

The Barcelona Pavilion—Real and Imagined

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Introduction in black and white

The Barcelona Pavilion was built in 1929 and was demolished after standing for barely nine months. Little remains of the original Pavilion except for some remnants,¹ a limited range of black and white photographs, a few drawings, and some first hand accounts.

The Barcelona Pavilion was included in the Barcelona International Exposition plans at the last minute and was not included in the promotional material.² There was scarcely a brief except for a requirement that there be 'not too much glass'.³ The building was well received during its short life but it was only in later reviews that it gained the status as one of the more significant twentieth century buildings.⁴

Until the Pavilion was rebuilt in the eighties, our visual knowledge of the Barcelona Pavilion was obtained primarily through black and white images. Rem Koolhaas suggests that rebuilding the Pavilion has damaged our black and white memories and knowledge. 'In 1986 the Barcelona Pavilion was reconstructed in color. Through its resurrection, its aura was killed. (In architectural history, it remains stubbornly black and white.).'⁵ In the process, other interpretations re-emerge such as Quetglas' understanding of the Pavilion as being constructed of reflections.⁶

The reconstruction architects, Ignasi de Solà-Morales, Cristian Cirici, and Fernando Ramos have thoroughly documented the research and decision making process associated with the rebuilding.⁷ This paper outlines some of the decisions made, including the replacement of the poorly drained, lightweight roof structure of the original with a concrete roof. Other more intriguing gaps, mistakes and omissions are explored, particularly in how the building has been represented. Did the demolition of the original Pavilion enable history to be redrawn and improved? I speculate that the answer to

this question is not straightforward, and that it leads us into considering the physical context of the Barcelona Pavilion, an issue often ignored in early writings about it.

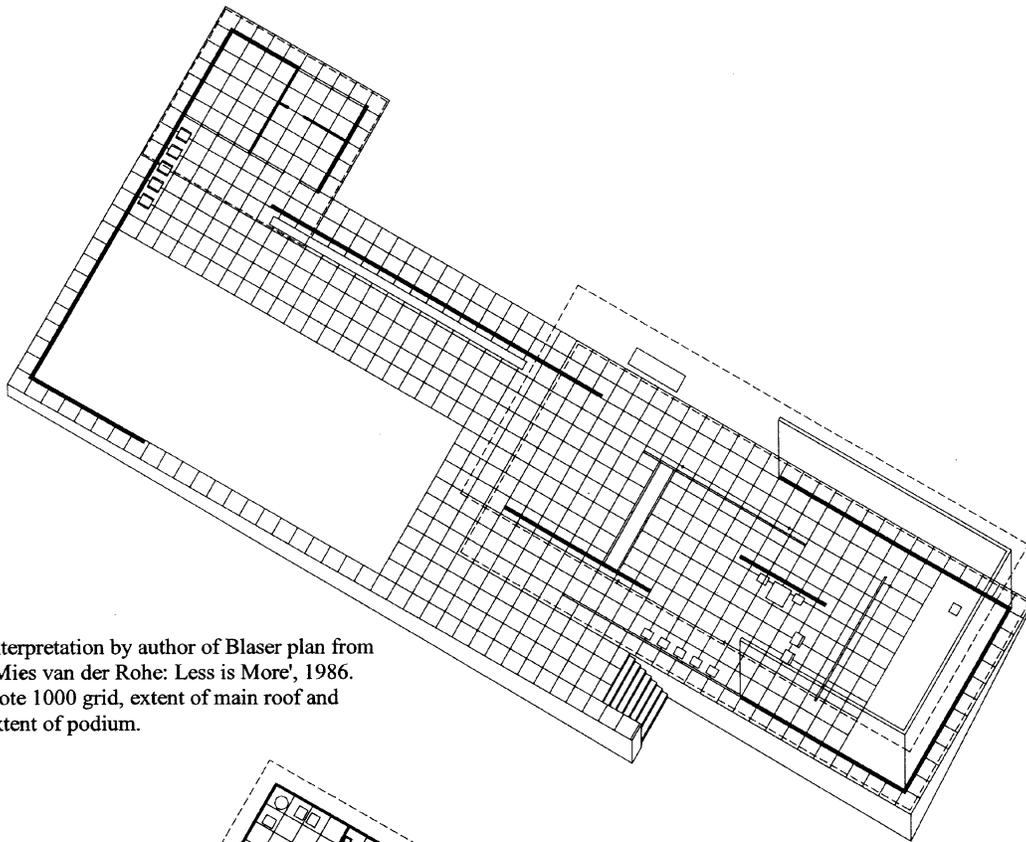
Correcting, repeating and adding mistakes

