

Athens Institute for Education and Research

ATINER



ATINER's Conference Paper Series

ARC2014-1264

**Hybrids for a Space under
Construction: The Intervention of
Jorge Oteiza in the Chamber of
Commerce of Córdoba (1953-54)**

**Emma Lopez-Bahut
Assistant Professor
University of A Coruña
Spain**

An Introduction to
ATINER's Conference Paper Series

ATINER started to publish this conference papers series in 2012. It includes only the papers submitted for publication after they were presented at one of the conferences organized by our Institute every year. The papers published in the series have not been refereed and are published as they were submitted by the author. The series serves two purposes. First, we want to disseminate the information as fast as possible. Second, by doing so, the authors can receive comments useful to revise their papers before they are considered for publication in one of ATINER's books, following our standard procedures of a blind review.

Dr. Gregory T. Papanikos
President
Athens Institute for Education and Research

This paper should be cited as follows:

Lopez-Bahut, E., (2014) "Hybrids for a Space under Construction: the Intervention of Jorge Oteiza in the Chamber of Commerce of Córdoba (1953-54)", Athens: ATINER'S Conference Paper Series, No: ARC2014-1264.

Athens Institute for Education and Research
8 Valaoritou Street, Kolonaki, 10671 Athens, Greece
Tel: + 30 210 3634210 Fax: + 30 210 3634209 Email: info@atiner.gr
URL: www.atiner.gr

URL Conference Papers Series: www.atiner.gr/papers.htm

Printed in Athens, Greece by the Athens Institute for Education and Research. All rights reserved. Reproduction is allowed for non-commercial purposes if the source is fully acknowledged.

ISSN: **2241-2891**

18/09/2014

**Hybrids for a Space under Construction:
The Intervention of Jorge Oteiza in the Chamber of
Commerce of Córdoba (1953-54)**

**Emma Lopez-Bahut
Assistant Professor
University of A Coruña
Spain**

Abstract

Collaborations with different artistic disciplines are a key factor in understanding the development of Spanish architecture in the 1950s. The sculptor Jorge Oteiza is an essential figure, as he worked with different architects on different projects, not only through his sculpture, but also by reflecting on the architecture itself and how it was integrated with other arts. Oteiza applied the things he learned by being in contact with architecture to his sculptures, and was also capable of translating spatial aspects to the architectural facets of his sculptural work

In this paper I analyse the specific case of the Chamber of Commerce of Córdoba (Spain, 1955), built by the architects Rafael de La-Hoz and José María García de Paredes, one of the first examples of organic architecture in Spain. Space, as a fundamental quality of organic architecture, and emptiness, a key aspect of Oteiza's sculptures, converge in the building.

This was Oteiza's first experience in which his sculpture had to be defined through an architectural space, which it also served to configure and define in an extreme way. Oteiza worked on the building while it was under construction, creating four pieces. The result was that they adapt to the building perfectly. What we see is a hybridization of sculpture and architecture, which without losing any of their own characteristics, absorb some of those of the other discipline. Similarly, all of the building is defined by the presence of these sculptures, in terms of its space, shape, lighting and use.

Keywords: Organic architecture, space, sculpture, Jorge Oteiza, Spain

The Chamber of Commerce and Industry in the Spanish city of Córdoba reveals the interest in combining the arts and architecture that existed in the country in the 1950s. Designed by Rafael de La-Hoz (1924-2000) and José María García de Paredes (1924-2000), architects who would become leading figures in the history of Spanish architecture, the building is a reflection of the ideas of Bruno Zevi set out in his book *Architecture as Space: How to Look at Architecture* (1951). It is an organic building which, taking its references from Wright and Aalto, proposes a type of architecture that is defined through space.

Despite the small size of the building and the conditioning factors of the land on which it is built, apart from achieving a sense of great spatial continuity in its interior space, there is a sensation of fluidity and expansion. The different floors are connected by an elegant staircase, which helps to prolong the space and lead the eye upwards, inviting visitors to climb it and continue discovering the building. The organic shapes, carefully designed furniture and intelligent use of materials all contribute towards space being the protagonist of the building.

