

CERAMICS - FROM WALL STEREOTOMY TO SKIN TECTONICS, FROM THE MATERIAL TO THE PIECE

V. Gutierrez del Canto

Ceramics Chair, Madrid ASCER ETSAM University
Technical College of Madrid, Spain

1. INTRODUCTION

Ceramic = "burnt substance". We need to understand ceramics as a process designed to obtain something and not as a final product. It is a process with numerous applications. To obtain the final product we start with a pliable material, which is extracted from soil. It is moulded using water and, after a series of procedures associated with fire and water, it is burnt/dried, which permits the fusion of the material. It is an art which requires man to use the 4 essential elements and, manipulating them with his hands and tools, he manages to make a final piece. It is one of the few materials which have persisted since our origins, from prehistoric times when it was used to build underground caves to the current age of industrialization.

This text is an attempt to get the reader to think about how ceramics can create and configure spaces, analyzing the evolution of ceramics from the process of their manufacture to their final applications, and comparing and relating these to the evolution of architecture.

In the same way that the earth is ceramics, architecture is synonymous with space. They are immanent in both cases because ceramics is the art of moulding the earth and architecture consists of creating living spaces.

This is a reflection on how the final product (**architecture-ceramics**) depends largely on time and the steps which are required to produce it. In itself the manufacturing process has not varied but its form has changed. Initially everything was done by hand using very humble implements. Now the process is the same but industrialization has improved the means and tools that are employed to facilitate production and advances have been achieved with the use of additives to improve the raw material. The current ceramic process admits no short cuts, not only during the manufacture of ceramics but also during their conception. The ceramics of the potter's wheel must always be present, given that, although in some cases industrialization and new techniques have improved the final result, they have also impoverished and devalued these. Sometimes advances have led to the falsification of ceramics, to transvestism, when ceramics need to continue to be proud of their origins and not try to be something else ...**the ceramics of the potter's wheel should make their presence felt. Things must last and be true to themselves for their own sakes and not for the sake of appearances**, a view which is expressed as follows in Tanizaki's In Praise of Shadows:

" [...] Of course, a meticulous man will go out of his way to acquire the most trifling thing, [...] which he will stow under the stairs [...], where it is least likely to attract attention. He will conceal electric cables and camouflage switches [...] in such a way that sometimes, after so much capacity for invention, you feel a certain irritation when you are faced with such a display of artifice. An electric lamp is something which has now become familiar to our eyes so why do we do things by halves, instead of leaving the light bulb

bare with a simple shade made of thin milky glass over it, which gives an impression of naturalness and simplicity?"

Things should be themselves and look the part too.

In architecture it is the same. We must not let ourselves be carried away by technologies, limitless access to information and instantaneous production when we design a project. Architecture which involves drawing with a pencil is falling out of fashion, when it is the very tool of our trade. It gives us time to think and develop our ideas. When the tool we work with is faster than us and the ease with which we can "express" ideas is more immediate, we stop thinking and all we do is produce. We do not let our ideas mature enough and we take short cuts, which may well take us to the same destination, but there are a lot of things we fail to see on the way, as Hugo Velásquez DF said in 1929: "In ceramics the creative process does not admit short cuts". Although ceramics are being referred to here as pieces, we can extrapolate this viewpoint to ceramics in general or, carried away by the immediacy of information and attractive graphic solutions, we can adapt our pace to the internet and the latest technologies, which lead us to forget the value of things.

In a text by César Jiménez de Tejada, which discusses the fable of the Rebellion of the Classrooms, we read the following:

"[...] Information and its immediate and unlimited access spread within the world of the universities like a panacea which would enable a range of solutions to be found to urban problems. As a result an infinite number of proposals emerged in which architectural value was measured in terms of the originality of the solution and its global versatility. [...]. It was enough to search here and there to find an unending number of solutions. Who was interested in words like order, harmony, reason, beauty, the senses, etc. any longer? If the methods of approximation and the perception of ideas of the XXth century avant-garde got left far behind, what is there to say of our more ancient history? [...]"

The ceramics of the potter's wheel and the architecture of the pencil must survive and new technologies and advances must serve them and not absorb them.

