

COMFORT AWARENESS

Redefining our Approach to Comfort in Architecture



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Theoretical master's thesis
EPFL

“Cheshire Puss, [...] Would you tell me, please, which way I ought to go from here?”

“That depends a good deal on where you want to get to,” said the Cat.

“I don’t much care where—” said Alice.

“Then it doesn’t matter which way you go,” said the Cat.

“—so long as I get somewhere,” Alice added as an explanation.

“Oh, you’re sure to do that,” said the Cat, *“if you only walk long enough.”*

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MOTIVATIONS

During my years at EPFL and my architectural education, there were two subjects that forever bothered me due to their nonexistence in our curriculum. First of all, rarely was the theme of comfort brought up during our projects or even classes. The rare times this concept was addressed was in the form of criticism from our project teacher, who would assert: “This space does not look comfortable.”. We would acknowledge the comment but never truly understand why something was or was not comfortable. Even though the remark was relevant, without being able to explain, we would recognise that we might not have suggested something comfortable.

I now understand why there are no studios that work on comfort as a central theme today. Still, I always felt frustrated to never actually have had the opportunity to discuss or have lectures about what was comfort and why precisely one project might seem more comfortable than another.

Secondly, I found it questionable when our work would not reflect a thought about local conditions, as most of our projects were siteless. Professors would say that they preferred it if we did not lose time with context or other factors other than the actual project design - which is, now that I am writing this essay, an absurdity. For me, asking for a project without a site is similar to building a project with an unlimited budget - it isn't realistic and seems to go against the architectural discipline.

If given a precise site for the project exercise, climatic conditions were barely talked through. Orientation of our projects - for example - would be discussed in the earlier stages of our projects, but debates would quickly shift to more theoretical and smaller-

scale concepts. If we tried to imitate local architecture, we were told that it was outdated; if we suggested something entirely different to the vernacular architecture, it was considered irrelevant.

We barely think about the reasons local architecture existed and if climatic conditions had an impact on the design of that type of architecture (as architecture students, we never take time to understand certain traditions or ways of living; if tomorrow I had to make an igloo for Eskimos, I wouldn't know where to start, nor understand the reasons of its particular architectural form.)

Moreover, we hardly ever questioned the livability of our projects in terms of comfort, never projecting ourselves into our projects and imagining their usage. It was only last year in Sophie Delhay's studio that I started questioning typology organisation, room sizes, standards, and the use of architectural devices and mechanisms in terms of comfort in the usage of the imaginary inhabitants.

Not only does the question of comfort impact domesticity, it has influenced our ways of building and has enabled architecture to evolve into what it is today. It has defined our cultural rituals and represents the evolution of all societies. The history of architecture is, in a way, the story of the development of comfort. Therefore, how is it that architects and ourselves students of architecture know so little about this notion of comfort, as it is a fundamental human need which must be fulfilled in our domestic sphere?

Consequently, how were we able to generalise comfort? How were we able to define a "comfort zone" if it is subjective and

not only based on our human physiology? Moreover, how were we able to define this “comfort zone” if every region and century have had their own cultural way of expressing their comfort?¹

Could comfort regain its position as the primary reason for constructing infrastructures? Furthermore, could comfort, with the climate emergency questions we face today, generate a new form of architecture more adapted to our needs and emergencies?

1 Rybczynski, *Home: A Short History of an Idea*, 217.

FROM MODERNISM'S INFLUENCE...

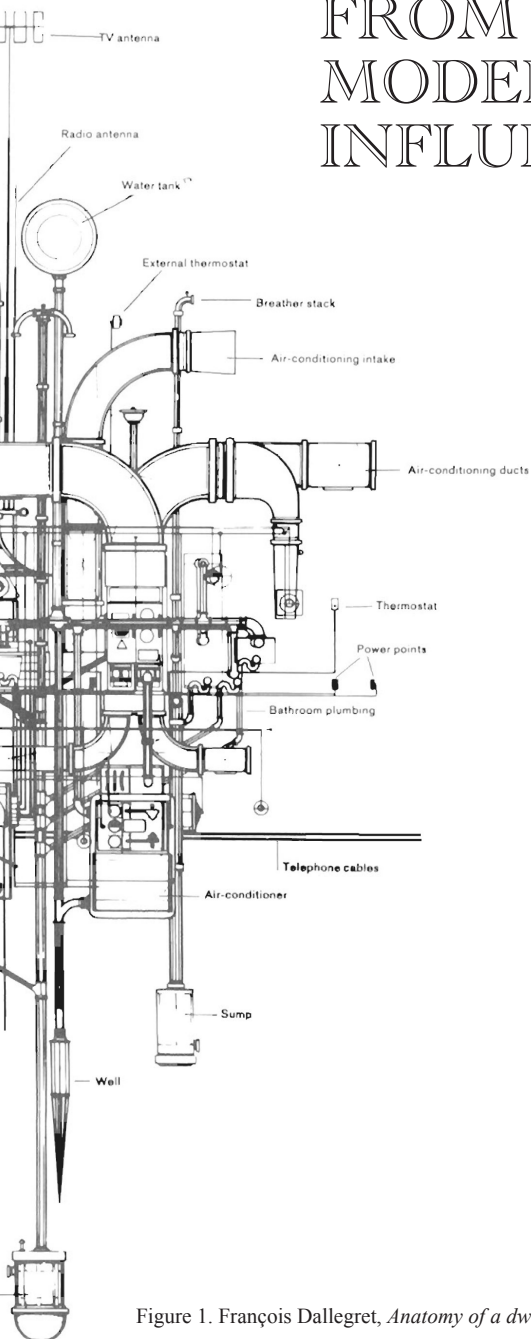


Figure 1. François Dallegret, *Anatomy of a dwelling*, Drawing #1.

...TO ECOLOGICAL IMPERATIVE



Figure 2. Hieronymus Bosch, *Creation of the World*.

CHAPTER 1: IDENTIFYING THE ISSUES

1.1 Modernism's heritage of synthetic environments

*"What the new architecture did was to civilise technology."*²

At the end of the XIXth century, industrial advancement invited itself into our houses. Domesticity was disturbed and disorganised as walls were pierced, engraved, sealed, and filled so that cables, tubes, and technical gains could be installed and plugged in for a new form of comfort.³ As the myth of the fireplace disappeared, so did space's symbolism and the usual typological organisation of dwellings. Artificial atmospheres and mechanised comfort became universally standardised and uniform in terms of temperature, light, and humidity. Everything was done so that seasons and nature's temporality could be reduced or even forgotten - as modernism's rules would replace nature's law.

Architecture, in its composition and elements, started to be dictated by technical factors instead of climatic characteristics. Windows surfaces - for example - became 1/6th the surface of rooms to enable a lighting of 50[lux/ m²] independently of the orientation or the place.⁴ The creation of air conditioning by Willis Haviland Carrier in 1902 would generate the idea of "Man-made weather" and became a requirement in every

2 Breuer, lecture given in Zurich, 1934, Buildings and Projects, London, 1962.

3 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 21.

4 *Ibid*, 69.

household in the United States.⁵

The idea emerged that dwellings were only comfortable if they welcomed industries' newest equipment.⁶ A clear distinction was still seen between installations and machines, and formalist concepts. Buildings became, for the first time, inhabited not by people initially but by a network of technology.⁷ As Le Corbusier would express, dwellings became: "*machines to live in*".⁸ Architects fantasised about autonomous, hermetic and independent structures, closed off from the outside climate and all of its inconveniences. The objective of architecture (and its essence) became to create the most stable and homogeneous space possible. Comfort was thus dictated by objectivism and normalisation. Later, even defining concepts such as the "exact respiration" - suggested by Le Corbusier - was based on the creation of these inside artificial climates.⁹

Modernism would describe the outside climate as irrational and variable in opposition to their rational and autonomous spaces.¹⁰

Post-modern architecture would inherit this mentality for its constructions. But machines were even more hidden to respect the idea of continuous, fluid and homogeneous spaces - that was desired by architects (and their style) at the time.¹¹ Mechanised comfort became a mysterious and magical circumstance. It is not easy to understand how systems worked as they were very complex and hidden to prevent us (inhabitants) from grasping

5 Banham, *Architecture of the Well-Tempered Environment*, 172.

6 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 70.

7 *Ibid.*, 102.

8 Corbusier, *Vers une architecture*, 73.

9 Rahm, *Architecture météorologique*, 27.

10 *Idem.*

11 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 49.

the concept and gaining control over it. New spaces were built for everything that was inconvenient in the architectural process. For example, as Slavoj Žižek would describe it: *the third space* would hide anything unwanted and inconvenient in the ceilings - but essential to creating a controlled environment.¹² Even architects didn't wholly understand mechanised comfort as they handed over the responsibility to imagine these systems to engineers. Consequently, as they were willing to give up this responsibility and the idea of incorporating technical systems into their projects, they abandoned two significant architectural design components.

First of all, they rejected any attempt to produce symbolic and cultural values in the definition of comfort as every room became equal in symbolism and comfort properties - no hierarchy in space arrangement was generated from symbolic elements such as the fireplace, for instance, as it was the case before - which used to be the centre of the family's lifestyle and traditions.¹³ The living room, which used to collect heat - as the fireplace was found there - now had the same temperature properties as any other room in the house.¹⁴

Reyner Banham's *Un-house, Transportable standard-of-living package* showcases the paroxysm of the house reduced to a bubble. A house which is only comfortable because of centralised machinery, the unique element left in the definition of our comfort and architecture. His drawn house becomes a critic of how the loss of symbolism in architectural elements and spaces has generated the standardisation of architecture as

12 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 49.

13 Banham, *Architecture of the Well-Tempered Environment*, 267.

14 Heschong, *Thermal delight in architecture*, viii.

modern life is reduced to:

*“shelter, food, energy, television”*¹⁵

His depiction has simplified architecture to a simple plastic transparent bubble. As the network of pipings, tubes, and electric cables accumulate to become the new domesticity and are held together without the need for a house as a structural element.¹⁶

¹⁵ Charles Jencks, *Architecture 2000*, 1969, quoted in Socks Studio, *François Dallegret and Reyner Banham: 'A Home is Not a House' (1965)*, October 31, 2011.

¹⁶ Banham, *a home is not a house*, 109.

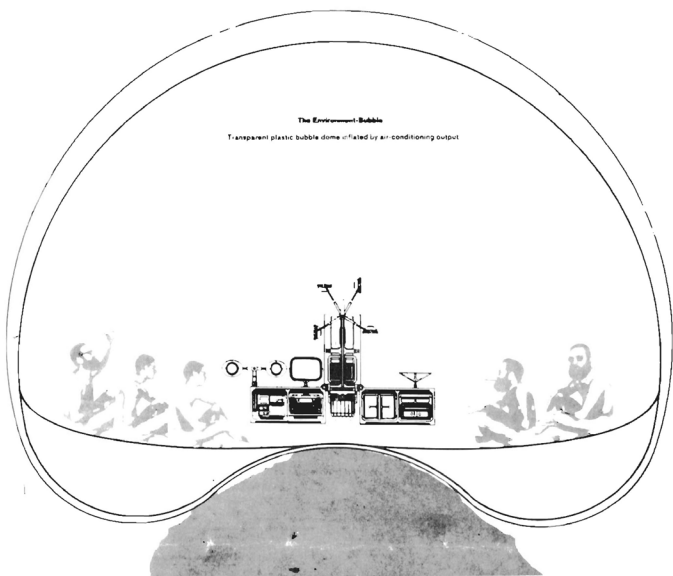


Figure 3. François Dallegret, *Un-house, Transportable standard-of-living package. The Environment-Bubble*, Drawing #5.

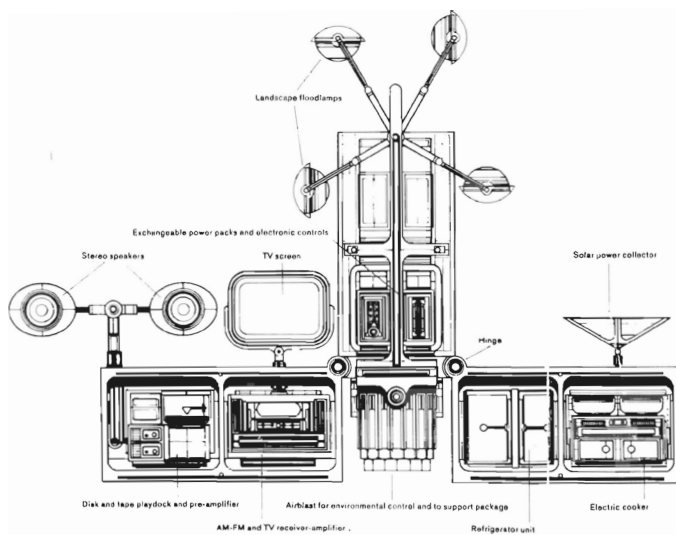


Figure 4. François Dalleget, *Un-house, Transportable standard-of-living package. The Environment-Bubble, Drawing #4.*

Secondly, architects shifted their priority and reflections from the inhabitants' usage of the house to the technological properties of the dwelling. In a way, the public had to accept this new vision of modern architecture because it appeared to be vital to their well-being instead of a mere choice.¹⁷

Thus, a technological culture was born. Not out of habit - at first - but because of the imposed belief that it was the only way of living and the only way that comfort could be obtained. Utopian cities arose from the architect's imagination, such as Frank Lloyd Wright's Broadacre City (1932). Featuring multiple technical innovations that would shape our daily lives. Such as flying vehicles or highly mechanised cars. From then on, ideas of a world controlled by machinery did not seem so far-fetched. More utopian visions started to arise, as we can see - for example - in Stanley Kubrick's *2001: A Space Odyssey*.¹⁸

Paradoxically, all these science fiction films would express the same idea: a warning, as all these movies end with the takeover of humans by artificial intelligence, getting rid of their creators, which have become obsolete for their survival.

¹⁷ Banham, *Architecture of the Well-Tempered Environment*, 267.

¹⁸ Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 156.

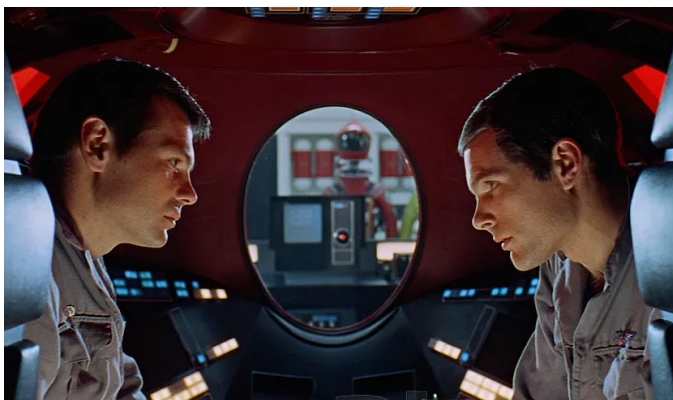


Figure 5 & 6. Stanley Kubrick, *2001: A Space Odyssey*, 1968.

Wavering a cultural habit is no easy task. For nearly a century, architecture has served technology in terms of its environmental management and all its innovations. Architecture has long lost the ability to be in control.¹⁹ It is a slave of the mechanical services - which held priority in the conception of projects - brought by the modern architecture and modern definition of comfort. Moreover, this cultural heritage of what Buckminster Fuller would call *the shelter industry* has been taught to the next generation of young architects.²⁰ Continuing the architect's behaviour of negligence regarding their duty - of creating himself from his knowledge a comfortable, controlled environment. We might know how to calculate some structural problems, but we are unable to fully understand how to calculate solar heat or any other environmental questions.²¹

Richard Hamilton's critical and humoristic collage "*Just what is it that makes today's homes so different, so appealing?*" represents, at the same time, the consumerism culture of society as well as the cheapening of modern comfort and architecture, which has turned to mass-production.²² This same mockery of modern comfort and leisure can be brought up in Boris Vian's book *L'écume des Jours*, which portrays a young single man distracted by the joys brought by the surreal modern comfort.²³ Until finding love and abandoning these futile forms of artificial comfort that never brought him as much happiness and well-being as the love he had for his wife.

19 Banham, *Architecture of the Well-Tempered Environment*, 269.

20 *Ibid*, 267.

21 *Ibid*, 269.

22 Dr. Allison Young, Richard Hamilton, '*Just what is it that makes today's homes so different, so appealing?*' (1956), December 6, 2021.

23 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 151.



Figure 7. Richard Hamilton, *Just what is it that makes today's homes so different, so appealing?*

Buildings have often in architecture been compared to human skeletons as this concept represents a traditional way of thinking about architecture - a structural mass (structure / bones) wrapped by an envelope (facade / skin) which protects spaces (rooms / organs). With modern architecture, technology has become the organ that enables the building to function.²⁴ However, it seems that this comparison with the human body, similar to a building, has forgotten the most crucial element: the human factor. A body without a soul is nothing but an inert object. A building without humans shouldn't be able to function independently even if today, mechanical systems are left to operate independently from us.²⁵ If mechanised systems enable a building to function, then construction should be associated with a cyborg-like being more than a human. Just like those robots, there is no consciousness, merely standardised thinking of ones and zeros.

The parallel between buildings and human bodies worked when fire still existed inside our houses, as this was the soul that animated the physical body that was our homes. The fire used to give a life-like feeling to the house - it acted as a living being which would consume food (wood) and then leave waste behind (ashes). It was its own heat source, just like us - humans. Moreover, as it died, this warm element would end up cold. Losing its ability to move mystically.²⁶

Some architects would express their displeasure with this new way of thinking about architecture and buildings. Louis Kahn expressed his discontent with environmental control systems:

24 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 101.

25 Heschong, *Thermal delight in architecture*, vii.

26 *Ibid*, 72.

*I do not like enclosed spaces. I do not like pipes. I do not like to hide the structure. [...] I want a man to be able to walk upright like a human being. I want a building to be a live thing. [...] It should be like a human being.*²⁷

This chapter, more than a criticism of modern times, is an explanation of the consequences that have arisen from the last meaning given to comfort. This mechanised bubble has rendered obsolete the meanings, symbolism and cultural rituals of previous times. Industrialising, standardising and internationalising everything and everyone. Moreover, this “ultra-comfort” has a price, as to create ultra-controlled mechanised spaces, much energy must be used simply to keep this constant, thus raising questions about the environmental impact that today’s comfort might have on it.

27 Louis I. Khan, cited in *World Architecture I*, Studio Books, Londres, 1964.

1.2 The necessity of ecological awareness

*“Ce sera bien assez tôt quand ce sera trop tard.”*²⁸

[*Translation:* It will be soon enough when it'll be too late]

Modernism, in a way, tries to push past or avoid the consequences of its actions. We blindly live with the effect our lifestyles have on our environment. Either ignoring it or, even worse, not being aware of its impact, thus not acting in regards to it. In a way, we might just compare our attitude in regards to climate consequences to Oedipus's myth. As just like in the Greek story, it is precisely because we try to avoid it that the catastrophe happens - For Oedipus, finally killing his father and marrying his mother, and for us worsening (and maybe one-day disfiguring) the planet.²⁹

It is no myth that energy has been the fuel for every human activity since the dawn of our history. It has supported our progress as energy and its different sources have evolved with us. Energy has shaped our world and is so impregnated in our daily rituals that we do not realise how vital it is to us.³⁰

Nevertheless, our behaviour towards its use has involved the irreversible situation that we find ourselves in, as some energy sources come with costly repercussions. Our high production and consumption in our everyday lives have opened the gates to global warming and all of its inconveniences. Our environment has been transformed in this well in which we can harness

28 120 secondes, *120 secondes: Le prix des billets des CFF*, 4:23.

29 Morton, *The Oedipal logic of ecological awareness*, 7.

30 Calder, *The story of architecture: From Prehistory to Climate Emergency*, 8.

energy without realising that it limits its resources.³¹

The Club of Rome had already reported that excessive energy consumption would lead to global warming and an increase in urban temperatures.³² In 2018, 90% of the energy consumption in the world originated from carbon-based sources - 26% from coal, 31% from petrol, 23% from natural gas, 10% from biomass and waste, 5% from nuclear, 3% from hydraulic energy, and 2% from wind or solar. As they suggested, we must drastically decrease our consumption of fossil energy.³³ If not obvious, our fight against CO2 emissions must become our priority.

Architecture has a vital role in this struggle, as 39% of the global emissions come from the building industry. Of those 39%, 28% are assigned to the direct operation of our buildings (throughout their lifetime) - mainly from heating and cooling systems.³⁴

Additionally, heating and cooling in the building industry represent half of the energy consumption in the European Union.³⁵ Overcoming our dependence on fossil fuels and reducing our carbon emissions should become our primary urgency. Changing our thermal performance becomes our responsibility and objective. As well as interrogating the formal and functional principles of our buildings and, more generally, our discipline (of environment management) to make them ecologically responsible.³⁶ We must not await the state of crisis emergency - if we are not already in it - as we have done in the

31 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, xvii.

32 Rahm, *Histoire naturelle de l'architecture: Comment le climat, les épidémies et l'énergie ont façonné la ville et les bâtiments*, 264.

33 *Ibid*, 271.

34 Rahm, *Écrits climatiques*, 103-104.

35 European Commission, "Heating and cooling", European Commission, 10 juillet 2015, quoted in, Rahm, *Histoire naturelle de l'architecture: Comment le climat, les épidémies et l'énergie ont façonné la ville et les bâtiments*, 272.

36 Rahm, *Écrits climatiques*, 104.

1970s.

The relationship between technology and architecture beg questions in terms of their symbolic relationship as well as how they are beneficial to one another. Technology must be interrogated in terms of its unnatural approach to the constancy and uniformity of our built environment. As James Marston Fitch wrote:

*“The technology of heating and cooling aims... to achieve a thermal “steady state” across time and a thermal equilibrium across space. [...] Neither of these criteria is easy to achieve since radiant and ambient heat are very unstable forms of energy.”*³⁷

The wish for uniformity and consistency is the reason for such high energy demand, as well as being highly unnatural as it requires soaring quantities of energy to keep it sustained.³⁸ Furthermore, unlike the energy crisis of the 1970s, short-term strategies are not to be used if we do not wish to risk ending in a state of permanent urgency. New technological innovations or finding new sources of energy aren’t long-term solutions as they keep the problem in a purely technical lecture and do not question the energy consumption.³⁹

We have to leave this habit of waiting for the state of emergency to arrive before actually starting to change the issues. As often

37 Fitch, *American Building: the environmental forces that shape it*, 46.

38 *Idem.*

39 Zardini, Russell, Borasi, Bobbette and D’Architecture, *Désolé, plus d’essence: L’innovation Architecturale En Réponse à La Crise Pétrolière de 1973*, 48.

countries which have the freedom of choice prefer not to take action and alter the course of our downfall.⁴⁰

There is a symbolic value that we can extract from the energetic crisis. It might as well play a strategic role in transforming our way of thinking about buildings, as the guiding thread would be to start interrogating the relation between humans, built environment and climatic conditions.⁴¹ With the freedom of having the choice and the possibility of change, ethical responsibility and symbolism rise too.⁴² Moreover, ecological awareness and ethics also implicate our alertness to preserve the planet's health for future generations.⁴³

Finally, by being aware of the current ecological situation, we are not denying it or pushing past it but facing and deconstructing the existing logic instituted by our modernist heritage of climate management. Nevertheless, the question of awareness more generally - not only ecologically - isn't only a question of understanding the current situation, it also means figuring out a way to think past it.

40 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, 108.

41 Zardini, Russell, Borasi, Bobbette and D'Architecture, *Désolé, plus d'essence: L'innovation Architecturale En Réponse à La Crise Pétrolière de 1973*, 46-47.

42 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, 108.

43 *Ibid*, 109.

1.3 Identifying the problem

As mentioned in both previous sub-chapters, modernism's consequences and ecological crises are connected by cause and effect. On one side, there is the ecological crisis and all the consequences of our past actions (the effect), and on the other, a lack of ownership in our homes due to modernist behaviour and the standardisation of comfort (the cause). We might say that both these themes - understanding and unravelling new solutions - are related, as one cannot work without the other. It is only by comprehending an issue (firstly) that we can question our current behaviour and doings and start proposing new solutions more adapted to all the given facts and factors. Consequently, awareness becomes the first driving element of our future solutions.

In this work, I will address the question of comfort and how architecture, in its design, may participate in encouraging residents to reclaim comfort through the process of awareness - as well as by (re)integrating the concept of environment into the housing project as a central element. Consequently, encouraging inhabitants to become active participants in the various mechanisms and elements of the habitat which are vital for their active appropriation in their well-being.

In parallel, I will also explore in this essay the current reasons and obstacles for the disconnection between comfort awareness and our environment - furthermore, explaining why inhabitants are not always fully engaged in their houses despite attempts to integrate comfort in architectural projects.

1.4 General organisation of the essay

This work has already presented the current situation caused by the modernist heritage and behaviour, which affects our understanding and ability to deal with comfort. Moreover, architecture's new challenges regarding our environment's control and ecological awareness have enabled me to establish my problem (Chapter 1).

This work will continue with a clarification of the definition and different meanings of the word comfort, as well as a particular description of the notion of awareness (Chapter 2). The second definition being related to comfort and architecture rather than a general definition of the concept of awareness.

In Chapter 3, I will depict the change of behaviour that we must start to adopt, as well as the two main protagonists and the role they play: architects in environmental management and the users in the appropriation of their well-being.

Finally, I will define a new layer to the many meanings of the concept of comfort through the idea of comfort awareness, concluding part I of this essay (Chapter 4).

In the second part of this essay, I will carry on explaining the idea of comfort awareness through a written work: Giancarlo De Carlo "*L'architecture est trop sérieuse pour être laissée aux architectes*". Introducing how the CIAM meeting of 1929 in Frankfurt worsened the question of the inhabitant as the main subject of the architectural project and drawings. Furthermore, I will explain Giancarlo De Carlo's disappointment with the negligence of the notion "*why*" and link it to the importance of the architectural process for comfort awareness (Chapter 5).

I will then go on to propose a new approach and analysis of architectural projects by developing the notion of stimuli as an awareness mechanism, how they enable us to embrace our own experience, and how they participate in the appropriation of our well-being. This approach will be supported by the exploration of three case studies: The Artists' Workshop Cooperative in Erlenmatt by Heinrich Degelo, the Zome House by Steve Baer, and finally, the transformation of 530 dwellings by Lacaton & Vassal (Chapter 6).

In Chapter 7, I will synthesise the second part of the essay, which includes the CIAM consequences and the exploration of stimuli through the case studies.

Ultimately, I will finish with a general conclusion of this work, summarising the general ideas and highlighting the importance of changing our behaviour as architects and users (Chapter 8).

This work is intended to raise awareness and induce people to alternative architectural projects that have already considered conscious climatic comfort as a central design objective. It is also, for me, an attempt to discover the meaning of comfort. As well as trying to seek answers to the question of climate as a source of architectural design.

PART I - EMBRACING COMFORT AWARENESS

Figure 8. Charles Eisen, *The Primitive Hut*, (*Allegorical engraving of the Vitruvian primitive hut*).



CHAPTER 2: GRASPING THE LEXICON - PEELING THE LAYERS

2.1 Unveiling comfort's multiple meanings

*“A site is encircled by a pen: landscape is traced by a pen. Architecture began at that moment. The artificial transformation of nature is followed by the negotiation of its condition.”*⁴⁴

There are two problems with the way we describe comfort in architecture nowadays. First of all, we see this notion as something which is objective and calculable - which is only half true.⁴⁵ Secondly, because comfort has changed so much during our human history, comfort is constantly changing in definition and not a continuous flow evolving - which again is only partially correct.

We have judged comfort by recording people's reactions and established a thermal “comfort zone” for a large number of people. Comfort is treated more like a marketing survey than a personal criterion today. Moreover, we seem more interested in measuring the limits of comfort and when we are uncomfortable more than what it actually is.⁴⁶ Architects today seem to treat

44 Fujimoto, Toyo Ito, Igarashi and Fujimori. Sou Fujimoto, *Architecture of the Primordial Future*, 101.

45 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 41.

46 Rybczynski, *Home: A Short History of an Idea*, 225.

it in a very pragmatic and scientific way. As if comfort could be described simply as a “*condition in which discomfort has been avoided*”.⁴⁷ This misconception of this scientific analysis of the word comfort, which only sees comfort as a measurable factor and denies the existence of any other aspect, gives us the impression that humans can only experience discomfort. As well as restricting the idea that comfort also exists as a physical phenomenon.⁴⁸ Moreover, it has become the only factor in conceiving and building architectural projects today. It is not staggering that particular forms of comfort are missing in our drawings - such as intimacy, which cannot be measured.⁴⁹ Nevertheless, it has created a separation between the habitat and the inhabitant who cannot project himself in his dwelling. He is in his house but does not feel at home.

However, history has shown us that comfort is very far from being a purely technical definition as our idea of it is today. Our well-being cannot just be a calculated idea based on temperature and humidity.⁵⁰ As it has evolved, every century has had its own way of understanding and defining our well-being.⁵¹ From this precarious shelter that represents for most architects the origin of architecture to today's sophisticated over-mechanised designs, it is not really clear what comfort is, but every period has been able to come to a form of consensus about what comfort and discomfort were to them.⁵²

However, we are not even sure - throughout history - if

47 Rybczynski, *Home: A Short History of an Idea*, 226.

48 Henry, *Comfort and Convenience: How Much?*, 1.

49 Rybczynski, *Home: A Short History of an Idea*, 228.

50 González, *La Cultura Del Bienestar. Poéticas Del Confort En La Arquitectura de Los Siglos XIX y XX* = *The Welfare Culture. Poetics of Comfort in Architecture of the 19th and 20th-Centuries*, 122.

51 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 41.

52 Rybczynski, *Home: A Short History of an Idea*, 225.

architecture considered comfort as a central function for buildings or if it was left for someone or something else to take care of it.⁵³ Moreover, comfort is a relative notion which explains why each era had its own definition as well as its own understanding of the word and people's well-being.⁵⁴

This begs the question of what comfort is and why it constantly changes from time to time.

To begin with, we must first explain that comfort is a concept that has many complex (and diverse) faces and meanings. Nevertheless, I like to see comfort as it is described in Witold Rybczynski's book *Home: A Short History of an Idea* - Comfort is similar to an onion. It has several layers of connotations. This metaphor also suggests the polysemy of the term itself as comfort like an onion is an idea that has evolved through our human history and has meant different things.⁵⁵ Nevertheless, this also means that there is an essence to the definition, a heart(h).

The English term comfort actually originates from the French verb *conforter*. Its etymology reveals that initially, it meant only to console or to be physically protected.⁵⁶ Vitruvius's depiction of Adam leaving Eden's garden and discovering rain for the very first time is the quiddity of what we call discomfort as he can only protect himself with his bare hands. In a way, one might say that the nature of the idea of being physically protected came as soon as humans were able to create microclimates that

53 González, *La Cultura Del Bienestar: Poéticas Del Confort En La Arquitectura de Los Siglos XIX y XX* = *The Welfare Culture. Poetics of Comfort in Architecture of the 19th and 20th-Centuries*, 122.

54 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 41.

55 Rybczynski, *Home: A Short History of an Idea*, 217.

56 Centre National de Ressources Textuelles et Lexicales, definition, *conforter*, CNRTL.

enabled them not to be casualties of nature's events.

