

Blindness and multi-sensoriality in architecture: the case of Carlos Mourão Pereira

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Abstract

The buildings architects design are multi-sensory in nature and much richer than the visual aspects that get most attention during the design process and discussions afterwards. There have been some reactions against this visual bias both from within the architectural discipline as well as from the field of disability studies. Persons who are visually impaired perceive the built environment very differently and pay more attention to tactile, haptic, auditory and olfactory aspects. A cultural model of disability can help in understanding how disability can critique this visual bias in architecture. It can even help in overcoming this bias. A dialogue between architects and people with a visual impairment can therefore contribute to a more multi-sensory design approach to architecture. In this paper we discuss the sea bathing facility designed by Carlos Mourão Pereira and especially the relation between its multi-sensory aspects and the process of becoming blind. Pereira lost his sight in 2006—after an extensive career in architecture—and develops his architecture from the new insights he gains. His blindness challenges his understanding of aesthetics in architecture, but also his sense of architectural space. Even in the way he explains this project, he searches for more-than-visual representations to shift the attention of the 'spectator' towards a more profound sensory awareness.

1. Towards a multi-sensory architecture

1.1. *Architecture, the body and the senses*

The term architecture and what it stands for has gone through a whole evolution. Traditionally, architecture is defined as the art of building. In this classic idea, architecture is a superior form of building as it brings about a harmonious merging of form, function and

construction (Heynen 2004a). What makes architecture more than mere building is for some the introduction of symbolic form. For instance Hans Poelzig (1931) reacts against a modern style based on mathematical and technological translations of processes in nature when he states that "the logos of art is not mathematical, it even goes against any form of arithmetic. It is mathematical, but in a more exalted sense. The logic of art goes just against nature—and against its laws." Others, like Le Corbusier (1923), argue that it is this mathematical order, harmony and touching proportions which make architecture rise above mere demands of construction and functionality. Heynen (2004a) continues her review with the *Neue Sachlichkeit* and the left wing of the Modern Movement of which the representing architects and theoreticians argued that architecture is not limited to the more representational or monumental buildings, but encompasses the total built environment.

This tendency to consider architectural qualities in terms of abstraction can also be found in the ideas about the role of the body in Western architectural history. As Van Herck and De Cauter (2004) describe, "the classicist architecture started from a mythical corporality of the building. [...] In a building, there is harmony when all building elements are in proportion as are the parts of the human body." They further define scale, size and proportion as aesthetic values that relate, directly or indirectly, to the body. But during the Modernist Movement, this anthropomorphism is being replaced by an organicism, exemplary of functionalist thinking. "The organicism of the modernist [architects] tries to understand the principles that are working in nature and reduces them to mathematical-physical laws, in order to surpass the mimicking of nature" (Van Herck & De Cauter 2004).

This abstraction goes even further and influenced also the perceptual experience of architecture. According to Van Herck and De Cauter (2004) the Modernist Movement proposes a new way of perceiving which is based on an immaterial principle to comprehend the underlying essence. "The intellectual comprehension of an immaterial ordering principle [e.g. mathematics] is seen as a superior form of perception, where sensory perception which cloud that perception, are by-passed" (Van Herck & De Cauter 2004). To them, this translates into the built form of Modern architecture as these buildings are designed for visual perception, since sight is traditionally the highest, less corporeal sense.

However, this over-attention for the abstract and visual qualities of architecture in architectural history, theoretical discourses, representational media and even built form does not mean that architecture was (and is) deprived of other sensory qualities. The built environment is perceived through the whole of the body. Not only how a space looks, but also the sound, the tactile aspects and the smell are of importance (Mellaerts 2006). Pallasmaa (2008) gives a further nuanced understanding of the visual bias in architecture. "It has to be emphasized that the conscious focusing on the mechanics of vision did not automatically result in the decisive and deliberate rejection of other senses before our own era of the omnipresent visual image. The eye conquers its hegemonic role in architectural practice, both consciously and unconsciously, only gradually with the emergence of the idea of a bodiless observer." Pallasmaa gives here the example of the Greek temple with its system of optical corrections but without rejection of haptic sensibility, materiality and authoritative weight. He even defends the extremely visually oriented architecture of Le Corbusier and the Modern Movement: "Le Corbusier, however, was a great artistic talent with a molding hand, and a tremendous sense of materiality, plasticity and gravity, all of which prevented his architecture from turning into sensory reductivism. [...] However, the reductive bias becomes devastating in his urbanistic projects" (Pallasmaa 2008).