From a conference by Peter Zumthor entitled Atmospheres, amongst the many interesting things he said, I would like to rescue one which I think is related to what Tanizaki wished to express in the text quoted above and which I am attempting to recover in this essay:

"[...] I try to do the same thing in my buildings; to ensure that I like them and you do too, and, above all, that they are in keeping with their use. We should accompany our projects to the end, prepare things, stimulate, offer

people a pleasant surprise or relaxation, but always, I must add, without being in any way academic; everything must feel natural."



Figure 1.

In the same way that the earth is ceramics, architecture is synonymous with space. They are immanent in both cases because ceramics is the art of modelling the earth and architecture consists of creating living spaces.

Over the centuries space has been studied and defined by innumerable philosophers, architects, artists and theoreticians and over time it has evolved, but it has always been conditioned by building. Space is contained, enclosed vacuity and it is "architecture" which has the ability to configure it, depending on the boundaries which contain it.

Throughout history this idea of space has undergone modifications, which are generally conditioned by culture and technical or building limitations. As **Louis I Kahn** said:

"Architecture is the considered construction of spaces and the continuous renovation of architecture stems from the evolution of our concepts of spaces".

Space is contained emptiness and architecture consists of playing with it, trapping or delimiting it, letting it escape and flow.

Lao-Tse (550 BC) considered emptiness to be what gave things their utility and it is clear that it exists because there is something which delimits and envelops it. If we accept this premise, several levels can be defined. Basing his classification on chapter 11 of the Tao Te Ching, Van de Velde (1863-1957), a Belgian architect, defines these three levels:

"Thirty radii meet at a single axis;

Precisely where there is nothing we encounter the utility of the wheel."

This refers to tectonic space, the addition of elements which create spaces, which give it some form of use.

"We bake clays and make pots;

Precisely where there is no substance, we encounter the utility of pots."

This refers to stereotomic space, to the subtraction of material to create spaces.

"With the chisel we make doors and windows;

Precisely in these empty spaces we encounter the utility of the room.

So it is that we regard possession as beneficial, but to have nothing is useful."

This refers to transitional spaces, which link the interior to the exterior.

Emptiness is present in the three spaces and it is the way they are mixed or arranged which configures one space or another. The first is a space which is the result of the addition of pieces, in which ceramics are to be understood as pieces, as a material, which configures a tectonic space as opposed to the second, a space created by the subtraction of material, in which ceramics are conceived as a continuous, pliable material; and the third and last is space which links the exterior with the interior, for example, in the case of the pantheon, it would be the oculus, the element which, as Jesús Aparicio puts it in the text *Stereotomic Thought*, The Pantheon:

"[...] In the Pantheon the wall closes off an interior space from the exterior and vice versa. The wall is an entire continuum which materializes the idea. Space emerges at the opening of the zenithal oculus, which, uniting the exterior and the interior by means of illumination and vision, evokes emotion. [...]"

My aim is to analyze the evolution of ceramics over the years in parallel with the evolution of architecture, taking space as a link they share, and to examine how they have coexisted in the creation of spaces, how ceramics conceived as a continuum, as material, participates in stereotomic spaces and how ceramics as pieces, as material, participate in tectonic spaces. This journey, far from appearing to be the result of chance, has occurred as a consequence of building. In its origins as a substance which is moulded it has always had a supporting (stereotomic) role in walls and, with the appearance of new techniques, it is being reinterpreted, but applied in a different way, as material, as (tectonic) piece.

In order to be loyal to the sayings of Lao-Tse we should all do a theoretical exercise with our projects. We should start a project thinking of an abstract wrapping device or container, something neutral so that we can concentrate on spatial configuration without worrying about which cladding system or latest skin technology we are going to apply. In this way we will prioritize space above other considerations and, once we have configured it, it will tell us what type of covering, container, skin, etc. to use. Everything stems from the idea, which is loaded with content, and what it will do is to add and confer value, and not detract importance from the space or become the protagonist.