So, we could link the first definition of comfort to the poetry of the fire and the hearth - which is also considered by many as the first element of architecture and civilisation.



Figure 9. Antonio Averlino Filarete, *Adam in Vitruvius*, on the origins of architecture.

In his book II of his *De Architectura*, Vitruvius wrote that fire holds a symbolic role in architecture. The physical consolation that came from controlling and containing fire not only laid the first stones of human societies but is also the bedrock of the term comfort.⁵⁷ What Vitruvius will call *magna commoditas* (great convenience) - linked to one of his three principles (*utilitas*) - allowed leisure as well as bringing people together.⁵⁸ As they tried to describe with signs to one another how comfortable being next to the fire was, from daily habits, they started to communicate and later talked to explain their everyday use.⁵⁹ The creation of a gathering generated a cultural ritual of keeping the fire alive, which in turn accelerated the rapid development of language and technology - in the sense of innovations, not mechanical technologies - as well as the appearances of the first constructions.⁶⁰ Energy, sociability and construction became intertwined and underlined how comfort - *commoditas* - provided by the element of fire ignited society.⁶¹

Moreover, humans discovered a mystical fascination with fire that emphasised the symbolic role that we gave to it. The fireplace became the most essential element of dwellings, as:

*“Reverie before a burning fire is...the first and the most truly
human use of fire.”*⁶²

57 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 43.

58 González, *La Cultura Del Bienestar. Poéticas Del Confort En La Arquitectura de Los Siglos XIX y XX* = *The Welfare Culture. Poetics of Comfort in Architecture of the 19th and 20th-Centuries*, 122.

59 Pollio, Howard, Morgan, and Warren. *Vitruvius: The Ten Books on Architecture*. Translated by Morris Hicky Morgan ... With Illustrations and Original Designs Prepared Under the Direction of Herbert Langford Warren. [Edited and Translation Completed by Albert A. Howard.], 38.

60 Koolhaas, *Elements of architecture*, 1003.

61 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 44.

62 Bachelard, *The Psychoanalysis of Fire*, 14.

The fireplace created the first typologies as the hearth became the symbolic heart of housings.⁶³ Every room was considered in terms of its function and how close it needed to be to the fire.⁶⁴ In a way, it became more important than its thermal function as other elements would participate in our thermal well-being, but none had such symbolic importance and layers of meaning in terms of fashioning domestic rituals.⁶⁵

63 Heschong, *Thermal delight in architecture*, 50.

64 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 45.

65 Heschong, *Thermal delight in architecture*, 50.



Figure 10. Cesare Cesariano, *On Fire and the Origins of Architecture*.⁶⁶

66 Figure 10: Illustration of the creation of fire. Displaying the duality between those who are gathered around the fire and those who are not. The first ones are using it to cook, benefit from its heat, build, talk, and eat. It is the essence of civilisation. The others in the background seem helpless, undergoing the vagaries of climatic conditions, unable to set their mind on something other than their discomfort as they are too preoccupied with finding shelter.

The symbolic crises of fire arrived as the improvements in engineering replaced fire with new technological advances.⁶⁷ Furthermore, as fire disappeared, so did the need to take care of our comfort. Which finally led it to take meaning elsewhere. Comfort as physical protection remained but became less important in our domestic ritual as there was no need to feed the fire. Our primary concern for comfort shifted elsewhere whilst we remained unconscious of the comfort brought by new technological innovations.

Thus, comfort would start to come from other sources than the fire. During the 17th century, comfort became privacy. Which would later transform from intimacy to domesticity.⁶⁸ During the 18th century, comfort shifted to leisure, such as physical well-being and subsequently led to the idea of psychological comfort, as stated in an 18th-century English dictionary, describing comfort as “*a state of tranquil enjoyment*”.⁶⁹ Modern architecture would point out the importance of technological comfort, questioning, in particular, the role of machines as centre points for our well-being.⁷⁰ Only recently - during the 21st century - have we started to study comfort as a subjective phenomenon.⁷¹

All these interpretations of comfort created new cultures that have, in turn, affected our architecture and the way we forge our domestic rituals. Rooms took on different sizes and functions

67 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 46.

68 Rybczynski, *Home: A Short History of an Idea*, 231.

69 Crowley, *The Sensibility of Comfort*, 752.

70 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 43.

71 Alavi, Verma, Papinutto, Lalanne. *Comfort: A Coordinate of User Experience in Interactive Built Environments*, 250.

and were designed/decorated in various ways. Comfort, like architecture, has a history. It has become a cultural idea which has lived on for centuries.⁷² Unlike technology, each new meaning adds itself to the melting pot that is comfort, which never rendered a previous idea of the word. Each unique value becomes a new layer to the earlier meanings, which are in that way preserved beneath, less visible and which seem less important in our daily routines as we are less aware of them but still very present. In that way, comfort and technology are not the same as new technological creations always render the previous ones obsolete and outdated.⁷³ In a certain way, we might say that technology is never evolving but rather is constantly recreating itself and being replaced.

At any given time, comfort incorporates all the layers of previous times. It does not encompass only the most recent - conscient - meanings. It is vital to be aware of the range of attributes that define domestic comfort - such as “*convenience, efficiency, leisure, ease, pleasure, domesticity, intimacy, privacy*” - all of which shape together our experience of comfort and the ambience that it creates.⁷⁴ Moreover, this would explain why it is today so difficult to give a specific definition to the word.

To finish this exploration of the notion of comfort, I will end with an example and explanation of what a “comfortable room” is given by architect Christopher Alexander, as he asks us to: “*Imagine [yourself] on a winter afternoon with a pot of tea, a book, a reading light, and two or three huge pillows to lean back against. Now make yourself comfortable. [...] for yourself. You put the tea where you can reach it: but in a place where you*

⁷² Rybczynski, *Home: A Short History of an Idea*, 217.

⁷³ *Ibid*, 231.

⁷⁴ *Idem*.

*can't possibly knock it over. You pull the light down, to shine on the book, but not too brightly, and so that you can't see the naked bulb. You put the cushions behind you, and place them carefully, one by one, just where you want them, to support your back, your neck, your arm: so that you are supported just comfortably, just as you want to sip your tea, and read, and dream".*⁷⁵ In a way, Christopher Alexander tells us that comfort is a reaction to something special that we may not be able to explain to someone but feels in place and favourable to us. As we decide on our preference for the position of the pillows or how we make ourselves comfortable, the idea of a "human-type" given today seems absurd.

As described earlier, comfort is a complex notion related to multiple factors. Nevertheless, it might simply be associated with a moment, a space, an action and our fondness. In Alexander's example of a domestic atmosphere, it is easy - for us observers - to recognise his description as a comfortable situation, as he uses a set place, time, context and activity. However, also to the strong ritualisation depicted by this setting and the comfort associated with it. Through this ritual, an atmosphere is established in this space which participates in creating our customs.⁷⁶

Today, science and most architects have failed to incorporate and take a grip on these particular unmeasurable rituals that together build the idea of comfort. This simple yet precise description of Alexander's idea of comfort contains all the defining meanings of comfort. As "*he includes convenience (a handy table), efficiency (a modulated light source), domesticity (a cup of tea), physical ease (deep chair and cushions), and*

⁷⁵ Alexander, *The Timeless Way of Building*, 32-33.

⁷⁶ Heschong, *Thermal delight in architecture*, 49.

*privacy (reading a book)''.*⁷⁷ We might add other sources of comfort not described by Christopher Alexander such as temperature, humidity, modularity, the view and other scientific factors that contribute to our well-being.

Nevertheless, like an onion, Alexander's idea of comfort and even comfort generally have different layers of meaning. Together, these various elements contribute to defining comfort as simple yet complicated - subjective yet recognisable and objective.

77 Rybczynski, *Home: A Short History of an Idea*, 230.

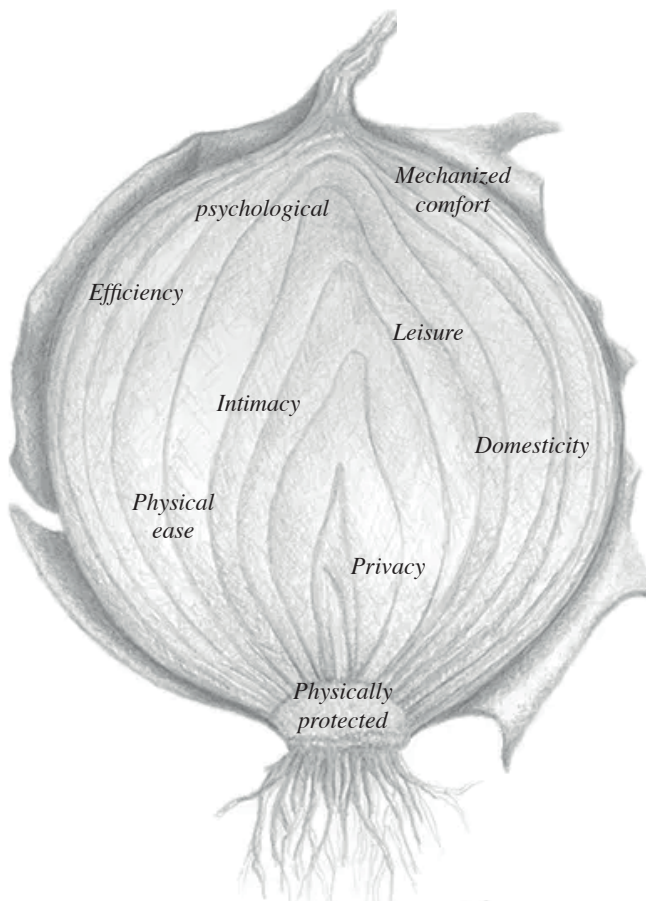


Figure 11. *Comfort and an onion's multiple layers.*

2.2 Clarifying the spectrum of awareness

[Talking about a breeze] *“You can’t see it or hear it,
It is so soft. But it is strong enough
To dust the mirror with pollen,
And thrum the strings of the lute.”*⁷⁸

As described by the French online dictionary - CNRTL - consciousness distinguishes humans from animals on a psychological level. It refers to our ability to be directly aware of our state, our actions, and their significance. It is why we humans are able to feel a sense of existence, to feel alive, to be present, to be ourselves. In a certain way, one might add that the more conscientious we feel, the more human we are, as for most animals, everything is automatic or implicitly experienced.⁷⁹ (One mustn’t take for granted that animals aren’t intelligent - as they are - but that some animals, like bacteria, have no consciousness. These living beings find their intelligence in an automatic “awareness”.⁸⁰)

Despite the complexity of understanding the concept of awareness, the objective here isn’t so much to give a general definition of the word nor go too deep into its meaning, which could enter other domains. This interpretation should rather be seen as a description of how awareness could be narrated in terms of its relationship to architecture and potential link to comfort.

Thus, I decided to approach awareness as described in the

78 Rexroth, *Love and the Turning Year: One Hundred More Poems from the Chinese*, 42.

79 Centre National de Ressources Textuelles et Lexicales, definition, *conscience*, CNRTL.

80 Damasio, *Feeling and knowing: Making Minds Conscious*, 5-6.

Cambridge dictionary: “as the knowledge and understanding of a particular activity, subject, etc...”.⁸¹

Expanding this definition and circling it back to the central issue of this work, our behaviour today in terms of our environment management needs to be more based on the awareness and understanding of the current devices. How can humans develop conscious “defence systems” to create comfortable environments? Animals possess natural defence mechanisms against particular climatic conditions; thus, in a way, they do not need awareness to be comfortable. For example, in terms of thermal comfort, bears have their innate physical attributes - their fur - to protect themselves from intense cold temperatures. Weapons that we have long lost, only keeping a useless automatic response: goosebumps.⁸² As a result, this would justify the need for an uprising and new approach to our physical protection as well as our well-being.

As written earlier, awareness is defined by knowledge and understanding. But we could also include a third specificity - control. When we are in control of a process, we, as a fact, understand it. We must develop ways to incite us to obtain all of these states. Finding methods to stimulate our perception of our physical environment and current state.⁸³ In my opinion, there are two mechanisms to generate consciousness.

The first mechanism is what we might call an *endo*-process, as it implies a change in our human state. A variation instead of a constant state. Human beings are more likely to realise change

81 Dictionary Cambridge, *awareness*.

82 Heschang, *Thermal delight in architecture*, 5.

83 Kowaltowski, Labaki, Pina, Borges Filho, and Bernardi, *Basic teaching instrument for awareness of environmental comfort*, 1.

in their environment than notice a steady state as our nervous system is more adapted to sensing change.⁸⁴ In her book *Thermal delight in architecture*, author Lisa Heschong gives us an example of our senses' way of working on a flower's smell:

*"We can only smell a rose for so long before the smell fades away. The sensors become saturated and attention moves on to new information."*⁸⁵

In change, we ignite our consciousness. For instance, relationships or friendships are filled with inconsistency in our emotions. Some days, we love our friends, brothers or sisters, and other days, we wish to "kill" them - not literally. These variations intensify these relationships, and some days - randomly - we might just realise how much we appreciate them. The greater the feelings, the more alive we feel. Loving someone is probably the most sensitive emotion which makes us feel the most alive. (Modern architecture has tended to try and diminish our ability to adapt and accept ourselves by creating a uniform environment, preventing us from building any sense of consciousness of our state. Which also asks for great energy power.⁸⁶)

The second mechanism concerns our connection to our environment - an *exo*-process. A change in our environment state that we can observe, as we need something identifiable to focus our attention on.⁸⁷ We need particular elements to become

⁸⁴ Heschong, *Thermal delight in architecture*, 19.

⁸⁵ *Ibid*, 19.

⁸⁶ *Ibid*, 41.

⁸⁷ *Ibid*, 35.

part of our well-being. As without anything, there is nothing to relate to, nothing that seems responsible for our awareness.⁸⁸ Just like the first mechanism for awareness, it helps if this particular element has its own variability, as we will probably notice something more if it is not there or in operation at times.⁸⁹ For instance, during the summer, on the veranda of Japanese houses, people will hang under the roof a wind chime or a sort of lantern which swings or rings a bell, suggesting a slight breeze and thus coolness.⁹⁰ A movement or a sound is consequently given to the action of the wind, thus enabling us to see or hear an invisible action/energy and enabling us to be aware of it.

Both ways might be merged when relating to our discovery of fire. Humans had a connection with fire as it was a physical element that was visible. Our focus on this mystical and hypnotic device generated our awareness, as this element constantly changed shape as if it were a living being (second method). As we domesticated it, we realised all of its potential. For instance, we got hotter the closer we approached it (first method).

This awakened awareness ignited us to protect this sacred source of comfort from nature's events as it provided us with light, protection as well as heat.⁹¹ If humans arrived on earth unaware of their state and acting mindlessly, fire incited the development of human knowledge and their understanding of its potential.⁹²

88 Heschong, *Thermal delight in architecture*, 36.

89 *Ibid*, 37.

90 Yoshida, *A Japanese house and garden*, 16.

91 Dougherty, *Prometheus*, 47.

92 Morton, *The Oedipal logic of ecological awareness*, 8.

(I do not believe that humans magically arrived one day on Earth. It is more the continuation of the metaphorical story of Adam's descent from the Garden of Eden, who suddenly lacked a form of consciousness of his situation and an explanation of his discomfort. Nonetheless, this also works with the idea that Homo erectus discovered fire and lacked a form of awareness before their discovery.)

CHAPTER 3: RECLAIMING RESPONSIBILITY FOR OUR ENVIRONMENT - REDEFINING ROLES

3.1 Recentering humans at the heart of dwellings

*“A house and the architecture as a whole, is a place for humanity. However, a place for living is not necessarily architecture. A person lives within a larger, expansive context that includes the notion of house.”*⁹³

Fire is an energy source that is linked to the rise of civilisations. It offered foundations for new populations, cultures, knowledge and socio-economical innovations.⁹⁴ It is the essence of our Promethean vision and our technological progress. But fire - as well as our Promethean vision - also embodies a remedy and a poison at the same time.⁹⁵ As expressed by Stéphanie Bru during the SIA conference *Les limites du confort* (Lecture given in Lausanne, November 28, 2023), technology embodies the concept of a pharmakon.

As explained in the last chapter, technology and mechanisms have taken over our houses like a virus. It is easy to find ten to twenty connections or types of cables for water, ten to fifteen for radiators, more than a hundred for outlets, and more. Architects

⁹³ Fujimoto, Toyo Ito, Igarashi and Fujimori. Sou Fujimoto, *Architecture of the Primordial Future*, 108.

⁹⁴ Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, xxii.

⁹⁵ Dougherty, *Prometheus*, 61.

struggle to incorporate all of these modern demands. Today, architecture and technology seem to be two systems that just cannot live together, as there is no relationship with the rest of the building.⁹⁶ Installations take 30% to 50% of the general cost. During construction, it takes 30% to 60% of the documentation and most of the professions involved.⁹⁷ Houses are not made for humans to live in but to shelter first those installations.

Civilisations and cities have always been linked to a form of energy consumption. Technology has enabled the development of humankind but also led us to our lack of understanding of the repercussions of our actions in terms of environment management and ecological awareness. As if we had lost the conscious behaviour we once had with our fire management. Today's new energy crisis requires our awareness, which prioritises less destructive solutions.⁹⁸ The question of having sustainable behaviour implies shifting our current state to something new. This does not necessarily imply that we must decrease our energy consumption, but rather that the energy source and the method must change.⁹⁹ This way of thinking is not revolutionary, as Lewis Mumford had already classed different stages of shifts in energy sources. Transferring from man to animal, and then from animals to machines.¹⁰⁰

The first step to returning to a form of awareness (for our comfort and environment management) is to place humans back at the core of our reflections. To treat the relationship of

96 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 98.

97 *Ibid*, 100.

98 *Ibid*, 22.

99 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, xxii.

100 *Ibid*, 15-16.

our environment and its direct effect on our health and well-being without having technological barriers.¹⁰¹ Awareness must be applied in our daily life patterns of use.¹⁰²

As written in the first chapter - *Modernism's heritage of synthetic environment* - if buildings are still to be compared to human bodies, they must consider the human factor, as "*A body without a soul is nothing but an inert object. A building without humans shouldn't be able to function independently even though today, mechanical systems are left to operate independently to us.*"¹⁰³ Buildings should not be containers for mechanised systems, but extensions of human bodies.

Therefore, we must shift our behaviour to the humanist idea that humans should be at the centre of architectural projects regarding their use and comfort. That architecture does not resume itself as being the spaces in which we install all the mechanisms that give us comfort, but that architecture is the relationship between a built environment and the direct effects on human energy and health.¹⁰⁴ Victor Olgyay describes this direct relationship and how humans' physical and mental activities are considered within a range of climatic conditions. This relates to the same idea expressed in Paul Valéry's book - *Eupalinos ou l'architecte* - of putting our human creations to the benefit of our bodies, as it is what we call *utility*.¹⁰⁵

101 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism* - New and expanded Edition, 14.

102 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 22.

104 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism* - New and expanded Edition, 14.

105 Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 97.

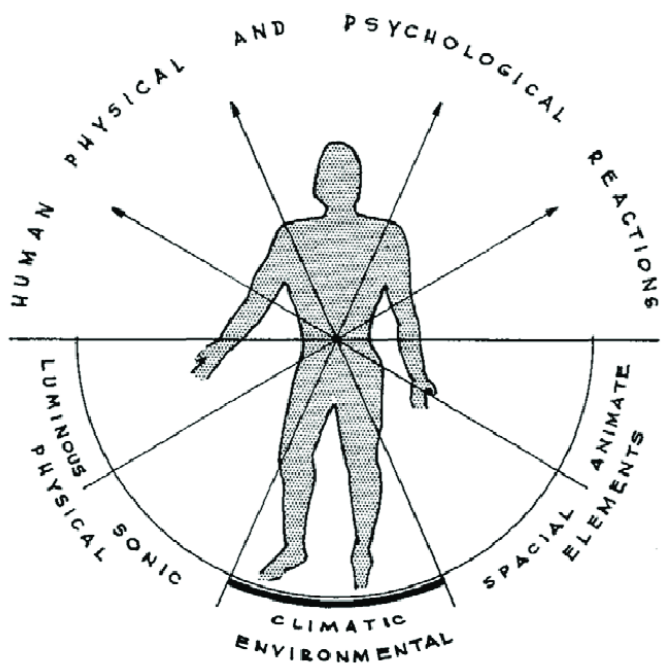


Figure 12. Victor Olgyay, *Man as the central measure in architecture*.

The concept of recentering humans at the heart of their dwellings also follows the idea developed by Sou Fujimoto in his book *primitive future*. He describes tomorrow's architecture as being both new and "*primitive*". This returns to a form of simpler architecture that essentially treated the interaction of humans with space depending on particular gestures and actions. Paradoxically, innovating architecture as new types of forms should also be thought out.¹⁰⁶

As Kenneth Frampton wrote, architecture played a role in the deficiency of our environment and typology creation. But it seems that nowadays, it is only being dictated by the rationalisation of the most economical solution and the most optimal use, meaning as few square metres as possible for any space.¹⁰⁷ Consequently, to implement this humanist vision, the next step of awareness would be for people to take responsibility and ignite the required changes. Architecture should, first of all, start ensuring new substitutes. Offering a well-thought-out project where space should not be built for the installations that will soon come but in terms of the relationship between the inhabitant and the environment and how both can contribute to humans' comfort and architectural design.¹⁰⁸

Enabling inhabitants to be involved in the process of comfort awareness as well as becoming active participants in the functioning of their homes.

106 Lucan, *Précisions sur un état présent de l'architecture*, 210.

107 Kenneth Frampton in Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 147.

108 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, 15.

3.2 The role of architects

*“Everywhere around the world, in all zones and countries, the climate has dictated a fundamental, technical order; not only in windows, but in all parts of a building. Technical aspects modestly and carefully followed the demands of nature and formed the basis of style.”*¹⁰⁹

As mentioned previously, architects need more awareness in terms of environmental comfort. Most have a superficial knowledge of the subject and are unable to convey clear ideas on the issue. This also inhibits any chance of stimulating awareness from the users’ standpoint. The relationship between the inhabitant and the spatial configuration - which should stimulate awareness - as a result does not exist.¹¹⁰

As professionals, architects are responsible for designing systems that should promote the incorporation of human intervention in the processes that allow for the appropriation of our houses - which consequently leads to our comfort. Thus, architects have two main objectives in their way of approaching conscious comfort:

First and foremost, they are responsible for understanding the process and elements that bring comfort. They must not give engineers the responsibility of figuring out the main climatic functions of our buildings - as architects have done. Even though recently - during this 21st century - some architects

109 Taut Bruno, *Architekturlehre - Grundlagen, Theorie und Kritik aus der Sicht eines sozialistischen Architekten, Beziehung zu den anderen Künsten und zur Gesellschaft*, 73. [trans.]

110 Kowaltowski, Labaki, Pina, Borges Filho, and Bernardi, *Basic teaching instrument for awareness of environmental comfort*, 1.

have started to take back control of architectural propositions in the fight against climate urgency. On the other hand, others criticise the efficacy of these projects somewhat symbolic. Swiss architect Philippe Rahm finds fault in most projects that favour an ecological appearance of the building rather than an actual ecological energetic performance. Most architects do not actually change and question the way of thinking, organising and constructing dwellings but instead prefer to start adding vegetation on balconies and roofs, for instance.¹¹¹ As a result, the mentality stays the same. This new reality of our world should compel architects to think of new ways of conceiving projects and generate a new movement in our architectural discipline - a new era based on the consciousness of our comfort.

In the case of Philippe Rahm, the idea is not to reject technology, but to understand its functioning to incorporate it in the architectural design and change the typical approach to domesticity. His project “*Domestic astronomy*”, a room Exposition in Humlebæk (Denmark), showcases an atypical prototype of a living space organised in relation to Archimedes principle (in which hot air rises whilst fresh air drops). Taking in the full potential of thermal properties of technical devices which in turn decide of the position and height of the different domestic activities. He will later on implement this new way of living in his 2011 project - an apartment for a young doctor in Lyon, France.

111 Rahm, *Histoire naturelle de l'architecture: Comment le climat, les épidémies et l'énergie ont façonné la ville et les bâtiments*, 276.

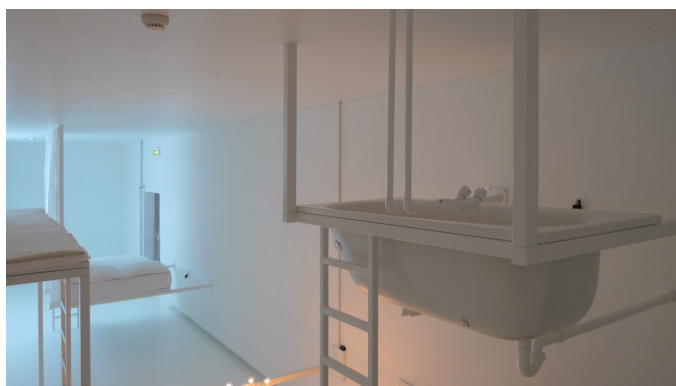
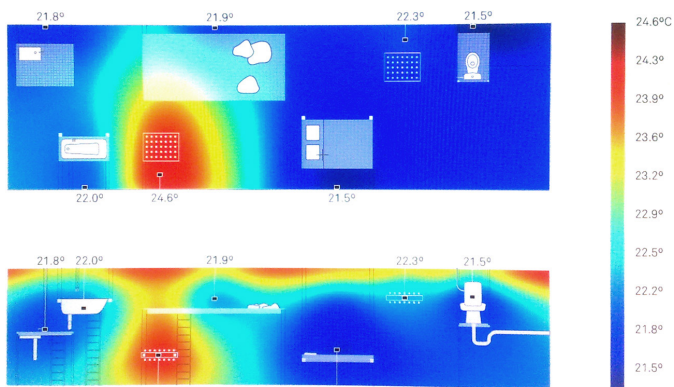


Figure 13 & 14. Philippe Rahm architectes, *Exposition Green Architecture for the Future*.

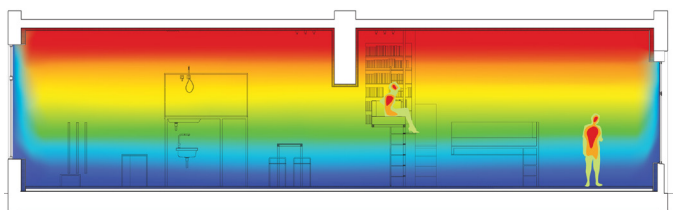


Figure 15 & 16. Philippe Rahm architectes, *Evaporated Rooms*, 201, apartment for a young doctor.

Moreover and secondly - still in the process of consciously analysing and thinking about architecture - architects must be able to identify and use a comprehensive set of design strategies which respect energy and environment management and that depend on climatic conditions.¹¹² As well as understand them and incorporate them in their architectural projects. Including them in the schematic part of the design process - in the early stages of the projects, which define the fundamental parameters of buildings.¹¹³

Our fight against climate change should be taken sooner in the design process by architects - who usually suffer rather than partner with the thermal regulations developed by engineers. For instance, solar panels are not valid strategies as they have no impact on a project's general aspect and questioning. They are an add-on.¹¹⁴ This newborn behaviour should focus on morphological and typological studies and define new architectural qualities from it. They should remind us of the primary elements of a particular location and their primary use. Natural elements such as wind, sun, rain, temperature and, more generally, seasons must be the defining elements of architecture and not just constraints to deal with unwillingly. Architectural elements have existed and been created for specific reasons (Such is the case with the elements of Gottfried Semper). Today, they lack any form of interest and hold no more value than just helping create this artificial garden of Eden generated by mechanised systems.¹¹⁵

112 Hønger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 35.

113 *Ibid.*, 15.

114 Rahm, *Histoire naturelle de l'architecture: Comment le climat, les épidémies et l'énergie ont façonné la ville et les bâtiments*, 274.

115 *Ibid.*, 279.

Architects must, therefore, stop just creating spaces for high-technology but start to create atmospheres again - in the sense that each space created has its particularities.¹¹⁶ Achieve a reconquest by coming back to the forefront of sustainable climate management in the long term. Either by creating low-tech systems or by integrating high technology into the design, as Louis Kahn did in his projects.¹¹⁷ Moreover, architects should stop trying to create architecture from purely geometrical principles - such as symmetry - as the only design rule and start integrating climate as a method of composition.¹¹⁸

As described earlier in this subchapter, symbolism without usage is useless. In his book *Topophilia*, Yi-Fu Tuan postulates that:

*“Symbol is a repository of meanings. Meanings arise out of the more profound experiences that have accumulated through time.”*¹¹⁹

Symbolism must arise from the use, which must be deemed essential to our human experiences beforehand. Consequently becoming part of our domestic rituals and ensuring its preservation through time.¹²⁰ Only then do building morphology, orientation, typology, and devices become physical elements with symbolic answers and sacredness to comfort awareness.¹²¹ Returning to the example of solar panels, this element is empty of meaning and symbolism. It is an add-on to an unchanging

116 Höniger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 32.

117 Banham, *Architecture of the Well-Tempered Environment*, 288.

118 Espazium. *L'architecture comme climat construit*, Espazium. Accessed October 15, 2023. <https://www.espazium.ch/fr/actualites/larchitecture-comme-climat-construit/>

119 Tuan, *Topophilia: A Study of Environmental Perceptions, Attitudes, and Values*, 145.

120 Heschang, *Thermal delight in architecture*, 51.

121 Höniger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 16.

architecture, thus having no impact on the human experience of the inhabitant's habitat, which serves as an excuse for our guilty consciousness.¹²²

By designing with the considering of the climatic aspect, architects are conscious of the role it implicates in the comfort of houses. Thinking of their project's general aspect and functioning instead of independent elements added later on. As well as how it plays an inspiring role in the building form, the different typologies, materials, and devices. Balancing between which characteristics from the exterior environment to keep and which ones to block from having an impact on the inside.¹²³

As described by Vitruvius, the architect must be:

*“Equipped with knowledge of many branches of study and varied kinds of learning, for it is by his that all work done by the other arts is put to test. This knowledge is the child of practice and theory.”*¹²⁴

Practice is the application of his manual knowledge, and theory enables him to describe and demonstrate his production. Thus requiring the architect to have many skills, understanding and education.¹²⁵

Architects have to start applying awareness in their discipline. As described in the subchapter of awareness (2.2), architecture must stimulate our perception of our physical environment by

122 Höniger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 14.

123 *Ibid.*, 34.

124 Pollio, Howard, Morgan, and Warren, *Vitruvius: The Ten Books on Architecture*. Translated by Morris Hicky Morgan ... With Illustrations and Original Designs Prepared Under the Direction of Herbert Langford Warren. [Edited and Translation Completed by Albert A. Howard.], 5.

125 *Ibid.*, 6.

implementing physical elements and objects to interact with the users and be recognisable and identifiable for our well-being.¹²⁶ Which in turn will integrate symbolism associated with valued meanings - just as the fireplace did.¹²⁷

As architecture has a vital role to play in the symbolic value that comes from humans' daily rituals, architects must find ways to make users participate in the appropriation of their comfort, increasing it from the standardised comfort.¹²⁸

126 Heschong, *Thermal delight in architecture*, 35.

127 Tuan, *Topophilia: A Study of Environmental Perceptions, Attitudes, and Values*, 145.

128 Banham, *Los Angeles: The Architecture of Four Ecologies*, 213.

3.3 The inhabitant's responsibility of active participation

“PROMETHEUS: I stopped men thinking of their future deaths.

