An important place for the display of multimedia exhibitions is the former, https://www.carrieres-lumieres.com/en (access: 10.07.2024).

it has the greatest impact on how we remember a place. Juhani Pallasmaa, in his book 'The Eyes of the Skin'[7], recalling his childhood smells, states that the smell remains in the memory longest and stimulates the imagination. Modern technology has reduced the role of the sense of smell to a minimum. Mass-produced building materials do not smell. If we perceive a certain smell, for example, due to temperature, in most cases, we can classify it as a chemical odour. In addition, buildings are ventilated, and mechanical ventilation is increasingly used. The smell of architecture is no longer associated with pleasant synonyms. Due to the cost of purchase, processing and faster wear and tear during use, natural materials are rarely used. Globalisation in building technology has caused architecture to lose its regional scent character. Instead, fragrances imitating natural scents are sprayed indiscriminately and uncontrollably in commercial spaces and beyond. The hope for a change in thinking about the use of the senses is the architectural work of architects such as Kengo Kuma, who also introduces natural wood into commercial spaces. This past year saw the creation of the 'AEAJ Green Terrace' building in Tokyo. Kengo Kuma proposed the form of a glass cuboid with a wooden, intensely dissected structure made of aromatic wood from Japanese cypress trees, which is also a natural diffuser of fragrance. The olfactory experience is the theme of this place, where visitors can experience unique scents from around the world, such as the scent of the Japanese citrus fruit 'yuzu', or 'saro', an herb that grows in Madagascar.

4. PERCEPTION OF PEOPLE WITH DISABILITIES AS A DESIGN GUIDELINE

The senses are becoming a popular topic in all areas of human life and are therefore being used on a wide scale, with varying intensity and aesthetic levels, including in commercial spaces. The popularity of this activity poses the danger of overstimulating the audience with multimedia technology. A plethora of sensory experiences causes, among other things, stimulation, nervousness and fatigue of users. Overstimulation mainly concerns places such as shopping centres, open workplaces and public spaces in the compact urban fabric. Places that reduce external stimuli are introduced as a remedy to this problem. Glass silence cabins in shopping centres and open-plan office interiors are ideal examples of this. However, these are not the result of a design idea, but only necessary interventions in a small field, in spaces that have not been properly designed before.

Retail companies use their customers' senses and need for tranquillity to build their brand image. Marketing and branding enter into the areas of collaboration with people from the world of popular science and art to increase the experience of customers in their stores and to influence their lifestyle, mindset and aesthetic preferences. In Australia, QVB, The Galeries and The Strand Arcade[8], Vicinity Centres offered customers 'in-store retail therapy', a shopping experience developed in collaboration with positive psychology expert Dr Tim Sharp. Chromotherapy, fractal anti-stress therapy and sound therapy were used. In London's Westfield White City shopping centre, The EE Studio's space is divided into zones designed to enhance the comfort of staying and using their products. One zone, called the

[7] J. Pallasmaa, *op. cit.*, p. 67.

[8] *Vicinity Centres reinvents meaning of 'Retail Therapy'* [in:] Vicinity Centres, 14.04.2023, https://www.vicinity.com.au/about-us/newsroom/vicinity-news/retail-therapies-in-sydney-cbd (access: 15.07.2024).

Digital Spa space[9], uses multimedia technology to provide customers with a multi-sensory experience: sensory, relaxing, simulating contact with nature. Experience has become the motto for the interiors of this retail chain.

