

**POETICS OF CHANCE  
UNEXPECTED FINDINGS IN THREE CERAMIC  
ARCHITECTURES**

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## 1. CHANCE AND NECESSITY

*Chance alone is at the source of every innovation.* Jacques Monod, winner of the Nobel Prize in Physiology and Medicine in 1965, uses this categorical and seductive affirmation as his theme for developing one of the central arguments of his essay, *Chance and necessity*, in which he attempts to explain the evolutionary processes of living organisms in terms of invariance and disorder.

Monod describes how disruptions can occur in DNA replication and translation mechanisms. These accidental changes are insignificant at a microscopic level, but their accumulation at the heart of a macroscopic system induces substantial modifications. These mechanisms are the only possible source of changes in the genetic script, which is the only repository of hereditary structures. This is why chance alone is at the source of every innovation in the biosphere.

For Monod this random process should be regarded as essential, but it is very different to the way games operate, for example those which involve using dice, in which uncertainty depends exclusively on a lack of control in the precision with which they are thrown. Chance is an essential feature of accidents, in which two series of totally unrelated events coincide, for example when someone is walking along and a tile comes loose and falls on them. In the same way, an event which results in a modification in the genetic code is essentially unforeseeable.

However, living organisms are intensely conservative systems. The stability of species depends on this state of affairs so, taken in isolation, a mutation is a very rare event. A single accident, once it has been inscribed in the structure of DNA, will be mechanically and accurately replicated and translated thousands of millions of times so that disruption gives rise to invariance and we go from the sphere of randomness to one of necessity. The only modifications which will be accepted and conserved during an evolutionary process are either changes which, at the very least, do not reduce the coherence of the system but reinforce it, or changes which enrich it with new possibilities. Chance is responsible for diversity in the global community of living organisms, and their stability and conservation will depend on necessity.

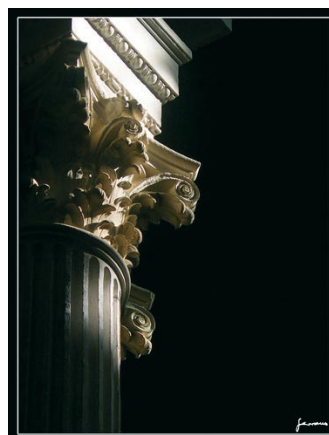


Figure 1. F. de Chambray, *Parallèle de l'Architecture Antique et de la Moderne* Corinthian capital.

## 2. COINCIDENTAL BEGINNINGS

Rafael Moneo, who won the Pritzker Prize in 1996, began the speech he delivered when he entered the Real Academia de Bellas Artes of San Fernando, *On the conception of arbitrariness in architecture*, with a passage by Vitruvius on the invention of the Corinthian capital.

According to this author, the sculptor Callimachus happened to be passing close to the tomb of a young Corinthian girl. On the tomb her nursemaid had put a little basket containing the things that the girl had loved in life and, to ensure that they would last, she had protected them from the elements by covering them with a brick. By chance, the basket had been placed over the root of an acanthus, which, when it flowered in the spring, curled itself around the brick, covering the basket. The sculptor perceived the delicacy and novelty of the composition and reproduced it in the columns he made for the Corinthians.

Moneo draws our attention to the way in which chance and arbitrariness in Vitruvius's text combine, contributing to the invention of the Corinthian capital, in his opinion the element par excellence of Western architecture. And he shows us how, taking this initial arbitrariness as our starting point, much of the history of architecture can be understood as the efforts of architects to make us forget this original sin.

At this point, Moneo's reasoning in the context of cultural inheritance is parallel to that of Monod in the sphere of genetic inheritance. The initially arbitrary transformation of an element shows how valuable it is by being used on innumerable occasions until its acceptance seems inevitable; discovery gives way to convention and convention becomes the norm.