CHORUS: What cure for this disease did you discover?

P: Inside their hearts I put blind hope.

CH: With that you gave great benefits to humankind.

P: And in addition to hope, I gave them fire.

CH: You did that for those creatures of a day? Do they have fire now?

*P: They do. And with it they will soon master many arts.”*¹²⁹

Humanity has been constantly developing and improving our living conditions and standards of living. In that way, we have been dragged into this state of unconsciousness of our (hyper-) comfort and being in a growing demand for consumer goods and an over-controlled human environment. We seem happier when we do not think of problems or when we are not responsible for our actions. The lack of relationship between nature and inhabitants is reflected in the consequences of our progress and how we have become victims of what we have created.¹³⁰

Moreover, we are not stimulated by our physical environment, thus not being aware of the standardised conditions we are in nor the comfort problems that come from it.¹³¹ Not only does this “plastic” comfort lead to the impoverishment of the social functioning in dwellings, but it also prevents inhabitants from creating a personal connection with their environment. The

129 Aeschylus, *Prometheus Bound*, Lines 248-254.

130 Novotny, *L'architecture et le milieu humain*, 22.

131 Kowaltowski, Labaki, Pina, Borges Filho, & Bernardi, *Basic teaching instrument for awareness of environmental comfort*, 1.

impersonal architecture and atmosphere of housing make it impossible for inhabitants to create a sentimental connection with it. It might be their house, but it does not feel like home. Something is missing, and they might even feel like strangers to their habitat as they are not fully satisfied by it.¹³² Consequently, it also reflects on the impoverishment of architecture's ideological mission of environment and atmosphere conception. Nevertheless, we cannot expect architects and their projects to be the only responsible actors for the enhancement of our comfort. The inhabitant cannot just "be given" as he is as much a client as the user and the creator of his environment and the comfort that comes from it. Being the main actors of their dwelling, inhabitants have the potential to influence and transform what surrounds them.¹³³

It is impossible to define humans without nature. We are, by essence, a product of nature itself, but also because we still maintain a relationship with it. Whether it is from energy, such as the sun's light or its warmth, or nature's element used for our nourishment, such as water or food, thinking of both entities separately is contradictory.¹³⁴ Humans are in constant interaction with their environment. They live with it as it influences their physical and psychological well-being and essence, formatting, supporting and evolving with us. Consequently, denying it is preventing it from elevating our condition and the possibilities of enhancing our comfort. Every negligence towards our environment and our habitat has repercussions on us - inhabitants.¹³⁵ This carelessness is reflected in our lack of

132 Novotny, *L'architecture et le milieu humain*, 31.

133 *Ibid.*, 23.

134 *Idem.*

135 *Ibid.*, 27.

attachment to it. The lack of awareness makes it impossible to use a mode of usage that could directly influence our residential environment.¹³⁶

We should shift our behaviour of unconsciousness and start being in control of our environment and aware of its potential. We are confronted with the responsibility - as users of our houses - to prevent the worsening of the climate crises and integrate new methods and philosophies in terms of environment management.¹³⁷ The overstepping of our current domestic rituals begs the question of adopting a form of ethics in sustainability through energy saving and leaving harmful energy production and consumption as much for us as for future generations.¹³⁸ Inhabitants are responsible for reclaiming their comfort by becoming active participants, not letting machinery take all the responsibility, and becoming obstacles for their current disconnection from their conscious comfort. But they are impelled by the few options offered to them in terms of their control for comfort.¹³⁹ If we wish for the user's reappropriation, we must participate in the adjustment of our environmental condition.¹⁴⁰

However, to survive - or at least be comfortable in your house - individuals must adopt different strategies during a yearly cycle that depend on the seasons and climatic particularities.¹⁴¹ As inhabitants, we should seek comfort from our interaction with

136 Novotny, *L'architecture et le milieu humain*, 34.

137 *Ibid.*, 22.

138 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, 109.

139 *Idem.*

140 Kowaltowski, Labaki, Pina, Borges Filho, & Bernardi, *Basic teaching instrument for awareness of environmental comfort*, 171.

141 Hönger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 35.

our environment - as physical setting and social situation.¹⁴²

By becoming active participants, inhabitants shift their behavioural patterns from involuntary to voluntary (or awareness state). Comfort as a (sub)conscious action is minimised by our interaction with particular designed (building) elements.¹⁴³ The active participation of inhabitants not only helps create awareness, but it is also an advancement towards sustainable energy use and development and enhancement of our well-being. As we become the primary source of energy for our daily actions, which participate in our comfort.¹⁴⁴ Simultaneously, ceasing to depend only on technological dependencies and other energy sources. As the cost of inaction creates unsustainable patterns and harmful cultural beliefs.¹⁴⁵

142 Alavi, Verma, Papinutto, Lalanne, *Comfort: A Coordinate of User Experience in Interactive Built Environments*, 251.

143 *Ibid*, 252.

144 Mega, *Sustainable development, energy and the city : a civilisation of visions and actions*, xxii.

145 *Idem*.

CHAPTER 4: A NEW LAYER TO THE MEANING OF COMFORT

4.1 Compendium Part I

*“Architecture is generally conceived in response to an existing set of conditions. These conditions may be purely functional in nature, or they may also reflect in varying degrees the social, political and economic climate.”*¹⁴⁶

In a way, we have taken our shelter’s essence for granted as it has become rooted in our subconscious.¹⁴⁷ The architectural issue of controlling our environment is as old as human existence, as every century has sought in its architecture to satisfy two basic needs:

- 1.- Protect ourselves from uncomfortable factors, and
- 2.- Providing favourable conditions for our inner endeavours.¹⁴⁸

It may seem that we have forgotten our second need, as we are more preoccupied with respecting the required standards than focusing on the creation of favourable atmospheres for the usage of inhabitants and their appropriation of those spaces.¹⁴⁹ Modernism has recently shaped a new cultural behaviour

¹⁴⁶ Ching, and Ching, *Architecture, Form, space & Order*, ix.

¹⁴⁷ Bachelard, *The Poetics of Space*, 12.

¹⁴⁸ Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, v.

¹⁴⁹ *Idem*.

towards our comfort by creating new living standards and significant dependence on artificial comfort. Forgetting what has been declared at the beginning of this chapter with the essence of our shelters and Vitruvius's depiction of Adam's despair leaving Eden's garden.¹⁵⁰ Moreover, as stated in the sub-chapter 2.1, comfort has had multiple meanings and has not always been defined only by our standardised, objective and technical approach. Comfort can and must be designated as a subjective matter that has evolved throughout the ages, and just like with the onion analogy, has kept its previous meanings whilst adding on newer ones.

To develop further what has been stated in the chapter *Modernism's heritage of synthetic environment*, there are two significant problems with the idea of mechanised comfort, as well as how it has influenced our behaviour towards protecting ourselves.

The first major issue is that, unlike comfort, technology is not a continuous flow. It is a non-evolutionary mentality in which the previous version is constantly replaced and rendered obsolete. This can be demonstrated with a simple device that most of us own: the iPhone (or any Smartphone). Apple creates a new, faster iPhone with more features and better photo quality every one to two years. People are left with two choices: either buy the new iPhone and keep the pace with constant innovations, tossing the older one, or keep their (now old) iPhone, which, in a few years at some point, will not be able to update the newest Upgrades (IOS 15, IOS 16, IOS 17,...) - in the end, still having to buy a new one. What seems to be an option is, in fact, the

150 Ganem, *Climate-Sensitive architecture, Is natural comfort possible?* 345.

same inevitable result: Buying the new iPhone. We might think we have the choice, but we are unaware of how little power we have over these processes.

Coming back to this concept in correlation with architecture, it therefore becomes difficult for architecture and architects to anticipate tomorrow's innovations in terms of mechanised systems. New systems create new standards, and buildings become non-compliant to these new standards - which means constant renovation and modification of "outdated" buildings.¹⁵¹ Moreover, architecture and technology advance at two different rates over time. The first can live for easily around fifty years with very few changes needed. In contrast, technology changes every few years.

The second issue with the idea of mechanised comfort is that technology has shaped us to live in what we could call a neutral state, as wished by architects who desired to create an international architecture - independent of climate. This neutral state is defined as one in which we do not feel discomfort. Author James Marston Fitch expresses this same idea:

*"The technology of heating and cooling aims... to achieve a thermal "steady state" across time and a thermal equilibrium across space."*¹⁵²

To be more specific, modern comfort wishes for a constant state, anywhere and always. An unnatural behaviour and approach of our built environment which to maintain requires high energy

¹⁵¹ In a way, one might add that if buildings don't take into consideration the overall process of energy they will be rendered outdated.

¹⁵² Fitch, *American Building: the environmental forces that shape it*, 46.

consumption. This stability of this environment also led us to perceive nature as merely being our background, as well as having us believe in a way that it had little impact on our actions and our comfort.¹⁵³

Moreover, this static condition accentuates the clear distinction between the exterior's climatic variables and the controlled man-made environment that are dwellings - or what Claude Bernard called *milieu*.¹⁵⁴

A culture has been created from the idea of a steady-state environment, which has become a widespread standard in most architectural projects around the world.¹⁵⁵ Even germinating the idea of controlling the exterior climate in some architects' heads. Buckminster Fuller's Dome proposition for Manhattan's overheating exposed this same idea. A geodesic bubble which would regulate a part of New York's climate whilst enabling the city-dwellers to keep their destructive and polluting habits.

153 Grossman, *Everyday Matters: Contemporary approaches to architecture*, 127.

154 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 69.

155 Hescong, *Thermal delight in architecture*, 20.

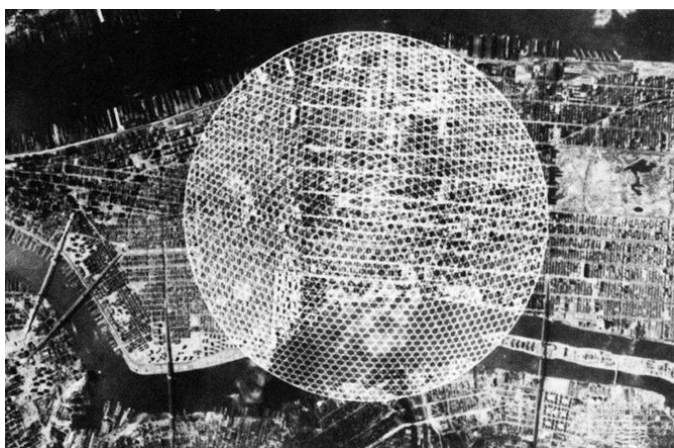


Figure 17 & 18. Buckminster Fuller, *Dome Over Manhattan*.

As a result, it also generated a behaviour of “no effort made” by the inhabitants in terms of their comfort, staying distracted from having to adjust to different conditions and any ecological impact our behaviour and habits could have on our natural environment.¹⁵⁶ Initiating a habit of (un)conscious blindness and lack of stimulated action.¹⁵⁷ Setting aside and flouting the natural cycles of our planet of daytime, nighttime and seasonality. We have followed technology’s rhythm and broken our harmony with our environment and its “laws of time”.¹⁵⁸ Being the sleep and light-deprived animals that we are today.¹⁵⁹ (Even though we still follow a few rules, such as sleeping at night, we unconsciously forget about our environment’s enormous impacts and necessity and how it contributes to our quality of life.)

Returning to the onion analogy of sub-chapter 2.1, modern comfort is the last layer of the onion. A rotten layer that encompasses all the other layers and gradually kills the onion. Not only has modernism contaminated our comfort in our domestic sphere, but it has slowly been destroying our planet, making every single one of our unconscious acts irreversible to Earth’s state and well-being. It is not by trying to shift to a different energy source that we will answer our current problem. It is just a provisional attitude that does not secure an honest and long-term efficient solution.

Incorporating this into what has been mentioned in earlier chapters (2.1 & 3.1), fire has simultaneously been a blessing

156 Heschang, *Thermal delight in architecture*, 21.

157 Morton, *The Oedipal logic of ecological awareness*, 8.

158 Rahm, *Architecture physiologique*, 147.

159 Discussion with Marilyne Andersen & Camille Sineau, 22.09.2023.

and a poison - embodying the concept of a pharmakon (SIA conference, *Les limites du confort*, Lecture given in Lausanne, November 28, 2023). Our Promethean vision might guide us as much to our extinction or the continuity of our race.¹⁶⁰ Until recently, it has been more of a poison, as we have lost control and understanding of what we have created. Nevertheless, it is to us that comes the decision of carefully choosing which path to take.

160 Dougherty, *Prometheus*, 61.



Figure 19. Jan Cossiers, *Prometheus Carrying Fire (to humans)*.

4.2 Phenomenological understanding of comfort awareness

*“When the sun is warm on my face and the breeze is cool, I
know it is good to be alive.”*¹⁶¹

By peeling the last decaying layer of the onion, questioning our way of perceiving architecture and analysing how we interact with our habitat, we shall start shifting our behaviour from poisonous to beneficial - enabling us to evolve and leave this static behaviour towards our dwellings. To enhance our well-being, we must be aware of our present state and must be willing to change some of our domestic rituals and routines to create new ones. As we develop a new state of mind, we ignite new convictions. However, for this conscious act to occur, we must be set in the correct dispositions to ignite the stimulation process.

The first step of the phenomenological understanding of comfort awareness begins with what has been described in sub-chapter 2.2. If we wish to trigger a form of awareness for our comfort, we must be able to stimulate a reaction by endo- and exo-procedures, thus enabling us to react and focus on something recognisable or recognise a change “in us”.¹⁶² In the case of an interest in a place - for the case of architecture - it happens when someone is able to project themselves in their house. The inhabitant will only be willing to make some sort of effort for his well-being and change his routine if he realises that there is a preferable state. Going forward, he will become responsible for his living space and his comfort, as naturally, when we

¹⁶¹ Heschang, *Thermal delight in architecture*, 18.

¹⁶² *Ibid.*, 35.

appreciate our house, we are more aware of everything that happens in it as we strive to optimise it to its full potential. On the contrary, a person who lacks affection for his dwelling will not realise, understand, or seek all of its possibilities and will not try to improve his living conditions. Accordingly, lacking interest hinders our living space's (re)appropriation.

Inevitably, awareness becomes one of the first steps of the comfort appropriation process, first stimulated by a change in our state (endo-process) and a reaction to a physical element (exo-process). Subsequently, awareness generates understanding and our control over our state and domestic devices, which in turn encourages inhabitants to reclaim their environment as they become active participants. By a domino effect, comfort evolves and uprises, creating a new layer to the onion: comfort awareness. This form of comfort is reflected and defined by the understanding, control and knowledge of its source and our direct participation in its effects.

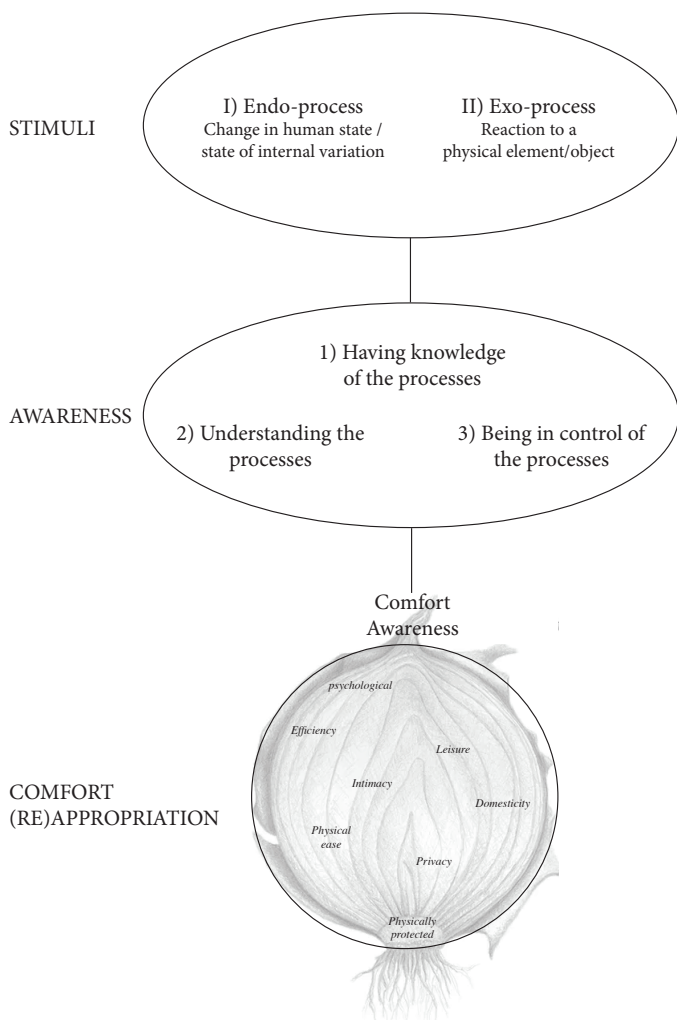


Figure 20. *Phenomenological understanding of comfort awareness.*

To exemplify this process, I wish to take a moment to describe an example that happened to me a few years ago of this process as well as link the idea of the stages of comfort awareness back to Christopher Alexander's description of comfort (2.1): basing his description of comfort on the attention of an ordinary situation in which a person does one action in a particular place.¹⁶³

I have lived for six years in my shared flat in Lausanne, a relatively typical apartment. However, a few years ago, I found myself discovering singularities - such as in our bathroom where the neighbour's hot water pipe runs from floor to ceiling. Whilst this element is somewhat ordinary - as it is common in most old buildings (like ours) - in our case, during the winter period when we struggle to heat most of our apartment's rooms, we enjoy leaning against this pipe as we are brushing our teeth. If we remember to close the bathroom door to the hallway and the window during most of the day, this 5-centimetre diameter tube can warm our 2,25-square-metre bathroom. I discovered a new pleasure in leaning against this pipe while brushing my teeth in the ordinary environment.

In this personal case, the phenomenological understanding of comfort awareness is the discovery of the unexpected heat emanating from the pipe triggered at the same time the exo-process - the pipe as the identifiable and physical source of heat - and the endo-process - a higher level of warmth when leaning against the pipe. As a result, it generates an awareness state of the element.

163 Rybczynski, *Home: A Short History of an Idea*, 229.

As expressed by Lisa Heschong in her book *Thermal delight in architecture*:

“[If we are] *To enjoy being warmed or cooled we need some awareness of the process. Clearly, it is impossible to consciously enjoy what we don't notice.*”¹⁶⁴

From that point on, we understood and took control of the element (the pipe) in the sense that we knew what to accomplish if we wished to gain comfort from it. Consequently, it made us embrace a new domestic ritual in our bathroom in winter (as during that season, every time we enter this particular room, we remember what we have to do to get its warmth). Therefore, achieving a new form of (conscient) comfort as we discovered a new liking to this device and its potential (which initially was not intended for us and that we, for a couple of years, used to not even consider as necessary, or even present).

This scenario would not occur in my bedroom, for instance. Firstly, because there is not a pipeline, but because the only element I could acquire heat from is my radiator, which I “take for granted”. I do not have any domestic ritual related to it, so I unconsciously do not realise its presence or benefits. Its typicality of fulfilling its primary function may not create any form of awareness, and so I never create the same scenario as in our bathroom. This might resemble the action of opening a fridge. We are not surprised by the cold that emanates from it.

164 Heschong, *Thermal delight in architecture*, 25.

4.3 Working together

*“Mais habiter est le trait fondamental de l’être (Sein) [...] mettons-nous un peu mieux en lumière que le bâtir fait partie de l’habiter et comment il reçoit de lui son être (Wesen).”*¹⁶⁵

[Translation: But dwelling is the fundamental trait of being (Sein) [...] let us shed a little more light on how building is part of dwelling and how it receives its being (Wesen) from it.]

I do not believe that the architects of my building intentionally installed this pipeline in that particular disposition, nor that it would ignite this particular quality. This demonstrates that despite the importance of roles described in subchapters 3.2 (*The role of architects and architectural drawing*), the inhabitant can (and even must) create his self-awareness from particularities, even if elements and devices are not intended for the special feature he will assign to it for his own comfort.

Despite this particular case, which is difficult to replicate in the architectural discipline, for the well-functioning of comfort awareness process, architects must start to consider more the need to incorporate these devices, as it is their responsibility to understand and bring elements that participate in our comfort. If inhabitants have to start understanding the devices thought out by architects, - as professionals - architects must be able to synthesise our current issues and create possible solutions to them.¹⁶⁶ However, the only way for architects to generate

165 Heidegger, *Essais et Conférences de Martin Heidegger: Les Fiches de lecture d'Universalis*, 192.

166 Dreier and Frenzel, *Social Loft, en quête de nouvelles formes d'habitat*, 27.

solutions is to consider how a living space works and how the inhabitant interacts with his built environment. Creating an architecture-specific, adapted and resilient.¹⁶⁷

We must thus break this established idea in which we envision an incompatible match between the concept of comfort and the idea of consciousness. Cease believing that the least effort is the most comfortable. As well as for its unethical approach in which:

*“Nous voulons très exactement que les Cieux innombrables, et que la terre, et que la mer, et que les cités ; et que les hommes aussi, [...] et leurs forces, et leurs grâces [...] et même nous voulons naïvement que les Dieux, ne soient tous ensemble, et [...] s’adapte à notre désir [...] et que toute l’opulence du Temps, ne sont qu’une bouchée pour notre bouche.”*¹⁶⁸

[Translation: We want very precisely that the innumerable Heavens, and that the earth, and that the sea, and that the cities; and that the men also, [...] and their forces, and their graces [...] and even naively want that the Gods [...] adapt themselves to our desire [...] and that all the opulence of Time, are only a mouthful for our mouth.]

Moreover, and as explained in this first part, it is the awareness and concern of both leading actors (architects and inhabitants) in the understanding and control of the built environment which enables its functioning. By working together, the phenomenological process takes action as it sets itself in motion by following this new direction. One of experience and

167 Ibid, 25.

168 Valéry, *Eupalinos ou l’architecte / L’Âme et la danse / Dialogue de l’arbre*, 120.

management. The definition of our human environment is based on awareness and direct action, independent of all disunited automatisms for our comfort.¹⁶⁹

An example of the awareness and concept of working together might be found in the question and process of being autonomous. Frequently, people express their desire to be self-dependent, for instance, in food industries, thus having a vegetable garden. The idea of autonomy is, first and foremost, an awareness of a current situation that displeases us and from which we wish to manage differently (and by our own means). Which later on turns into a physical act of change. This requires us to be in control of a process and understand its functioning so that we do not have to depend on another entity. By understanding a system and acting differently, we create awareness. To put it in another way, the initiator and the beneficiary are the same person. Creating new solutions and being the utiliser of it.

If we one day arrive at this vision and practice of the architectural discipline, those convictions in which we believe and that enable us to take ownership of our living spaces through our latest domestic behaviour, might just start creating better relationships between actors. Showing solidarity and accepting more of our potential mistakes.¹⁷⁰

169 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 166.

170 Dreier and Frenzel, *Social Loft, en quête de nouvelles formes d'habitat*, 145.

PART II - UNRAVELLING THE STIMULI FOR COMFORT APPROPRIATION

SKIN — SENSE OF AI

CONTACT STIMULI

Passive Touch
air movement
temperature
radiation
humidity

SMELL

INHALED STIMULI

Primary odorants
Camphoraceous
Resinous
Ethereal
Pungent
Burned
Floral
Spicy
Minty
Musty
Putrid

Expansion of Spa

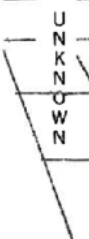
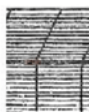


Figure 21. Malnar & Vodvarka, *Ranges of senses*.



Compression of Space

ACTIVE TOUCH

Pressure and Tension

B
A
S
I
C

O
R
I
E
N
T
I
N
G

VISION

DISTANT STIMULI

-binocular sensations of shape & size

ratios of color
shade & shadow
space
motion

HEARING

DISTANT STIMULI

- stereophonic sensations of localization

loudness
pitch

HAPTIC

CONTACT STIMULI

Active Touch —

surface temperature
roughness or softness
hardness or softness
contour identity
vibration

KINESTHESIA

Position & Movement of body parts

CHAPTER 5: THE SIGNIFICANCE OF THE SUBJECT IN ARCHITECTURE HOUSING

5.1 The use of *how* and the ignorance of *why*

*“Comment mettre en œuvre une révolution sans couper de têtes? Peut-être en commençant par interroger les questions. Y compris celles qui nous rassemblent aujourd’hui.”*¹⁷¹

[*Translation:* How do you implement a revolution without cutting off heads? Perhaps by starting to interrogate the questions. Including those that bring us together today.]

As described previously in Chapter 4, the consideration of how a living space works and the process of how the inhabitant can appropriate that space must be at the centre of our reflection as architects.

The idea of being protected in these enclosed spaces that are our dwellings has pushed the architectural innovations in the direction of an “ultra-comfortable” and “ultra-efficient” space design without really taking into consideration the human factor of usage. Whilst the required new technological advancements in our houses begged the question of how to manage a space that would enable their installation and functioning, humans, as the inhabitants of these houses, were, in a way, forgotten. Consequently, with those technological devices’ arrival, the

171 Aurélien Barrau, *Intervention au Medef, toute la table ronde*, 6:34.

housing cost would rise, and architects had to counterbalance it. One of the most pivotal moments of this modernist mentality and loss of the sensibility towards housing would be the - *Congrès Internationaux d'Architecture Moderne* - CIAM meeting in Frankfurt in 1929.¹⁷² Where architects would reflect on the idea that architecture should cease generating what they would call a *historiography reconstruction* of architecture and start questioning the *Existenzminimum* of dwellings (minimum existence).¹⁷³

By trying to find the limits to what housing surfaces could be, architecture would reduce itself to the implementation of mechanised devices and adopt a new architecture language based purely on the description of technical elements as defining architectural solutions. Quality of life would be represented in the architect's plans as the drawing of those devices that started predominating the typology organisation. Statistics and scientific philosophy became the critical elements of housing design and drawing as domestic space was optimised. Subjective parameters of the potential future inhabitants were sought to be minimised by the rationalisation of the housing typology.¹⁷⁴

172 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 150.

173 Korbi and Migotto, *Between Rationalization and Political Project: The Existenzminimum from Klein and Teige to Today*, 299.

174 *Ibid.*, 304.

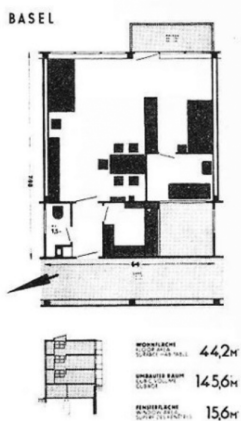
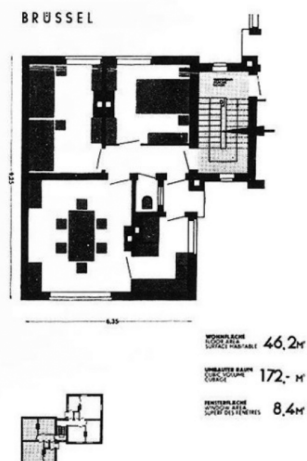
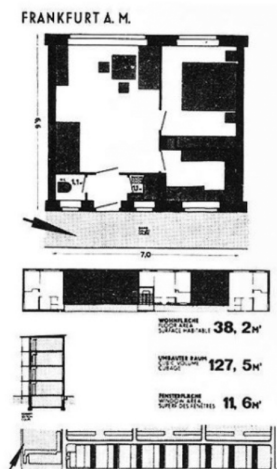


Figure 22. From CIAM (Frankfurt, 1929), *Existenzminimum dwelling* - exhibition panels.

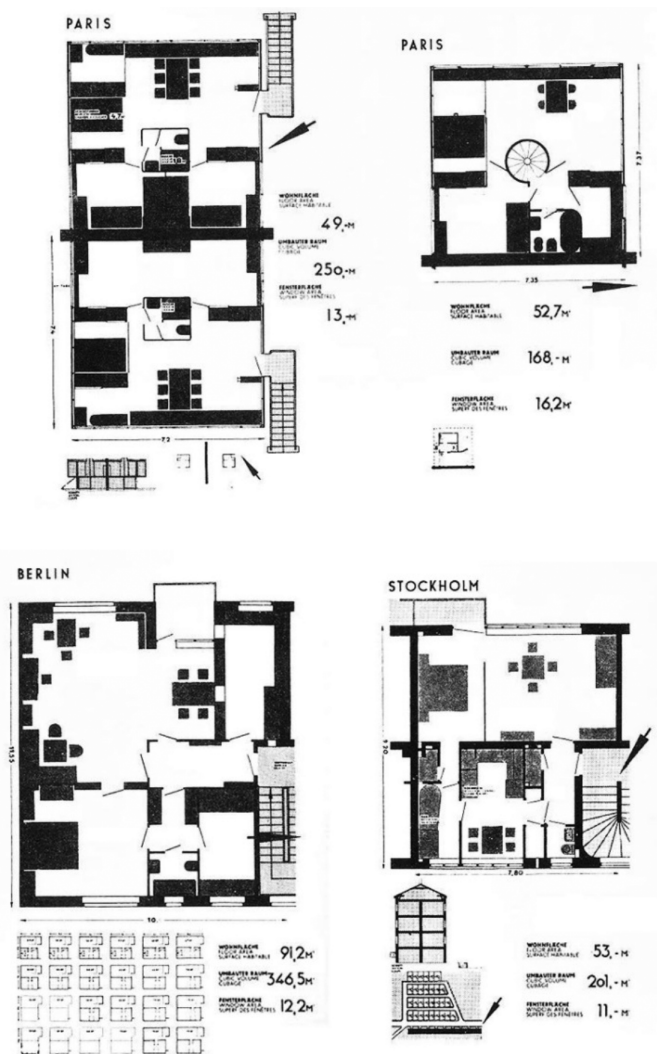


Figure 23. From CIAM (Frankfurt, 1929), *Existenzminimum dwelling* - exhibition panels.

In his book *L'architecture est trop sérieuse pour être laissée aux architectes*, Giancarlo De Carlo criticises how the decisions taken during the discussion of the CIAM in 1929 have generated the typification of dwellings by inserting a “human-type”. A human without any history, society and no subjective criteria.¹⁷⁵ In other words, this postulates that all inhabitants are the same in their behaviour and unconsciousness of usage as all variations are to be diminished.

What the CIAM might not have realised - or not cared about - is that by rationalising the domestic sphere and creating a “human-type”, the question of the subject would shift from the inhabitant to what Giancarlo De Carlo would relate to as the omelette, or the omelette making. Moreover, by not mentioning the users (inhabitants), architecture wouldn't have to be contaminated by the tangible aspects of the inhabitants' everyday ritual and the reality of their existence.¹⁷⁶

In the case of the Frankfurt kitchen - designed by architect Margarete Schütte-Lihotzky - the entire cooking process was broken down into a specific set of sequences, as all the equipment was clustered together.¹⁷⁷ The question of its functioning didn't depend on how inhabitants would use it, but how one could cook an omelette in the fastest possible way.¹⁷⁸

Thus, by trying to answer the housing crisis, the solution brought by architects of *Existenzminimum*, machinist thinking and methodic behaviour of the user rendered inhabitants' sensibility obsolete as it wasn't a factor nor a reality anymore. The idea arose that they should instead adapt to their new

175 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 181.