The architecture, sculpture, painting and design of the furniture make this building a complete work of art, orchestrated by two young architects who turned to the sculptor Jorge Oteiza to make it a reality. The integration of architecture and other arts formed a major part of the architectural debate in Spain in the 1950s, with Oteiza appearing as a leading figure who took part in key projects in the history of Spanish architecture, such as the basilica of Aránzazu, the Chapel of the Way of St. James or the Spanish pavilion at the Brussels Expo in 1958. In Córdoba, his presence led to the creation of the multi-disciplinary *Grupo Espacio*, and three years later, of *Equipo 57*¹.

Oteiza created four pieces for the Chamber of Commerce, the most important of which are the two on the ground floor, as they play key role in defining the architectural space. They were created on the basis of his concept of the activation of emptiness² but within architecture. This is why the result blends in perfectly with the building. After working in Córdoba, he read *Architecture as Space*, becoming immersed in the new approach towards space as a fundamental aspect of architecture, something that transcended his own sculptures.

The building stands in the historic centre of Córdoba, a medium-sized city in the south of Spain, and completely fills the 150 square-metre plot on which it is built. It has three floors, each of which is organised according to the frequency of its use: on the ground floor there is a large lobby and offices; on the next floor is the chairman's office, the meeting room and the library, and on the top floor there is an events room.

¹The *Grupo Espacio* was created around the figure of Oteiza, although no joint manifesto or declaration exists. Some of its members grouped together in *Equipo 57*, signing its first manifesto and exhibiting in Paris in May 1957.

²During the early 1950s, Oteiza split away from the traditional concept of sculpture –a mass that occupies a space– as a result of working with minimal hyperboloid shapes that are capable of highlighting the space that surrounds the statue, transforming the relationship between emptiness and mass, between the visible and the invisible.

Having analysed the timescale of the building, we can conclude that Oteiza did not participate in the initial project for the building from 1950, as he came into contact with the architects once work on the building had already begun. They met at the start of 1952, without Oteiza being aware of how work was progressing on the buildings. There are major differences between the original plans and the building itself, some of which are a result of Oteiza's collaboration with the architects. Also, as Oteiza was living in Córdoba at the time, it can be said that the sculptor was present in the decision making process that led to the initial plans being changed and the definition of the building that stands today. For this reason, this paper explores the period when Oteiza was working on the Chamber of Commerce, between 1953 and 1954, focusing on three aspects: his sculptures and their relationship with the architecture; his involvement in defining the architectural project, and his stays in Córdoba when he was working on the building and with the architects.

Oteiza's Involvement in the Project

The architects presented Oteiza's work on the Chamber of Commerce in the following way: *"Finally, we were lucky enough to have the exceptional collaboration of the artists who worked closely with us during the project: Jorge de Oteiza enriched the hall with a mysterious sculpture, half of which is a feminine form and the other half a snail, beneath the spiral of the staircase; he created a work of art out of the front desk, bringing a sense of style and grace to the seriousness of concrete, and he has enriched the façade with a superb bronze lion emerging from a vaguely tower-shaped structure, in a highly personal re-working of the ancient shield of Córdoba with its castles and lions."* (La-Hoz and García de Paredes, 1955).

We will continue by analysing Oteiza's three contributions to the building: its sole façade; the ground floor, focusing on its space and the front desk as an element that conforms this space, and the presence of the sculpture in the stairwell. After briefly examining the first floor, where there are no elements created by Oteiza or any significant spatial variations, we will explore the sculpture in the lobby of the events room on the top floor, even though this is not included in the architects' report.

The Façade

The north-facing façade is 8.5 metres long and approximately 11 metres high, close to that of the adjacent building. It stands in a very narrow street, which means that the façade is always seen at an angle. The only front view of the building is from a street that runs perpendicular to the front of the Chamber of Commerce (Figure 1).

Figure 1. *Elevation. View from the Street Running Perpendicularly to the Building, the Only Point from where it is Possible to Have a Head-on View (January 2011)*



Based on the first proposals, the elevation is seemingly domestic¹, although it was designed with and used the materials that were typical of the official architecture of Franco's dictatorship built in Madrid; rough granite, red brick and limestone around the doors and windows. The elevation was designed symmetrically and does not reflect the highly dynamic, varied interior of the building.