Far from wanting to separate space from its wrapping or container, the

exercise should be understood as an exaggeration to enhance the value of space in comparison with the outer layers that are so fashionable of late and which are designed with no thought of what they contribute to space, except in terms of architectural display. When we had more limitations, in terms of construction and graphics, we were more loyal. Except for differences in perception, it is rather like a gift in its wrapping paper. If the wrapping paper is the most beautiful part of the present, it is almost better to leave it as it is and observe it. Then it is no longer what it pretended to be. It has become an object, the wrapping paper has to do something for the present, etc. It is curious that we can find ourselves in a situation where the wrapper is nice but the present is ugly, but we rarely find a nice present wrapped in paper which fails to do it justice. If someone has spent money and time on a present, they will try to get the right gift wrap.

Ceramics needs to be understood as a material which is capable of contributing value to space. It is a material which can be presented in many ways and, depending on how it is treated, it will configure space in one manner or another.

SIGFRIED GIEDION analyzed spatial evolution through the course of history and summarized it into three historical moments:

Architecture as bodies of radial space (Egypt, Mesopotamia and Greece). External shapes predominate and space is considered to be empty.

Architecture as interior space (Roman, Medieval I (Romanic, Gothic, Renaissance and Baroque). Religious and social changes underlie changes in architectural forms and the discovery and development of new techniques.

Architecture as form and interior space. The most decisive influence came as a result of the revolutionary building methods developed by industry in the XIXth century.

To illustrate this trajectory I will analyze "extreme or theoretical" situations in which the stereotomic and tectonic concept are the generating principle of architecture and I will relate them to ceramics when their intrinsic value and character are maintained, comparing historical moments in architecture with current or recent works and explaining how ceramics participate and configure space.

The origins of the use of ceramics, as an unprocessed material, are **subterranean buildings**, the closest thing to the conception of stereotomic space, in which theory is one with practice. It is the emptying of a material for the creation of spaces, it is when architecture responded exclusively to a single use, to resolving a functional problem without concerning itself with appearances.



Figure 2.

The first references to brick are in the VIIth century BC, in the period of the **Mesopotamians**. Their settlements around the Euphrates and the Tigris used local raw material for construction purposes, to put up buildings. This is the most “romantic” period of ceramics, when people built with what came directly from the earth and it was extracted in situ. During this period buildings were treated as objects, in which space was contained, and interior-external connections were avoided.



Figure 3. Choghazanbil2.



Figure 4. Villa Malaparte.

A contemporary example which responds to the same principle is the **Villa Malaparte**, built by Adalberto Libera and Curcio Malaparte, the owner and a participant in its design, 1938/40, which gives the impression that it has always been there. The steps which greet you when you arrive seem to emerge from the rock and solidify in the final parallelepiped. The achievement here is the building of the location, the place itself. It is presented as a sculpted object containing a space, which it then allows to escape through tightly controlled openings which frame the incredible views of the cliffs.

In the period of **Roman architecture** from the third century BC to the fifth century AD brick reached its peak as a building material. Technical advances enabled the Romans to erect buildings, such as thermal baths, with their impressive brick manufacturing methods which worked in a “sincere” manner. Perhaps the heyday of brick had something to do with the discovery and the conquest of interior space. These are static spaces, surrounded by thick walls, which create and even contain spaces. They are walls which, using touch, have been virtually moulded by hand and they not only create interior space but also spaces within themselves.



Figure 5. Pantheon ground plan.

If during the period of subterranean buildings they removed earth in situ and modelled it, now they treated ceramics as a continuum and, once it had been extracted from the ground, they moulded it to contain space. It is easy to imagine the architect as a potter. Instead of using a pencil and a drawing board, he used a potter's wheel and a lump of clay, which, when modelled by hand and experience, is able to create a useful space, in one case to contain water and in the other to contain space.

The Gondomar Multi-Use Sports Complex, by Álvaro Siza, is a recent example which demonstrates that approaches dating back 20 centuries are still valid. Clad in brick and freshly sculpted, within its walls it houses service spaces and it forms a bowl as if it were a served space which is colonized with race tracks and rows of seats in a unique static space. The skylights in the zinc roof give a temporal dimension to the space.