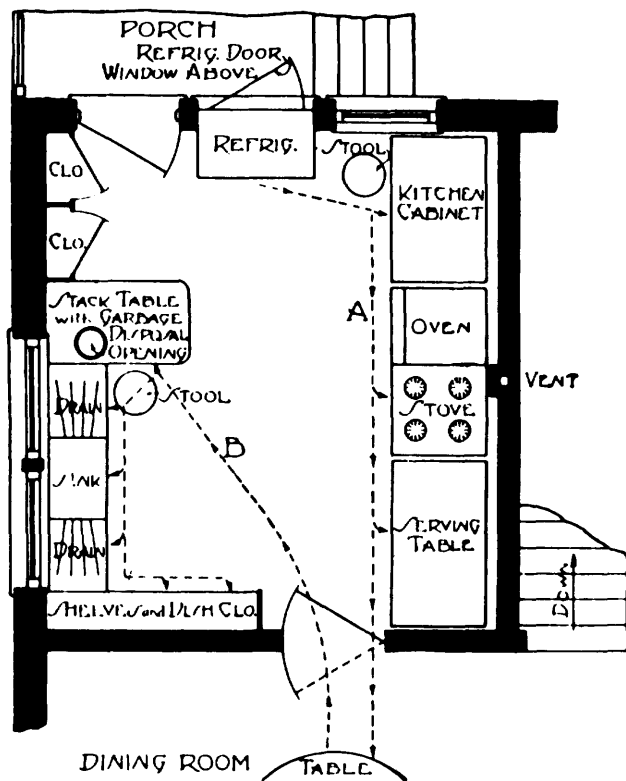
176 *Ibid.*, 173.

177 Bullock, *First the Kitchen: Then the Façade*, 180.

178 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 181.

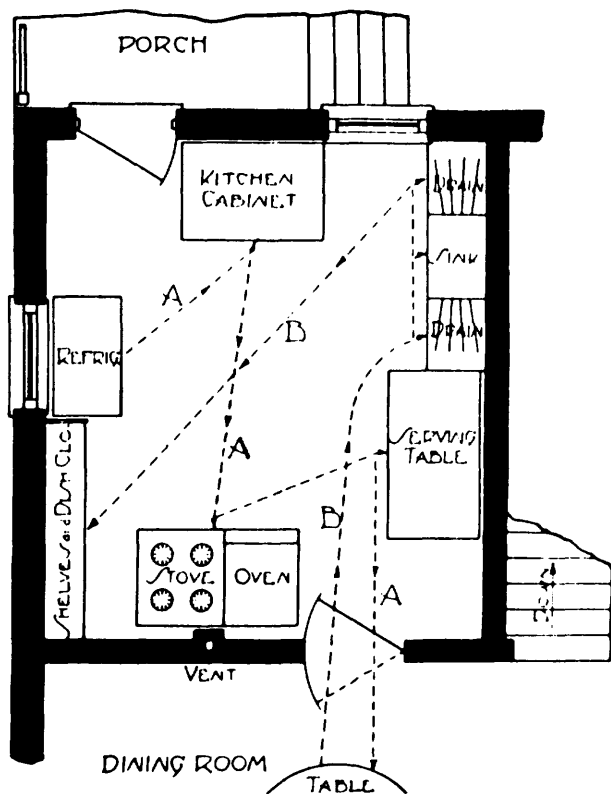
dwelling configuration.¹⁷⁹ The Frankfurt kitchen - an example of the multiple innovations and questioning of that time - ceased to question human use as a sensible matter but rather as a scientific, statistical and unconscious behaviour. A “good” or “bad” kitchen disposition would only be defined depending on the arrangements of mechanised equipment and not on the inhabitant’s appropriation of the space. In other words, it didn’t matter if a particular person had his way of using his kitchen and appropriate this space by creating his domestic rituals; if the kitchen was not efficient in its planning, it would be considered a bad kitchen.

179 Bullock, *First the Kitchen: Then the Façade*, 177.



EFFICIENT GROUPING OF KITCHEN EQUIPMENT
 A. Preparing route. B. Clearing away route.

Figure 24. Christine Frederick, *Household Engineering: Scientific Management in the Home*, Efficient grouping of kitchen equipment.



BADLY GROUPED KITCHEN EQUIPMENT

Figure 25. Christine Frederick, *Household Engineering: Scientific Management in the Home*, Badly grouped kitchen equipment.

As stated by Kenneth Frampton, as architects tried to rationalise the typology plan of dwellings, architecture played a significant role in the poorness and underdevelopment of these environments. Compensating for the installation of expensive mechanised devices, plans were reduced as much as possible for economic reasons. This decision was justified by what they considered to be the optimisation of use, whereas we might say that it was, in a way, the suppression of the subjective use for a common, standard, objectified and forced use.¹⁸⁰

Giancarlo De Carlo outlines those decisions and consequences as the result of two correlated effects. The first comes from a shift of mentality in defining the main subject - as described earlier. The second originates from what he calls the use of “how”. In other words, for him, the modernist movement would be the pinnacle use of the “how” and the complete ignorance of the “why”.¹⁸¹

In other words, all solutions proposed in Frankfort by the architects were based on “how” questions. For instance, how can we reduce new housing projects as much as possible? How can we incorporate the new mechanised elements in typology plans? Whilst trying to solve the problems that came from the housing crisis, they actually viewed dwellings differently without solving anything, as they weren’t asking the correct questions.

Moreover, in the process of suggesting architectural projects and innovations only founded on “how” questions, architects have inevitably shifted the subject from humans as central elements of dwellings to the mechanised elements that compose them.

180 Kenneth Frampton, in, Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 147.

181 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 151.

Completely denying the essential physiological behaviours of inhabitants.¹⁸²

To a certain extent, we could say that the introduction of inhabitants in the architectural project should become the first authentic discovery of a project's operation and functioning.¹⁸³

Nonetheless, they would envision the construction of their projects as a finality, denying in a way that architecture starts a new cycle as the building is done being built and begins to welcome the inhabitants.

Proving in a way that the priority of the subject wasn't on the future inhabitants and if they would joyfully make this habitat their own, rather than if the technological solutions and systems installed in the dwellings worked.

If we come back to Margarete Schütte-Lihotzky's Frankfurt kitchen and what has been previously said, we realise how the "how" question has defined the design and functioning of this space. The principal purpose of this kitchen was to propose the most efficient space possible for housewives. Thus, how could architects submit a kitchen which would rethink and reorganise a new domestic ritual whilst getting rid of outdated habits and equipment, generating a new everyday lifestyle?¹⁸⁴

By removing everything that constituted a kitchen, the Frankfurt kitchen eliminated any cultural representation that it once had and became an international and standardised system. Consequently, by objectifying the kitchen for every user - physically and ritually, the main thread would shift from the subjective subject to the new equipment and all that it represents.

182 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 152.

183 *Ibid*, 196.

184 Bullock, *First the Kitchen: Then the Façade*, 177.

Coming back to what I have written as the title of this subchapter, what I call the use of “*how*” and the ignorance of “*why*”, or in other words, the behaviour of modernist architects, is correlated to what has been written in sub-chapter 4.1 - Compendium part I. By asking ourselves “*why* questions”, we are reminded of architecture’s cultural assignments of protecting ourselves from uncomfortable factors and providing favourable conditions for our inner endeavours.¹⁸⁵ Why should we reduce our houses to the smallest size possible? Why is a kitchen with newer equipment better than one that we are used to operating in and in which we have our own domestic ritual? Why shouldn’t we spend more effort trying to create a protected, spacious, comfortable, prosperous, intimate and creative space whilst trying to answer the problem of the housing crisis?...¹⁸⁶

The new architectural language didn’t wish to be contaminated by the usage definition. Therefore, human behaviour, cultural rituals and even nature’s representation have been forgotten and have been replaced by these unanimated plans highlighting only the lifeless elements that brought modern comfort.¹⁸⁷ Consequently, the combination of the question that arised from the *Existenzminimum* (and the CIAM meetings) with the mechanisation of our environment and its devices created the rationalisation of our domestic sphere.

185 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, v.

186 De Carlo, *L’architecture est trop sérieuse pour être laissée aux architectes*, 151.

187 *Ibid*, 17.

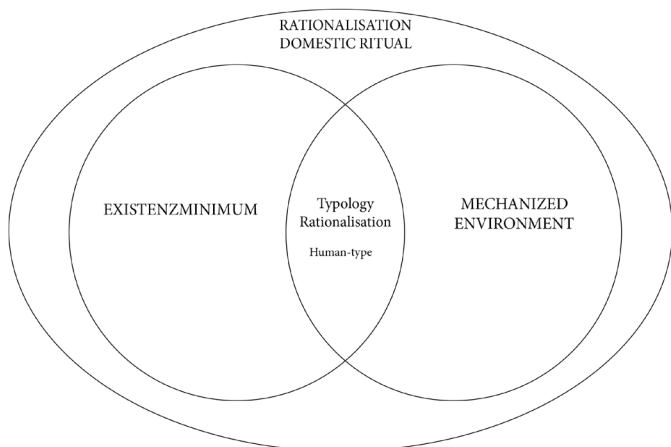


Figure 26. *Embodiment of rationalisation of domestic rituals and comfort.*

Our superficial architectural suggestions don't demonstrate any tangible solution to the immense panel of unresolved problems that we face in today's human man-made environment and its correlation to the climate emergency. We tend to try and separate the innovations from society's real context and needs. Moreover, architecture has taken the role of deciding what is comfortable and how a dwelling should work instead of letting inhabitants control their well-being and create their domestic rituals, thus preventing them from appropriating their space.

Architecture has lost track of its purpose by working only with the “*how*” and ignoring the “*why*”. It lost its defining condition and became instead this superficial practice whose objectives remain uncertain to this day.¹⁸⁸ Maybe explaining why the definition and explanation of the architect's profession today is so ambiguous and vast.

188 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 148-149.

5.2 The importance of the architectural design process

*“Il faut [...] que mon temple meuve les hommes comme les
meut l’objet aimé.”* ¹⁸⁹

[*Translation:* My temple must stimulate people just as the cherished
object moves them]

In Paul Valéry’s book *Eupalinos ou l’Architecte*, a hypothetical discussion occurs between Phèdre and Socrate in the afterlife. In their conversation, both reflect on the past and the people they met. Phèdre starts to speak about an architect he once knew - Eupalinos - and how he believed in becoming a master of his craft as he wished to learn everything about it.¹⁹⁰ He explained how vital it was for him to thoroughly understand the process of his discipline, as he would rigorously scrutinise every action and detail on the construction site.¹⁹¹

As for him, a:

“Un brin de soie mal préparé a rendu le savoir assassin” ¹⁹²

[*Translation:* A piece of silk poorly sewn would render knowledge
pointless]

Later in their discussion, Socrate introduces the character of Tridon, a shipwright master. The latter explains his preoccupation with navigation in his soul and how to build an

¹⁸⁹ Valéry, *Eupalinos ou l’architecte / L’Âme et la danse / Dialogue de l’arbre*, 24.

¹⁹⁰ *Ibid.*, 17-18.

¹⁹¹ *Ibid.*, 23.

¹⁹² *Ibid.* 22.

efficient ship that could withstand nature's force.¹⁹³ He applied an industrious spirit in making his ships, deploying every technology that would come to his mind and conveniently to hand - even if the solution was not part of ship-building traditions. He believed that when building a ship, nature's movement and what he called "*the rest of the world*" were only there to destroy what he was creating.¹⁹⁴ Instead of fully understanding nature's mysteries, Tridon would find methods that would, in a way, replace the sea. Trying to outsmart nature by mimicking and standing against it.¹⁹⁵

In comparison, Eupalinos was more concerned with discovering the most accepted and suitable method for an allotted task. He would find philosophical problems in every decision. Doing the opposite of Tridon's method of using the most practical and instantaneous method.¹⁹⁶ Consequently, Eupalinos thought about other factors than purely the most efficient technological answer.

In a way, we could associate Tridon's mentality with the architecture's modern way of seeing comfort and how it has envisioned housing projects (subchapter 5.1) as architects are indifferent to the inhabitants' usage of their created spaces.¹⁹⁷ Inhabitants should instead adapt their standards to the architect's requirements.

Working with the "*how*" without thinking about the "*why*" of our decision generates no thought for the usage of those devices. As we only think about the finality of a process, we do

193 Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 135-136.

194 *Ibid.*, 98.

195 Banham, *Architecture of the Well-Tempered Environment*, 268.

196 *Idem.*

197 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 167.

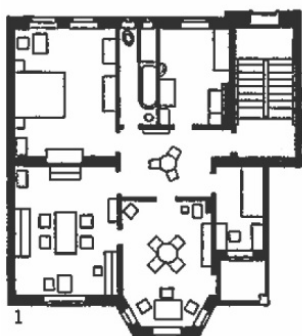
not consider the user's appropriation of a system. These forced specialisations not only impact the quality of those proposals but also block any attempt at modification and variation of usage.¹⁹⁸

This could be seen in Alexander Klein's plan diagrams, as he demonstrated how his objective evaluation dictates what a good or bad domestic space is in its organisation based only on the schematic representation of imposed routine movements throughout the day.¹⁹⁹ Moreover, his standardisation of the domestic ritual of everyday life becomes the new architectural drawing. As every action is measured and monitored to quantify every movement, he starts to reduce what is superficial in the architectural project.²⁰⁰

198 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 152.

199 Korbi and Migotto. *Between Rationalization and Political Project: The Existenzminimum from Klein and Teige to Today*, 304.

200 Grossman, *Everyday Matters: Contemporary approaches to architecture*, 41.



A. Bad Example



B. Good Example

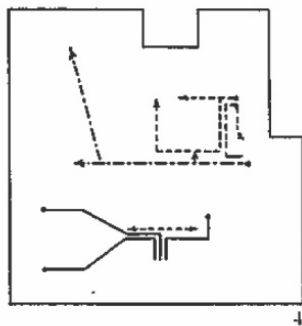
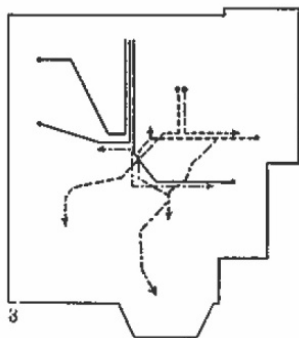


Figure 27. Alexander Klein, *the functional house for frictionless living*.

Despite what has been suggested by the CIAM at Frankfurt, as I have said in sub-chapter 3.1, the first key element to insert a form of awareness for our comfort and our environment management is to not consider humans as mannequins or the inhabitant as a human-type. It is to place them back at the core of our reflections. To accept them with all of their requirements, and become once more the fundamental element which becomes the criterion for the definition of their environment.²⁰¹ More strikingly, we can match Paul Valéry's thinking with what has been written about Giancarlo's "why" as Eupalinos's architectural projects strive to ignite a reaction from the inhabitants. Moreover, seeking answers to the philosophical questions he asks himself.

In his approach, Eupalinos always remembers who his work is intended for, or in other words, who the subject is. As he consciously wishes to ignite exhilaration in the spirit of the future users of his works.²⁰²

In other words, it is thinking - in the architectural design process - not about how the installations will organise a living place, but rather how can we design a specific, adapted and resilient domestic space based and thought out for those who will be the inhabitants?²⁰³ Additionally, how can they participate in the implemented processes?

To reapply the written statement of the chapter - *Awareness of comfort - A reconnection with our environment* - Eupalinos's awareness of the matter creates an interest in architectural practice. This consciousness, therefore, enables him to envision himself in this discipline.

The study of Giancarlo De Carlo's book and Paul Valéry's

201 Novotny, *L'architecture et le milieu humain*, 33.

202 Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 23.

203 Dreier and Frenzel, *Social Loft, en quête de nouvelles formes d'habitat*, 25.

sayings enable the demonstration of how necessary it is to have some sort of awareness of the design process in architecture - by adopting the “*how*” and “*why*” questions together (Giancarlo De Carlo) - and the importance of considering the inhabitant as the protagonist of all decision making and operation of the housing project (Paul Valéry). Enabling occupants to be in control of their own domestic rituals.²⁰⁴

Architects should suggest a different architectural approach in which they develop environments where inhabitants become the main subjects. Architecture must not be a barrier between the inhabitants and the appropriation they might have of a space. The elements that constitute our built environment should stimulate us to participate in our well-being, not impose on us a dictated domestic sphere that we unconsciously follow and accept.

To some extent, designing becomes a democratic and liberating act, as finding stimulation in action and devices generates multiple types of participation from the inhabitants. Not only does the design process become a legitimate social and political act, but it should also help create adaptable solutions to the adverse that is time.²⁰⁵

204 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 167.

205 *Ibid*, 161.

CHAPTER 6: STIMULI ANALYSIS OF VARIOUS APPROACHES FOR COMFORT APPROPRIATION

6.1 Stimuli for comfort appropriation

“To improve people with good examples, one must be aware of their vices and virtues; one must caress some of them to make others adore them.” ²⁰⁶

As written in the book *A manifesto on the appropriation of space: A Methodology for Making Architecture*:

“Buildings are not empty containers [which should] awaiting their inhabitants.” ²⁰⁷

In other words, we must not patiently hope for changes in our architectural lair. Coincidentally to Claude-Nicolas Ledoux’s statement, and as the first step of the appropriation process, architects must consider essentially incorporating the human body as the main subject and emphasise a human-centred approach in their design. We must think of architecture with the eye of the main subject of the habitat: the user the inhabitants.

²⁰⁶ Ledoux, *L’architecture considérée sous le rapport de l’art, des mœurs et de la législation*, 143.

²⁰⁷ Escandón, Matias and Ceballos, *A manifesto on the appropriation of space: A Methodology for Making Architecture*, 8-9.

Alternatively, as Frascari Marco would talk about it, it is:

*“a new anthropomorphic practice of body/building topology, a practice that avoids the too simple road of isomorphism, isotropic, and metaphoric representations of the past.”*²⁰⁸

The human body must not be simplified to the metaphorical description of architecture nor as the simple tool for the standardisation of built environments and their elements.²⁰⁹ Instead of this allegorical approach, architectural projects should tend to become real “human projects” by reconsidering the relationship between architecture and the human body. Between the *“art of living well [and] the art of constructing well”*.²¹⁰ Consequently, returning to the concept of well-built projects established on the well-being and inner endeavours of inhabitants.

As written at the end of the previous chapter, architecture must find stimuli which prioritise the active participation of its inhabitants.²¹¹ Enabling them to generate what we could call experiences in their households: experiencing situations of (conscious) comfort through the effects of stimulated actions. Relatively to architecture, the effectiveness of an architectural project in its stimuli for comfort awareness depends on two

208 Frascari, *A New Corporeality of Architecture*, 23.

209 In correlation to what has been said on page 26: *“Buildings have often in architecture been compared to human skeletons as this concept represents a traditional way of thinking architecture - a structural mass (structure / bones) wrapped by an envelope (facade / skin) which protects spaces (rooms / organs). [...] But it seems that this comparison with the human body - as a building - has forgotten the most crucial element: the human factor. A body without a soul is nothing but an inert object.”*

210 Frascari, *A New Corporeality of Architecture*, 23.

211 Escandón, Matias and Ceballos, *A manifesto on the appropriation of space: A Methodology for Making Architecture*, 8-9.

factors - how the human body (1) and the built environment and its components (2) interact and generate stimuli. (*This correlates to what has been formulated in sub-chapter 2.2. The body being the endo-process (1) and the built environment and its components being the exo-process (2).*) The content of both of those mechanisms (or processes) are what generate the different approaches for comfort awareness.

In other words, an experience is defined by the awareness that human beings generate by their actions in a particular environment and how they take hold of those environmental characteristics.²¹²

212 Luyat, and Regia-Corte, *Les affordances : de James Jerome Gibson aux formalisations récentes du concept*. *L'Année psychologique*, 303.

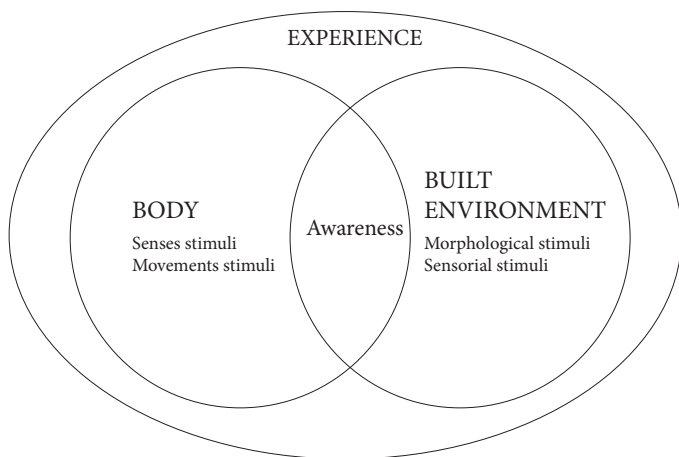


Figure 28. *Embodiment of stimuli process and association for comfort awareness.*

Going further into details of their content, the endo-process - or the body - is intrinsically linked to two characteristics: senses and movements. The exo-process - or built environment - consists of the morphological and sensual factors.²¹³ (as described and inspired by Keunhye Lee in her work - *The Interior Experience of Architecture: An Emotional Connection between Space and the Body*).

In terms of the content of the endo-process, the first one (senses) considers all the possible ranges of senses. The most commonly known senses are sight, smell, touch, hearing and taste. They are the most essential to our architectural experience. However, there are more than just the five known typical senses, such as the psychological sense.²¹⁴ The second characteristic - our body's movement - consists of all potential physical motion, from the action of sitting to the one of running.

Both characteristics are linked as a particular physical movement (like sprinting) will generate a variation of body senses such as temperature or breathing. Furthermore, we ignite familiarity through both characteristics by perceiving and reacting to our built environment.

As stated by Martin Heidegger:

*“The hand is infinitely different from all the grasping organs [...] Every motion of the hand in every one of its works carries itself through the element of thinking, every bearing of the hand bears itself in that element. All the work of the hand is rooted in thinking.”*²¹⁵

213 Lee, *The Interior Experience of Architecture: An Emotional Connection between Space and the Body*, 4.

214 Li, *The dynamics of architectural form: space, emotion and memory*, 192.

215 Heidegger, *Basic Writings from Being and Time*, 357.

Through our actions and senses, we perceive and treat information.²¹⁶ We can generate awareness through our body movement and our different senses. Moreover, each and every one of us understands architecture and perceives environmental information and experiences through our senses and movements in our own way.²¹⁷

The second participating factor to stimulation is the built environment - or exo-process. In other words, it is what information we extract from our environment.²¹⁸ In terms of the built environment as stimuli, in her work *The Interior Experience of Architecture: An Emotional Connection between Space and the Body*, Keunhye Lee describes three groups that can impact this category. (In this work, only the first two are considered). First, the morphological factors, which concern the physical aspects of buildings (shape, volume, order, scale,...). And secondly, what she calls the sensual factors: texture, light, colour, sound, smell.

At this layer, architects are responsible for identifying a set of comprehensive design strategies to give perceivable value to the functioning building elements. Regarding the discipline that is architecture, compared to others, it has the advantage of having the power to produce tangible images of what the physical environment should or could be.²¹⁹ Enabling the inhabitant's body to react to something, as:

“Space calls for action.” ²²⁰

216 Pallasmaa, *Touching the World—Architecture, Hapticity and the Emancipation of the Eye. In The 8th Meeting of Heads of European Schools of Architectur*, 37.

217 Li, *The dynamics of architectural form: space, emotion and memory*, 192.

218 Luyat, and Regia-Corte, *Les affordances : de James Jerome Gibson aux formalisations récentes du concept. L'Année psychologique*, 303.

219 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 159.

220 Bachelard, *The Poetics of Space*, 12.

Typology organisation, as well as the general form and orientation of buildings, impact our daily lives and our behaviours as inhabitants. They serve as the intermediate layer between the climatic characteristics and their effect on our physical and physiological behaviours. Simplifying them to geometrical figures would take away from them their values as physiological components.²²¹

Architecture should stop only being defined and be satisfied by the description of only the simple creation of spaces.²²² The architectural environment could be considered as our third skin - after clothes - thus a sort of organism or extension of our body that we can react to - and not see it as a lifeless machine.²²³

Thus, architecture should, in its assignment for comfort awareness, emphasise the possibility of stimulating reactions by implementing a set of devices that would participate in the creation of experiences or atmospheres (consequently making a point of reinforcing our well-being instead of fabricating an artificial setting).²²⁴ Framing its components or specific elements, devices or systems and giving strengthened meaning to them. In a way, it would give new meanings and description (more than their physical presence) to those elements, by emphasising on the concept of architectural stimuli, such as depicted in Malnar & Vodvarka's drawing "*Ranges of senses*". (A wall, for instance, is more than purely a material element. It could be defined by its temperature, colour, or effect on space rather than what constitutes it.)

221 Höniger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 16.

222 *Ibid.*, 32.

223 *Ibid.*, 34.

224 Pallasmaa, *Touching the World—Architecture, Hapticity and the Emancipation of the Eye. In The 8th Meeting of Heads of European Schools of Architecture*, 35.

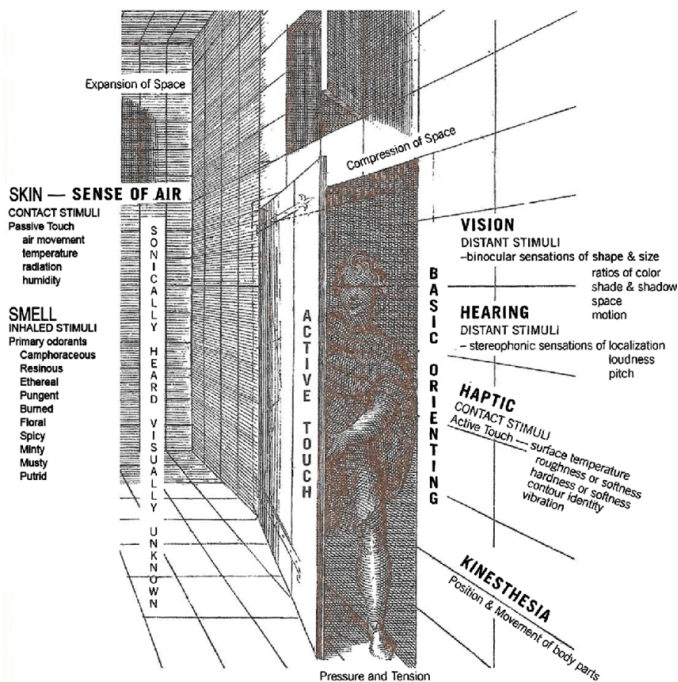


Figure 29. Malnar & Vodvarka, *Ranges of senses*.

Consequently, in the case of architecture, to generate an experience of awareness, both endo- and exo-process must work together. As,

*“Through the senses of architectural forms, we [...] have perception and experience, and then we understand the world and ourselves much better.”*²²⁵

Accordingly, our built environment must generate stimulation, enabling us to ignite an awareness and understanding of our experience. The architectural project does not end as the building process is achieved. It is only the beginning of its development and operation. As the architect, project manager, and workers leave the site, the inhabitants become the new actors of its functioning.²²⁶

In terms of the living experience (and as the starting point for the awareness process), stimuli enable inhabitants to induce new behaviours and forms of action. In understanding the consequences of their actions, they control their man-made environment. The idea of stimuli for comfort awareness and its appropriation encourages inhabitants to be active participants in their comfort as well as how and what architecture should incorporate in terms of devices, elements or construction that encourage residents to reclaim their well-being. As architecture symbolises *“how the world touches us”*.²²⁷

225 Li, *The dynamics of architectural form: space, emotion and memory*, 191-192.

226 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 168.

227 Maurice Merleau-Ponty, *The Film and the New Psychology*, in Maurice Merleau-Ponty, *Sense and Non-Sense*. Northwestern University Press, Evanston 1964, 19.

In consequence, both architects and inhabitants are concerned about this procedure. We must not give the responsibility of our well-being to machines or other professionals the responsibility of creating devices for our comfort. We must instead replace the mechanised comfort that we know, which renders our consciousness obsolete.

Now that the stimuli as a theoretical approach has been set, this chapter finds its meaning in the analysis of three built projects that enable inhabitants to be active participants in their well-being. Using Malnar & Vodvarka's drawing "*Ranges of senses*" as a drawing reference for this analysis and Keunhye Lee's written work for the stimuli description and categorisation.

The three analysed architectural references are:

- 1) Zome House by Steve Baer (6.2)
- 2) Artists' Workshop cooperative by Heinrich Degelo (6.3)
- 3) Transformation of 530 dwellings by Lacaton & Vassal (6.4)

The idea of using stimuli as an approach and analysis of architecture is that it is something that everyone can identify with in their own way. The simplicity of its content (senses, for instance) enables a universally common language that is understandable by architects and everyone. They allow the subjectiveness of actions and their objectives to be highlighted simultaneously. Additionally, stimuli can easily be "translated" into the architectural language, thus enabling stimuli and architecture to be associated. (This new analysis system allows me to examine and describe architecture differently.)

The objective here is to seek, in those projects, how architects

and inhabitants have generated experiences through the stimulation of various mechanisms and elements of the habitat, enabling the process of awareness in their usage. Furthermore, in analysing those case studies, it is essential to monitor as well how those situations and devices enable architecture to increase inhabitants' awareness of ecological problems. As the concern for our environment's well-being becomes part of our own. Enabling the environmental concern to be part of the architects' design of buildings and inhabitants' use of them.²²⁸

228 Piotrowski and Robinson, *The discipline of architecture*, 159.

All three examples are residential buildings or houses since they incorporate the question of comfort the most (as they are places where we do the most diverse types of deeds, where we spend most of our time, and which are the most relatable to anyone reading this work). Nevertheless, it could be possible to analyse non-residential projects or find similar strategies in non-housing projects.

6.2 Zome principal for thermal comfort awareness

“Everywhere around the world, in all zones and countries, the climate has dictated a fundamental, technical order; not only in windows, but in all parts of a building. Technical aspects modestly and carefully followed the demands of nature and formed the basis of style” ²²⁹

Steve Baer’s project offers an atypical solution to local overheating problems during the summer in New Mexico. Built in 1971, the house makes the best of the climatic characteristics of the region and, at the same time, brings the inhabitants closer to the natural cycle of the sun. The architect intended to follow the idea of sustainability and propose a self-sufficient passive energy house through the Zome system. This geometrical structure enables less material use than our conventional house-built system. Employing no mechanical conditioning in the house also enables a more economical and ecological comfort solution.²³⁰

Steve Baer’s house is an L-shaped house of eleven rooms, or as he calls them, *Zomes*. All those with a facade orientated south possess a completely glazed facade where you can find the primary thermal system of the house. Also called the “Drum Wall”, this type of facade enables the inhabitants to collect solar power through the installation of water-filled oil drums on steel racks placed right behind the glass.²³¹

229 Bruno Taut (1937) in Hönger, C., & Boltshauser, R. (2014). *Climate as a design factor: Architecture and Energy*. Quart Architektur, 19.