Missing information, misinformation or changed circumstances are mentioned in much of the written discourse, including the very useful record of research and detailing prepared by the reconstruction architects. Some gaps in the documentation are itemized below, leading to the question of whether the rebuilt Pavilion is the Barcelona Pavilion or whether it is has paradoxically destroyed the famous Pavilion that it represents.

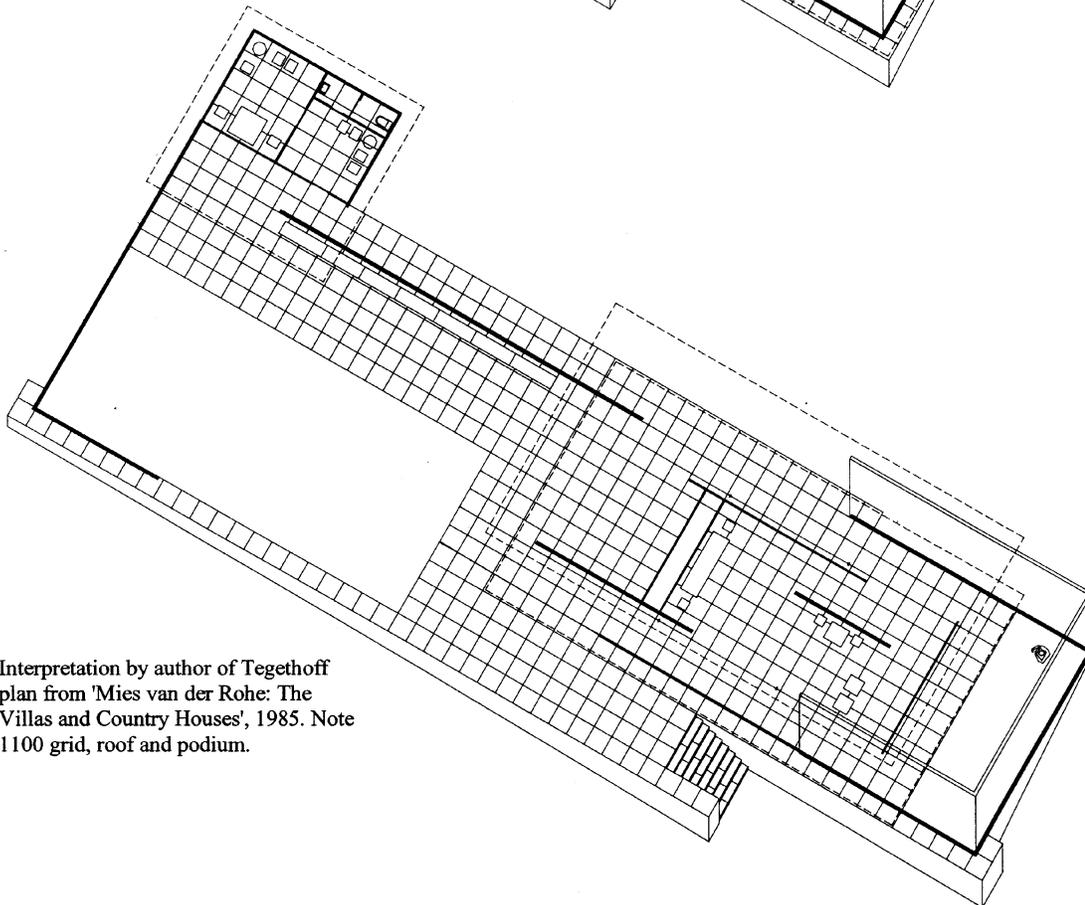
Most writings on the Pavilion since 1929 use one of three plans to illustrate the relationships between the ceiling, walls, pools, sculpture and podium.⁸ The differences in the plans are significant although they at first appear minor. Interpretations by the author of the two later plans are shown over. The first plan was prepared for publication 1929 and contains well-documented discrepancies between it and the building. Wall widths and the podium format were simplified and unified.