¹The façade is reminiscent of a typical house from Córdoba, with large openings on the ground floor for commercial uses, with more domestic sizes on the upper floors. Apart from the coat of arms, the upper levels include a feature seen on traditional houses: initially, eight openings were planned, used for attaching scaffolding, but finally nine outward-jutting beam heads were added (Mosquera Adell & Pérez Cano, 2001, 49).

The architects declared that they had worked on the façade using geometric ratios associated with the golden ratio. If we check these proportions of the façade, Oteiza's coat of arms finally adapts to them, as it is aligned with the measurements of the openings on the first floor.

In its different versions, the façade evolved and acquired volume within the urban space in order to emphasise its presence in the street, for example by tilting all of the frames of the doors and windows or the sign in relief. The coat of arms occupies a niche that the architects set aside for it, although it blends in with the structure of the façade. It is left unframed by the sloping white limestone used on the other elements on the façade, as Oteiza's sculpture itself includes this same slope (Figure 2). The lion and the towers jut out in the same way as the other architectural elements. He worked in artificial stone to make a plaster mould, and then cast the coat of arms in bronze.

Figure 2. *Close-up of the Façade and Coat of Arms*

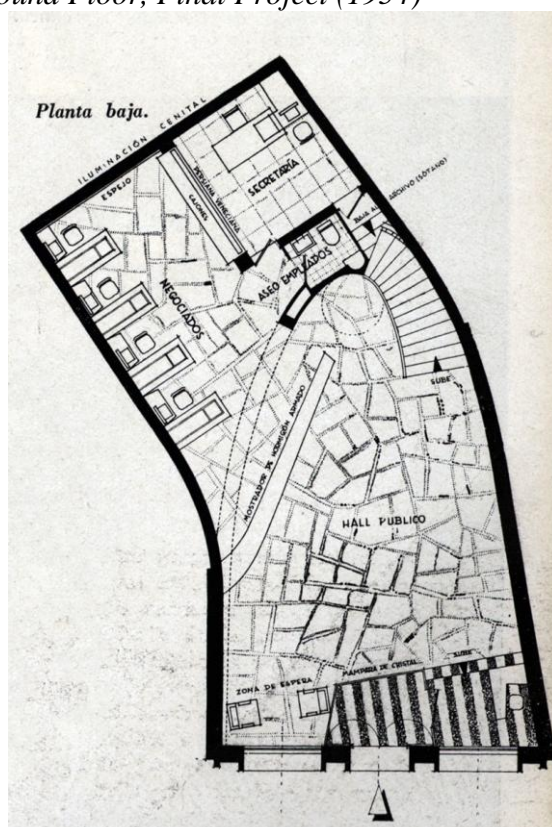


The coat of arms is a figurative piece, with the same type of approach as the rest of the architecture: a bold interior, but with a conservative façade. Oteiza created it in the knowledge of the changes the architects had made to the façade and took them into account in its design, although he was not involved in these changes.

Ground Floor Space

The parabolic shape is included from the first designs, possibly chosen for its dynamic appearance (Figure 3). However, at first the ground floor was not designed as a continuous space, as it was divided between the entrance and area for attending to the public and the offices, with a wall containing a front desk. This wall disappeared during construction, allowing the space to grow and expand. Apart from avoiding dividing up the space, other strategies were used that included aspects from architecture, design and art¹. The parabolic interior design was transformed into an even larger, artistic space typically seen in organic architecture, giving the building a fluid, dynamic sensation.