Van Herck and De Cauter (2004) observed a reaction to this emphasis on the visual and the exclusion of the other senses in their analysis of the theoretical discourse starting after World War 2. By contrast, Pallasmaa (2008) argues that in architecture there is even a stronger focus on the visual. Van Herck and De Cauter interpret the upraise of ergonomic approaches as a return of attention for the body in architecture, but find these ideas still too reductionist as the body is seen as nothing more than the sum of its parts. Pallasmaa, on the other hand, argues that the visual bias in architecture only grew stronger as "architectural theory and criticism have been almost exclusively engaged with the mechanisms of vision and visual expression." Moreover, Marta Dischinger (2006) contends, "the current over-emphasis on the intellectual and conceptual dimensions of architecture contributes to the disappearance of its physical, sensual and embodied essence." She understands the traditional tools to represent architecture mostly using visual media as evidence for this.

Before Pallasmaa's extensive argument of the visual bias in architecture and his call for a truly multi-sensory

approach to designing, discussing and theorizing architecture, there were some (smaller) attempts to bring this under the attention. Van Herck and De Cauter (2004) see this in the writings of Kenneth Frampton (1983) and Hans Kollhoff (1993). Frampton calls for more attention for the tactile qualities when saying "the tactile resilience of the place-form and the capacity of the body to read the environment in terms other than those of sight alone suggest a potential strategy for resisting the domination of universal technology." Kollhoff, so state Van Herck and De Cauter, uses the cladding principle to bring the materiality of architecture in relation to the body back under attention. The reason Kollhoff gives is that "man wants an environment he understands, in which he can experience his body, because technical evolution works in a world that surpasses our comprehension."

1.2. Disability as critique on architecture

There are a number of different ways to understand disability, of which the medical model is the most dominant in western society. Besides this medical model, however, there is a social model of disability coming into existence and growing in importance. These two models now co-exist, something that is recognized by the recent cultural model that further develops thinking about disability.

The medical model defines visual impairment by means of measurable criteria (see for instance the definitions of visual impairment and blindness given by the World Health Organisation (WHO 1993)). The impairment is situated in the person and the solution to the problem caused by the impairment lies in the use of prosthetics to restore the function of the body. The social model, on the other hand, situates (visual) disability in the interaction between a person and the context of his/her actions (Butler & Bowlby 1997). This context can be social as well as physical. So the solution to resolve a disabling situation can just as much come from an alteration of the environment.

Further, the cultural model does not just point to the responsibilities of architects in creating situations that are less or more potentially disabling. It looks at the meaning of disability for society and in doing so, how this can change our viewpoint on e.g. architecture. The very different experience people with a visual impairment have of the built environment compared to how it was conceived can in itself be a critique on this conception, resulting for example in the book *Blindness and the*

multi-sensorial city (Devlieger et al. 2006). McDermott and Varenne (2003) worded the critiquing abilities of disabilities in a more general way: "In cultural terms, the difficulties people in wheelchairs face with curbs and stairs tell us little about the physical conditions requiring wheelchairs or cart, but a great deal about the rigid institutionalization of particular ways of handling gravity and boundaries between street and sidewalk as different zones of social interaction."

More general, McDermott and Varenne (2003) describe how disabilities are culturally constructed concepts which can evolve into a critique on that same culture. They argue that "approaches using each term –culture and disability– differ along a continuum of assumptions about the world, its people, and the ways we learn." In this they distinguished three approaches: the deprivation approach, the difference approach and the culture as disability approach. In this first approach different groups of people develop differently but are being compared according to a stable set of tasks and possibilities. The second approach accepts that people can develop differently in their own ways and these ways are "equivalent paths to complete human development." The third approach goes even further and "takes up the possibility that every culture, as a historically evolved pattern of institutions, teaches people what to aspire to and hope for." People can be socialized into a disability.