230 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, 10.

231 Banham, *Architecture of the Well-Tempered Environment*, 284.

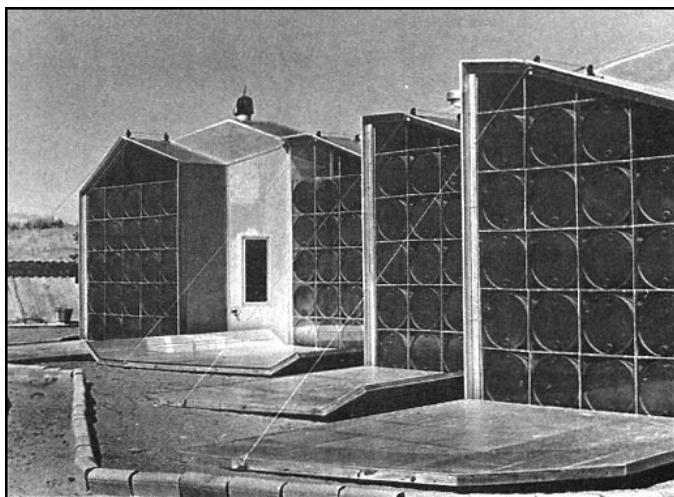


Figure 30. Steve Baer, *Zome house*, New Mexico, USA.

This heat-accumulating wall works in two different ways depending on the seasonality. During the summer, the large aluminium-faced shutters are kept up (closed) to keep the barrels and the water inside cool. They are only opened at night to cool the barrels by radiation to the night's temperature (2). During the day, the barrels absorb the inside heat and provide a comfortable temperature (1).

Throughout winter, the process works the other way around - closed vertically during the night (4) as the shutters are insulated to prevent heat loss and opened during the day to gain energy from the sun. During the day (3), the shutters are laid horizontally on the terrace, which reflects more heat the water-wall.²³²

232 Banham, *Architecture of the Well-Tempered Environment*, 284.

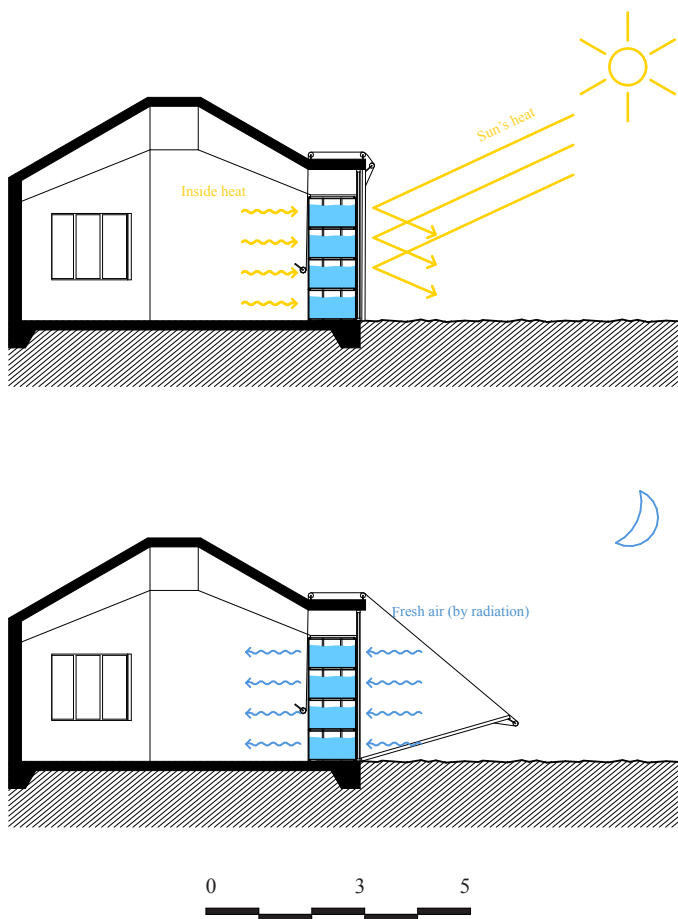


Figure 31. Section, *System functioning during summer daytime and nighttime*, 1:150.

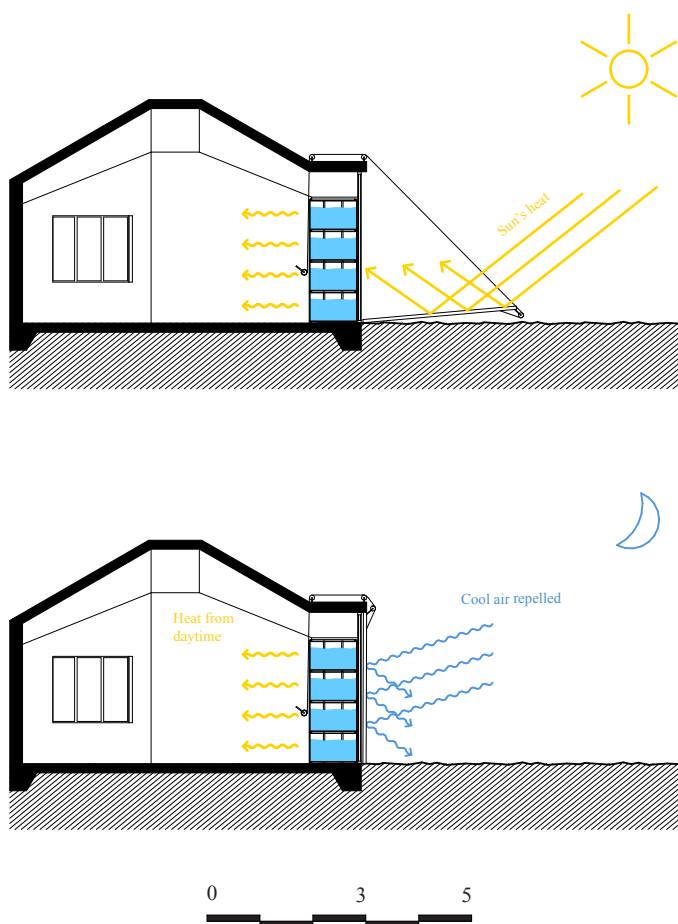


Figure 32. Section, *System functioning during winter daytime and nighttime*, 1:150.

The architectural solution suggested by Steve Baer enables the experience of awareness in this project as it generates both the endo- and the exo-process.

First of all, the device generates multiple stimuli in the exo-process. Its morphology in terms of scale and position results in the installation of large barrels in front of the glazed facades. Furthermore, it also affects our sensual stimuli - touch, light, temperature. The element provokes multiple thermal variations as it filtrates the hot or cold air and lightning through the house, depending on whether the shutters are closed or not.

Secondly, the architect has designed a device in which the inhabitant is required to participate in the performance of this system. The physical act of using the crank handle to open or close the aluminium shutters requires the inhabitant to participate in this ritual (endo-process). This movement becomes a form of stimuli as the inhabitant needs to understand seasonalities, thus giving meaning to his actions and thermal well-being.

Consequently, there is always a need for an action to make the system work.²³³ The device would not work without the inhabitant, making him as vital as the device itself. The ritual set by the inhabitants in their daily lives enables them to control their house and its climate and, consequently, the comfort that comes from it.

By understanding this thermal system, the inhabitants discover qualities that can be derived from it. In other words, the occupant starts the appropriation process by taking ownership

233 Banham, *Architecture of the Well-Tempered Environment*, 287.

of the space and implementing specific experiences based on his preferences and local conditions.

In multiple photos of the project, we often see armchairs or tables right in front of the barrels. The domestic activities find themselves being in direct correlation to the thermal properties and variations of the barrel system - gaining from their heat or coolness.

As expressed earlier in this subchapter, the Zome and its devices are not used similarly, depending on the season. Not only does it vary in its usage, but also in its characteristics and the stimuli that can arise from it - such as light, temperature, colour, and shade. Additionally to the shutter system, the experience generated from the process and meaning of opening or closing the aluminium shutters also enables other elements to take meaning and create stimuli.

This is, for instance, the case of stained glass in some of the Zomes, which finds meaning during the summertime. As the shutters are closed, the stained glass becomes the primary light source for the Zome. The coloured glass filters the light of the moving sun, which passes through them. Which in turn generates a constantly changing ambience of colour and shape inside the house. This makes the inhabitant more aware of the sun's progress and movement throughout the day as the light beam moves inside the house. This will not happen during winter as the glazed facade is completely open, bringing most of the light and thus significantly impacting the stimuli possibilities.

Nonetheless, this, in fact, only enables us even more to appreciate the presence of these elements and makes us more aware of their characteristics, as:

*“We are more likely to notice the function [and significance] of something if there are times when it is not in operation [or not there].”*²³⁴

The stained glass’s presence and impact on the Zome space’s ambience are only as strong if they are the primary light source. Thus, as it becomes the primary source of light and variation during the summertime, it also becomes the house’s most noticeable element.

Consequently, the function and the activities that one can do in a particular space (Zome) vary depending on the time of day and period of the year. It becomes a more natural way of living in tune with the traditional use of the sun, which is typical of New Mexico’s local traditions.²³⁵ The inhabitants can become more welcoming to the natural characteristics of our environment. Accepting, for instance, that heat can make us slower in our daily activities and that it requires us to make more effort.²³⁶

234 Heschong, *Thermal delight in architecture*, 37.

235 Baer, *Renewable Energy Puzzle*, 16.

236 Heschong, *Thermal delight in architecture*, 27.

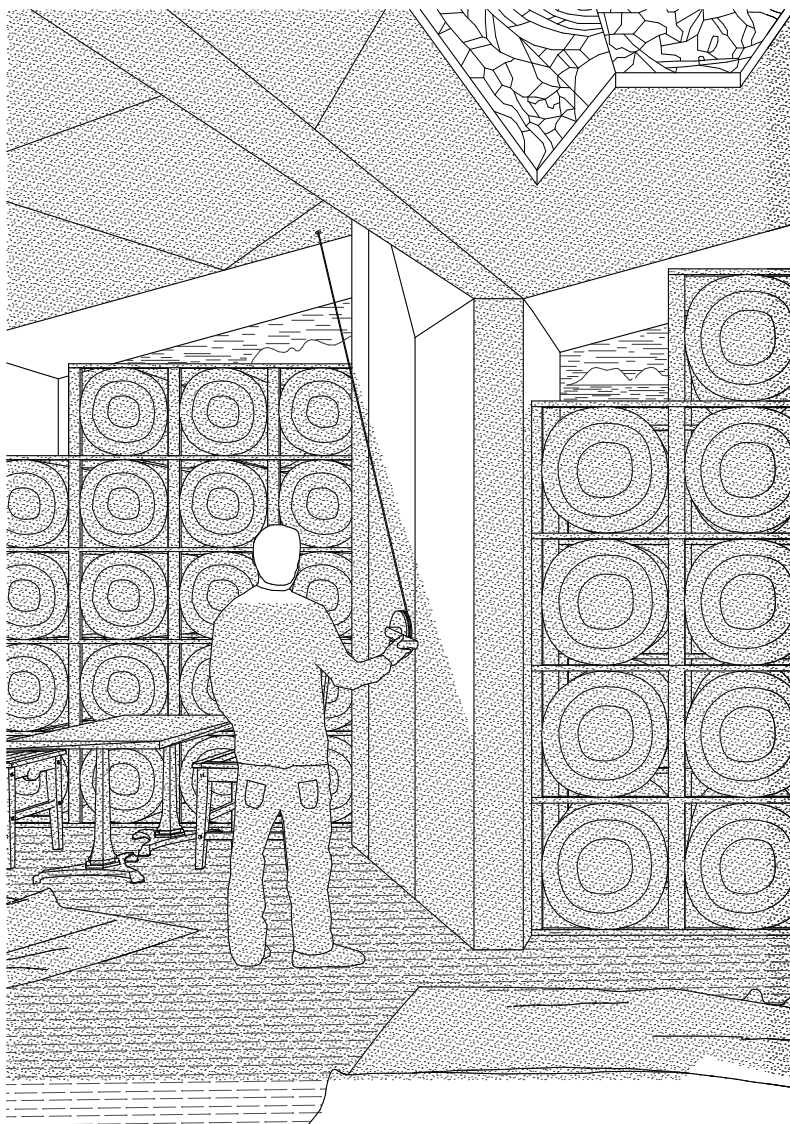
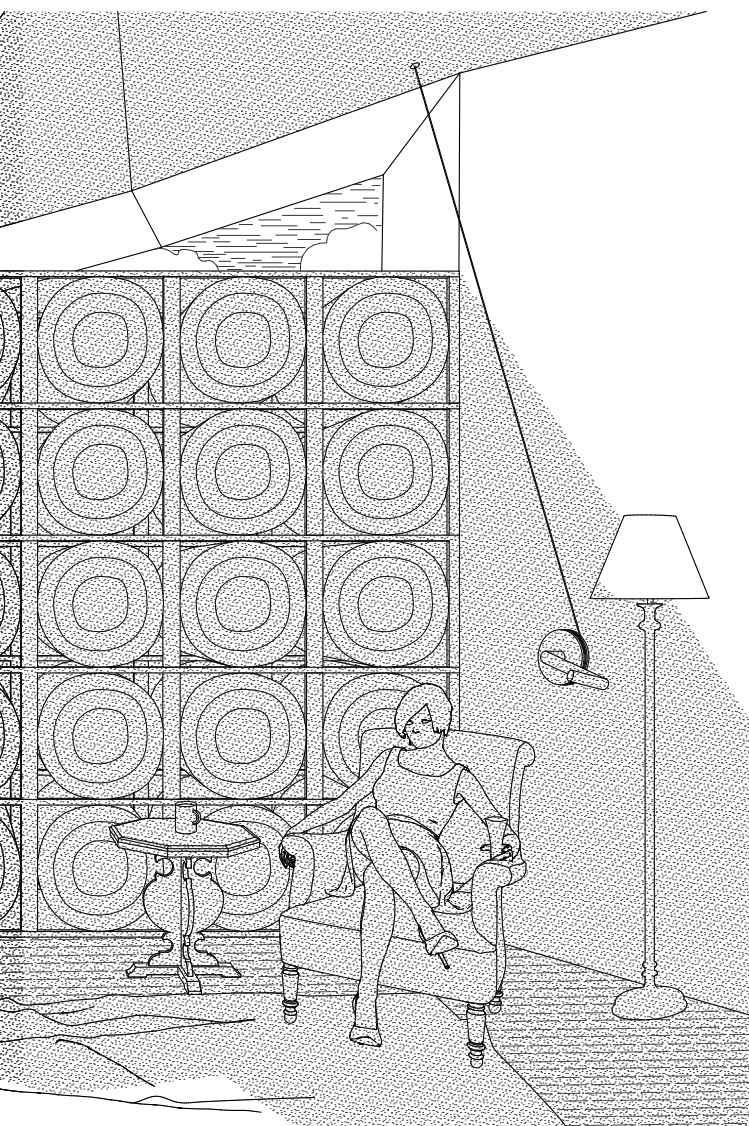


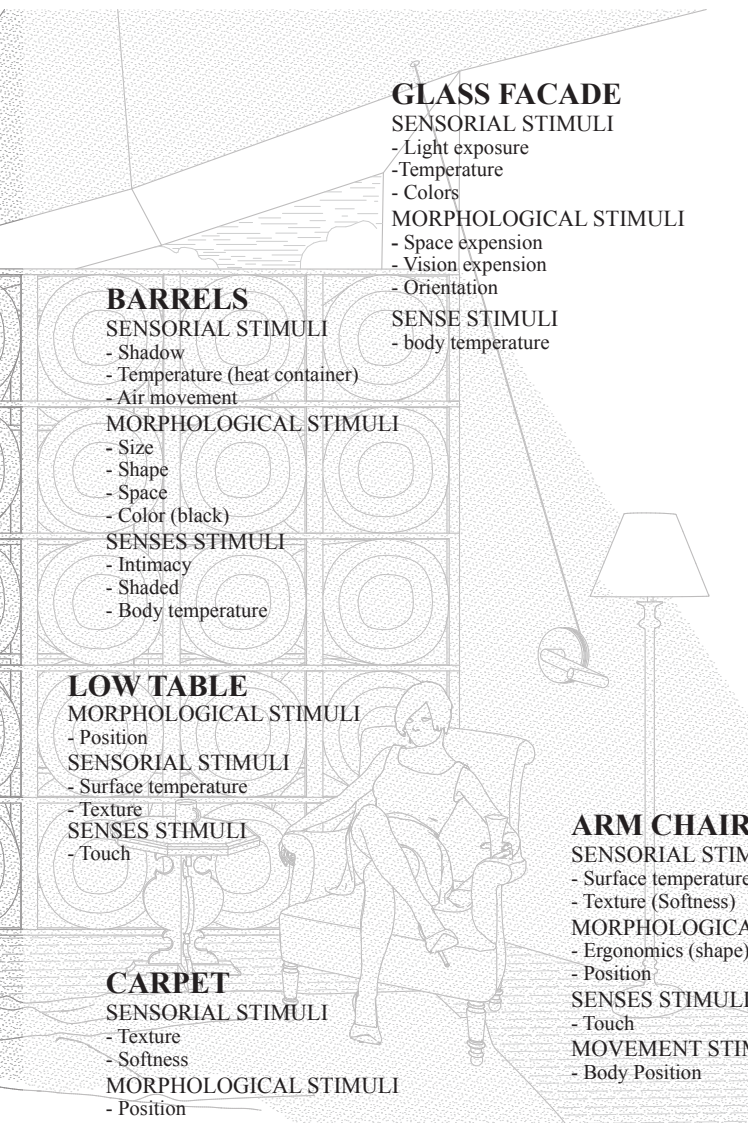
Figure 33. Perspective of the Zome House, *Appropriation experience*, *Winter daytime*, (without stimuli).



Experience 1: *Opening shutters*
Experience 2: *Resting near the barrels*



Figure 34. Perspective of the Zome House, *Appropriation experience*, Winter daytime, (with stimuli).



GLASS FACADE

SENSORIAL STIMULI

- Light exposure
- Temperature
- Colors

MORPHOLOGICAL STIMULI

- Space expansion
- Vision expansion
- Orientation

SENSE STIMULI

- body temperature

BARRELS

SENSORIAL STIMULI

- Shadow
- Temperature (heat container)
- Air movement

MORPHOLOGICAL STIMULI

- Size
- Shape
- Space
- Color (black)

SENSES STIMULI

- Intimacy
- Shaded
- Body temperature

LOW TABLE

MORPHOLOGICAL STIMULI

- Position

SENSORIAL STIMULI

- Surface temperature
- Texture

SENSES STIMULI

- Touch

ARM CHAIR

SENSORIAL STIMULI

- Surface temperature
- Texture (Softness)

MORPHOLOGICAL STIMULI

- Ergonomics (shape)
- Position

SENSES STIMULI

- Touch

MOVEMENT STIMULI

- Body Position

CARPET

SENSORIAL STIMULI

- Texture
- Softness

MORPHOLOGICAL STIMULI

- Position

Experience 1: *Opening shutters*
Experience 2: *Resting near the barrels*

In the case of Steve Baer's Zome House, the thermal state of variation of the house due to seasonalities becomes intricately knotted with our physical state (our body), generating the experience of the space. We are constantly experiencing the heat flow or cool flow from the water-filled barrels, which in turn generates a sort of "background" and condition for all the activities that the inhabitant decides to carry out in the Zome.²³⁷ Additionally, the intentions of sustainability throughout by Steve Baer find their meaning in the phenomenological process of awareness that is ignited by using his specific devices that enable the climatic understanding and control of the house. Consequently, the inhabitant can be more aware of the natural environment elements, what they bring to them and how they can use them. As Janius Eddy expressed (talking about the meaning of living in a solar home):

*"It is not just the financial savings. We grow more in awe of the tenuous hold our lives have on this small planet, more convinced that the sun renews us, in an almost religious way. It has made us profoundly grateful that the sun is up there, the centre of our universe, warming us up and keeping us alive. That atavistic sense of the elements that early man knew and felt has become part of our lives."*²³⁸

The Zome house becomes a reference of what can be made with very little acquisition and by proposing a system that leaves the typical consumptive standards of architecture's mechanical systems.²³⁹ Before thinking about the typology

237 Heschong, *Thermal delight in architecture*, 29.

238 Skurka, *Design for a limited planet: Living with Natural Energy*, 130.

239 Banham, *Architecture of the Well-Tempered Environment*, 286-287.

organisation, Steve Bear first thought of how sustainable principles and devices could be implemented in the usage of the house, thinking of particularities before thinking of the general image. Consequently, creating the barrel-glazed facade and the experience that would come from it. In other words, the Zome's principle was thought out first before being repeated 11 times (some with a glazed facade, some not), creating the general house and its typology organisation.

We could finally say that this house acts like a person's "third skin". As it varies like a living organism to the exterior climate and characteristics. Leaving the idea of an invariable architecture in which machines compensate for the lifeless aspect of our buildings.²⁴⁰

240 Höniger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 34.

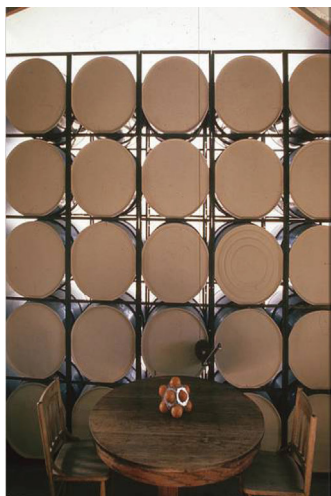


Figure 35. Inside photos, *experiencing the water-wall*.

6.3 Awareness in design freedom

*“Or, de tous les actes, le plus complet est celui de construire.
Cette œuvre découle du plus intime de ta vie.”*²⁴¹

[*Translation:* Of all acts, the most complete is that of building.
This work springs from the most intimate part of your life.]

Our behaviour towards housing has remained unchanged since the CIAM meeting in 1929. The architect's response to the housing crisis was to reduce the dwelling units, as houses became containers for the most minor possible kitchens, bathrooms, and bedrooms. Even creating the built-in furniture to minimise the number of square metres of the habitat.²⁴² Consequently, the permanent functioning and definition of spaces by the furniture has often prevented the establishment of working activities or spaces. The rigidity of the family typology of housings suppresses the possibility for a new scenario of living organisation.²⁴³

As expressed by Pier Vittorio Aureli in his book *“Living and Working”*:

*“A major obstacle for affordable live/work spaces is real estate's commodification of housing [and] the restrictive zoning laws, which has made generous living and working space impossible in many cities.”*²⁴⁴

241 Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 120.

242 Dogma, *Living and working*, 40.

243 *Ibid.*, 170-171.

244 *Ibid.*, 41.

The only tangible solution so far has been designing an industrial space with the most minimal partitioning possible - the loft. As the interior division was reduced, the flexibility of the typology organisation, as well as the personal domestication of the space, became possible.

Heinrich Degelo's project, *Künstlerateliers* in Erlenmatt Ost in Basel, is a four-floored building with 17 artists studios offering 130 square metres per apartment - enough space for working and living activities. All inhabitants are artists who are part of the "Coopérative d'Ateliers". All of them participated in the design of the project with the architect. Leaving the standardised approach of project making and enabling the personal appropriation of each resident to their apartment.

In this case study, all members of the cooperative are also the residents of the building. They found solutions in a radical change of standards - especially for the necessity of designing a space for living and working. The project questions the efficacy of this "reducing mentality" initiated by the CIAM meeting in Frankfurt, just as Giancarlo De Carlo stated with the "how" mentalité in its lack of concern for the main subject (the inhabitant). Why should the reduction of dwellings be the best possible solution? How can the architect design a space that can be used for living and working? How could this type of project see the light of day whilst remaining affordable?

The project's objective was to achieve the target of 10 CHF/m² monthly rent by finding tangible solutions (one-third of the city's average rent prices).²⁴⁵ Instead of reducing the squared

245 Detail. *What Do People Need? Residential and Studio Building in Basel*. Detail. Accessed December 26, 2023.

https://www.detail.de/de_en/what-do-people-need-residential-and-studio-building-in-basel/

metres, could the dwelling in its typological organisation be reduced to the most essential elements whilst creating a space for the well-being of the artist's life?²⁴⁶

Three strategies were applied to reduce the monthly rent and design an ecological architectural proposition. These action plans would abandon the standardised approach to project making and our overuse of mechanised devices and comfort. Consequently, this enabled the instauration of stimuli and appropriation for the residence's domestic well-being. As well as give freedom to the inhabitants to design their own apartments.

Firstly, the architects did not install any partitioning inside the apartments. They were handed in as an "empty space" without any preliminary typology organisation. Thus, it came down to the residents deciding on the spatial division. This free partitioning would enable them to project how to organise their domestic space as they would build the necessary elements.

Consequently, it allowed them maximum flexibility, allowing for various uses of the space and enabling any kind of modification. Thus, the living and working areas became free of any possible disposition and could be furnished as wished by the user without being imposed by built-in furniture. Moreover, the height of the ceilings is 3,45 metres, proposing a vertical freedom and better utilisation of the general surface.²⁴⁷

The active participation of inhabitants in the elaboration of a pre-project design implicitly meant the prerequisite control

246 Espazium. *Case Atelier Artisti Basilea*. Espazium. Accessed December 26, 2023. <https://www.espazium.ch/it/attualita/case-atelier-artisti-basilea/>

247 *Idem*.

of their dwelling and its organisation. Therefore, all potential barriers are removed, enabling them to develop their domestic behaviours and actions inside of their apartments.²⁴⁸

As architecture ceases to create a forced domestic usage, the building process and space usage become one. The tenants become, in a way, architects too, as they understand its importance for the appropriation of the domestic sphere and its usage.²⁴⁹

248 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 158

249 *Idem*.

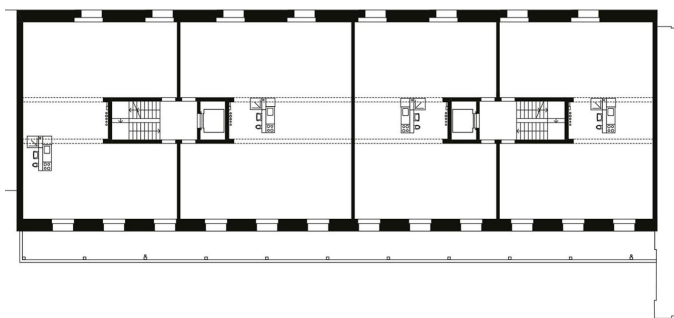


Figure 36 & 37. *Apartments before inhabitants intervention - Empty space.*

Secondly, they decided to have only one sanitary unit per apartment commonly. This sanitary kitchen unit has a shower, a sink, and a toilet on one side and all the necessary connections for a functioning kitchenette on the other.²⁵⁰ It is usually challenging to transform a dwelling with all of today's technical systems, which can be found everywhere. Preventing us from necessary interventions.²⁵¹ The installation of flexible hoses attached to the ceiling enabled the free positioning of the unit.²⁵²

By concentrating all the immobile furniture and typical house facilities into one unit, the organisation of the residence is free of any predetermined element, minimises the construction cost, and reduces the number of different workers (electrician, plumber,...), as only the installation of the unit was necessary.²⁵³ Furthermore, by not having a scattered network of cables and pipes around the dwellings, the simplicity of a single sanitary and kitchen unit gives them more importance as central pieces of domestic activities.

Additionally, the residents can use the extension cords from the unit to transfer electrical lines throughout the apartments. As a consequence, the possibility for the residents to fix themselves their lines is possible, furthering the avoidable need for electricians for the building process of the building.²⁵⁴

250 Espazium. *Case Atelier Artisti Basilea*. Espazium. Accessed December 26, 2023.

<https://www.espazium.ch/it/attualita/case-atelier-artisti-basilea/>

251 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 97.

252 Detail. *What Do People Need? Residential and Studio Building in Basel*. Detail. Accessed December 26, 2023.

https://www.detail.de/de_en/what-do-people-need-residential-and-studio-building-in-basel/

https://www.detail.de/de_en/what-do-people-need-residential-and-studio-building-in-basel/

253 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 71.

254 Detail. *What Do People Need? Residential and Studio Building in Basel*. Detail. Accessed December 26, 2023.

https://www.detail.de/de_en/what-do-people-need-residential-and-studio-building-in-basel/



Figure 38. *Sanitary and kitchen unit.*

Thirdly, as expressed by Heinrich Degelo, people do not need active heating; they only require air, heat and light. Consequently, no mechanised heating system was installed inside the apartment.

Only three natural heat sources are provided: the human body, the sun's warmth, the kitchen elements' residual heat, and potential electrical appliances. We often forget that after fire and sun, humans can become the warmest elements of their built environment, as we, too, generate heat.²⁵⁵ Additionally, our ability to vary and adjust our metabolic temperature enables us to maintain our thermal comfort through a span of different thermal conditions.²⁵⁶

Heinrich Degelo has enabled the body to become a conscious instrument in the comfort process, giving it a vital position in the thermal comfort of the inhabitants, and allowing it to become a stimuli.

Furthermore, the building becomes a sort of third skin for the inhabitants after their clothing.²⁵⁷ The 80cm peripheral masonry walls keep the apartments warm and are only heated by the sun's radiations. The deep brickwork exterior walls and the windows provide the natural protection needed during the overheating summers. They also enable it to keep as much heat from extracting itself outside the apartments. Not only does it enable the reduction of CO2 emissions, it also helps reduce the prices per square metre.

255 Heschong, *Thermal delight in architecture*, 26.

256 *Ibid*, 5-6.

257 Hønger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 34.



Figure 39 & 40. *Facades.*

In his quest to create a tangible solution to affordable living and working spaces, Heinrich Degelo offers multiple environmental stimuli (the sanitary unit, the spatial freedom). However, the most important is that he lets the tenants design and build their own environmental stimuli. Consequently, by designing their environment, they understand it and thus control it better. They can build everything to their own human proportion and their fondness.

By putting all the technical aspects of a building into one unified element, the dwelling as a whole is more understandable and simplified for the tenants' use.

Moreover, by designing a building's thermal capacity based on the waste generated from the devices, people start to be aware of them and project new ways of organising them in their domestic sphere.²⁵⁸ The tenants become more cautious of the disposition of their sanitary unit as they realise that the shower or the oven can procure heat for the whole apartment - thus questioning if they should be contained in a space or open for all of the dwelling.

In the particular case of resident Barabara Bühler, she built a partitioning to enclose the sanitary units in a smaller space. Allowing for the heat of the shower to be contained and heat the bathroom.

(All the following drawings are a depiction of Barbara's apartment, based on photos, discussions with her and other students' drawings.)