Figure 3. *The Ground Floor, Final Project (1954)*



The west wall, with a parabolic shape, starts at the façade and connects with the bottom of the staircase. It starts with bare brick, with the horizontal pointing more clearly defined, transmitting a sensation of being a public space, then dematerialising into a translucent glass sheet that continues up to the

¹The architects explained: “In order to create a sensation of space that did not exist, we applied the criteria of not uselessly dividing up the space, replacing physical dividers (dividing walls) with other types of psychological “dividers” (colour, shape, decorative elements, lighting, etc.). In this way, the emptiness of each area is connected to the adjacent areas, and one’s view – the vehicle of all artistic sensations – does not come up against unpleasant visual obstacles, and instead can gently peruse the panorama, even allowing it to roam, imaginarily, beyond the horizon” (Sánchez, 1954, 21).

second floor. The staircase is sinuous, inviting visitors to climb up it. This wall is connected symmetrically to the façade, although it continues through to the office area without any interruptions, with its continuity guaranteed by the material itself. Two elements are connected to this brick wall that stretch towards the stairwell: the black front desk, and an upper white strip. The sensation of space is further enhanced by the presence of a vertical mirror at the back of the office area (Figure 4).

Figure 4. *Ground floor showing the Space without Any Furniture or Fixtures (1954)*



The white strip preserves the parabolic shape of the first version, continuing the shape of the parabolic wall to the west, although its different material makes it stand out as a separate element. It juts out sharply from the brick wall, without any continuity, giving the sensation that the elevation of the façade does not belong to the spatial layout (Figure 5). This white strip curves and splits into two, ending at the stairwell with complicated dynamic shapes. By using white and chipped stone, the effect is created of impossible bases for

the pillar on the white strip and the staircase, whose handrail rises directly from the floor, further emphasising the sinuous ascending sensation and energy of this point.

Figure 5. *Ground Floor (January 2011), showing the Change in the Curve of the Brick Wall, the Continuity of the Upper White Strip and the Opposite Curve of the Front Desk*



The hall is lit by lighting fixtures set into a black ceiling, creating an atmosphere that diverges from what the viewer would expect. The lights spread out from the spotlight in the parabolic vault in the stairwell. Gently subdued light enters from the hall through the stairwell from the glass wall that rises two floors, with the stairs seemingly disappearing into the distance thanks to their black steps and white risers. The office area is lit with a series of evenly spaced lighting fixtures designed for this type of use. This means that the front desk is backlit, as the lighting is stronger in the office area than in the hall. This idea is further enhanced by an overhead spotlight that juts out from the white strip but

which does not directly illuminate the front desk, but instead backlights it when seen by anyone entering the building.

The front desk is a lightweight element that stands apart from the parabolic shapes that define this space, curving away in the opposite direction to them, and jutting out from the upper white strip. It stretches away elegantly from the brick wall, is only supported on single point, and points towards the focal point of the whole composition: the stairwell containing Oteiza's other sculpture. As it stands independently from the wall, the front desk becomes a stone element which at the same time is light, black and glossy, which floats over a floor made of black and white marble. The front desk is made out of reinforced concrete, attached to the wall and floor, covered with chips of black marble, whose horizontal surface was then enamelled (Figure 6).

Figure 6. *Close up of the Front Desk (January 2011)*



As described by those who witnessed it¹, the structure of the front desk was designed by La-Hoz and shaped by Oteiza, moulding the concrete and then applying the corresponding finish. Thanks to a series of letters that have been preserved² we know that during February 1953 Oteiza stayed in Córdoba for several weeks next to the site, working inside the architectural space that contained the front desk and his sculpture.

¹The front desk “was prepared by La-Hoz, who designed its structure, installed a beam so it could be attached to the wall, and another to support it on the floor. Using a hydraulic jack, the armature was stressed, modelling the concrete with Oteiza. The sculptor covered it – with the help of Aguilera – using black marble chips from Belgium, aligned to create a series of guidelines...” (Mosquera Adell and Pérez Cano, 2001, 81-82).

²Correspondence between Oteiza and his wife, on file in the Archive of the Jorge Oteiza Foundation Museum in Alzuza (Navarra, Spain), ID: 8667, 16084.

On the ground floor, Oteiza's sculpture in the stairwell has a major presence. The spatial layout of the hall, the shapes, lights and front desk all heighten the overall impression, focusing the viewer's attention on the stairwell.

Oteiza created a rough model of the statue in wood and then worked on it in the same way as the front desk, modelling the concrete once it was in place, and then enamelling it. It measures 2.15x1.40x1.07 m and is based on three points, rising directly from the floor (Figure 7).