Devlieger, Rusch and Pfeiffer (2003) further develop this thinking about disability in cultural terms and suggest a cultural model of disability. First of all, this model "recognizes and integrates the strengths that are present in each of the practiced models and recognizes that they are localized." Such a model takes into account that there already are different ways of understanding disability. Secondly, "disability is localized in the ways people could not and cannot conceptualize the phenomenon in all its complexity." This interstitial nature of disabled people can then lead to the growth of disability identity and at larger scale disability culture. "A cultural model therefore emphasizes potentiality and transformation, as it can be reached from the construction and deconstruction of information, emotionality, and spiritual growth." In other words, disability questions existing categories and this questioning may lead to new insights and inspirations.

Marta Dischinger (2006), for instance, argues how our perception of the built environment on the conscious level is mostly focused on the visual aspects, how this influences the way buildings and urban structures are

designed, and how people with a visual impairment question all this. She mainly focuses on way-finding and how urban designs rely on (distant) visual landmarks to guide visitors to their destination. But people with a visual impairment pay more attention to other aspects and qualities of the built environment, to auditory, haptic, and even olfactory cues. And by doing so they remind us of the richness in experiences we may otherwise forget exist.

"Twentieth century theory of architecture defines architecture first and foremost as a part of space: space is the most specific aspect of architecture as a discipline" (Heynen 2004b). But as much as this space can be perceived through all the senses and the whole of the body, design in and theory of architecture have focused to a great extent on the visual aspects of this space. There has been some critique both from within as from outside of the field of architecture on this visual bias, and a call for a more multi-sensory attention for the built environment. Disability studies are one direction out of which this critique has emerged. At the same time, the cultural model thinking in this area has also given a possible strategy to deal with this critique in a positive way.

2. The Lourinhã Sea Bathing Facility by Carlos Mourão Pereira

Carlos Mourão Pereira is an architect who works on developing multi-sensory aspects of architecture, but from a very intriguing angle. Pereira is a Portuguese architect who became blind in 2006. He completely lost his sight in a short period of time but he decided to continue his architectural practice. He always had an interest in the senses and multi-sensory architecture and he realizes how being blind means that "now [he] can work with the senses." It is in this context and period that the idea for a project like the sea bathing facility (Fig.1) starts to take shape. Up until now, this project has not been built yet. It started as a study object and was not commissioned by a client, although Pereira is looking for sponsors and trying to convince the municipality. This however does not prohibit us from analyzing this project as fully developed architecture, because the built form is only one aspect of an architectural design. Or as Sonit Bafna (2008) words it: "Drawings in the imaginative mode are often architectural works in their own right, and they can function as works by invoking a special mode of visual attention."



Figure 1: sea bathing facility, Lourinhã: Overview and location (Sant'Ana 2008)

2.1. Data collection and research method

The data available to us for analysis are published materials (on Pereira's website and in magazines), materials provided by Pereira and two lectures given (one about his architecture and one about his Ph.D. research). We also interviewed him in order to know more about specific aspects of the projects and his design process. The documents found on his website are written summaries of different projects together with architectural images explaining them. Also video (moving images and sound) are used to explain a certain location. In architectural journals, two articles appeared: one in A10 (Sant'Ana 2008) about the Lourinhã sea bathing facility, and one in Mais arquitetura (nr. 31, January 2009) with an interview on his opinion and experience of architecture. A more profound description of the Lourinhã project and his ideas about architecture were given during a public lecture for architecture students in Leuven in 2009. Any further questions we had were answered in an interview which elaborated on his way of working in general and specifically in the case of the Lourinhã project. Both the lectures and the interview were recorded and transcribed word for word. For this paper we looked specifically for instances in these data that point to multi-sensory aspects of Pereira's architecture.

2.2. The Lourinhã Sea Bathing Facility

The sea bathing facility that Pereira designed for the Paimogo Beach in Lourinhã in Portugal is, as the name suggests, a place where the sea can be experienced, but in a safer and more controlled environment than the violent surf of the Atlantic Ocean. The main space of this project is an H-shaped basin that is implanted on the remains of an old abandoned fishery. The main basin is accessible through a slope which comes down from the

cliff towards the sea. Within this basin are a number of smaller tanks which form places where sea life can grow and develop (Fig.2). The whole is made of recycled concrete, a material that meets functional, financial and ecological demands as well as demands of resistance to the sea water.