In the mid-sixties, a curious new plan was prepared by the Mies office in Chicago for Werner Blaser, with the approval of Mies van der Rohe.⁹ In this plan, some of the obvious mistakes of the 1929 plan were corrected and furniture and landscaping were added. Some discrepancies of the 1929 plan were retained and some disturbing new inaccuracies were added.

The most blatant mistake was that the roof was drawn as though it extended over the entire sculpture pool. This plan, with the obvious mistake, continued to be used in publications even after Wolf Tegethoff published a more accurate plan in 1981.¹⁰ Quetglas attrib-



Interpretation by author of Blaser plan from 'Mies van der Rohe: Less is More', 1986. Note 1000 grid, extent of main roof and extent of podium.



Interpretation by author of Tegethoff plan from 'Mies van der Rohe: The Villas and Country Houses', 1985. Note 1100 grid, roof and podium.

Fig. 1. Compilation drawings by the author.

utes the plan from the sixties to Bonta although others attribute it to Blaser. Quetglas states that:

But in the plan of the pavilion published in a monograph (An Anatomy of Architectural Interpretation, by J. P. Bonta), the roof is shown to cover the statue and the whole of the pool, coming to rest on the perimeter wall. By virtue of this lack of regard for the very object of criticism, Bonta has reserved for himself the honor of standing last (in both senses of the word) among writers who have discussed the pavilion. What is worse still is that, since 1975, perhaps because no-one cared or noticed, and perhaps because it has allowed publishers to cut costs, a whole series of studies has featured this same plan, the last being, for the time being, Werner Blaser's 1986 Less is More.¹¹

The plan and the podium

The plan developed at the time of the Pavilion's launch has a seductive simplicity: walls are kept the same thickness, the perimeter of the podium is simplified, doors are omitted and furniture is not located. In these drawings the podium sits proud of the walls around the entire perimeter of the building by a meter or so. Although photographs of the Pavilion are generally restricted to certain views, some photographs do reveal the podium returning back to the wall line at both ends of the Pavilion. That Mies maintained a separate podium line around the perimeter in both the original published 1929 plan and in his collaborative 1964 plan with Blaser, suggests that this was his preferred option.¹² Did documented budget cutbacks lead to the building of a less preferred option? Tegethoff writes that we can, with some caution, think of this as the idealised plan.¹³ If the smaller footprint was a result of budget shortfalls when the Pavilion was first built, should the rebuilt Pavilion have taken the idealized plan? Prior to the rebuilding of the Pavilion, Philip Johnson approached Cristian Cirisi and argued that the podium should be built as drawn because Mies was a classical architect using Greek temples as his reference.¹⁴

It was only after understanding the building context that I became convinced that the more complex form was developed to resolve the slope rather than as a result of budget cuts. The shifting relationship from podium to ground at the front, the wall extending down to the ground at the sides and the floor at the level of the natural topography to the rear are sophisticated transitions. Even visitors in 1929 would not have immediately perceived the slope of the site, as the end elevations were secondary and somewhat hidden by

vegetation. When Mies' office developed the 1929 drawing for publication it seems they were more concerned with the clarity of the idea rather than the reality of the building on a sloping site. The more complex footprint of the built podium becomes logical only within the context of the sloping site.