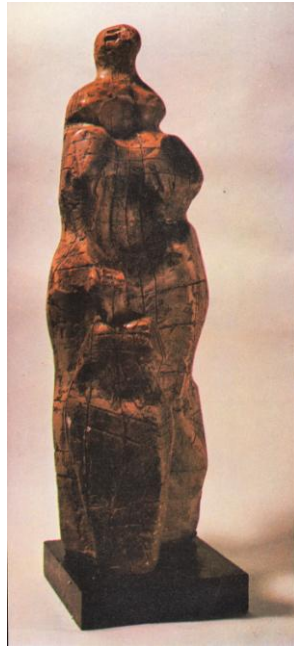
Figure 7. *The Staircase and Oteiza's Sculpture on the Ground Floor (1955)*



The sculpture fits in perfectly with the space in which it is located and the surrounding architectural elements. There is a major difference between it and the first sketch that was made of this sculpture by Oteiza, probably before he had seen the building (Figure 8). The stairwell is the area of greatest spatial

tension on the ground floor, firstly because from a geometric perspective it is the position of the spotlight that creates the parabolic shape of the hall. The front desk emphasises the importance of this space, as its shape means it points towards it. Also, it is favoured by the treatment of the vertical plane through the creation of curved shapes thanks to the materials used, the white finish and the chipped granite. This is the point where the white strip and the staircase and its handrail meet.

Figure 8. *Oteiza, Sculpture for the Stairwell, 1952*



It is important to note that the stairwell is not limited to the ground floor, but is instead a space that continues vertically via a 3-dimensional spiral formed by the staircase as it rises upwards (Figure 9). Also, the overhead lighting of the stairwell emphasises these forms, with the body of the statue in shadow, static, while its outstretched, dynamic arms are illuminated and highly visible. The curved arrangement of the overhead lights on the ceiling can also be seen from this point.

Figure 9. *Left: Stairwell seen from the Ground Floor (1955). Right: View of the Stairwell from the Second Floor. The Paving on the First Floor Imitates an Infinite Staircase (January 2011)*



Access to the building is through its central axis, via a small lobby enclosed by a glass wall and semi-transparent curtains (Figure 10). There is a difference in height which means the passageway towards the hall is raised and diagonal. This is the most open area, with a clear view through to the back of the offices (Figure 11). Viewers enter the building face to face with the sculpture, which seems to be embraced by the staircase. As the hall and the offices are 30 cm lower, on entering people are faced with a statue of their same height.

Figure 10. *View from the Offices (1955)*



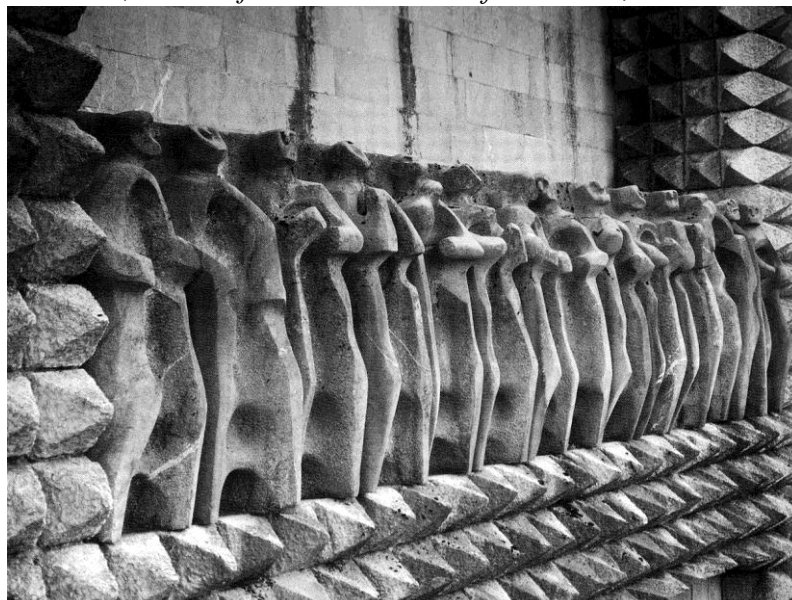
Figure 11. *From the Entrance (January 2011)*



The spatial organisation, shapes and lights pull this space together, focusing the viewer's attention on the centre of the staircase where Oteiza's statue is located. The statue is adapted to the characteristics of its location and was created precisely for this location in all of its proportions. Similarly, the colour and surface finish of the statue blends in with the architecture, with the granite in the niche and the risers of the staircase.