Figure 2: sea bathing facility Lourinhã: Section(website Pereira)

As Pereira explained during the lecture for architecture students, there are three central themes to his architecture: "inclusion, sustainability and the senses" (Pereira 2009). These three themes are found to a greater or lesser degree throughout his projects, and the sea bathing facility is no exception.

When Pereira became blind, it was not safe anymore to go into the sea by himself. The surf at the Portuguese beaches can be very perilous. As a reaction to this, Pereira started developing his ideas about the sea bathing facility. He wanted to create a safe environment for all to enjoy the rich experience of the coastline. An accessible ramp leads from the parking up the cliff down to the main basin. A hand rail at two different heights offers a comforting guideline and support. The round corners and smooth concrete form a safe environment for all to enjoy the richness of this location.

As Pereira was thinking of a material that would make these rounded organic forms possible, concrete seemed appropriate. Not only does it allow these forms to be created, it can also withstand the relatively aggressive environment it is in. Sea water is highly corrosive and the movement of the surf can easily erode softer materials. For sustainability reasons, Pereira has opted for recycled concrete. There is also a sustainable aspect of water treatment. The sea bathing facility is not mechanically filtered. Because of its location, the water of the pool is naturally and regularly recycled. When the tide is high the pool is submersed in the sea and the waves wash through the basins. This creates the necessary water flow to keep the sea life in the secondary tanks alive.

But the true innovation of this project comes from Pereira's third concern: attention for the senses. The location is intentionally chosen. For Pereira, this border where water and land meet has a very rich and specific multi-sensory character. It is a unique place where wind and water interact with the land, something that we

appreciate with all our senses. After Pereira became blind he got "more conscious of certain spaces as they are more multi-sensorial and [he] discovered as most sensorial space the space between the sea and the land where we can listen to the waves and smell the sea."

Not only the choice of location is responsible for a profound multi-sensory experience. The project in itself is conceived to further enrich this experience. The people who might use the sea bathing facility not only get in contact with the water, the wind, the sun, etc. but they can also experience touching the sea life that develops in the smaller tanks. These shelters allow for plants and fishes to live and grow. The location, the sea life and the basin itself all act together in creating an environment where people can get stimulated by their whole body. Linked back to Pereira's principles of inclusive design, the project can be described as a botanic garden of sea life, for as many people as possible to visit and experience. The sea bathing facility mimics and gives form to an experience as enjoyed by Pereira at the sea shore (see the extract from one of his letters to Juhani Pallasmaa).

In this part of the letter (Fig.3), Pereira describes a childhood memory of a peculiar phenomenon that occurred once every year at the Portuguese coast. He tells in great detail how a few days long, the sea becomes totally silent and reveals the landscape that otherwise stays hidden beneath the waves. This landscape of little pools and shelters in the cavities of the rocks provides shelter for a person and forms the habitat for small aquatic gardens. Compared with these memories, the sea bathing facility allows for the same rich multi-sensory experience of the ocean and the life within. The small pools are recreated in the smaller touching tanks where a person can look at, feel, even smell the seaweeds growing inside them.

Letter from Carlos Mourão Pereira to Juhani Pallasmaa, August 22nd, 2007

"... made me remember an acoustic phenomenon that was happening cyclically in the summer, in a beach on the north of Lisbon, in which I used to spend some time on holidays, in my childhood.

In this point of the coast, the ocean is shown by a sound of great waves to wet the coast. The singular phenomenon was happening in two or three days, during July and August. In these

