

# Introduction



# Introduction

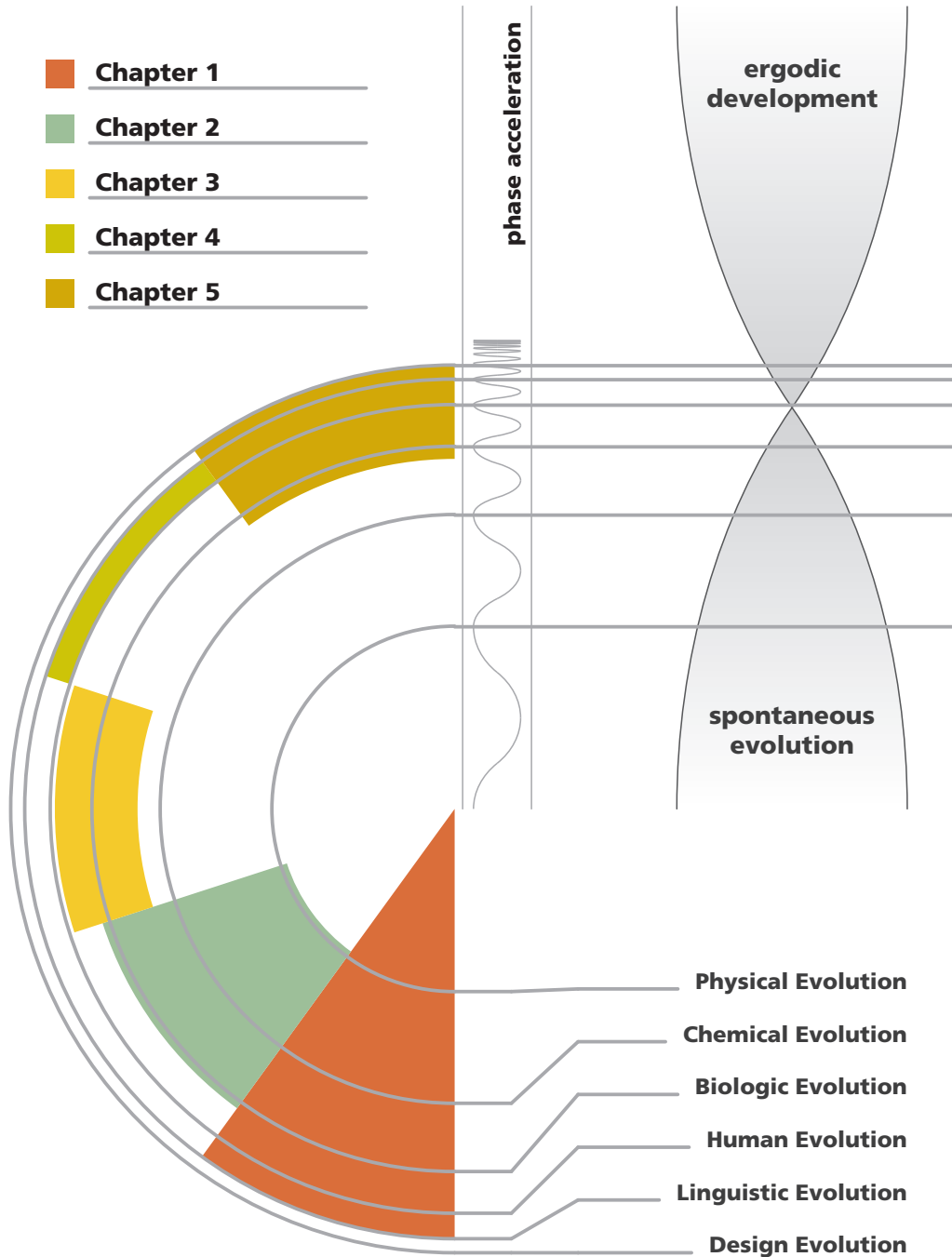
## **Thesis' motivations, intentions and structure**

This thesis is a compilation of results of a comprehensive study on evolution theory, aiming to find a fundamental formula for the study of evolution and propose a new method for Design. This idea was motivated with the perception of weaknesses in Design study on comprehending the semantics of products, aspects of that could not be explained in any state of art design methodology. After a preliminary analysis, this intuition was organized into a series of questions and suppositions converging to the hypothesis that the reason why some aspects of Design cannot be explained by the Cartesian form-function formula is that artifacts are not created from zero, every product is an evolutionary link, an element with a historical and evolutionary background and an paradigm or trend.