258 Detail. *What Do People Need? Residential and Studio Building in Basel*. Detail. Accessed December 26, 2023.

https://www.detail.de/de_en/what-do-people-need-residential-and-studio-building-in-basel/

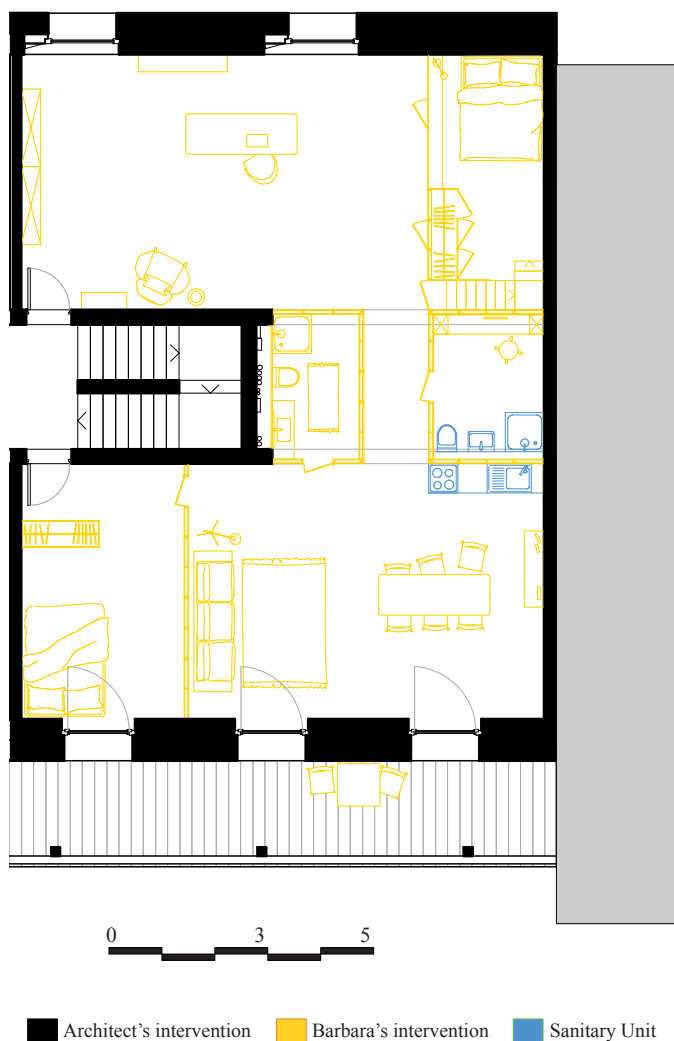


Figure 41. *Layout plan of Barbara's apartment, 1:150.*



Figure 42. Perspective of Barbara's apartment, *Appropriation experience*, (without stimuli).



Experience 1: *Working at a desk*
Experience 2: *Living - going to bed*

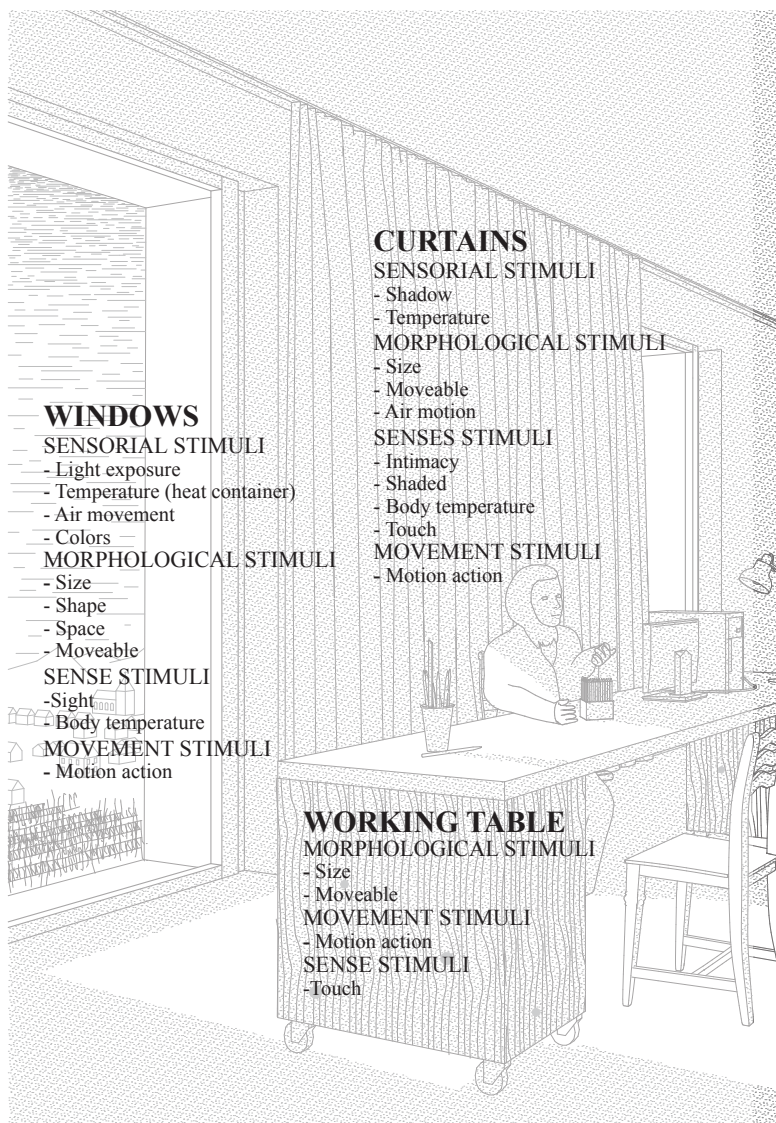


Figure 43. Perspective of Barbara's apartment, *Appropriation experience*, (with stimuli).

BED

SENSORIAL STIMULI

- Temperature (heat container)
- Texture

MORPHOLOGICAL STIMULI

- Size
- Position

SENSES STIMULI

- Intimacy
- Body temperature
- Touch

MOVEMENT STIMULI

- Body position

MEZZANINE

SENSORIAL STIMULI

- Temperature (closer to ceiling)
- Shadow

- Threshold

MORPHOLOGICAL STIMULI

- Higher level
- In-built space
- Enclosed

- Position

SENSES STIMULI

- Shaded
- Body temperature
- Compression of space (Protection/intimacy)

CURTAINS

SENSORIAL STIMULI

- Temperature (heat container)
- Shadow
- Texture

MORPHOLOGICAL STIMULI

- Size
- Position

SENSES STIMULI

- Intimacy
- Body temperature
- Shaded
- Touch

MOVEMENT STIMULI

- Body position

WORKING SPACE

MORPHOLOGICAL STIMULI

- Size
- Open
- Proportion

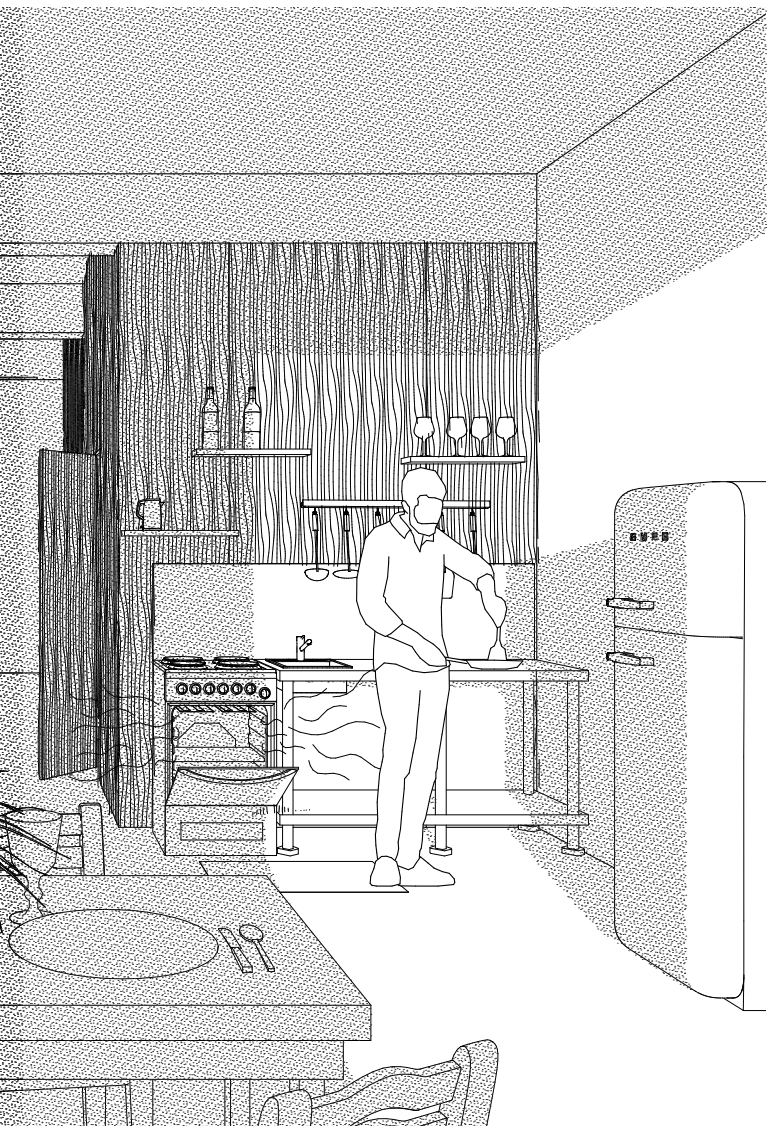
SENSES STIMULI

- Generosity

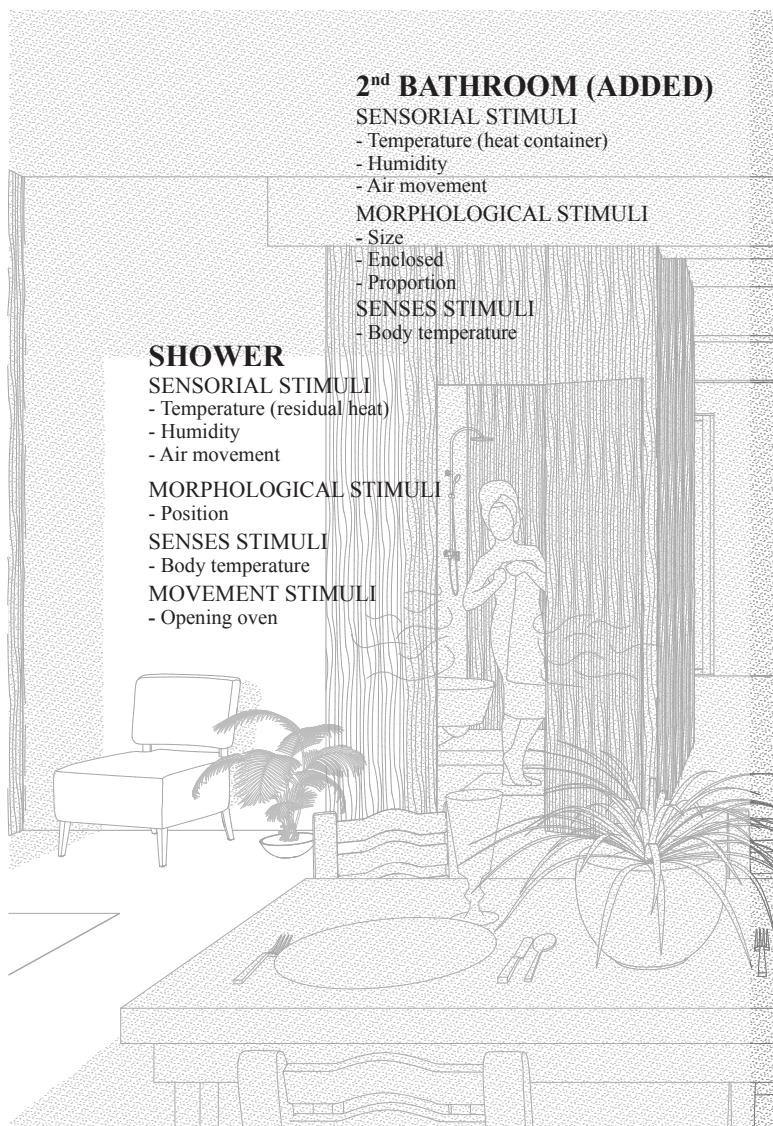
Experience 1: *Working at a desk*
Experience 2: *Living - going to bed*



Figure 44. Perspective of Barbara's apartment, *Appropriation experience*, (without stimuli).



Experience 3: *Living - Showering*
Experience 4: *Living - Cooking*



2nd BATHROOM (ADDED)

SENSORIAL STIMULI

- Temperature (heat container)
- Humidity
- Air movement

MORPHOLOGICAL STIMULI

- Size
- Enclosed
- Proportion

SENSES STIMULI

- Body temperature

SHOWER

SENSORIAL STIMULI

- Temperature (residual heat)
- Humidity
- Air movement

MORPHOLOGICAL STIMULI

- Position

SENSES STIMULI

- Body temperature

MOVEMENT STIMULI

- Opening oven

Figure 45. Perspective of Barbara's apartment, *Appropriation experience*, (with stimuli).

1st BATHROOM

- Sanitary Unit

SENSORIAL STIMULI

- Temperature (heat container)
- Humidity
- Air movement

MORPHOLOGICAL STIMULI

- Size
- Enclosed
- Proportion

SENSES STIMULI

- Body temperature

OVEN - Sanitary Unit

SENSORIAL STIMULI

- Temperature (residual heat)
- Air movement

MORPHOLOGICAL STIMULI

- Position

SENSES STIMULI

- Body temperature
- Touch
- Smell
- Sight

MOVEMENT STIMULI

- Opening oven

Experience 3: *Living - Showering*

Experience 4: *Living - Cooking*

In a way, this project has demonstrated the unreasonable idea that an affordable place, by definition, means less space. It becomes a sort of lesson that comfort should not be associated with wealth. Moreover, the postulate that if we wish for more comfortable dwellings we must sacrifice some forms of comfort of our dwelling is half true. In this project, the inhabitants didn't just renounce mechanised thermal comfort, they swapped it with the possibility of having bigger apartments. The priority has shifted but the dwellings aren't less comfortable.

As we have reformulated from Antoine Lavoisier:

“Rien ne se perd, rien ne se crée, tout se transforme.” ²⁵⁹

[*Translation:* Nothing is lost, nothing is created, everything is transformed.]

The tenants had made together a consensus on what was the most important for them, and on what the apartments should prioritise in terms of their living and working comfort. As it was more vital to have the necessary space for their activities and experiences despite renouncing to a mechanised thermal steady system.

Nonetheless, this would imply that they had to create strategies to answer the probable climatic problems that could arise. Sometimes, having to put on more clothes during winter than in a typical apartment, or having to open their windows more often and install curtains for the warm summer period. Consequently,

²⁵⁹ Antoine Lavoisier, Inspired from the *Traité élémentaire de chimie*, https://www.cnrs.fr/cw/dossiers/doslavoisier/contenu/alternative/alter2_textes.html#:~:text=%20Rien%20ne%20se%20perd%2C%20rien,en%20450%20avant%20Jésus%20Christ

making them more aware of the characteristics of their local climatic conditions and how they affect their domestic sphere. However, it enabled everyone in the residence to design their apartment. Creating their own experiences, instoring their domestic rituals and defining what is comfortable to them. In a way, the inhabitants of this project are, at the same time, the architects and the users.

The design of a one-room type habitation has empowered the reorganisation of the dwelling by the inhabitants. Leaving a traditional organisation of splitting the domestic activities into specific functioned rooms - with their built-in furniture.²⁶⁰

Heinrich Degelo could identify each user's real needs and requirements by doing so. The collective participation of the tenants in the design process has enabled a way to offer everyone the chance to create their own domestic experience. They all set up multiple different usages from their own spatial configuration. A final result which could not have been predictable. This way of undertaking the project process prevents the architectural approach of imagining generalised trends and behaviours, which prevents the appropriation of a place.²⁶¹

In other words, the project's unstandardised and non-normative approach - as well as its final result - enhances residents' space awareness, improving their living conditions and comfort by suggesting a specific dwelling.

260 Dogma, *Living and working*, 204.

261 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 160.



Figure 46. *Different interiors and personalisation of each typology organisation.*

6.4 Transforming in the name of flexibility and use

*“We shape our buildings, thereafter they shape us.”*²⁶²

It is complicated to transform a house or building once built. The installation of pipes, cables, ducts and electric circuits prevents from simply destroying elements of the house.²⁶³ Modification becomes an expensive deed. Combined with those technical networks, the typology organisation is a closed system that makes any transformation uncomfortable. Buildings generate an inward-looking attitude as mechanised energy control becomes an obsession. The housing crises of the 1960s showcase this mentality, which led to the construction of multiple urban projects. Such is the case of the Grand Parc buildings in Bordeaux, France. The large-scale urban project of three building blocks was built for the refugees and low-income workers (after World War II).²⁶⁴ Totalling 530 dwellings, the project aimed to have as many habitats as possible. The poorly accounted comfort conditions (rendered obsolete) led to a gradual decrease in the neighbourhood.²⁶⁵ In 2017, architect duo Lacaton & Vassal transformed and renovated those three buildings to address the building's low standards in terms of living conditions - which were not up to today's standards either. Nevertheless, instead of destroying the buildings, they enlarged the households. Adding an independent 7.5m x 4.5m concrete structure to the facade.²⁶⁶

262 Sir Winston Churchill, *Speech to the meeting in the House of Lords*, October 28, 1943.

263 Graf and Marino, *Les dispositifs du confort dans l'architecture du XXe siècle: connaissance et stratégies de sauvegarde*, 97.

264 *Arquitectura viva, Vivienda rehabilitada, Hacia una Europa sostenible*, 16.

265 Panzini and Quadrato, *Pre-Existence and Prefabrication. Lacaton & Vassal: Methodologies for Social Housing Renovation*, 58.

266 Hanisch, *Analyse interprétative de la grammaire architecturale de Lacaton et Vassal dans les projets de transformation*, 72.

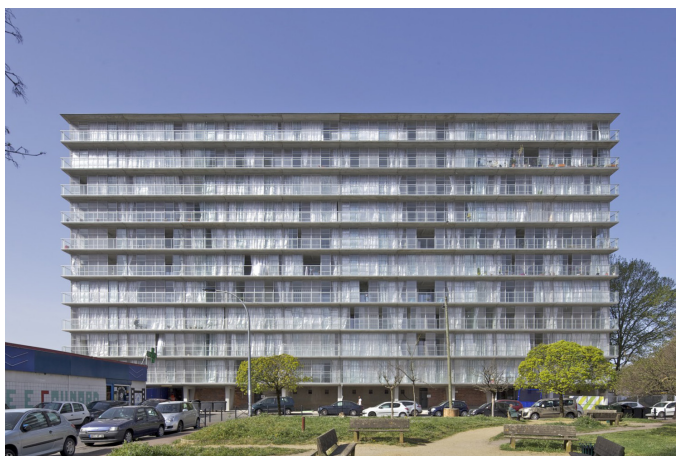


Figure 47 & 48. *Before and after transformation*, Building G.

Lacaton and Vassal aimed for three objectives in their approach (which also dictated most of their projects). The first is to not destroy what already exists but to add (1). The second is to open the building to the natural environment (2). And finally, to reinvent the domestic everyday space (3). All three objectives work together as each one makes the other possible.

Moreover, through those intentions, the architects can free themselves from today's standards, which generally prevent the appropriation process. Comfort and natural environment management became the new defining elements of the project. They wish that people feel at home as

*“lorsque la vie y est agréable, les usages et les sensations
[deviennent] inattendus.”*²⁶⁷

[*Translation:* when life is pleasant, the uses and sensations [become]
unexpected.]

Not only does their project enable the inhabitants' appropriation, but the project's openness generates unexpected experiences as they do not wish to impose any fixed usage of spaces.

To do so - in their architectural process - Lacaton and Vassal do not start by destroying anything but by questioning what is already there. Despite the problems of this modernist complex, it remains a historical heritage vital to preserve.²⁶⁸ They approach projects in a mathematical way as:

²⁶⁷ Lacaton and Vassal, *Lacaton & Vassal*, 96.

²⁶⁸ Hanisch, *Analyse interprétative de la grammaire architecturale de Lacaton et Vassal dans les projets de transformation*, 28.

*“La démolition et la reconstruction c’est toujours (1 - 1) +
1 = 1*

Ajouter, c’est 1 + 1 = 2

*Les chiffres sont clairs. L’économie est la clé.”*²⁶⁹

[*Translation:* Demolition and reconstruction is always (1 - 1) + 1 =

1. Adding is 1 + 1 = 2.

The figures are clear. Conservation is the key.]

Consequently, only the facade is demolished to welcome the new extension. This enables the opening up of the apartment with sliding translucent shutters and aluminium frames, giving more light to the existing building spaces.²⁷⁰ During the day, the extension serves as a solar thermal collector as it accumulates the sun’s heat through the house, whilst curtains serve as filters. During nighttime, the greenhouse becomes a heat retainer, preventing the accumulated heat’s dispersion.²⁷¹ Similarly to the Zome house, the use of the system varies between summer and winter seasons.

Just like the human who wears clothes, a building can have its own clothes.²⁷² The new envelope protects not only the existing building but also the curtains and shutters, which can vary in their disposition and adapt to the occupant’s requirements and preferences (thus serving as metaphorical clothes).²⁷³

²⁶⁹ Lacaton and Vassal, *Lacaton & Vassal*, 158.

²⁷⁰ Panzini and Quadrato, *Pre-Existence and Prefabrication. Lacaton & Vassal: Methodologies for Social Housing Renovation*, 59.

²⁷¹ *Ibid.*, 61.

²⁷² Loos, *Comment doit-on s’habiller?*, 55.

²⁷³ Dana, K. (2014), *Vingt ans après, Lacaton & Vassal toujours à l’aventure des grands espaces*, 4.

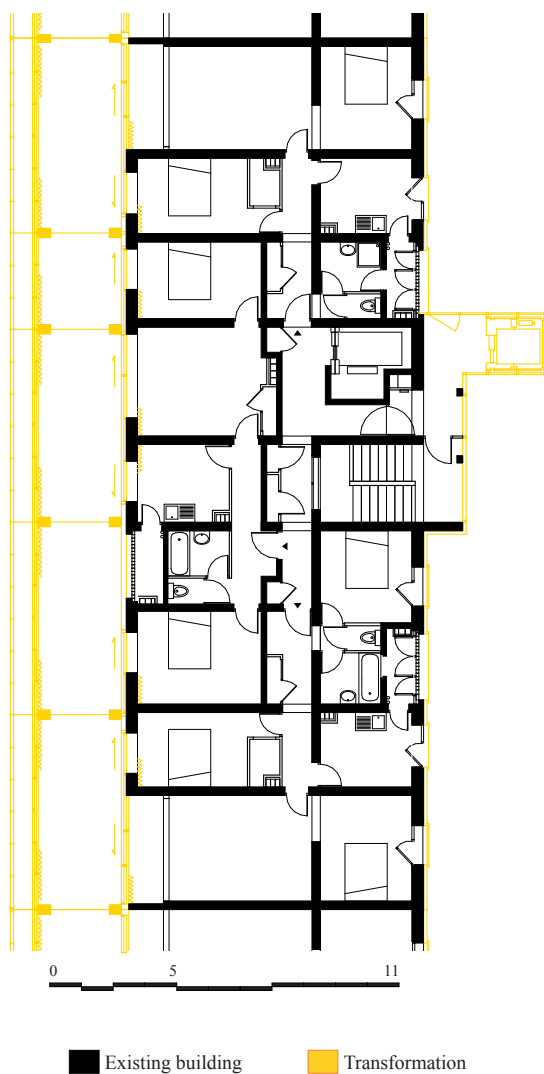


Figure 49, Plan, *typology extension*, 1:150.

The second process to enable inhabitants experience is to open the building to the local climate and encourage them to manage their energy intake in a more natural way.²⁷⁴ For Lacaton & Vassal, architecture should fit in the environment (natural and already built) with modesty and respect. The aim is to work with and not against what already exists.²⁷⁵ Whilst building standards wish to create the most hermetic environment possible, they wish to open up the building to climatic conditions and create thresholds, enabling an energy-saving approach.²⁷⁶

For the architects, opening to the local environment also enables us to open our senses. Allowing the surrounding atmosphere to be part of the architectural stimuli. Peter Zumthor describes the idea of architecture and local atmosphere as:

*“Seuils, passage, petite ouverture pour se faufiler, transition imperceptible entre intérieur et extérieur; une incroyable sensation du lieu, de la concentration, lorsque soudain cette enveloppe est autour de soi et nous rassemble et nous tient, seul ou en groupe.”*²⁷⁷

[*Translation: Thresholds, passageways, small openings to slip through, imperceptible transitions between inside and outside, an incredible sense of place, of concentration, when suddenly this envelope is all around us and brings us together and holds us, alone or in a group.*]

Architecture is not limited by its physicality but by our

274 Hanisch, *Analyse interprétative de la grammaire architecturale de Lacaton et Vassal dans les projets de transformation*, 32.

275 *Ibid.*, 18.

276 *Idem.*

277 Zumthor, *Atmospheres: Architectural Environments, Surrounding Objects*, 41.

perception limit. Our only limit becomes ourselves, our senses.

Both architectural procedures empower the potential for everyday space reinvention of our domestic sphere. According to Anne Lacaton, spaces are essential for a better quality of domestic life. Enclosure creates tension, whereas generosity and openness become the key elements to freedom in use and domesticity.²⁷⁸ The extension becomes the occupant's specificity of use as there is no fixed function determined by it and is instead defined by the thermal properties it procures.²⁷⁹ Consequently, comfort is generated by the balance between the flexibility of use, spatial qualities and specific thermal conditions.

In a way, they favourise the active participation of occupants in the programmatic organisation of their dwelling - by offering more space too - instead of deciding themselves the general typology organisation and definition.²⁸⁰

Moreover, it is compelling to recognise that the building extension was done after a survey where all inhabitants expressed their most significant problems with the original project. The transformation process, thus, was done with the involvement of the occupants (and not only for them). This enables them to understand and control the architectural work that will be done. They have an architectural perspective on their homes and are aware of the potential that will come from the facade extension.

278 Conférence de Anne Lacaton, *Inventer l'espace*, CID au Grand Hornu, le jeudi 8 février 2018.

279 Hanisch, *Analyse interprétative de la grammaire architecturale de Lacaton et Vassal dans les projets de transformation*, 33.

280 Dana, K. (2014), *Vingt ans après, Lacaton & Vassal toujours à l'aventure des grands espaces*, 5.

As mentioned, the development of stimuli comes directly from the definition of usage by the climatic characteristics. The project creates three thresholds: An outside balcony, an inner membrane (a tempered winter garden), and a hermetic inside space (which is the existing building).

The intermediate layer becomes the most stimulating space of the newly constructed apartments, as it serves not only as a natural thermal mechanism (which is also allowed by the thermal curtains), but as a place for personal experience.

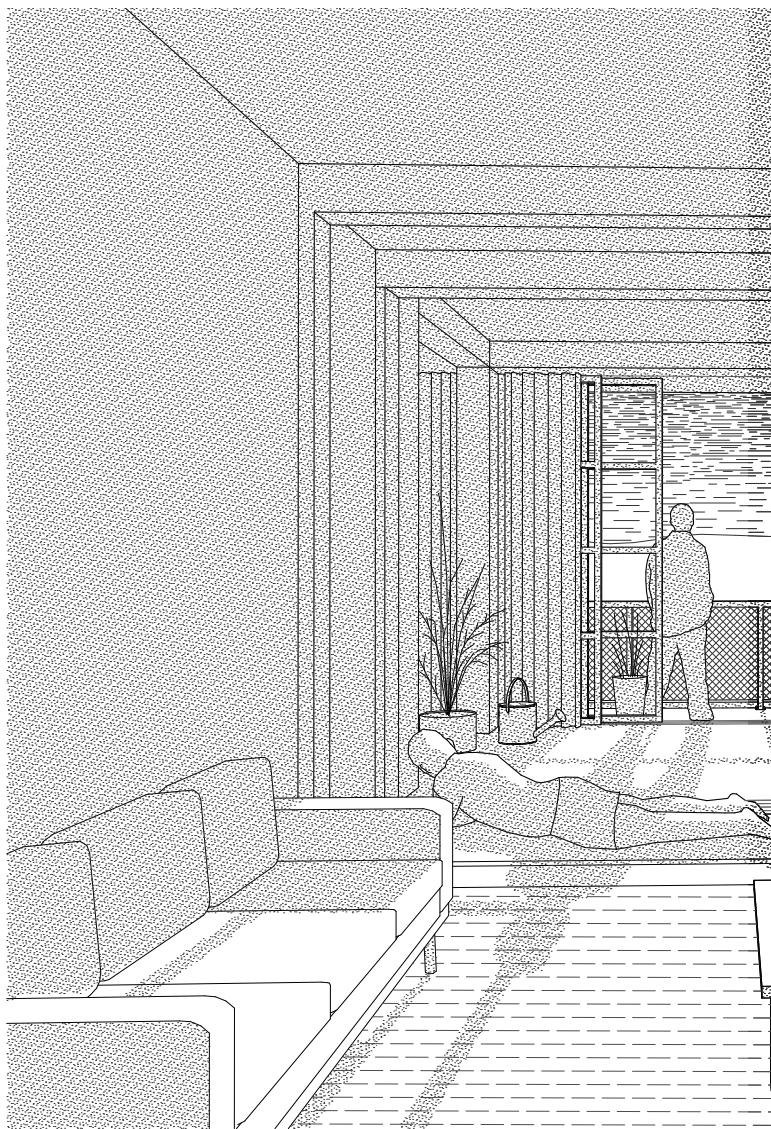


Figure 50. Perspective of an apartment, *Appropriation experience*, (without stimuli).



Experience 1: *Balcony - standing*
Experience 2: *Winter garden - sitting*
Experience 3: *Inside space - yoga*

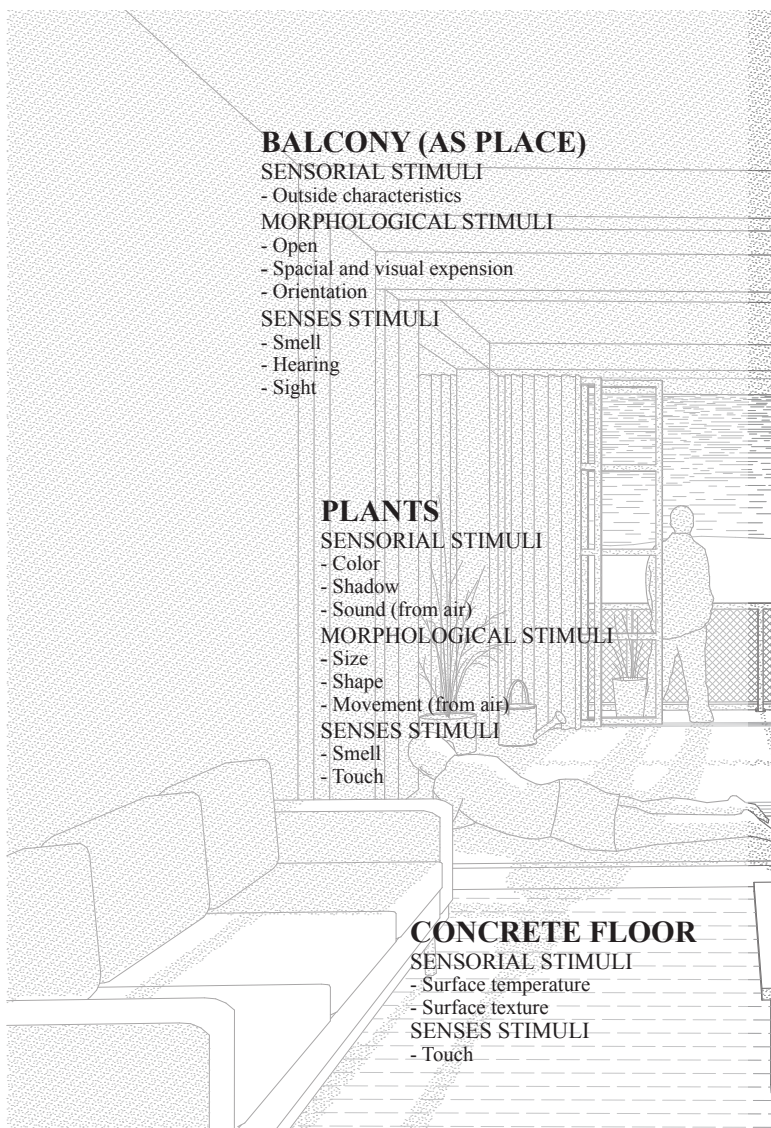


Figure 51. Perspective of an apartment, *Appropriation experience*, (with stimuli).