Overlaying a uniform grid

In the Mies approved plan prepared for Blaser, a uniform meter wide grid was proposed across the podium controlling the placement of walls. In contrast, the stone layout plan, held in the Mies archive, reveals a changing module. Various researchers have shown the uniform module to be incorrect. Perhaps the grid of the Blaser plan was seen as an improvement on the built design. Certainly later work by Mies, including the Illinois Institute of Technology, did make use of universal grids. In contrast, Solà-Morales saw the Pavilion as a series of modules creating 'music with different rhythms'.¹⁵ Support for this argument can be found in the construction drawing for the long travertine bench facing the large pool. The bench supports and cuts in the stonework do not coincide with either the paving or the wall behind. The seat acts as an autonomous detached element rather than conforming to a universal grid.¹⁶

The columns

The structural logic of the Pavilion is deceptive in three ways. The columns seem to be the means by which Mies was able to separate the function of support from the definition of space following the principle of free space first espoused by Le Corbusier fifteen years earlier. But the columns are not sufficient to carry the roof loads, and so extra columns are hidden within the walls. In fact the Pavilion's walls are so close to the columns that the structural loads carried by the columns could have been absorbed into the walls. Additionally, if structural logic had been the priority for Mies, the cruciform shape would have been rejected for a more efficient profile.¹⁷

Photographs of the Pavilion under construction reveal a patched up structure of bolted plates and girders that are later concealed within sleeves of chrome or within the roof space. It was only in the Farnsworth House built thirty years later that construction methods had been refined enough for Mies to express the actual steel structure. Commentators on the Pavilion have generally ignored the awkward nature of the construction even though this is at odds with the need for honesty and simplicity proclaimed by Mies. Hilberseimer states that Mies van der Rohe's architecture is notable for clarity of

structure: 'He is a master of impeccable technique. The perfection of his work is revealed in every detail.'¹⁸

In contrast, Frank Lloyd Wright suggested that the Mies should get rid of the ridiculous little columns.¹⁹ The 1922 Brick Country House by Mies did not use columns. Why did the columns appear in the Barcelona Pavilion if they were not necessary for structure? Franz Schulze says the function of the columns was not structural but as an expression of an ordered structure. In describing the Lake Shore Drive façade built decades later, Schulze says it has 'an elegantly structural look about if even it is not structural, just as Mies invariably sounded logically consistent even if he wasn't always in fact.'²⁰ But the columns do more than just give the expression of an ordered structure. The columns define the location of the main ceremonial activity and suggest an order and symmetry within the otherwise flowing space.²¹

Mies was a master of the paradoxical and it may be for this reason that so many of the writings about Mies are conflicting. Tegethoff quotes Mies as saying that Berlage would not accept anything that was fake. 'Nothing should be built that is not clearly constructed. His famous building in Amsterdam, the Beurs, had a medieval character without being mediaeval. He used brick in the way medieval people did.'²² The Barcelona Pavilion does not achieve the same clarity of construction.

The section drawings

No original section drawings exist. One argument is that sections would reveal little that is not already apparent in the plans.²³ In fact, if sections were drawn, they would reveal a structure that is at odds with our perception of the Pavilion as a flat floating plane tied to the podium below by eight thin columns. Construction photographs reveal that thick and heavy beams are hidden within the roof and then chamfered down to the thin edges seen within the publicity photographs. Honest section drawings would also have shown Catalan arches supporting the flat slab.

Reugenberg, who worked for Mies on the original building and later devoted years to resolving some of the technical issues that the Pavilion posed, developed section drawings that may be idealized rather than a true record of construction.²⁴ A problem with untangling the history of documentation and writing for the Pavilion has been that interpretative drawings have often been presented as though they are original documents.²⁵

Avoiding junctions

Mies proposed freeing the ceiling from the walls by ending the walls one centimeter below the ceiling and blurring the line between exterior and interior. Mies avoided any overt expression of the joint and so the bolted connections are never visible in the work.²⁶ A diverse palette of materials and colors also helps to separate the component parts of the building.

From when the Pavilion was first built, it has been described as using modern materials, innovative construction and advanced technology. In fact, construction photographs reveal that the structure was a mess of steel and the podium was constructed using a conventional Catalan technique of shallow brick vaults. What was new was not the material so much as the techniques used to conceal connections and provide large reflective surfaces.