The uncomfortable relationship between arbitrariness and architecture has existed throughout history. This started to change in the last quarter of the twentieth century when certain architects, such as Hejduk, Stirling, Gehry or Eisenman, assimilated and included it in their project strategies, combining arbitrariness and method. Through the analysis of his work, Moneo shows us that the relationship of the architect with arbitrariness is related to the way he approaches the constructed form as something which is accepted or freely chosen.

Both in Jacques Monod's essay and in Rafael Moneo's speech, chance emerges as a factor which is essential to change and linked to the origin of what is new. However, if in the field of biology it presents itself as inevitable, in the architectural project it emerges as the deliberate acceptance of the unforeseeable. At this point, our two paths separate and architecture, guided by the will, embarks on a route in which we attempt to give meaning to chance, including it in our projects through the mediation of our intention.



Figure 2. M. Duchamp. *The large Glass A. Siza. Schlesisches Tor. Berlin.*

### 3. UNEXPECTED FINDINGS

In 1926 the Large Glass by Marcel Duchamp was broken and shattered completely while it was being transported to a gallery in New York. Duchamp reacted in an unexpected way to the accident and, instead of protesting, as we would expect in response to the destruction of his work, he decided to include the accident in the creative process by declaring the work to be definitively unfinished. Alvaro Siza reacted in a similar way in 1980, when the words *bonjour tristesse* were scrawled on the façade of *Schlesisches Tor*, the block of apartments he was building in Berlin. Siza decided not to have the piece of graffiti removed, which would have been much easier to do than in Duchamp's case, so the text was left permanently stuck to the image of the building, as if it were necessary.

Architecture can assimilate an accident once it has been produced, but it also has the option of incorporating the unforeseeable as a substantial component of a project. The premises on which a proposal is based do not necessarily need to specify a single solution or a particular form, so the inclusion of chance does not imply the absence of project criteria or intention but the indetermination of result. The result will not be deducible from the direct application of basic principles, but it can be explained by them perfectly easily. The unforeseeable does not necessarily lead to the inexplicable.

In this case, chance acts as a driving force which promotes a change that is kept within the bounds of the limits imposed by the project. In fact, it is common to see how the possibilities contained in a proposal emerge, develop or transform themselves, as a result of the need to respond to situations and conditions which were not envisaged at the outset. Often the need to stray from the expected path leads us to take an alternative route which, as in the case of Callimachus, leads us to unexpected findings.

Using these discoveries as a starting point, some project plans go beyond the scope of a specific case and become research lines, which their authors explore through different pieces of architecture. If we follow their evolution, we can see how, in some formulations, a fortuitous start becomes a project strategy which seeks an objectivity that makes us forgive its source. In other cases, chance does not occur at the beginning but is integrated during the course of a project, for example through the combination of random and intended elements. Finally, there are times when it is a destination point, the end of a journey in which the coincidental manages to reinforce the coherence of our proposal.

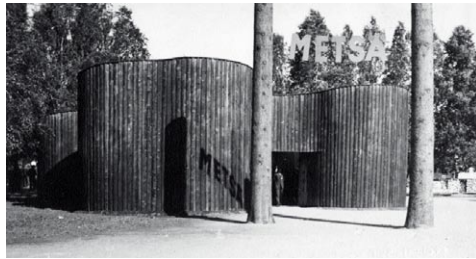


Figure 3. A. Aalto. Forest economy pavilion. Lapua.

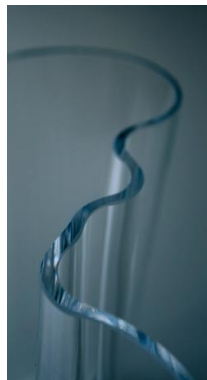


Figure 4. A. Aalto. Savoy vase.



Figure 5. A. Aalto. Muuratsalo. Ceramic samples for the Arts Centre.



Figure 6. A. Aalto. Arts Centre. Helsinki.