The intention to comprehend the evolution of design gave rise to two hypothesis, the first is that there is a strong cultural and technological "genetic" load on design, that artifacts have some characteristics that have no connection with practical functions, universal formal values or industrial limitations and processes, but instead are related to adaptation, as if they weren't generated from function, but answered the best way possible, or rather partially, to a functional request. And so, that there might be an eventual gap between a product's functioning and the function the product is supposed to respond to.

The second is that some of those characteristics are in actuality the result of a cultural and social development, that an artifact would be designed in different ways according to the cultural background of a society. Ultimately, there was the an even bolder supposition that the cultural composition of a people would have geographical, biological and temporal wherefore. Following the same line of thought, design should have evolved and still does like anything else, following a natural evolutionary flux.

# Introduction



# Introduction

That theory, in order to be tested or proved, required an extensive investigation on evolution in different levels. Initially, and that was summed in the first chapter, it was performed an inquiry on the most abstract conception of evolution, based on the idea of acceleration as the universal motor of every evolutionary level, an investigation that has been busying mathematicians and physicians' minds since the sixteenth century. In this first chapter, it is presented the most compelling claims of these theories, a series of speculations and experiments that build a reasonably solid frame of evolution, but not yet a model.

The investigation on natural evolution than, focused on the biological phase, from the appearance of life till the development of complex creatures intelligence and society. The second chapter points up a number of phenomena that over time got manifested either several times in different situations, characterizing a pattern, or manifested cumulatively in a same system in different moments or in different scales. The chapter is just a summed collection of these evolutionary phenomena in a preliminary classification.

The third part of this investigation approached the most directly connected to design phase of evolution. The study of anthropology and the development of the human occupation helped not just to find the human equivalent to natural evolutionary phenomena, but also to identify strait connections among design developments in different cultures as a result of their geographical and ethnical background. A more deepened research on linguistics confirmed the mathematical link between the biological evolution and suggested the sequential evolutionary development from geographical and ethnical composition of the peoples, development of languages in divergent structures as a consequence of these geographical, historical and ethnical differences, and finally, the development of design and aesthetics as a physical and visual manifestation of these cultures, a visual language that followed the development of cultures just like a spoken language, and even more fundamentally, as a late biological manifestation.

At that point, the basic frame of an evolutionary model was already defined,

# Introduction

but before outlining and listing them, it was proposed a first test. The idea was to identify a number of design issues and frame them in the model to verify its validity. The work chosen was already a sort of model proposal. The A Pattern Language reunited 253 “conflicts” on design, architecture and urbanism and proposed generic solutions that would theoretically fulfill every possible design issue. The material was not quite as perspicacious as the initial proposal, but it gave to the overall research a basic idea of applicability of the model.

In the end of this four layered gradual research, there emerged finally the outline of what could be a generic model of evolution, a set of simple and complex phenomena that would be at the basis of every evolutionary process. In the fifth chapter, the model is explained in detail, the names that were preliminarily pointed out are grouped and categorized. Some association among the areas studied earlier are used as examples but the application of the model as a method to understand the genetics of design required a deeper and more accurate verification.