Like the front desk, the statue is guaranteed a certain type of lighting by the architecture itself. It is located in a position whose lighting changes throughout the day, although it is always supported by an overhead spotlight. During the day, natural light shines in from the patio through a curved, translucent window that rises alongside the staircase. Also, in the last floor slab there is a small opening that once guaranteed a source of overhead lighting, which today has been replaced by a lighting fixture. The artificial light comes from a series of light fittings in the ceiling of the ground floor and another in the floor slab of the first floor, which shines down onto the stairwell, resulting in a dramatic effect on the sculpture and the shapes of the staircase.

Figure 12. *Oteiza, Statues from the Basilica of Aránzazu, 1954*

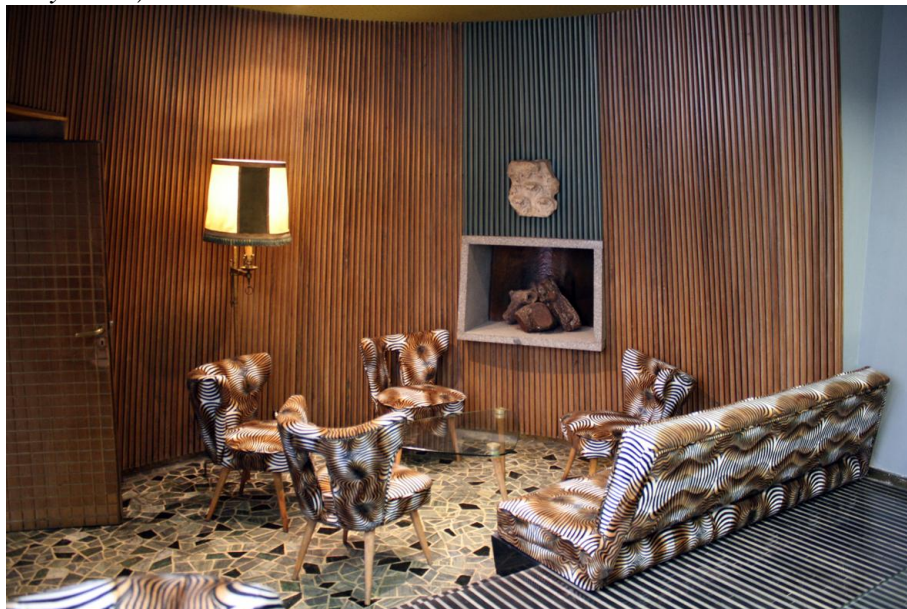


The sculpture in the stairwell is associated with the sketches and studies that Oteiza was creating at that time for the statues of the basilica of Aránzazu in the Basque Country, in which he combined different strategies: removing mass and creating concave openings, perforations, and compressed or deformed sections (Figure 12). However, the main difference between these sketches and the statue itself is that the plans for Aránzazu were designed as a piece for a wall on the façade that acted as a boundary, moving in one direction towards the viewer. There are compressed sections, concave sections and masses that stretch outwards, enveloping the surrounding space in front of them. However, this limitation is not seen in the statue from Córdoba. It is inserted in a complete architectural space with a considerable interplay of movement and directions. For this reason, the piece stretches out in every possible direction, growing and reacting to the space in which it is located. In order to create this statue, Oteiza must have understood and experienced the space in which it was to be located. Otherwise, it would be impossible to imagine the resulting symbiosis between the statue and the building.

First Floor Space

From the ground floor, the staircase invites visitors to climb it with its sinuous shape, its overhead light and varying width. Oteiza was not involved in this space, but art and architecture are still integrated to achieve a total work of art. Here the most outstanding features are the furniture that was specially designed by La-Hoz, with light fixtures, chairs and tables (Figure 13).