#### 4. PLIABLE CONTOURS

In 1938, Alvar Aalto designed the Forest Economy Pavilion for the agricultural fair which was held in Lapua in Finland. Using the title *Forest Pavilion*, Aalto developed a proposal which consisted of defining an exhibition space within a woodland setting. To do this he designed an undulating fence composed of sawn-off tree trunks with their bark intact. With these same tree trunks tied together using ropes he arranged an interior structure supporting a perforated roof, which permitted zenithal illumination of the enclosure. The flexibility in the definition of the outer perimeter shows itself to be an effective strategy for combining the inherent indetermination of an exhibition enclosure of this kind with its insertion into a context in which trees determine the space which is available.

In its materialization it echoes the magical symbolism of the forest in Finland expressed through epic tales like the Kalevala. Whatever the case, this solution based on small vertical elements is particularly suitable for resolving a curvilinear floor plan and elevation design which varies cross-sectionally, a geometry which had already been used by Aalto in previous productions, such as his acoustic ceiling in the proposal he submitted for the Helsinki Library competition or his first pieces of laminated wood furniture. However, unexpectedly, we find the most direct referent for this work in his former design in 1936 of a domestic object, the *Savoy vase*, which applies a completely different scale, material and use to that of the pavilion.

The wooden fence becomes a ceramic wall in the *Municipal Arts Centre* of Helsinki, built in 1958. Following a very similar design to the one he used for the pavilion, a continuous ceramic sheath, based on a curvilinear plan which varies in height, defines the perimeter and encloses an interior space which serves as the auditorium of the arts centre. Probably the permanent nature of the building in contrast to the temporary nature of the pavilion determines a material transformation, which, since the first experiments Aalto conducted at the house he built for himself in Muuratsalo retains, in its layout and format, the memory of his earlier experience, the *Forest Pavilion*. The non-interlocking bonds, the sunken joints, the small dimensions of the pieces and their rounded edges are decisions which adapt to the formalization of a ceramic structure designed with a strict radius of curvature, but which, at the same time, manage to maintain the image of flexibility and the pliable nature that was achieved with his wooden fence or the sheet of glass.

The profile of the *Savoy vase* might have originated from the observation of nature, but it is difficult to associate it with needs that derive from its use. However, in the *Forest Pavilion*, the conditions imposed by the woodland setting and the organization of the exhibition space do, to a large extent, determine the final design which was adopted. But it was in the *Helsinki Arts Centre* that the perimeter became an envelope which established a balance between the interior

and exterior with a level of necessity which seems to want to overcome its initial arbitrariness.



Figure 7. Cover of do.co.mo.mo Brazil/bsb.  
O. Niemeyer, A. Bulcão. Apartments in Belo Horizonte.

## 5. INTENTION AND RANDOMNESS

As a result of the intense collaboration between the Brazilian artist Athos Bulcão and Oscar Niemeyer in the buildings the latter completed in Brasilia in the fifties and sixties, a working method characterized by a precise equilibrium between chance and necessity emerged.

Immersed in the accelerated pace of execution which the building of Brasilia demanded, Bulcão investigated the creative possibilities offered by mass-produced modular elements and their repetition by means of combinatorial series or directly in a random manner. Pursuing this work methodology he completed works, such as the ceramic panels of the National Congress in 1958, the cement relief detail on the façade of the National Theatre in 1958 or the wooden lattices and partitions of the Palace of Itamaraty in 1967.

In the ceramic panels the module is normally a white glazed tile measuring 15x15 or 20x20 centimetres, on which a geometric figure is depicted in a bright colour - either blue, red or orange - and placed in an eccentric position in contact with one of its edges. The composition is based on a principle as simple as the 90° rotation of the piece, which enables the coloured figure to be placed in four different positions with respect to the grid. The whole composition is organized, either by means of the repetition of larger units consisting of a specific number of these 4, 6, or 9 modules, or by the random arrangement of each single element, although in some cases he uses a combination of both systems. The effect this produces is that of an unexpected grouping of coloured particles which vibrate while they are suspended in space.