days the sound of the ocean was disappearing. The extraordinary event was consisting of the alteration of the waves resulting in a completely flat and silent sea, where the waves were coming down to the scale of the grain of the sand instead of that of the beach. This space change was noted with joy while observing of the top of the cliff such a calm sea. During most of the days, the green of the sea and the foam of the waves didn't let see the lush interior that there was. Now the water was colourless and just far away it were coming a green translucent, the one that was becoming blue when it was touching the sky. It was possible to walk along aquatic gardens. While we were walking, the sand could massage the feet. It was also possible to find some shelters on the empty spaces of the rocks. There were little seaweeds of a dark red and others of a yellowed green of the dimension of the feet, others of intensely green-emerald put a velvet touch onto the grey and dark brown rocks. There were also rocks that were pointed out of the level of the sea that appearing for some hours under the form of small islands. It was possible to go out from the interior provided by the water and to rise for the top of a rock and to be wetted by a tepid sea breeze, with the sense of a rising in a promontory. These rocks were containing brown green seaweeds with spherical empty tips in his interior that were causing resonant pops while being trodden. The mobility in this space was implicating skill and balance not to slip. In the middle of these rocks there were other interiors, some of shelter others of contemplation. Puddles with stone smooth bottom, for times with sand or almost spherical stones. There were variable dimensions and some of the puddles were allowing a uterine interior. The big brown green seaweeds were so smooth that touching it was like touching another human skin. Finally I might enter inside the ocean. ..."

Figure 3: Extract from letter to Juhani Pallasmaa, August 22nd, 2007

2.3. Blindness and multi-sensoriality combined in the work of Pereira

His thinking about the senses inspires Pereira to design more than visual objects and forms. As an example he describes how the placement of nothing more than a wall on the beach can shape the wind, and change a

person's experience of that same wind: "Now the air has lost its transparency. ... With this wall you can make so many colours and details in the air." He describes how different orientations of the wall relative to the direction of the wind can change its effect from almost unnoticeable when aligned to very disruptive when transverse. Also important is the place of the body. Standing behind it, the wall can be sheltering, but when in front you are completely exposed to this strong wind. But the wall does not only shape the wind, it radiates heat and allows for a direct tactile interaction through touch. Just this simple rectangular form becomes a much more complex entity through its interaction with the environment and the body.

As he became blind, this interest in the senses only grew. He became more aware of the acoustic, tactile and olfactory components of architecture. He describes in an interview as being "in a state of great receptivity to new influences, with particular emphasis to the ones of bigger sensorial complexity" (Mais arquitetura 2009). His visual impairment allows him to pay more attention to the senses other than sight, attention that before was spent mainly on the visual world. He did not think of his blindness as a threat to his architectural practice, but he considers it as a unique opportunity to learn more about his other senses. In turn, this awareness further inspires and informs his architecture.

Although he cannot see anymore, Pereira still relates to the visual realm, both in his perception of the space, his architecture and his way of working. He describes his present experiences as a combination of sound, touch and smell, but also the mental image these experiences bring up. In this way he gets "an image of the space he touches, hears and smells" (Mais arquitetura 2009). He explains it as if you are reading a book your imagination also creates images in your mind, you 'see' what you are reading. This is the kind of visual experience he still possesses. His visual impairment has made him more aware and attuned to his other senses, but his experience of his surroundings still has a visual component.

This visual component can be understood as imagination but also memories play a part in this respect. Pereira describes in his letters to Juhani Pallasmaa how he still has strong visual memories, mostly concerning natural spaces and water. He describes then one of these memories as he talks about "the clear and transparent waters of Hilara River, shadowed by the leaves of the trees and protected by his canyon" (Pereira 2007).

These memories can be brought up by direct experiences, but also through description of the space. Further in the same letter, Pereira mentions how "the acoustic atmosphere of people talking in a bar enjoying a fantastic view, and some descriptions of this interior space, the size and position of the windows and this view angles, really [gave him] visual space memories" (Pereira 2007).

These new insights in how multi-sensory space is perceived also made Pereira question his former ideas about architecture and aesthetics. He summarises it in the interview with Mais arquitetura (2009) as follows: "Nowadays, sharp edges are not as important as a rounded one." His former ideas on aesthetics were mostly influenced by the "visual consumption of recent Portuguese architecture which favours stimulating spaces with poor details in what respects the form and the texture." This would lead him to design, for instance, handles and ironworks with deperate shapes and sharp edges. Now, he prefers those elements where a person gets in frequent and immediate contact with a building to have more ergonomic forms. His new ways of experiencing the built environment have made him question his own visually oriented beliefs on aesthetics. Visual purity became less important than tactile well-being.