Figure 13. *The Chairman's Office with its Original Furnishings and Materials (January 2011)*



Second Floor Space

The second floor contains Oteiza's last sculpture, more static than the rest, but still integrated with the surrounding space and associated with the bottom of the staircase that reaches the lobby of the events room. As this space is two floors above the lobby, it still maintains a parabolic shape. The floor is slightly sloping and the ceiling undulates in the shape of a parabolic vault, which is covered in gold leaf for acoustic purposes. Its vertical end wall is also sloping and panelled in wood (Figure 14).

The statue is positioned in front of the bottom of the staircase, welcoming visitors, at the point where the curved shapes of the events room and the straight lines of the lobby meet. They form a niche where Oteiza's sculpture is located, a piece carved from holm oak wood supported on a stone base, nearly 2.6 metres tall (Figure 15).

Figure 14. *Second Floor. The Events Room with the Illuminated Lobby in the Background (January 2011)*

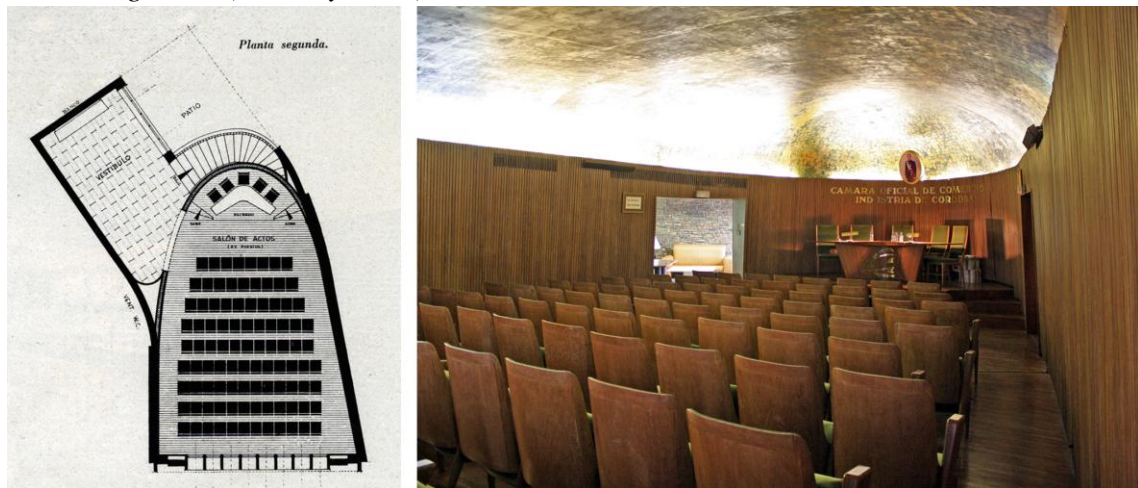


Figure 15. *View of the Entrance to the Events Room (1955)*



The architects conceived the lobby as an external, public space, and so they used these materials, creating the largest opening in the whole building, taking advantage of the translucent glass used in the staircase and designing a seat reminiscent of a park bench. Oteiza once again adapted his work to the architecture, designing a statue with static shapes corresponding to a natural, non-dynamic space. The sculpture is made of wood with a stone base, in keeping with the architecture and furniture in the lobby. However, the piece does not interact with the space with the same intensity as the sculpture on the ground floor and the front desk. We do not know if Oteiza created it in situ. It seems to have been carved in wood based on an earlier sketch and then fitted in place, as it is not directly fixed to the floor.

Hybrids for a Space under Construction

Oteiza's projects for the Chamber of Commerce were a result of a hybridization between architecture and sculpture, and as hybrids, constitute a series of new elements that conserve typical features from each discipline. The four pieces by Oteiza were created as a result of the interaction with their surrounding space and were designed especially for this position, and were differentiated through the varying combination between art and architecture.

The coat of arms on the façade is not so strongly hybridized, as it blends in closely with the surrounding urban space. Oteiza was not involved in the design of the outside of the building, unlike his involvement in the basilica of Aránzazu. In the Chamber of Commerce he merely fitted the piece into the opening designed by the architects, but created it to blend in fully with the rest of the façade, aware of the variations this would experience during construction. The coat of arms has few architectural features, and is a statue that responds to a specific position on the building.