CONTEXT (EXTERIOR ENVIRONMENT)

SENSORIAL STIMULI

- Sound
- Colors
- Temperature

MORPHOLOGICAL STIMULI

- Scale
- Movement

SENSE STIMULI

- Smell
- Hearing
- Sight

RAILING

SENSORIAL STIMULI

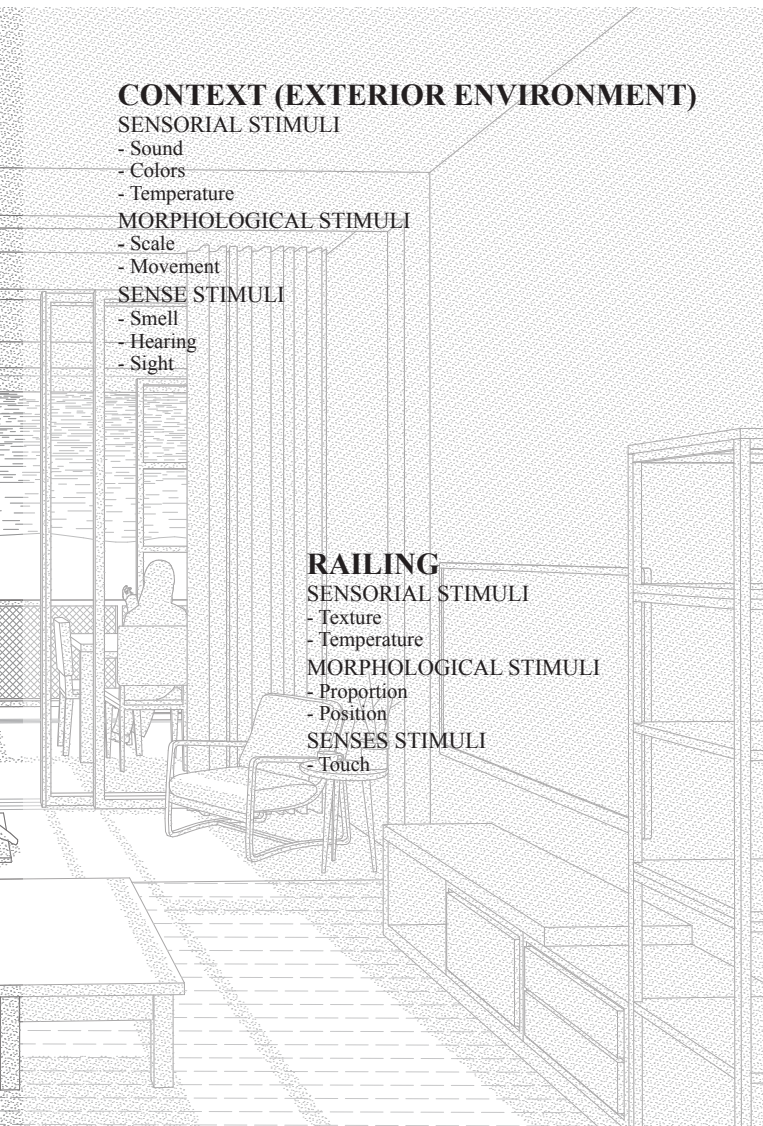
- Texture
- Temperature

MORPHOLOGICAL STIMULI

- Proportion
- Position

SENSES STIMULI

- Touch



Experience 1: *Balcony - standing*

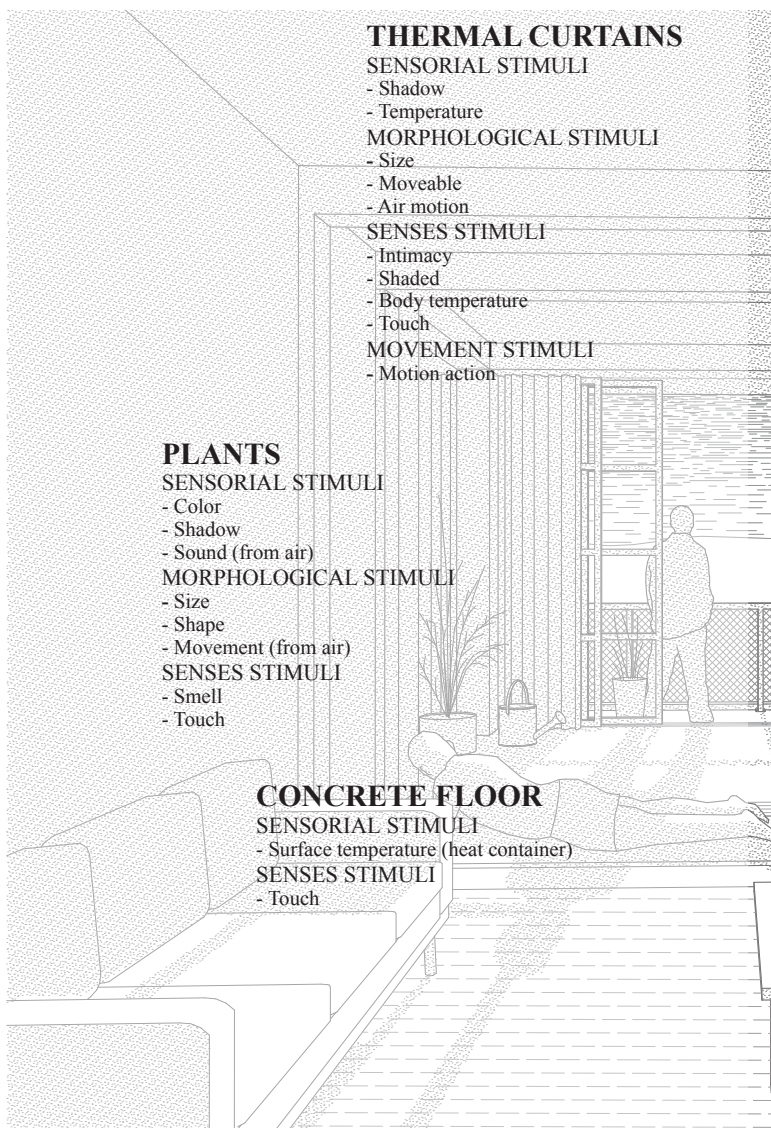


Figure 51. Perspective of an apartment, *Appropriation experience*, (with stimuli).

SLIDING TRANSLUCID SHUTTERS

SENSORIAL STIMULI

- Light exposure
- Temperature
- Colors

MORPHOLOGICAL STIMULI

- Space expansion
- Vision expansion
- Moveable

SENSE STIMULI

- Vision
- body temperature
- Touch
- Sound

MOVEMENT STIMULI

- Motion action

TABLE

MORPHOLOGICAL STIMULI

- Position

SENSORIAL STIMULI

- Surface temperature
- Texture

SENSES STIMULI

- Touch

CHAIR

SENSORIAL STIMULI

- Surface temperature
- Texture

MORPHOLOGICAL STIMULI

- Ergonomics
- Shape

SENSES STIMULI

- Touch

MOVEMENT STIMULI

- Position

WINTER GARDEN (AS SPACE)

MORPHOLOGICAL STIMULI

- Volume
- Open
- Proportion
- Contrast

SENSORIAL STIMULI

- Air temperature

Experience 2: Winter garden - sitting

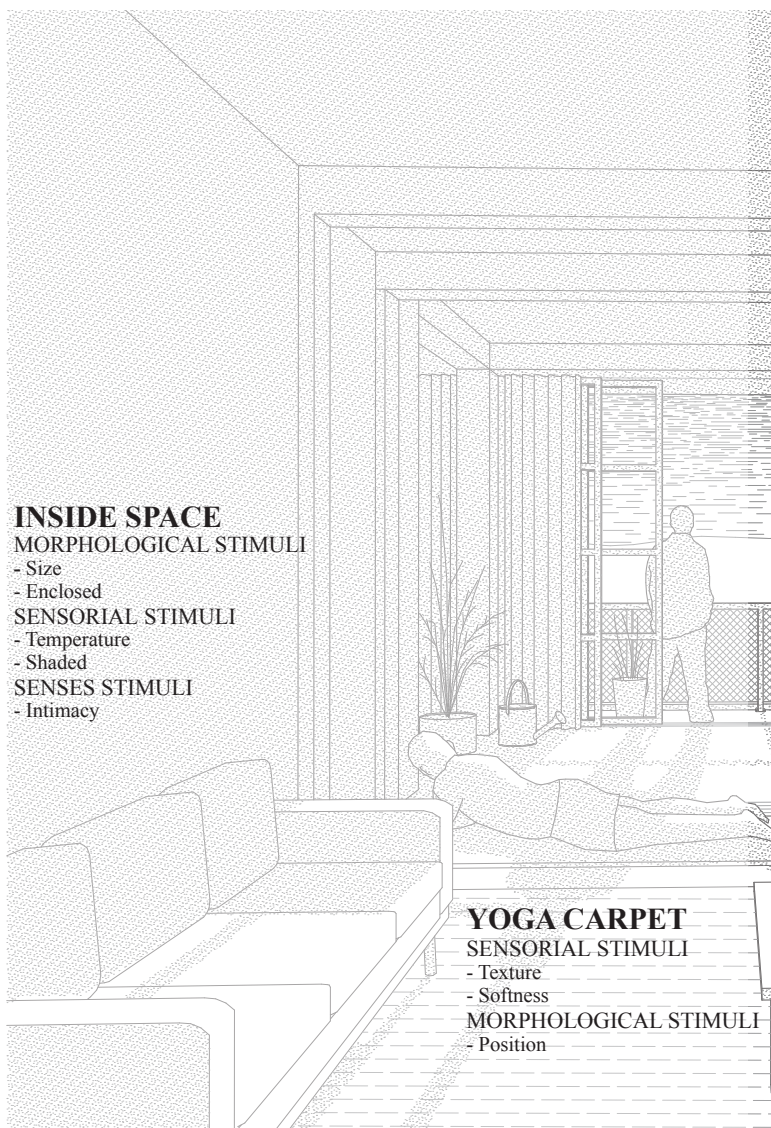
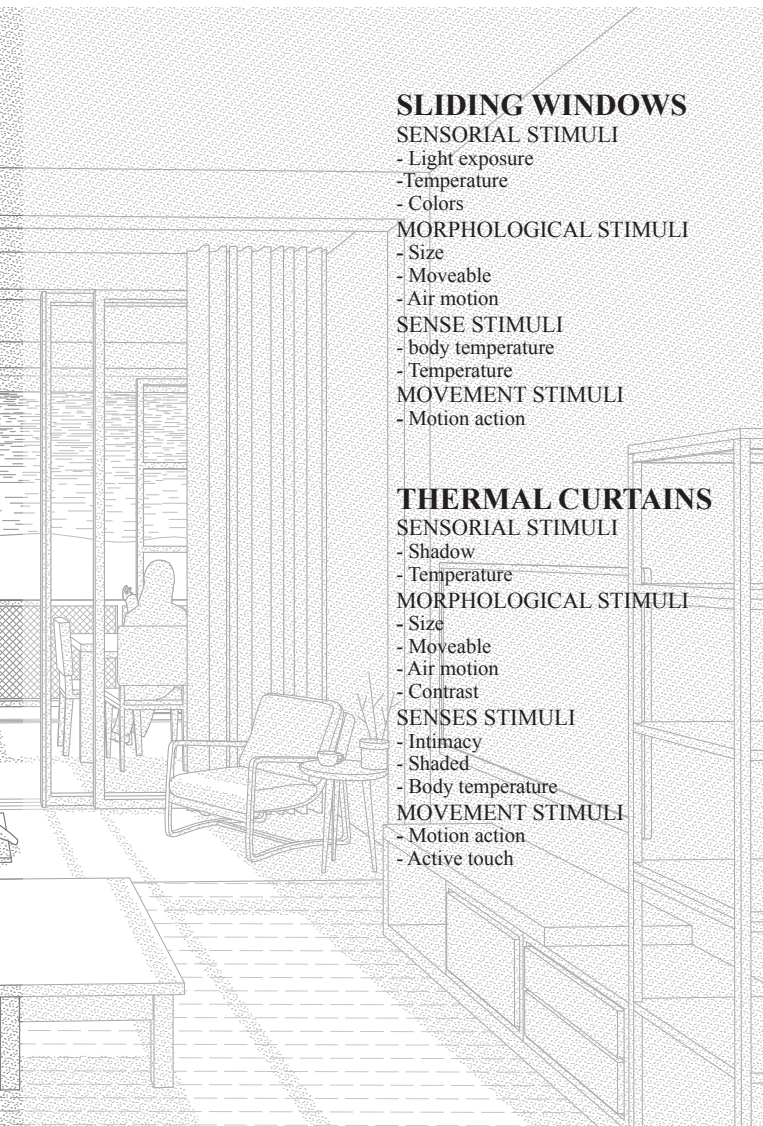


Figure 51. Perspective of an apartment, *Appropriation experience*, (with stimuli).



SLIDING WINDOWS

SENSORIAL STIMULI

- Light exposure
- Temperature
- Colors

MORPHOLOGICAL STIMULI

- Size
- Moveable
- Air motion

SENSE STIMULI

- body temperature
- Temperature

MOVEMENT STIMULI

- Motion action

THERMAL CURTAINS

SENSORIAL STIMULI

- Shadow
- Temperature

MORPHOLOGICAL STIMULI

- Size
- Moveable
- Air motion
- Contrast

SENSES STIMULI

- Intimacy
- Shaded
- Body temperature

MOVEMENT STIMULI

- Motion action
- Active touch

Experience 3: *Inside space - yoga*

Lacaton and Vassal's project in Bordeaux showcases how a building meant for quantitative purposes can be changed into a durable and comfortable contemporary building, where comfort, natural environment management, and stimulated awareness become the new defining elements of the project.²⁸¹

They have created a flexible approach, as freedom and variable use applying the same ideas of opening buildings to the local environment. However, they remain specific as they use particular systems to make the building function. They find roots in the desire to keep adding to the existing values instead of applying a *tabula rasa* mentality of starting all over again.

Going back to Giancarlo's writings, they answer the question of *how* to offer a better living place and enable inhabitants to generate experiences of appropriation in their households by asking *why* they should destroy the existing building. Consequently, having the ability to create more with less as they focus on more specific devices and systems in the project, which in turn generates the occupants' awareness from them.

281 Lacaton and Vassal, *Lacaton & Vassal*, 175.



Figure 52. *Different appropriation of the winter garden.*

CHAPTER 7: SYNTHESIS AND DISCUSSION OF FINDINGS

7.1 Questioning our generalist approach towards architecture

*“Nous [humains] ne sommes pas la solution, nous sommes le problème.”*²⁸²

[*Translation:* We [humans] are not the solution; we are the problem.]

The CIAM meeting of 1929 changed architecture into this generalist profession with generalist architectural propositions. In a way, we do not seem to realise the problem of trying to please everyone and simplify the complexity of our human needs by creating a human type. Since the Frankfort meeting, numerous buildings have been designed and built on this basis. Most of these ideas still exist to this day. Nevertheless, this does not mean their optimal functioning.

As we have said, buildings became containers for future inhabitants to fulfil the most basic needs without enabling any form of appropriation and favourable comfort awareness.

Some architectural propositions showcase the failure of trying to incorporate the reformist ideas of the CIAM.²⁸³ Such is the case for the Pruitt-Igoe housing project in St. Louis, Missouri,

282 Aurélien Barrau, Intervention au Medef, toute la table ronde, 7:01.

283 Jencks, *The language of post-modern architecture*, 9-10.

(USA) by architect Minoru Yamasaki.

Completed in 1954, it offered 33 buildings totalling 2'870 apartments. The project was a direct answer to the slums problem at the time. All with the promise of better living conditions for future tenants.²⁸⁴ The Pruitt-Igoe project found solutions in modernist innovations by implementing high-end elements, such as elevators, new kitchen equipment, and many more.

Despite all the efforts to promote modernism's domestic life, the project denied their previous domestic rituals and cultural baggage. The strict architectural proposition no longer enabled people to practise their ways of living and express their once community spirit, as it was designed as an "individual neighbourhoods" mentality.²⁸⁵ They no longer felt a form of stimulation or personal experience, thus disconnecting them from their new residence, which prevented them from their usual collective rituals and any form of appropriation of their new living space.

The neighbourhood slowly started dismantling the utopic "better living conditions and typology organisation" once promised. The housing situation would paradoxically start degrading as people no longer cared for their homes. To some extent, we could say that the modernist approach did not "touch" people, as the incorporated methods and devices were deemed more inconveniences than innovations. The lack of ownership and care soon turned the buildings into places of vandalism and increasing violence by those very same residents.²⁸⁶ The social degradation would later turn into the physical deterioration of

284 Katharine, *The Pruitt-Igoe Myth*, *Journal of Architectural Education*, 164.

285 *Ibid*, 165.

286 Li, *The dynamics of architectural form: space, emotion and memory*, 191.

the neighbourhood. Most families - with children - would leave, not having ever felt safe or at home.

The demolition of the project in the mid-1970s would represent the end of modern architecture for many architects in its quest to provide better living conditions for mass housing.²⁸⁷ In a way, we could say that the project's collapse originated from the averted approach to the inhabitants' human behaviour, reactions, senses, and needs. As well as neglecting to incorporate the cultural and social heritage of the tenants and their previous domestic rituals.²⁸⁸

Whether the built conditions are scientifically comfortable, the act of forcing people into a new living condition irrelevant to their own habits prevents them from appropriating a place. In their innovative proposition, the CIAM suggested methods relatively different from what could have been seen before. Their swift international inauguration has left no time for adaptation to its new ideologies - consequently, explaining some failed projects.

287 Katharine, *The Pruitt-Igoe Myth*, *Journal of Architectural Education*, 163.

288 Li, *The dynamics of architectural form: space, emotion and memory*, 190.



Figure 53. Pruitt-Igoe, *Demolition of one of the buildings.*

This also displays the attempt of the CIAM and, more generally, today's architectural mentality of trying to solve untechnical problems with a purely technological reading of those issues, thus suggesting only technical and objectified solutions - such as with Margarete Schütte-Lihotzky's Frankfurt kitchen or Alexander Klein's plan diagrams.²⁸⁹

The failure of the Pruitt-Igoe project showcases not only the ideological problems of the CIAM but also the need for more awareness regarding the inhabitants' appropriation of a place, as architects tend to avoid trying and putting themselves on the other side. The side of the users and their rituals who - in a way - suffered from architecture.²⁹⁰ (Whereas everyone who makes use of architecture becomes the architecture's public. Thus, it should be for their experiences, not for the architects).

There is a responsibility, as architects, to be aware of how inhabitants interact with the architectural element, as:

"Architecture concretises how the world touches us." ²⁹¹

Nevertheless, as demonstrated in the St. Louis neighbourhood, it cannot be imposed. Architecture must reflect on social rituals instead of creating new-fashioned ones in their architectural approach. More than being the construction of buildings, architecture represents the creation of the relationship between buildings and humans. It becomes the physical representation of our social, psychological, political, and cultural identity

289 Zardini, Russell, Borasi, Bobbette and D'Architecture, *Désolé, plus d'essence: L'innovation Architecturale En Réponse à La Crise Pétrolière de 1973*, 48.

290 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 148.

291 Maurice Merleau-Ponty, "The Film and the New Psychology", in Maurice Merleau-Ponty, *Sense and Non-Sense*. Northwestern University Press, Evanston 1964, 19.

and requirements.²⁹² Efficient design methods are the ones that identify the real needs of users and take them into account in the design process. In a way, architects who do so are planning with them - instead of creating for them a universal method independent of cultural criteria.²⁹³

Consequently, architects must consider the behavioural patterns of the subjects (inhabitants) and be aware of the influence of architecture on their comfort - as comfort arises when the built environment matches the behavioural needs of tenants (which enables appropriation).

By considering the behavioural aspects of the subject, architects should thus find new ways of approaching the architectural project design. When looking at urban plans, all buildings are often the same. Moreover, typologies are relatively constant as they only vary regarding the required rooms. They lack any form of specification or identity.

Instead of trying to please as many people as possible - as seen with the CIAM propositions and the international architecture - architecture should leave this generalist approach and begin focusing on specific elements or devices of typologies.

This would consequently mean pleasing a smaller panel of people - as particularities only attract some people; however, the intrigued individuals would be more invested in their habitat, as they would identify more to those highlighted particularities of the architectural project and enabling them to create their own experiences. Such being the case for the inhabitants of the three case studies.

292 Li, *The dynamics of architectural form: space, emotion and memory*, 190.

293 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 160.

Not only should this be seen as a new approach to the architectural discipline, but it should also be seen as its specification. Architecture has evolved into an ambiguous profession with many different connotations throughout the ages. As Giancarlo De Carlo asserted, it has been used to indicate the chief mason as well as the god who built cathedrals.²⁹⁴ This evolution has thrown architecture into a vague and unconscious state, which may explain the CIAM events.²⁹⁵

The potential for its revaluation and specification in its definition might not only help define this discipline more, but understand more precisely what it is to build a comfortable environment.

294 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 145.

295 *Ibid.*, 147.

7.2 Synthesis of stimuli exploration & case study analysis

*“Il me semble d’avoir fait de l’existence qui me fut donnée, une sorte d’ouvrage humain. A force de construire [...] je crois bien que je me suis construit moi-même.”*²⁹⁶

[*Translation:* It seems to me that I have turned the existence I was given into a kind of human work. By dint of building [...] I do believe that I have built myself.]

The idea of the architecture specification has been the common thread of the three projects studied in Chapter 6 (6.2 to 6.4), as their particularities have enabled the appropriation of their inhabitants. Moreover, the analyses of the stimuli have allowed us to put the particularities of each project to the light of day. Understanding how and why occupants could identify themselves with a place, create their own experiences through awareness, and develop their own form of comfort.

As expressed throughout this work, combining the human body with the built environment serves as stimuli for comfort awareness. Through the functioning of those stimuli, they can become active participants in their well-being. The case studies generated different stimuli for each inhabitant, and it is by their association with the particular element that the process was initiated.

Steve Baer’s Zome house focused on developing his water-wall as the igniter of a domestic ritual. Heinrich Degelo concentrated on the development of his sanitary unit. Whilst Lacaton &

296 Valéry, *Eupalinos ou l’architecte / L’Âme et la danse / Dialogue de l’arbre*, 33.

Vassal worked on the transformation of an already existing building to put it up-to-date.

By highlighting a particular element or aspect to the detriment of another, this might reduce the range of people interested in living in such a place. Nevertheless, the success of their approach and the result of appropriation from the occupants of the place should become a source of inspiration to start, as architects, to push forward some aspects despite having to renounce to others. Instead of designing generalised and standardised architecture that aims to please as many people as possible, only for them to find themselves in a poorly constructed dwelling.

Furthermore, this could be linked back to the idea of trying to escape from the generalist mentality of modern times. The architectural discipline should establish more specific systems that architects incorporate into their projects, which would attract fewer people but be more inspired in terms of their active participation and association with a project.

The concept of having no mechanised heating system in Heinrich Degelo's project in Basel - for instance - showcases how a particular uncommon method might not correspond to everyone. Nonetheless, all residents made a consensus acknowledging this atypicality but also making it the strong point of the project as all of them have made their apartments their own. Each of them has designed their partitioning and has been able to work and live in the same space.

In addition to the comfort appropriation, the stimuli have enabled the creation of awareness regarding the question of sustainability and the ecological crises we are facing. Denying (or reducing) the use of mechanical systems, which not only are energy-consuming but also operate independently of the user.

As well as not fitting into the architectural design process.²⁹⁷

In most of these projects, not only does the question of our thermal comfort enable ecological solutions, but it has also shaped different approaches to our comfort. Integrating in the earlier stages the thermal aspect and functioning of the architectural object.²⁹⁸ Highlighting local and cultural characteristics and strengthening their significance in people's domestic rituals.

The answers suggested in those projects are independent of specific devices but on adaptive actions. Creating awareness as:

*“Thermal qualities not only influence what we choose to do but also how we feel about the space.”*²⁹⁹

Thermal comfort does not become only a necessity; it gives meaning and value to one's experience of a place. Steve Baer emphasised the necessity of the inhabitants to open and close the shutters daily, enabling it to become the central element of each Zome, where all domestic acts are centred around the barrels' thermal properties.

In the case of the *Künstlerateliers* project, the architect has thrived in the integration of a high-technology - the sanitary and kitchenette unit - into his design process. Empowering it to become more than a conventional element but rather the unique high-tech element of a low-tech building. By its unicity, it creates an awareness in its use and its importance to the project

²⁹⁷ Heschong, *Thermal delight in architecture*, vii.

²⁹⁸ *Ibid.*, 65.

²⁹⁹ *Ibid.*, vii.

functioning. Offering, in the end, a sustainable architectural proposition whilst remaining affordable.³⁰⁰

It is also essential to highlight that all those projects generate an interior thermal condition that is much more variable than any machine-driven project.³⁰¹ Not only does it help raise more awareness of one's own thermal state, but it also enables us to feel more comfortable in hotter and colder conditions than in a mechanised project. Frédéric Haldi defines this circumstance as an "*adaptation-corrected temperature*".³⁰² Occupants use adaptive actions to respond to environmental discomfort. Thus, by having environmental stimuli that enable us to identify - more simply - the source or the required action for change, comfort is more easily obtainable and allows humans to understand and control their well-being. Consequently, they are more tolerant towards their environment temperature and accept hotter or colder conditions.³⁰³

Not only do the sustainable approaches of the case studies ignite a higher tolerance of our comfort to our environment's temperature, but they have also drawn us back to a more natural rhythm (of life). Our domestic activities, as well as our thermal actions for comfort, become seasonal patterns (or strategies).³⁰⁴ Through the case studies, it is also possible to notice how the mechanism of stimuli enabled all inhabitants to their

300 Hönger and Boltshauser, *Climate as a design factor: Architecture and Energy*, 17.

301 *As modern architecture has sought to create an invariable built-environment which doesn't succumb to the outside climate. This constant inside temperature in turn generates high energy consumption just to maintain its steady state.*

302 Haldi, *Towards a unified model of occupants' behaviour and comfort for building energy simulation*, 138-139.

303 Haldi, *Towards a unified model of occupants' behaviour and comfort for building energy simulation*, 135.

304 Hescong, *Thermal delight in architecture*, 5-6.

appropriation in their own way. In a way, we could say that stimuli are universal, in the sense that they could affect everyone - as it uses the human as the centre of their process, yet specific as their approach and experience is specific to each individual, hence its uniqueness.

By the appropriation process, in a way, the architectural object is not static; it evolves as it is transformed by the user who installed his domestic rituals.³⁰⁵ This is literally the case for Degelo's project - where the tenants designed their own space, but it is also the case for the two others. In each of these three projects, by not giving a defining function to a space and by not installing any technical elements or built-in furniture, the residents are free to inhabit the space as they wish - thus allowing free appropriation.

Whether it is by reducing technology and mobile furniture into a single element (Degelo), or by describing spaces by their thermal capacity (Lacaton & Vassal), inhabitants create their own experiences based on this liberty of arrangement. Even if certain rooms are predefined in Steve Baer's project (kitchen, bathroom), the rest can accommodate any function.

In a way, two hypotheses (or rather questions) arise:

- 1) Does the non-definition of space in architecture lead to a better appropriation and personal experience of the habitat?
- 2) Is Mies Van Der Rohe's "*Less is more*" accurate regarding the necessity for comfort appropriation?

Similar to a loop, our use of a place is shaped and depends on the

305 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 168.

intrinsic qualities of the architectural object. However, at some point, the architectural object undergoes the variations of use as the inhabitant wishes to adjust it to his needs and experiences. Consequently, our experiences shape architecture.³⁰⁶ Thus, through usage, architecture sets itself into a new motion, following the direction of the inhabitants' experience (during the use phase).

In a way, we intrust a building, an apartment, a space to the occupant who in turn builds the environment by experiencing it, by being aware of its many devices and elements, and by being in control of his comfort.³⁰⁷

306 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 168.

307 *Idem*.