This is the case of the ceramic cladding system that Bulçao proposed for the apartments in the Praça Liberdade, which Oscar Niemeyer designed in Belo Horizonte from 1954 to 1960. Here the geometric figure which was chosen, a cobalt blue square, occupies two thirds of the white tile and is centred next to one of its edges.

The cladding system is set back in the façade and confined between the strict succession of rippling planes of cement, which are approximately one metre apart and distributed three on each floor. The unaligned arrangement of the points of colour manages to free them, both from the strong horizontal plane component and the vertical nature of the building. The blue squares float independently between the sheets, avoiding any contact with the cement and with one another, owing to the white background of the tiles. This separation gives the envelope a lightness and vibration, which make it look almost like a curtain hanging behind the horizontal planes of the façade.

The experimentation on the perception of lightness in a building envelope would be addressed again by Bulçao in the latticework of the Itamaraty Palace, constructed in 1967. A separating element between the high gallery and the entrance to the palace is involved, in which the bonding condition between two spaces was to be the determining factor in the adopted solution. Made of wood, this separating panel is set on flat guides with a variable spacing, arranged from floor to ceiling at right angles to the gallery. Among them are hung, randomly, small blind wood panels lacquered in red, white, and black. From the room, the possibility of seeing them against the light allows us to understand the arrangement as a filter of a textile lightness, embodying a translucent memory of the Belo Horizonte experience.

In 1976, for the Green Hall of the Palace of the National Congress of Brazil in Brasilia, Bulçao created a sculptural wall made of lacquered wood in a colour similar to that of the room. Its square module was based on the already tested module in the Praça Liberdade apartments, but in contrast to the ceramic panel, the wall was to have a free position, so that it had to be self-bearing and stable. For this reason, the piece became volumetric and with the thickness arose the opportunity to perforate the inner square, instead of drawing upon the surface, an operation that would lead him, once again, to take up his research into the permeability of the wall, a line of research that had been conducted at Itamaraty. The lacquered wooden base reflects and mingles with the rest of the room; on this background, the randomly arranged square perforations provide us with a fragmented vision, decomposed and accidental, of what occurs behind. The holes show us what the wall conceals.

With the introduction of randomness in a modular system, Bulçao was able to make intense creative experimentation compatible with an elementary production system that responded to the needs and pace of the building work that he was doing. In this approach to the work, chance does not appear to be related to an initial discovery, but is incorporated into the process by randomness and is always tied to a defined intention for each project. The own formulation of this

experimentation system constitutes an effective finding that underpinned all his artistic research in relation to architecture.

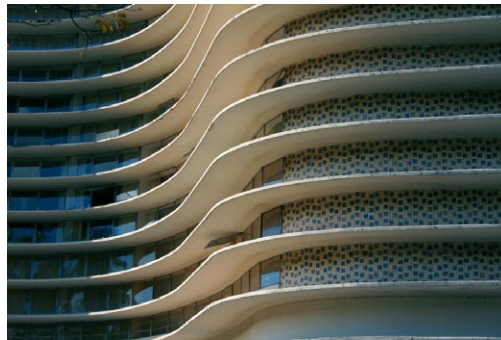


Figure 8. O. Niemeyer, A. Bulçao. Apartments in Belo Horizonte.



Figure 9. A. Bulçao. Wall of the Green Hall of the National Congress of Brazil.



Figure 10. O. Niemeyer, A. Bulçao. Palace of Itamaraty.

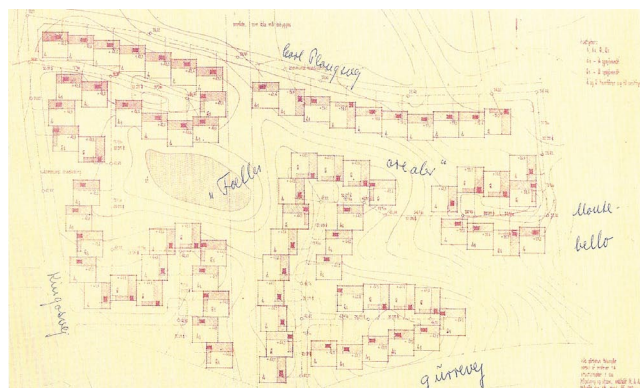


Figure 11. J. Utzon, Kingo Houses. Elsinor.