The sculpture on the second floor is more hybridized, bringing to life one of the sketches of the statue in the opening on the stairwell, through its shape, direction and dimensions. Like the coat of arms, the statue on the second floor was created for a given space, and is more sculptural than architectural in nature. It is associated with the space at the top of the staircase, although if it were removed the space would not lose any definition or change in its configuration. As a result, the statue and the shield were sculptures that were fitted in with a given type of architecture.

The pieces on the ground floor are more hybridized with the architecture, as this is the most complex space in the building, and there is a special relationship between them. The sculpture in the stairwell was created for this position, from which it takes its name, and adopts special dynamism of the hall and the vertical tension created by the staircase. Like the staircase, it is spiral, twisting around itself and reaching out its arms in different directions. Oteiza created the sculpture for a given architectural space, to which it is adapted in a different way to that seen in the initial sketches, which were probably made by Oteiza before he knew about the characteristics of the building.

The sculpture in the stairwell, maintaining its character as a statue, plays a key role within the building. Oteiza completed it in situ, once it had been anchored to the floor when construction work had finished. It responds to the front desk, the vertical design, the shapes of the staircase and the niche created at the bottom. The statue is modelled through the architecture. However, the statue on the second floor seems to have been put in place afterwards, as an extension to one of Oteiza's original sketches.

The front desk is the most hybrid piece of all, as it presents an equal proportion of architectural and sculptural elements. It defines the architectural space through its materiality and character without losing any of its qualities as a statue. It also has to serve a specific function as a front desk, which it accomplishes perfectly. It has not been possible to verify if there was any collaboration between Oteiza and the architects in its design, although this would seem to be the most logical answer. To create it, Oteiza worked in situ, gradually shaping the desk. This was the first time he had worked on a piece directly within an architectural space, being able to model it at full size.

However, the building is not immune to the presence of these sculptures. It is formally defined through them, and interacts in a different way with each. The architecture is connected to these pieces through its space, material, shape, light and use, as it is a project in which the architecture and sculptural elements interact in the extreme. There is also a high degree of hybridization with the sculptures seen in other architectural elements, such as the staircase or the white strip that runs from the floor to the stairwell.

For Oteiza, this was the first time in which his statues had to be defined through a given, architectural space, which they also served to configure and qualify. In the basilica of Aránzazu the space, while real, is limited in the way it is distributed on the façade, as one dimension is eliminated as a result of the Apostles leaning on the wall. However, in the Chamber of Commerce, Oteiza dealt with a specific space, defined by a building under construction. This is why this hybridization can be seen at different levels, with the pieces on the ground floor interacting the most, as the material that Oteiza shared with La-Hoz and García Paredes was the architectural space.

For the first time, Oteiza sculpted from inside the architecture and in the space where the piece was positioned. This is why the result blends in so perfectly with the building. We see a hybridization of sculpture and architecture which, without losing any of their individual features, take on those of the other discipline. The highest level of hybridization can be seen on the ground floor, mainly in the front desk, as this has a function, defines the space and still maintains its sculptural qualities. Similarly, the building is defined by the presence of these sculptures in terms of its shape, space, light and use.

References

- La-Hoz, R. and García de Paredes, J. M. 1955. Cámara de Comercio de Córdoba. *Revista Nacional de Arquitectura*. 164 (August 1955), 6-12.
- López Bahut, E. 2013. *Jorge Oteiza y lo arquitectónico. De la estatua-masa al espacio urbano*. Doctoral Thesis. University of A Coruña. <http://hdl.handle.net/2183/10136>
- Mosquera Adell, E. and Pérez Cano, M. T. 2001. *Cámara Oficial de Comercio e Industria, Córdoba, 1950-1954. Rafael de La-Hoz y José María García de Paredes*. Architects' Association of Eastern Andalusia. Almería Delegation, Almería.
- Sánchez, C. 1954. La Cámara Oficial de Comercio e Industria de Córdoba en la vanguardia del progreso español. *ABC*. (25 April, 1954), 20-21.
- Zevi, B. 1951. *Saber ver la Arquitectura: ensayo sobre la interpretación espacial de la arquitectura*. Buenos Aires.