Early drawings

The first perspective sketches that remain of the Pavilion use symmetry and asymmetry to different extents. Some sketches show no columns and the roof is presumably supported on the walls. An early sketch shows six instead of eight columns. Drawings include three locations for sculptures and one can speculate that budget restraints may have reduced the number of sculptures to one.²⁷

The early perspective sketches contain vertical planes sliding between the flat roof plane and podium. The podium acts as an artificial flat plane on the sloping site. These sketches show steps carved into the cubic mass of the podium at right angles to the main façade but are refined later to sit between the two façade planes facing the main square.

Many of the final elements appear within the 1928 plan.²⁸ What is not yet resolved is the location of the large pool, the office footprint and layout and the sides of the podium.

The missing photographs

Perhaps no other building has achieved fame on the basis of such limited images. Until its rebuilding in the 1980s, the Barcelona Pavilion was known primarily through a few key photographs that were generally taken and cropped in a way so as not to show the exact limit of the podium. The row of eight existing columns in front of the Pavilion meant that some photographs of the front were taken from an extreme side angle

revealing the abrupt end of the stone cladding and the podium.

Some images are noticeable by their absence. The sides of the building and the rear were rarely photographed. Due to budget constraints the exterior side walls and rear part of the Pavilion were finished in ordinary rendered and painted brickwork instead of stone and it is possible that Mies ensured that only the more resolved components were included in the publicity photographs.

The office area

A major difficulty with the rebuilding was to speculate on the layout and finishes in the office area, as no photographs remain.

However, detailed drawings for the office pavilion do remain and are held by the Mies archive. Quetglass argues that in the absence of other detailed drawings, these must be considered as the best option for the layout and has adopted these in what he argues is the definitive plan.²⁹ But the most resolved plan is not necessarily the built plan, especially as the building was constructed within such a small time frame. For this part of the building, the plans published for the publicity in 1929 are more likely to be correct. Solà-Morales states that simplifications to the office area were introduced when the constraints of the topography became apparent.³⁰

The strategy by the reconstruction architects to overcome the lack of information was to use timber paneling and detailing typical of Mies' later interiors while taking the layout from the first published plan. The timber finishes are incongruous in this small office zone compared with the stone and glass finishes of the rest of the Pavilion.

Joseph Fujikawa who worked in Mies' office remembered Mies saying more than once that the reason the Gothic church is such a great building is because it doesn't have plumbing. He said that 'even in the Barcelona Pavilion he built the little structure in back because they needed running water'.³¹ Effectively the rebuilding of the Barcelona Pavilion as an architectural icon provided an additional requirement in the brief for a visitor center, complicating the reincarnation process with a different brief. The office was originally a service and secondary pavilion but is now the crucial hub of the public space.

The reconstruction architects assumed stone would have been Mies's preferred cladding for the office. The

decision to use stone instead of rendered brick led to a series of detailing decisions that resulted in changing the location and size of the side window to the office area. To keep stone sheets as large as possible and avoid L-shaped panels the window was enlarged and shifted.

The original plans, including the detailed shop drawing of the travertine floor, do not show travertine laid behind the bench wall yet photographs show that it was. Tegethoff explains that the distance between the Pavilion and the existing steps doubled from 5.5 meters as a result of the many shifts of the Pavilion's position along with the reduction in size to help cut costs.³² The original effect of not having travertine along this section would have been to further separate the office from the ceremonial part of the Pavilion.

The cross-section of the column

The famous cross-section of the column drawn by the Mies van der Rohe office in 1964 for Werner Blaser is identified as the incorrect version in the publication of the Mies archive.³³ A second section is identified in the archive as a more correct version. Fujikawa drew this version while working in the Dirk Lohan's office, Mies's grandson. This section was based on a sketch drawn by Reugenberg who worked on the original pavilion. It is curious that the reconstruction architects chose to use the incorrect cruciform column as the main graphic on the cover of their book. Cristian Cirici gave no particular reason for this decision. The graphic qualities of the Blaser version are more powerful and better known as a symbol of the original Pavilion than the later more 'correct' version although postcards within the rebuilt Pavilion use the later version.