## 6. ADDITIVE ARCHITECTURE

In a brief text written in 1970 entitled *Additive architecture*, Jørn Utzon addressed the subject of industrialized building and architecture. For Utzon the principle of addition emerged from a search for freedom in response to needs which would give rise to a new architectural form. Pure addition means a design operation which is comparable, owing to its coherence and its effect on form, to the action of *adding more trees to the forest or more pebbles to a beach*. The reflections in this text are based on his previous experiences but, at the same time, they act as proposals which convert the text into the destination point of projects which have already been completed and the point of departure for new projects.

It is difficult to determine when this additive adventure began. It has probably been present throughout his entire career as an architect, but we can pinpoint 1953 as a key moment because it was then that he won the first prize in a competition designed to commission inexpensive housing for the region of Skåne in Sweden. By means of a stepped brick wall, Utzon defines a square 20x20 metre enclosure. Sheltered by this wall, in one of its corners he defines all the specifications for a family home facing out onto the central space. The brick wall, together with the ceramic flooring and the tiled roof, materially unify the structure, establishing a primary relationship of continuity with the landscape. The residential unit produced from this design has links with both the modern house-patio and the vernacular architectures of Nordic origin.

Paradoxically, although the proposal was never actually built, it was the starting point for a significant line of research into residential complexes formed by the aggregation of housing units. As a result of the Skåne project, the basic functioning of the residential module was decided, while its grouping system was gradually improved, thanks to projects such as the *Kingo* houses in Elsinor -Denmark 1956-, and residential complexes in Bjuv and Planetstaden -Sweden 1956-57- and, finally, in Fredensborg -Denmark 1959-65.

Even with the application of the same housing system, the different characteristics of each of these sites enable us to explore the opportunities each project offers. The aggregation principle in Skåne is based on an elemental repetition and the displacement of the modules, following the curved line corresponding to the road which gives access to the housing units. In the *Kingo* houses there is a symmetrical duplication of the unit in order to produce the access points and the clearly differentiated function of the roads and collective interior spaces organized around the small lake which already existed on the site. In Bjuv the housing complex, obliquely penetrating the flat space which is available, is freed from the street plan.



Figure 12. J. Utzon, Residential complex in Fredensborg. University of Odense.

But it is in the Fredensborg residential complex that the special conditions of the site enable the solution to show its exceptional ability to respond to an environment of greater complexity. The site is the side of a hill, which is not very steep and situated next to an area of forest close to the Royal Palace and Lake Esrum. The drawing of a line which delimits an environmentally protected area provides a solution similar to that of Bjuv. In this case, the housing complex extends over the protection line, but this occupation is compensated by a withdrawal on the side corresponding to the site. The proposal efficiently makes the most of concrete discoveries made in prior projects, but its greatest achievement resides in the delicate continuity of the collective space with the nature reserve setting, as a result of the initial design of the project, and in the efficient exploitation of the slope of the hill to build the units on different levels, converting them into a succession of terraces spread out over the landscape.

In the proposal for the University of Odense competition in 1966, the system becomes more complex and its entropy increases. At this point, it has positioned itself very close to its additive architecture formulation dating from 1970. As the complex gains in identity, the unique relationship shared by the pieces is gradually liberated, permitting it to assume a greater number of configurations that respond to needs which are more heterogeneous than the requirements of housing units. In this project Utzon seems to have attained the freedom which he referred to when he compared the additive principle to *adding more trees to the forest or more pebbles to a beach*. From then onwards, chance would play an important role in the formation of a composition whose logic would no longer depend directly on the number or the position of its elements.