BEYOND
MODERNISM -
TOWARDS A
BEHAVIOURAL
PROGRESS

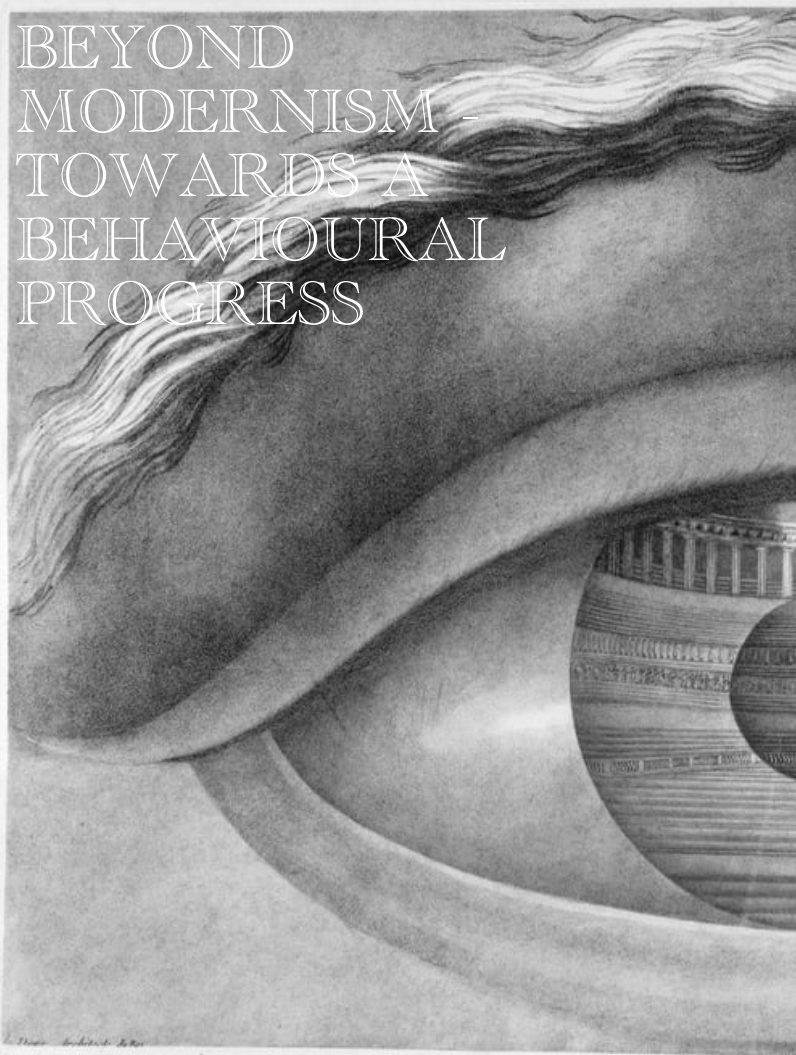
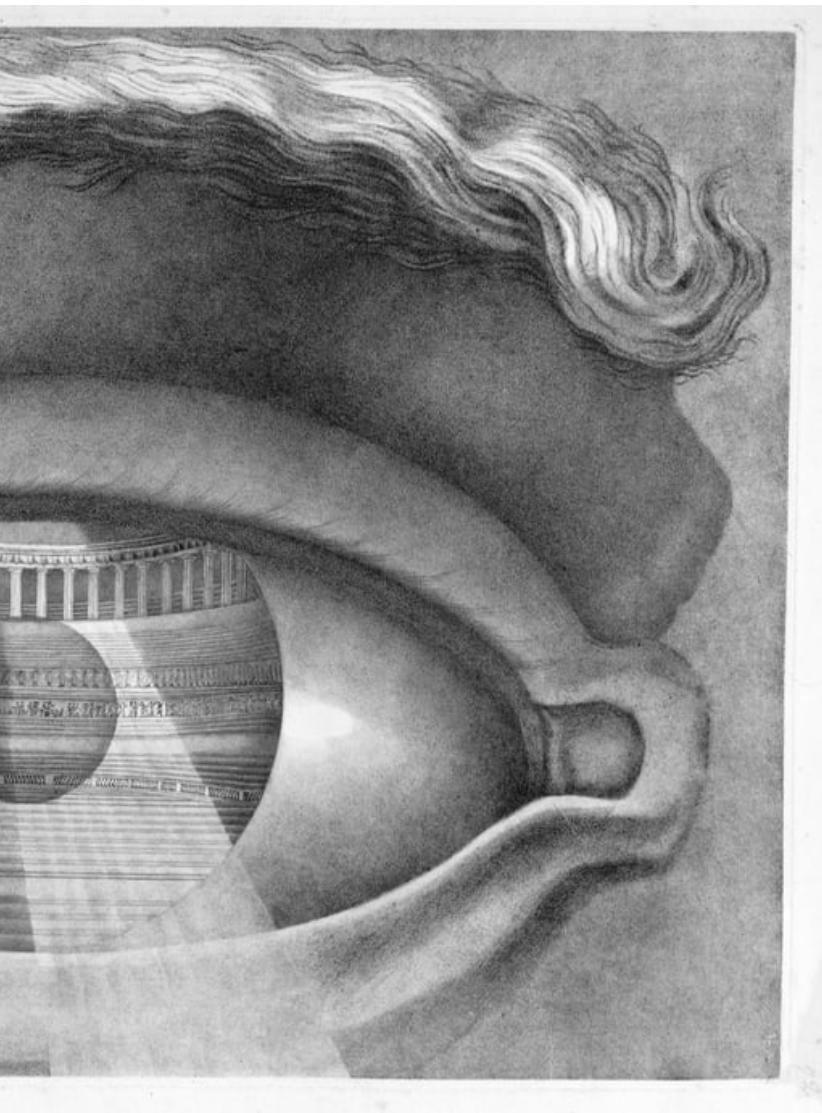


Figure 54. Claude Nicolas Ledoux, *Eye enclosing the theatre at Besancon*.



CHAPTER 8: GENERAL CONCLUSION OF THE ESSAY

8.1 Synthesis of the challenges

“Plus je médite sur mon art, plus je l’exerce ; plus je pense et agis, plus je souffre et me réjouis en architecte ; - et plus je me ressens moi-même, avec une volupté et une clarté toujours plus certaines.” ³⁰⁸

[*Translation:* The more I meditate on my art, the more I practise it; the more I think and act, the more I suffer and rejoice as an architect; - and the more I feel myself, with ever greater pleasure and clarity.]

A house is more than a physical shelter; it protects our body and soul. It is a fundamental element in an individual’s life, as without it, we become scattered beings. It becomes the centre point of our lives as it shapes our domestic rituals. Therefore, to some extent, we form it in turn.³⁰⁹ Nevertheless, more than anything else, it gives us comfort.

As detailed throughout this work, comfort is linked and has been influenced by various social, cultures, traditions, and ideas that find roots in us occupants. But at the core of it all, the heart’s fire became the first ever element to create an experience - an ambience - which transformed the house into a

³⁰⁸ Valéry, *Eupalinos ou l’architecte / L’Âme et la danse / Dialogue de l’arbre*, 32.

³⁰⁹ Bachelard, *The Poetics of Space*, 7.

home.³¹⁰ Architecture has grown from this idea and has drawn its definition and symbolism from it. Enabling architecture to progress into what we know today and growing comfort's definition and interpretations throughout the age. Just as the onion analogy adding new layers of meaning to the concept of comfort.

Furthermore, we have observed how subjective comfort could be (might it be because of political, economic or social reasons). Henceforth, shedding light on why it has been so complex to define it precisely. Moreover, it is intriguing to observe that the concept of comfort - in relation to our environment in particular - has only been theorised or discussed very recently (as can be seen from the bibliography used for this work - the vast majority of works having been written during the 21st century).

Nevertheless, as expressed with the concept of the *pharmakon*, our behaviour towards it has separated our routines from nature's seasonal patterns. Our creation of a built environment generated the artificial comfort that we still know to this day as we spend most of our time constrained in our built environment.³¹¹ Our climatic conditions disappeared as our freshly installed mechanical devices became the new essence of our comfort. Forgetting in a way our architectural heritage and vernacular culture for international siteless projects.³¹² Thus, architecture lost its role of natural mechanised shelter to become artificial containers.

Consequently, the more mechanised systems control our built environment, the greater the indicator of wealth and well-being

310 Heschang, *Thermal delight in architecture*, viii.

311 Rahm, *Architecture physiologique*, 149.

312 Espazium. *L'architecture comme climat construit*, Espazium. Accessed October 15, 2023. <https://www.espazium.ch/fr/actualites/larchitecture-comme-climat-construit/>

becomes. Transforming comfort into a consumerist concept which depends on wealth and consumption.³¹³

Jacques Tati's film *Mon Oncle* humorously showcases this rising lifestyle in France, where modern innovations invade the domestic life of residents as they are supposed to participate in making their comfort greater.

The film creates a satire of this modern approach where every device found in the modern house feels somewhat dictated by a stylist's point of view rather than for pure functionality, as they all seem less practical than the other. The ironic and clumsy use of those devices by the protagonist, Mr. Hulot, displays their non-intuitive usability despite being necessities for our domestic life. This suggests that the modern environment lacks comfort and convenience, and instead of bringing people and communities together, it has generated division and prevented human interaction. (This can be observed by the high fences around the house's garden and the struggle during lunchtime of having everyone around the table in the garden.)

313 Crowley, *The Sensibility of Comfort*, 752.



Figure 55 & 56. Jacques Tati, *Mon Oncle*.

Multiple times in this work, I have discussed the necessity of having the human - and all it encompasses - as the architectural object's main design element and focus. It is essential to specify that this is not a newly discovered approach. During the XXth century and the industrial times, numerous entities sought to standardise the architectural approach to make the building industry more efficient (in its production).³¹⁴ Humans became tools for this regularity. Albert Einstein's quote in Le Corbusier's book *The Modulor* describes how architects wished to create:

“[a] *scale of proportions which makes the bad difficult and the good easy.*”³¹⁵

Multiple architects established theories and projects based on the human body - Le Corbusier's *Modulor* (1) being one of them. Charles Édouard Jeanneret sought to link human stature with mathematical principles in his approach. Relating the Golden Section to human proportions, as this would become his basis for a unified international standardisation of architecture.³¹⁶

As stated, the “centred human” approach is not groundbreaking. Nevertheless, the issues with the attempts of architects such as Le Corbusier resulted from the standardisation of architecture and typification of the human body - the creation of the human-type. Those theories would even become, in a way, the pivotal

314 Ostwald, *Le Corbusier (Charles Edouard Jeanneret), The Modulor and Modulor 2 – 2 volumes*. Basel: Birkhäuser, 2000, 145.

315 Le Corbusier, *The modulor: A Harmonious Measure to the Human Scale, Universally Applicable to Architecture and Mechanics*, 58.

316 Ostwald, *Le Corbusier (Charles Edouard Jeanneret), The Modulor and Modulor 2 – 2 volumes*. Basel: Birkhäuser, 2000, 145.

moment of architecture's development in the standardised approach that we know today.³¹⁷

Moreover, it has furthered us from the sensible approach to comfort, which would be deemed too complicated to explain and measure - to reuse Albert Einstein's words. By making this subjective aspect of comfort non-existent, they have, as a matter of fact, transformed our houses into machines to live in.³¹⁸

317 Ostwald, *Le Corbusier* (Charles Edouard Jeanneret), *The Modulor and Modulor 2* – 2 volumes. Basel: Birkhäuser, 2000, 146.

318 Rybczynski, *Home: A Short History of an Idea*, 231.

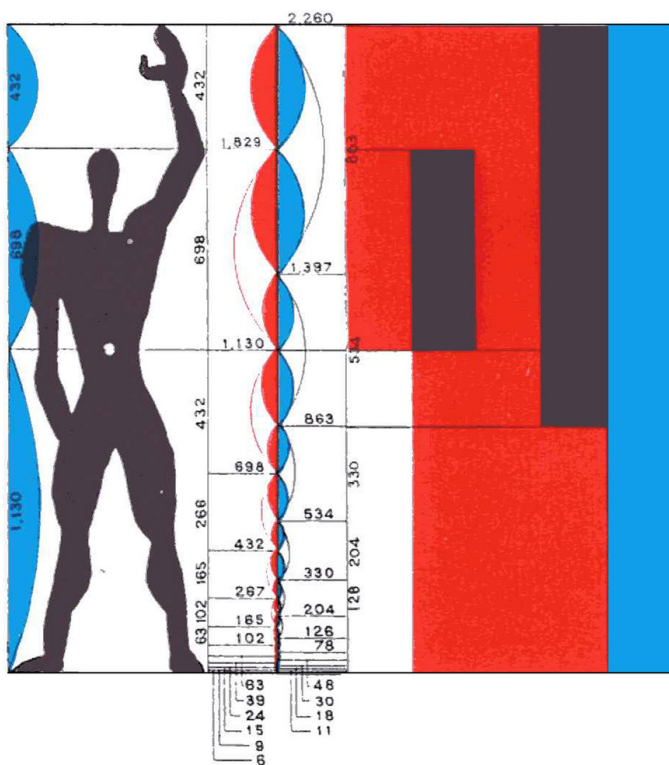


Figure 57. Le Corbusier (Charles Édouard Jeanneret), *Modulor I*.

This behavioural pattern has not only impacted architecture ever since, but it has corrupted the essence of architecture in its definition of creating environments.³¹⁹ Consequently, a universal approach of architecture could not generate specifications.

In a way, the CIAM meeting of Frankfurt accelerated the ecological crises we face today, as comfort is only defined by the installation of mechanised systems in houses. They tried to answer the housing crisis with technical answers that they deemed to be purely technical - as they only asked “*how*” questions, which did not question the essence of the problem, as the “*why*” did. The solutions brought out by the *Existenzminimum* reflect this technological approach. Creating answers which do not change our behaviour according to the emergency.

Nevertheless, just as showcased by the case studies, it is possible to achieve a higher and greater comfort at lower cost without having to reduce our habitat’s size.³²⁰ Paradoxically, through the suppression (or at least reduction) of the mechanised systems suggested by the CIAM meeting, we can offer superior and more conscious comfort. Whilst considering the climatic conditions in making the architectural object - just as Steve Baer’s House, for instance. What once was seen as a solution was, in fact, our demise.

One might say that Eupalino’s concern of discovering the most acceptable method for an allotted task resembles the awareness we should apply today regarding ecological matters. Today,

319 Novotny, *L’architecture et le milieu humain*, 31.

320 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, 10.

we should not search for the most efficient technical method for housing projects, rather the most acceptable one relative to ecological sustainability.

8.2 A gentle reminder to *Messieurs les architectes* ³²¹

“These virtues of shelter are so simple, so deeply rooted in our unconscious that they may be recaptured through mere mention.” ³²²

In our quest for comfort awareness and sustainability awareness, we must progress towards answers which do not depend solely on technical solutions but rather on a changing mentality. In a way, the importance of climate urgency should help change people’s awareness and behaviour towards the management of their built environment as well as how they shape it.³²³ We must start to employ strategies founded on natural climatic characteristics, which reduces our dependency on other (unnatural) energy sources. Whilst developing newer ways of inhabiting and living.³²⁴ To a certain degree, we should take a step back in our architectural approach and behaviour towards it.

Global warming should stimulate us to contemplate what once was architecture - the art of building climates (as in the past, they could not depend on those technological innovations and had to find solutions elsewhere). As well as return to this relationship between local climates and architecture which generated comfort.³²⁵

What Sou Fujimoto called “*primitive future*” highlighted

321 In reference to Le Corbusier’s chapter in: *Vers une architecture*, (1924).

322 Bachelard, *The Poetics of Space*. Beacon, 12.

323 De Carlo, *L’architecture est trop sérieuse pour être laissée aux architectes*, 272.

324 Rahm, *Histoire naturelle de l’architecture: Comment le climat, les épidémies et l’énergie ont façonné la ville et les bâtiments*, 281.

325 Rahm, *Écrits climatiques*, 105.

simultaneously the necessity for a new architecture (the architecture of tomorrow) and a return to essential actions - what he calls primitive. This did not mean returning to an original form of life or architecture, but instead remembering the interaction between space and man and his way of existing in space - as well as returning to a more natural way of living more in tune with the natural environment. Recollecting on the once conscious acts and actions of our well-being.³²⁶ (The fire had to be maintained by those who took advantage of its flames just as Steve Baer's shutters have to be opened or closed.) Paradoxically, this would mean taking a step back as we look at previous behavioural patterns and a step forward as we look for new architectural solutions.³²⁷ Through nature, we understand and learn about architecture and its functioning.³²⁸ Consequently, finding inspiration in comfort's essence and our understanding of its true meaning.³²⁹

To handle the global warming problem, architecture must begin to be more conscious of its methods and be aware of the implications of natural sciences. Rediscovering its original vocation.³³⁰ As stated by Vitruvius, the house's style (design) must be determined by the climate as they affect as much the elements of nature as our bodies.³³¹ Consequently, climate gives an identity to architecture and an identity to the active occupants of this architecture.

326 Lucan, *Précisions sur un état présent de l'architecture*, 210.

327 *Ibid.*, 218.

328 Andrew, *Louis Sullivan and the polemics of modern architecture: The Present Against the Past*, 74.

329 Rybczynski, *Home: A Short History of an Idea*, 221.

330 Rahm, *Histoire naturelle de l'architecture: Comment le climat, les épidémies et l'énergie ont façonné la ville et les bâtiments*, 285.

331 Pollio, Howard, Morgan, and Warren. *Vitruvius: The Ten Books on Architecture*. Translated by Morris Hicky Morgan ... With Illustrations and Original Designs Prepared Under the Direction of Herbert Langford Warren. [Edited and Translation Completed by Albert A. Howard.], 170.

In summary, it is possible to distinguish two key behaviours - or fundamental actions - that we must adopt to treat the question of conscious comfort in architecture (inspired by the case studies). Alternatively, to stay in the onion metaphor, to start and treat the vegetable's last rotten layer.

First and foremost, we must aim to embrace a new architectural approach, finding fundamentals in climate. Thus evolving our modernist version of comfort to a conscious comfort. Leaving a *space-capsule controlled life* to a *man/environment* system. Finding sophistication not in highly developed machines but in a well-thought-out project that makes use of available equipment and climatic resources and where comfort and climate management are linked to the overall design concept of architectural projects.³³²

As,

*“all [...] aspects of architecture and planning have environmental consequences.”*³³³

It might even be possible that no complex machinery may be involved at all - as some actions for comfort and environment control are as easy as drawing a blind over a window - which also does not ask for any sophisticated, complex mechanism.³³⁴ To further elaborate, we must shift our conception of nature and our behaviour of separation from it. We must proceed to work with nature's forces and its potential for a better living condition. We must refrain from applying universal methods

332 Heschang, *Thermal delight in architecture*, vii.

333 Piotrowski and Robinson, *The discipline of architecture*, 158.

334 Banham, *Architecture of the Well-Tempered Environment*, 302.

and solutions to particular problems. Climate layout, as well as regional variations, must be studied. This also means that architects must accept the climatic particularities while being more “in tune” with the seasonalities. Utilise the accessible environmental resources which can participate and lead us to comfort appropriation and awareness.³³⁵ Consequently, it is crucial to collect knowledge and new design systems from the relation of architecture and its environmental characteristics and impact.³³⁶

The second fundamental behaviour is the question of a human-centred mentality in a non-human-type approach. Ending up with a different conclusion of the modernist period. The biggest mistake of these architects was probably that in their approach, they never put themselves on the other side, the side of the people who use their architecture.³³⁷ Consider the body and its variations in the bases of architectural design as well as its relation to environmental characteristics.³³⁸

Consequently, we cease to define comfort uniquely by scientific calculable methods and stop quantifying subjective responses to our well-being. We begin to recognise that there are no absolute environmental standards as comfort is also relative to each and every one of us.³³⁹ One’s appreciation of temperature might differ from someone else, especially if one comes, for example, from a hotter climate and the other from a cooler one. Every culture has set its customs and activities depending on its climate and seasons.³⁴⁰

335 Olgyay, *Design with Climate: Bioclimatic Approach to Architectural Regionalism - New and expanded Edition*, 10.

336 Piotrowski and Robinson, *The discipline of architecture*, 159.

337 De Carlo, *L’architecture est trop sérieuse pour être laissée aux architectes*, 148.

338 Piotrowski and Robinson, *The discipline of architecture*, 161.

339 Banham, *Architecture of the Well-Tempered Environment*, 301.

In a way, the occupant's satisfaction becomes a form of objective and fundament in the meaning of building an architectural object. It, therefore, becomes the result of a collaboration. Either by a literal collaboration between the architect and the future occupants (as seen with Heinrich Degelo's project - 6.3) or by offering the inhabitant as much appropriation as possible.³⁴¹

Only once the full consideration of those two key behaviours is addressed can we begin offering a new approach to our comfort. Based on the ethical approach of awareness.

340 Heschong, *Thermal delight in architecture*, 31.

341 Friedman, *L'architecture de survie: une philosophie de la pauvreté*, 19.

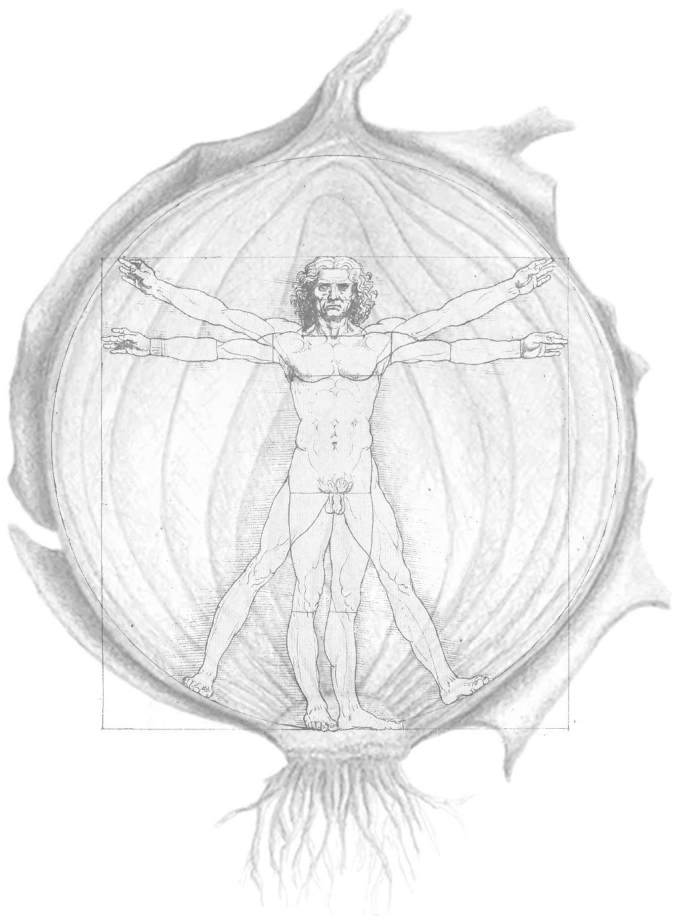


Figure 58. *Human-[anti-]type.*

8.3 Outlook

*“A society grows great when old men plant trees in the shade of which they know they shall never sit in.”*³⁴²

Everything explored in this work has tried to develop the concept of our comfort appropriation and the active participation of inhabitants in this process. Moreover, we have observed how action - through stimuli - as a response to our discomfort leads to awareness, which enables occupants to generate their own experience of a place and develop their comfort with it. Creating symbolism and meaning through their profound experiences.³⁴³ To some extent, we could say that we must learn to *inhabit* again (from the French “*habiter*”).³⁴⁴ Consequently, we should not patiently wait in our shelters, hoping for cultural and architectural change to arise and instantaneously provide us with greater comfort. We should, on the contrary, start without delay to adapt our condition to a more suitable situation.³⁴⁵

Following the idea of developing stimuli and awareness in the architectural project, we must thus reject our current quantitative and repetitive tendencies, which overrule the quality of the architectural object. The architectural discipline also becomes an educational and social task, as we have the responsibility to find new values whilst getting rid of our old habits and lack of awareness in our conventional and unconscious daily actions.³⁴⁶

342 Anonymous Greek Proverb, <https://www.goodreads.com/quotes/666987-society-grows-great-when-old-men-plant-trees-whose-shade>.

343 Tuan, *Topophilia: A Study of Environmental Perceptions, Attitudes, and Values*, 145.

344 Lucan, *Habiter: Ville et architecture*, 32.

345 De Carlo, *L'architecture est trop sérieuse pour être laissée aux architectes*, 159.

346 Novotny, *L'architecture et le milieu humain*, 34.

As written in subchapter 7.2, architecture should stop focusing on the idea of pleasing as many people as possible (generalised architecture). The new architectural approach and design should instead find its essence in the development of more specific typologies that correspond to a smaller group of people who are more willing to inhabit the place.³⁴⁷ This would also enable architecture to leave its generalist attitude and vision of the discipline, allowing for the specification of the profession. The architectural discipline would be one of designing specific elements and systems that enable the awareness process and generate action for comfort.

Some of us might be sceptical of the idea of action for their comfort, as many wish that:

*“les Cieux innombrables, et que la terre, et que la mer, et que les cités [...] et même nous voulons naïvement que les Dieux [...] s’adaptent à notre désir.”*³⁴⁸

[Translation: the innumerable Heavens, and the earth, and the sea, and the cities [...] and even we naively want the Gods [...] to adapt themselves to our desire.]

Modernist comfort has made us believe that things are owed to us and that by having to take action, it becomes an effort. Furthermore, this effort is seen as a chore, not a necessity. Most would probably wish to stay in their artificial garden of Eden, unworried and unaware.

³⁴⁷ As stated in subchapter 7.2, the more specific the typology, the more possible is the identification and appropriation of the inhabitant to the architectural object, thus enabling them to generate more easily their own experience of the place.

³⁴⁸ Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 116.

It may seem that, similarly to Vitruvius' drawing of Adam, we have the impression of leaving the utopic garden. The realisation of discomfort represented by Adam enduring the rain may make us dubious about leaving such a habit. Nevertheless, it is precisely by being aware of our discomfort that we can act for our comfort. Moreover, we do not realise the vitality of the concept of awareness. By being aware of the work that we do, not only do we understand it and respect it more, but we are also able to find different, more effective answers to our comfort.³⁴⁹ We might think that we are today in comfortable dwellings, but we do not realise the unconscious efforts in our daily lives. As well as how expensive today's comfort is.

This idea of comfort by awareness is not something that our generation can magically start embracing. Anyone who arrives in a new place probably has had to adapt to their new settings. The artists that inhabit Heinrich Degelo's project probably had to transform some of their usual domestic rituals. There is a period of adaptation for any new approach.

Nevertheless, our initial awareness of every process and action might become a habit, converting into a second nature - as it is for anything that we do a repetitive number of times. Consequently, we would integrate new cultural habits for future generations, giving them the foundation of a new definition of comfort as they would not have to go through this adaptive period.

Rather than seeing the process of awareness as an effort, I would instead describe it as a missed opportunity. The necessity for our behavioural change (subchapter 8.2 - *the 2 key behaviours*)

349 Dreier and Frenzel, *Social Loft, en quête de nouvelles formes d'habitat*, 148.

highlights the essential acts of action. Not only within the spectre of comfort but also in terms of our responsibility and our moral obligation.³⁵⁰

As the architectural object involves two processes: the process of creating and the process of using, everything which has been said concerns the architect as much as the occupant. The architects have the responsibility of creating an appropriate built environment, and the inhabitants have the role of operating it accordingly.³⁵¹

We would become what Philibert De L'Orme theorised as the allegory of the architect. Where the "good" architect is the one who can integrate knowledge from other disciplines. Highlighting his versatility of vision.³⁵² The symbol of a complete philosopher as he lets his discipline evolve through time and knowledge. But at the same time, a person who has restraint, and who does not allow himself to be seduced by excessive and unvirtuous consumption and ways of living or building.

The architectural discipline has the potential to renew its knowledge for greater comfort and awareness. The ethical consequences will create inheritance principles that will influence future architectural education as well as our practice of this discipline.³⁵³

350 Piotrowski and Robinson, *The discipline of architecture*, 159.

351 *Idem*.

352 Delorme, *Le premier tome de l'architecture de Philibert de L'Orme conseiller et aumônier ordinaire du Roy & Abbé de S. Serge les Angiers*, 282.

353 Piotrowski and Robinson, *The discipline of architecture*, 159.

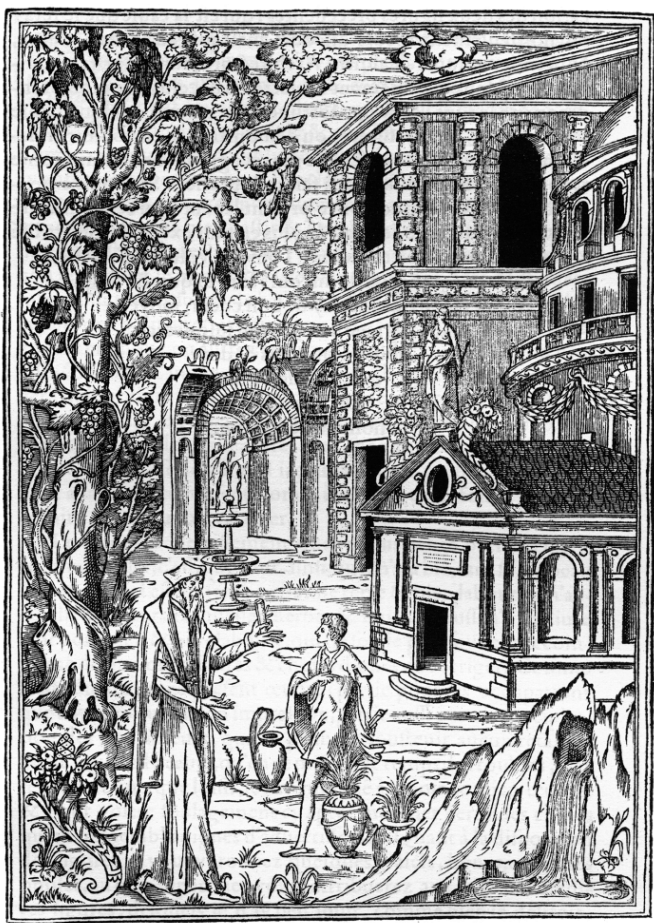


Figure 59. Philibert De L'Orme, *The Good Architect*, from *Le Premier Tome de l'Architecture de Philibert De L'Orme*.

8.4 Postscriptum

“O mon corps, qui me rappelez à tout moment ce tempérament de mes tendances, cet équilibre de vos organes, ces justes proportions de vos parties, qui vous font être et vous rétablir au sein des choses mouvantes ; prenez garde à mon ouvrage ; enseignez-moi sourdement les exigences de la nature” ³⁵⁴

[*Translation:* O my body, which reminds me at every moment of the temperament of my tendencies, the balance of your organs, the just proportions of your parts, which make you be and restore you in the midst of moving things; take care of my work; teach me, deafly, the demands of nature.]

[PS to the PS] *This subchapter must not be mistaken as the conclusion of my work - as the previous subchapters already have this purpose. This part is instead the expression of my personal epilogue.*

After finishing chapter 8, I felt inclined to return to the beginning of my work. More precisely, to Christopher Alexander's example of a comfortable room, which I can now recognise as a comfortable experience - in correlation to what has been written during the entirety of this essay. The motivation here is not to restate what I have already written about his example. It is instead an attempt to analyse his instance, but this time, with everything that has been developed since.

From the position of the mug in correlation to his arm's length.

354 Valéry, *Eupalinos ou l'architecte / L'Âme et la danse / Dialogue de l'arbre*, 45.

The placement of the cushions relative to his back. The intensity of the light and its effect on his eyes. Everything in his case has been thought out through an approach of awareness. Every detail has been carefully premeditated relative to his preferences and his body. He might have done it so often that it became an unconscious act. Nevertheless, he knows exactly what to do if he feels an inch of discomfort - changing positions, reheating the tea, or taking off a pillow. Scientific reasons purely define none of the elements that he describes - they might serve as a partial explanation. Still, it is not a strictly scientific analysis that will enable us to reproduce and understand his comfort experience.

Comfort might not be as complicated as described in the earlier stages of this work. Instead, I should have said that it is difficult to reproduce or put into action - especially for architects - as it is relative to everyone at some point.

Coming back to what I have written in my motivation introduction, I think that I am starting to understand better what my teachers were trying to tell me about what a comfortable or uncomfortable situation is. The architectural discipline is to find and create comfort in as many situations as possible. However, it is because we relate to it through our experiences and through our actions that we can define what is subjectively comfortable. Despite this, the idea of a human-type is more than ever absurd. Everything Alexander describes is related to the body but is based on his body, proportions, and likings. Nevertheless, that is also why his example or experience is so relatable and compelling. We recognise the elements that we can identify as enjoyable and this ritual that we all have experienced. This gives comfort its objectiveness. However, if we were in his situation, we would change a few things to our fondness. Maybe

the position and the number of cushions? Or the emplacement of the mug on the table? Some of us prefer reading our books in bed. Thus giving is subjectivity, or rather its specification.

I personally would not be drinking tea. Rather a glass of Japanese whisky with two ice cubes. Some music in the background, not too loud but subtle enough for me to hear and enjoy the background melody. As well as a hearth. Because who does not like the warmth of a fire and the site of its dancing flames on a cold, snowy wintery night?

The End

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