This thinking about multi-sensoriality and architecture has also influenced Pereira's concept of what an architectural space is. For him, it is "more complex than a visual thing." One visual coherent space can be experienced as multiple spaces when a person inside that space focuses on tactile qualities. The part of a space that is lit by direct sunlight is for Pereira a whole different space than the part in the shadow because the heat of the sun gives a completely different tactile warmth experience. If we look at the example of the wall again we could say that the wind side is a whole different space than the back side. Although both sides 'look' identical, they are 'experienced' very differently.

To give another example, the water that fills up the basins of the sea bathing facility is as much part of the architecture and the experience as the concrete used to shape the basins. The space of the sea bathing facility would not be the same without the water. The reason Pereira gives is that the experience of the space would change to a great extent if the water were omitted. The experience that he wants to create is as much part of the architecture he strives for. As a result of this way of thinking, the water becomes as much a building material

as, say, the concrete. But water is in that sense a very special 'material'. It allows a person to be "involved in the material."

Special to this project is that one can discuss these aspects without them actually being built as they are consciously created and very well thought of. They are not just qualities of the built edifice, they are intentionally designed. They are part of the architecture made here. Experiences are as much given form as space is being formed and we can analyze them in the different forms they are represented. Sonit Bafna (2008) already mentioned how architectural drawings can invoke a special mode of visual attention. But in the work of Pereira, the architecture is also present in other forms such as texts, sound recordings, tactile models or even complete multi-sensory installations; and a purely visual attention is opened up to a tactile, auditory and olfactory attention.

One example for this is the exhibition space that Pereira designed for the International Architectural Model Festival in Budapest. There he explained this multi-sensory project in a way that appeals to all the senses, also to make a more inclusive exhibition. The main piece of this exhibition space was a wooden model filled with water and it was made to touch, not only to look at (Fig.4). Also the water was perfumed with the smell of seaweeds and arnica and the model was surrounded with the sounds of the site to represent the olfactory and acoustic space of the project. This whole multi-sensory setup was further completed with a textual description, also in Braille and audio format (Pereira 2009a).

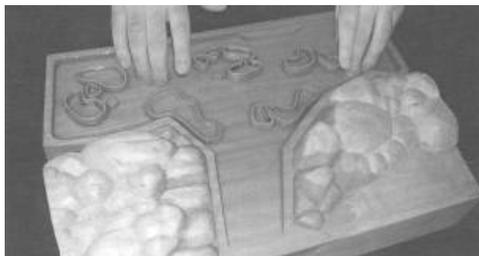


Figure 4: sea bathing facility: Presentation model (Mais arquitetura 2009)

3. Conclusion

We looked for traces of a multi-sensory approach to architecture in the recent work of Carlos Mourão Pereira. This Portuguese architect always had an interest in how architecture was perceived with all our senses and the

whole body. But when he became blind this attention for the sense got a profoundly different dimension. His attention for non-visual perception grew and made him question architecture as it is today. "A wise architect works with his/her entire body and sense of self," Pallasmaa (2005) wrote, and this is what we found in Pereira's sea bathing facilities, how he talks about his architecture and explains his concepts. But to say that this is because of his becoming blind would not give him enough credit. Pereira gives the impression that he always was aware of his body, but his body changed and so did his awareness.

This altered awareness made him question his ideas about aesthetics in architecture and they evolved from appealing to the eye towards more comfortable shapes for the whole body. Shapes that cut the hand are replaced by shapes that are softer, and more pleasant to touch.

The same goes for his interpretation of architectural space. He understands it now as something much more complex and much more full than the empty void that our eyes traverse when only seeing its boundaries. The body is very much involved in the mass of the space. This became clear in the example of the water as a material that can carry an architectural shape, but also in the example of the shaping of the wind.

So disability can indeed question 'fixed' ways of working and thinking about architecture and formulate a critique on existing culturally constructed *idée-fixes*. But it goes beyond the mere critiquing and allows also to re-think these questions and inform us about alternative solutions. When Pereira became blind, he questioned the visual bias in architecture. But he also got more conscious of his other senses which in turn was for him an opportunity to develop his architecture in a very nuanced multi-sensory direction.

However, architecture is more than just the built form. It starts a long time before the opening of the building; some architectural projects do not even get past the drawing board. In future research we will therefore focus more on the design process of Pereira. There are already some hints in that direction when we described how Pereira is looking for more-than-visual ways of presenting the project of the sea bathing facility.

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