The sixth chapter, the method, is a multidirectional testing of the model. Initially, the application of the model as a synthesis method, a way of understanding past, present and future of design through the evolutionary key. This chapter proposes a different reading of design evolution, not just as a great incidental sequence of genial ideas that happened uniquely thanks to the outstanding minds of designs and architects, but as a fluid sequence of chained events triggered by a more primordial motor. All the phenomena pointed out before are illustrated with design cases. Firstly, the fundamental phenomena and their variations in three different areas of design, Product Design, Communication Design and Informatics Design. Then, the semi complex phenomena, or rather, a simple combinations between the fundamental ones. After that, the complex phenomena described earlier are exemplified with long term design trends and evolutionary processes. Finally, the classical design timeline is framed into the model, evidencing the large scale manifestation of the simple and complex phenomena listed before. After that, the model is applied as an analysis method. The same three areas of



# Introduction

design abducted for the synthesis method's examples are now analyzed in the research for one of those blind spots of design, cases or products that due to the organicity and spontaneity of design just remained the way they were because no one thought they could deny their genetic burden or no one realized that a large scale environment changed their exigencies or possibilities. In the seventh chapter, some last conclusions and personal considerations are laid.

The Appendix chapter brings the transcription of a profound and prophetic article addresses and published in The Press, from New Zealand in June 13, 1863, that was a the trigger for the idea of creating the model and the method. Moreover, it brought the breakthrough idea that everything we design, not just autonomous machines, already belong to a new kingdom.

## **Preliminary semantic premises**

All the development of life was a slow cumulative process that started with the formation of organic matter from chemical, mechanical and magnetic processes and overtime increased in complexity, gathering gradually lifelike characteristics. The parameters of the definition of life, traditionally accepted didn't happen all at once, making the concept of life significantly relative. The categorization of viruses as partially living creatures illustrates well this concept. The very fact that multicellular complex organisms with different organs and tissues for distinct tasks are associations of bacteria with different origins, makes us understand the development of life in a more flexible way. All characteristics and behaviors associated to life are theoretically reproducible artificially, which places the biological manifestation as a relatively disposable component.

Some theorists using the expression post-biological life, interpret the development of machines, technology and artificial intelligence as a natural process, as if after the biological phase, there was a new rise of life, evolution and development. This process, started by man and its natural desire to transform its surroundings and create artifacts that furthered him to



# Introduction

perform functions not possible in any other way, theoretically, tends to an inescapable development of post biological conscience and intelligence. Along this logic, there comes an astonishing ascertainment, machines are not necessarily autonomously functioning devices, also because nothing living or non living can exist autonomously. A car is not an object that works independently, even because no machine or body can function independently.

If the idea that makes us think that the machines have overdone humans is the fact that they perform tasks more easily than men, a hammer is a machine because it manages to pin a nail into a piece of wood with more ease than a man could ever do with his bare hands. A stone could also be considered a primitive machine because it allows one to break the shell of a walnut in one beat.

The same pattern found in the development of life as a sequence of cumulative developments can also be found in the evolution of machines, from their most primitive forms till the development of consciousness and auto reproducibility. Following this principle, primitive artifacts are equivalent to the organic matter that preceded life, and any designed artifact is a primitive ancestor of this post-biological life form. The fact that the machines grow supported by the existence of human beings does not make them any less legitimized to become living or to be considered part of evolution, once even animals, fungi and plants could not exist without the support of bacteria or each other.

It means that a chair is not a four legged piece of furniture that follows the aesthetic language of the dinner table and matches beautifully with the rug. It is an artifact designed for a purpose, to accomplish a goal, and perform a function. Chairs, hammers, cars and magazines are primitive forms of machines, just like organic matter or the first protein chains preceded living creatures.

They are indeed very primitive, as organic compounds were once, primitive and unable to perform autopoiosis, to reproduce, multiply or die. They exist in a slow and unconscious drift till the pure case or human ingenuity produces the spark that will unleash the phenomenon of life.



# Introduction

The evolutionary processes through which all existing things undergo are indivisible, they are all connected and those connections are in fact transitions. The role of design in this evolutionary process is at the basis of this post-biological process, it is the multidisciplinary and transversal motor through which every machine or pre-machine is conceived.

Design, thus, was not a discipline invented after the industrial revolution, it follows the development of mankind since its beginning, and it is precisely the behavior that allowed man to be the biological entity capable of performing the transition from biological to post-biological. Thinking in evolutionary terms, especially in Design theory, is probably the key to transform spontaneous into rational and make this transition in a better more benignant and more sustainable way.

“The alternative to not thinking in evolutionary terms is not to think at all”

Peter B Medawar  
Nobel Laureate  
1960