Being in overstimulated places is uncomfortable for most people, and it can be even more difficult for people with disabilities, hypersensitive hearing, poor eyesight, psycho-physical or autism spectrum disorders. Equality, accessibility and legibility for all are postulates of Universal Architecture. Katarzyna Jelonek, an architecture student at the Bydgoszcz University of Technology, used an experimental method to treat conditions of perception of a disabled person, in this case a blind and visually impaired person, as design determinants[10] when developing the concept for a centre for the blind in Bydgoszcz , which is part of her master's thesis (Ill. 13)[11]. The architectural concept, form and functional layout details, materials and technologies, and the design of the building's surroundings, were subordinated to the needs of visually impaired people. The user profile was also extended to include people without psycho-physical dysfunctions, as the premise of the work was to create a place for education and social integration. The proposed composition of four cylinders, one of which is the central place for the distribution of communication around the building, the rounded forms and interiors resulting from the difficulty of movement, selection and differentiation of materials[12], are elements that were intended to support spatial orientation and create spatial memory. The architecture and special development around the building have been designed to allow for multi-sensory perception when moving around the facility. The proportions of the rooms and the material finish make it possible to send out auditory, tactile and olfactory stimuli.

The presence of organised and appropriately selected greenery provides an olfactory experience and also communicates a sense of movement, and to a limited extent, also provides taste stimuli. As a result of the collection of information and careful research, the designer creates a building project that will be equipped with a series of sequential signals. Spatial distinctions placed in specific locations in relation to each other are recorded in the recipient's memory, which Magdalena Mlostek describes as semantic memory[13], on the basis of which an allocentric map can be made, showing the position of all landmarks

[9] *EE unveils innovative new studio store in Westfield London* [in:] Newsroom EE, 15.07.2023, https://newsroom.ee.co.uk/ee-unveils-innovative-new-studio-store-in-westfield-london/ (access: 15.07.2024).

[10] As part of the research and experimental design method, the perception and needs of a person with autism spectrum disorder were used during design and theoretical tasks with students of the Bydgoszcz University of Technology, as the main determinant in designing integrated schools. The results of the work were published in: M. Kaus, *Perception of space and architectural form of children with Asperger's syndrome as a universal guideline for education of space design*, "AIP Conference Proceedings" 2022, no. 2574(1), art. no. 070009.

[11] Master's thesis at the Faculty of Civil, Architecture and Environmental Engineering of the Bydgoszcz University of Technology by Ms. K. Jelonek entitled: *Projekt koncepcyjny architektoniczny ośrodka dla osób niewidomych w Bydgoszczy jako miejsce integracji społecznej i przykład architektury uniwersalnej*, under the supervision of Dr. Eng. Arch. Małgorzata Kaus, 2024.

[12] The use of brick as a material pleasant to the touch, with a small form enabling the differentiation of the application. Each of the circles was distinguished by a different brick thread, which provides a variety of textures and orientation for the visually impaired, a visual, tactile and olfactory experience, in contact with atmospheric precipitation.

[13] M. Mlostek, *Nawigacja w przestrzeni – od komórki do mentalnej mapy*, "Wrzechświat" 2018, no. 118(4–6), pp. 87–92.

relative to each other. The intensity of perception and the recording of interrelationships depends not only on the message, the means of expression, but also on the location of the respective element, the sensory stimulus. The delineation of areas of different visual intensity can be done with the ISOVIST[14] space analysis. Touch and taste are very intimate senses, whereas hearing depends on acoustic conditions and measurements of reverberation time and sound absorption, acoustic parament measurements of products and materials can then be implemented in the design process. The designer, however, cannot fully predict how his work will be perceived because the experience is influenced by many factors, including emotional perception. Peter Zumthor believes that 'We perceive atmosphere through our emotional sensitivity'[15].

5. SUMMARY

Conscious creation of sensory experience through architecture is an important issue because it not only builds urban space, architectural form, but has an impact on the comfort, quality of life and perception of its audience. The discussed examples of architectural interventions showed a wide spectrum of design activities dedicated to different types of perception. They proved that perceiving architecture as a sensory creation of space and form, can enhance architectural quality, but can also become an element of the market game.