The missing furniture

Furniture is a key component of this building and indeed many buildings by Mies. The famous Barcelona Chair was designed for the King and Queen of Spain to use during the formal ceremony. The ceremonial furniture designed specifically for the Pavilion is not included in the original plan, and yet the presence of the Barcelona chair in photographs must have contributed to the renown of this building. Photographs indicate that furniture locations were flexible except for three components which were always present in the published photos; the two chairs for the King and Queen, the table for signing and the long table beside the lit walls, presumably for the champagne.

Some furniture is even missing from the rebuilt Pavilion. The two travertine tables are not present in the current Pavilion, as Knoll International found them to be

unstable. The reconstruction architects decided not to include these unstable tables or a revised version, at least initially.³⁴

Where is the carpet?

The 1964 plan published by Blaser was given scale by the inclusion of furniture. The plan was prepared with the knowledge and approval of Mies van der Rohe, and yet curiously the furniture was placed somewhat carelessly. If a rectangle for the carpet were overlaid on Blaser's plan, a chair would be spilling off the edge. Blaser (and Mies?) chose not to show the carpet within this revised plan for the Pavilion even though the plan included furniture. Quetglas argues that the photographs show that the carpet had a striking effect on visitors, 'they always stop beside this carpet, on which they dare not tread'.³⁵ Was it decided that the carpet within the plan graphic would give too much stability around the ceremonial focal point?

The missing doors

The doors are located on the working drawings but not on the 1929 or 1965 plans. There is no doubt that they existed. Even though they are rarely seen in the black and white photographs, the housing for the supports can be seen even when the doors are removed. The absence of these doors has become legendary in that their removal each day much have been arduous and requiring a strong team of people.³⁶ Photograph 10.20 of the Mies archives shows the doors in place. Unfortunately there is no convention for removing the doors in the current Pavilion.³⁷

Pragmatic constraints and design for longevity

The original Pavilion was not designed for longevity. The roof was kept as light as possible with a covering of strips of asphalt roofing felt.³⁸ A lath and plaster ceiling was suspended from the roof structure and painted white. Inadequate drainage meant that when it rained the Pavilion became awash. The unsatisfactory resolution of the roof was due in part to the temporary nature of the structure and the limitations of the construction industry at that time. The horizontal roof supported on thin columns was a form of building that was only tentatively resolved within the office of Mies van der Rohe but one which he continued to work on decades later. 'A complicated system of cantilevers and moment connections was devised to stiffen the structure. Despite these efforts, the eight cruciform columns alone could not support this roof and five more columns had to be lodged in the double-skinned marble screens around the exterior.'³⁹

Construction of the original Pavilion was completed in a frenzied three months. Photographs of the construction work show marble being hung from the steel frames prior to the installation of the roof. The rebuilt Pavilion has a concrete roof with concealed drainage. The reconstruction architects have carefully documented and justified the detailing decisions made for the rebuilding.⁴⁰ Circici regrets that post-tensioning of the roof slab was not an available option for the rebuilding. Instead deflection was allowed for by using contraflexure in the slab.

Other changes include the use of a highly polished stainless steel instead of chrome, stronger, more compact travertine for the flooring slabs, an inclined floor slab for drainage, and some changes to the hanging of the stone cladding. The search for onyx that was as close to the original is well documented by Sola-Morales. The finding of a remnant of column within the excavation allowed the column sections to be corrected by 8mm thick angles to 10mm.⁴¹

The selection by the reconstruction architects of the onyx stone is generally accepted as being as close to the original as possible. However, Tegethoff has expressed concern that the green glass between the ceremonial space and the sculpture pond was too transparent. New manufacturing techniques changed the range of glass available and although hand made glass could have been found, costs were prohibitive.⁴²

The Pavilion and its context

One of the more obvious discrepancies that a 1929 visitor would notice in the 1986 version would be the changed context. The context has been largely excluded from most of the images of the first Pavilion either by careful framing of the photographs or by airbrushing. Juan Bonta published a photograph of the Pavilion in which an adjacent older building has literally been wiped out.⁴³ The reconstruction architects and Quetglas argue convincingly that the context was crucial to the design of the Pavilion. Perhaps the major contribution by Quetglas was not his understanding of the mirror-like ethereal quality of the original pavilion but its theatrical setting. Indeed the ethereal quality of the building was written about in first hand reports in 1929.