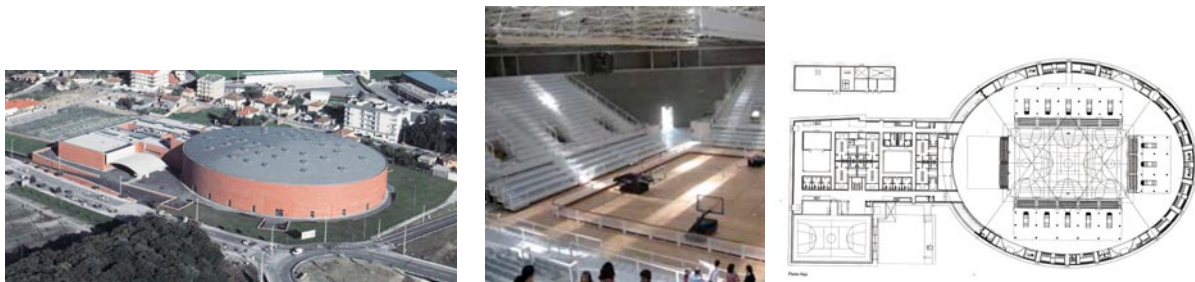


Figure 6.

As a result of Spanish-Muslim stylistic influences, **Mudejar architecture** (in which brick has a strong presence, owing to the fact that it is a material which

was cheaper and easier to work with) emerged in Spain and persisted from the XIIth to the XIVth century. The use of brick enabled people to incorporate Islamic decoration. By "sculpting" a brick wall they transformed it into a canvas decorated with religious motifs.

As a contemporary example we might refer to the **Home of Arvéus by Alejandro de La Sota**, in which he dares to design a continuous, windowless wall made with curved bricks that make the façade vibrate. It is easy to see how the architect sank the chisel into the mass of the brick to rip open the wall as if it were a vessel of some kind. It is clear that the wall is composed of many pieces, but the image the building projects is that of a sculpted, torn continuum.



*Parroquieta de la Seo (La Seo Parish Chapel).
in Zaragoza*



*Vivienda Arvéus by Alejandro
de La Sota.*

Figure 7.

The **Kolumba de Zumthor** museum is a modern example of working the thickness of a wall. In this case the architect sinks the chisel right into the wall to make holes and create a trellis, which enables us to see the width of the wall. The scale of the gaps in comparison to the body of the wall accentuates the continuum.

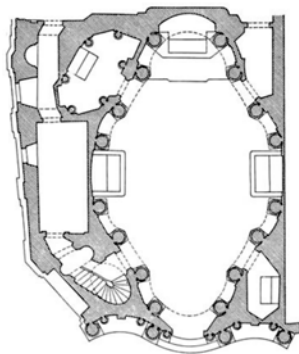


Figure 8.

The revaluation of the wall during the **Renaissance** meant another resurgence in the use of brick, in particular as a reflection of the study of Roman architecture. The conception of space is an evolution of what was initiated in the Roman period. They are static, homogenous and symmetrical spaces and ceramics are nearly

always present as building elements, which were regarded as a continuous material, almost like the continuum of the vessel that contains a space. This thick material can be sculpted, whether as a means of expression for religious themes or punctured to enable light to penetrate its interior.

A further step in the modelling process was the **Baroque** style. The search for movement in cladding systems and asymmetry began to generate walls which could be convex on one side and concave on the other. This took to an extreme the image of the potter, who, exploiting the ease with which the material can be manipulated, is capable of modelling a building to distort its volume and project an exterior image that fails to correspond to the space which is inside. They are what Antonia María Perello, in her book *Las Claves de la Arquitectura* (The Keys to Architecture), calls *insincere spaces*. In this period brick has a constructive presence and it continues to be used as material, as a continuum which can be modelled, but it is always covered with other less “mediocre” materials.



San carlos de las cuatro fuentes.

Figure 9.

The last step explaining the way in which ceramics have been used to configure spaces is related to the **industrial revolution** and the new building techniques, which consign brick to a role as a filler material. Steel, glass and concrete make brick a poorer, secondary material which is used for very specific purposes and it loses its intrinsic value as a building element.