Chance emerges at the end of a journey that started with the Skåne competition and constitutes a discovery which reinforces an extensively explored design approach, an unexpected finding that becomes a necessary ingredient in many of his future projects.

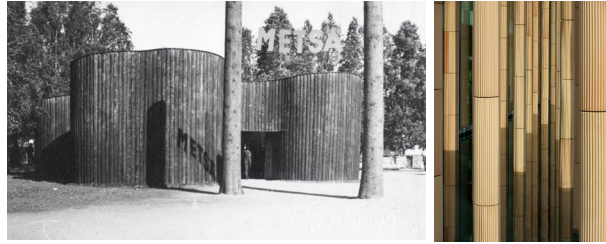


Figura 13. A. Aalto. Forest Pavilion / Mangado. Spanish Pavilion.

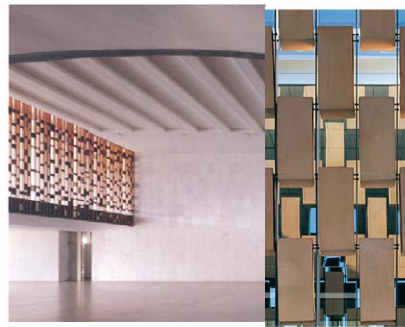


Figura 14. A. Bulçao. Itamaraty Palace/ Paredes-Pedrosa. Conference Centre, Peñíscola.

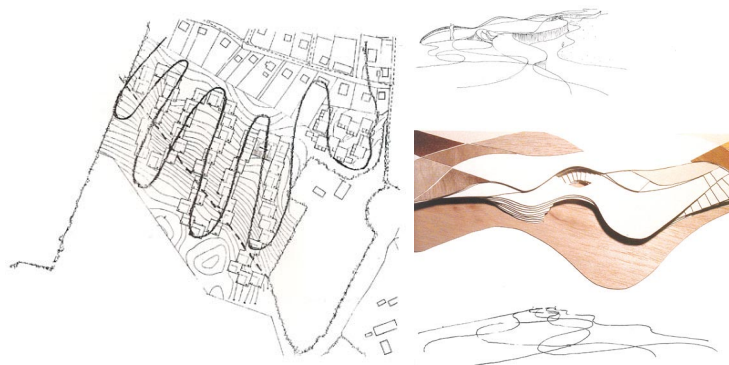


Figura 15. J. Utzon. Fredensborg / Ferrater-Martí. West Beach Promenade, Benidorm.

## 7. THREE CERAMIC ARCHITECTURES

It is tempting to try to establish a connection between the research lines which have been described above and some of the most brilliant accomplishments in contemporary ceramic architecture.

Without any intention of proposing that there is a direct link, we can detect a certain, perhaps coincidental but common, link between some of the approaches and solutions which appear in these works executed from the 1930s to the 1960s and recent projects, which will inform and define the scope of experimentation in the years to come.

Aalto's Forest Pavilion exhibition enclosure, consisting of tree trunks with their bark intact, seems to resonate in the shade of Mangado's forest of tile-clad pillars.

Against the light, the almost textile appearance of the pieces of wood suspended from Bulçao's Itamaraty Palace comes to mind when we contemplate the ceramic curtain at the entrance to the Conference Hall of Peñíscola by Paredes and Pedrosa.

In the oscillating movement Utzon creates on the environmental protection line in the Fredensborg residential complex, we are able to recognize the hand of Ferrater when he designed the undulating promenade of Benidorm on the straight demarcation line of the beach, pushing it into urban areas of the city.

If, as a theoretical exercise, we would like to find an explanation for these reasonable similarities, we might deduce that, faced with the need to respond to similar project conditions, it is easy to come up with the same solutions. Or, if we prefer to, we can put it down to the efficacy of a cultural inheritance which is transmitted invariably over time. Alternatively, we can identify randomness in these associations and conclude that everything is the result of chance.

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