Directing sensory experience as a main design guideline is increasingly emerging in the architectural design space, which is why some universities in Poland and around the world have introduced this aspect of design as a subject in the architectural education process[16] . However, if the design process extends to include multisensoriality, perhaps this issue should already be a general guideline, coordinated on a building or building complex scale, or even on a city scale, through maps of sensory experience in architectural space. Excessive creation of places saturated with stimuli can lead to chaos, incoherence and the 'littering' of space, just as happened with light. There is a danger that architecture will become a mere shell of a box for simulating experiences to be translated into the commercial success of a place. The danger concerns not only architecture, but also its recipients, because if young people are only susceptible to simulated and very intense external stimuli, this will disrupt the natural sensory sensitivity of humans, especially when communing with nature. The profession of an architect is holistic in nature and draws knowledge and experience from other fields, such as psychology, sociology and even medicine. Therefore, the common perception of an architect as a profession dealing with the aesthetic layer of a building in combination with the technical layer should change. Architecture is perceived with all the senses and architectural presentation should not be limited to the visual side of a building. Modern technology makes it possible to simulate and test the potential sensations in a designed building.

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[14] A. van Nes, C. Yamu, *Introduction to space syntax in urban studies*, Springer, Cham 2021.

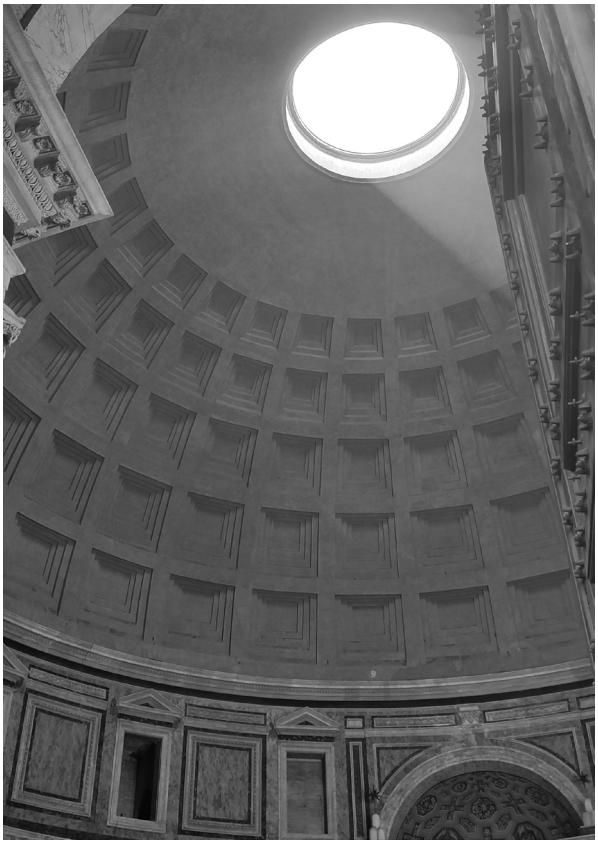
[15] "We perceive atmosphere through our emotional sensibility, a form of perception that works incredibly quickly, and which we humans evidently need to help us survive." P. Zumthor, *Atmospheres*, Birkhäuser, Basel 2006, p. 13.

[16] Since 2020, the Architecture major at the Bydgoszcz University of Technology has been offering lectures and design classes in accordance with the adopted study program entitled: 'Designing in the aspect of multi-sensory perception'.

Ill. 1. Nezu Museum in Tokyo, architect: Kengo Kuma, photo by M. Kaus, 2010.

Ill. 2. A view of the windswept open curtains at the Curtain Wall House, architect: Shigeru Ban, Itabashi, Tokio, 1995, source: https://shigerubanarchitects.com/works/hh/curtain-wall-house/ (access: 15.07.2024).

Ill. 3. A view of the Curtain Wall House, closed with curtains, architect: Shigeru Ban, Itabashi, Tokio, 1995, source: https://shigerubanarchitects.com/works/hh/curtain-wall-house/ (access: 15.07.2024).



Ill. 4. View of the oculus in the Pantheon in Rome, photo by M. Kaus, 2010

Ill. 5. A view of rose petals falling through the oculus into the interior of the Pantheon in Rome during the celebration of Pentecost, source: *Deszcz płatków róż w Panteonie. Symbolizują języki ognia, które spłynęły na Maryję i Apostołów* [in:] Republika, 23.05.2021, https://tvrepublika.pl/Deszcz-platkow-roz-w-Panteonie-Symbolizuja-jezyki-ognia-ktore-splynely-na-Maryje-i-Apostolow,119193.html (access: 15.07.2024).