The evolution of building techniques should prompt us to think about what other direction we might take to use ceramics, which is something completely different to erecting brick walls with perfectly aligned windows and rows of balconies or distorting the ceramic continuum with false ceramic façades that try to seem continuous when they are not. **We should avoid anything which it takes more to imitate than to be.** I have never liked things that appear to be something, but, when you look at them from behind, what you discover is a complicated system devised to deceive us.

New ways of using ceramics need to focus more on their use as independent pieces so that they can then be displayed as they are. If the ceramic is thin or if it is thick but light, it can be exhibited and, if it is curved, it can boast about the fact and show that it is proud to be what it is.

Returning to the image of the potter, I imagine myself designing and modelling a piece which I will then hang out to dry using steel expanders that will protect me from the light from the south.

Whereas I used to think of the potter as the creator of a continuum which sets boundaries or delimits space, now I imagine him as the creator of a beautiful and useful piece, who solves a problem related to space, light, noise and so on or who adds value and configures space, colour, brightness. But this all entails understanding ceramics as material, as pieces that display and do not disguise themselves.

Some outstanding examples, which I believe use ceramics in this way and make the most of its qualities, include:

El Palacio de Congresos (The Conference Centre), Paredes & Pedrosa. It is composed of ceramic pieces arranged in the form of a 3D mesh which protects the entrance lobby from the sun. By means of an ingenious system, the pieces are twinned to form a lattice window, although, owing to its scale and the way it is presented, we comprehend perfectly that it is the result of the addition of pieces. They resolve the transition between the interior and the exterior by means of a single piece which protects you but still lets you see. It is a space in which you can be inside and outside. It is clear that they have not modelled the pieces, but I am sure they visited the factory many times to see the work in order to ask the potter to change something, to listen to the voice of experience and to modify the details.



Figure 10.

La Biblioteca Nembro Archea Associatti (The Nembro Archea Associatti Library) is another example of how to understand ceramics as pieces, as addition rather than subtraction. In this case, as if they were the pages of a book, pieces of terracotta are pierced with steel tubes which permit them to rotate on their axes, creating a veil, which affords protection from the sun. Somewhat opaque in nature, it gives a uniform image of the exterior during the day as it unifies the whole of the interior. Once we are inside, it is quite the opposite. It becomes a light glass façade and at night it is transformed into a single piece, almost as if it were ceramic lacework, like those perforated vessels that look solid when the candle inside is not lit but look as if they are going to melt when it is. When I look at this façade, I feel like taking one of those sheets and bringing it home to put on the table as simply a very intense red, uniform, shiny object ...



Figure 11.

Now that we have more means at our disposal and we can do what we like with ceramics - "We can even make wood with them" - this is when we have to be more aware of the potter's wheel and the potter, and feel almost like one when we are sat in front of our drawing board so that we can imagine the ceramic we need for our project and we can make the most of industrialization to repeat it. As Lao Tse said at the beginning of this essay, 30 radii meet at a single axis and it is the space which is created between them that makes the wheel go round.

The evolution of ceramics and the new uses to which they are put will involve returning to their origins, to the creation of pieces of intrinsic value, but now we must use techniques that permit the industrialization of pieces and mass production, although never forgetting what we imagine at the potter's wheel.

REFERENCES

- [1] Las claves de la arquitectura. Antonia Mario Perello.
- [2] Libros de la Tradición, composición Tao te Ching Lao Tse, version by Luis Racionero.
- [3] El Muro, Jesús Aparicio.
- [4] Adalberto Libera, serie di Architettura.
- [5] Alejandro de la Sota, published by Pronaos.
- [6] La poética del Espacio de Gastón Bachelard.
- [7] El elogio de la sombra, Tanizaki, Biblioteca de ensayo Siruela.
- [8] Como sacar provecho de los Enemigos, Plutarco, Biblioteca de ensayo Siruela.
- [9] Conversaciones con estudiantes, Eduardo Souto de Moura, GG.
- [10] Pensar en arquitectura, Peter Zumthor, GG.
- [11] Atmósferas, Peter Zumthor, GG.
- [12] Aprendiendo a pensar, Alberto Campo Baeza, nobuko.
- [13] Louis I. Kahn, idea e imagen, published by Xarait ediciones.
- [14] Inquietud teórica y estrategia proyectual, Rafael Moneo.