Ill. 6. Interior of the Art Museum on the Japanese island of Teshima, architect: Ryue Nishizawa, SANAA, Rei Naito, source: ArchDaily, 19.07.2011, https://www.archdaily.com/151535/teshima-art-museum/1311025649-17teshima-museum-rna-1291.jpeg?next_project=no (access: 15.07.2024).

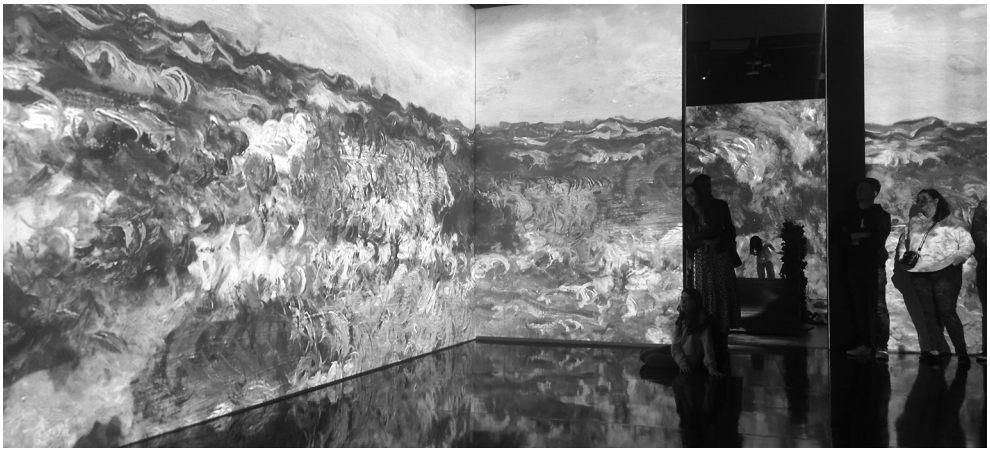
Ill. 7. The building structure of the Art Museum on the Japanese island of Teshima, architect: Ryue Nishizawa, SANAA, Rei Naito, source: ArchDaily, 19.07.2011, https://www.archdaily.com/151535/teshima-art-museum/1311025649-17teshima-museum-rna-1291.jpeg?next_project=no (access: 15.07.2024).

Ill. 8. Rain wall simulation, Miyako Messe Exhibition Center building, architect: Kawasaki Kiyoshi, photo by M. Kaus, 2010

Ill. 9. Rain Room, authors: Hannes Koch and Florian Ortkrass, source: Chalcraft E., *Rain Room by rAndom International at the Barbican* [in:] dezeen, 4.10.2012, https://www.dezeen.com/2012/10/04/rain-room-by-random-international-at-the-barbican/ (access: 15.07.2024).

Ill. 10. A frame from the play by The Eight Day Theatre entitled: "Czas Matki" (Time of Mothers) against the background of shipyard cranes, performed as part of the FETA project in Gdańsk in 2008, photo by M. Kaus, 2008.

Ill. 11. A frame from the performance of the Eighth Day Theatre entitled “Time of Mothers” against the background of the architecture of the Gdańsk Shipyard area, staged as part of the FETA project in Gdańsk in 2008, photo by M. Kaus, 2008.



Ill. 12. Multisensory exhibition entitled: “Immersive Monet & The Impressionists” at the Norblin Factory in Warsaw, photo by M. Kaus, 2023.

Ill. 13. Visualization from the master's thesis of arch. Katarzyna Jelonek, majoring in Architecture at the Bydgoszcz University of Technology, entitled: *Projekt koncepcyjny architektoniczny ośrodka dla osób niewidomych w Bydgoszczy jako miejsce integracji społecznej i przykład architektury uniwersalnej* under the supervision of dr Małgorzata Kaus, author: K. Jelonek, 2024.

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