The site originally offered to Mies was adjacent to and reliant on the Pavilion of France. The alternative site chosen by Mies was behind eight tall Ionic columns erected by Puig I Cadafalch in 1923 to define the central Exposition zone.⁴⁴ These columns would have dramatically affected the experience of the original Pavilion by

almost setting a stage front behind which the Pavilion existed as a stage set.

When asked about the importance of the original columns to Mies' design and whether the columns should be reinstated, Cirici was not emphatic that they should be but was simply relieved that an existing concrete building on the plaza in front of the Pavilion had recently been demolished.⁴⁵

Conclusion

A study of the variations on the plan has given insight into the rigor of some researchers and the carelessness of others. The plans reveal something of the ideologies of those drawing them.

Reviews on the rebuilt pavilion correctly congratulate the architects on their thorough research and sensitive interpretation. The rebuilt pavilion is regarded as an accurate interpretation of the original despite a few minor and unavoidable changes. And yet, not only are the changes significant, the decision to rebuild has provided a new representation that damages our black and white memories. While many mourn this loss, the phoenix pavilion also reveals new qualities and confirms some that were suspected.⁴⁶

The changes in the rebuilt pavilion have been outlined in detail by the reconstruction architects and summarized in this paper. Some changes were seen as necessary or desirable while others arose from changed techniques and materials. The simple decision to clad the office in stone required a window to be resized and relocated. There were two particularly interesting reconstruction changes. One was the strategy of looking to later work by Mies for precedent in the office wall lining and the other was to open up the rear pavilion as a main visitor hub.

Ironically the cult status of the original building may only have been achieved by its destruction. The building was rapidly constructed and not detailed to age or be viewed from all angles; rather it was a stage set used for a short ceremony. If the building had remained, problems to do with inadequate drainage, aging of travertine and unauthorized viewpoints may have contaminated the pristine architecture present within the black and white images. The original building did not exist to confuse or taint the idealized and simplified plans that were developed in later years.

ACKNOWLEDGEMENT

The author would like to thank Sr. Cristian Cirici architect, for his observations. The approach taken in this review, by its nature, does not give due credit the reconstruction architects who took on the difficult task of interpreting the many conflicting sources. The architects undertook a rigorous review of existing documents to achieve the best reproduction possible and their efforts have been unanimously applauded.⁴⁷ They have undertaken the task as a self-conscious exploration of the aspects that separate a work of art from its copy.

The author thanks the Illinois Institute of Technology for the use of the Graham Resource Center during a sabbatical in 2002 and Professor Edward Ford, University of Virginia for his suggestions and influential research.

NOTES

¹ Cristian Cirici, reconstruction architect, gave the following information during an interview with the author on 13 June, 2002. The old foundations were discovered during excavation and so the size of the pavilion was confirmed and a placement error of around 30mm in each direction could be corrected. A part of the cruciform column and its attachment method to the footing was discovered. From the original Pavilion, it was known that a piece of onyx was used as a table top by Dr Reugenberg. Philip Johnson acquired an armchair and the metal base of an ottoman stool was used by Mies in his Chicago apartment.

² Ignasia de Sola-Morales, Cristian Cirici, and Fernando Ramos, *Mies van der Rohe — Barcelona Pavilion*, (Barcelona: Gustavo Gili, 1993).

³ D. Pollens, *Barcelona Pavilion*, (D.L. Pollens, Video Editor, Lumen Inc, 1990).

⁴ Juan Bonta, *Architecture and its interpretation*, (London: Lund Humphries Publishers Ltd, 1979). Bonta, J.P., *Anatomia de la interpretacion en arquitectura*, (Barcelona, Gustavo Gili, 1975). In this book and the original 1975 Spanish version, Bonta tracks the emergence of the canonical interpretation of the Barcelona Pavilion. Sola-Morales et al disagree that the building received little attention saying that twenty favourable reviews were recorded in the official diary of the Exposition.

⁵ Rem Koolhaas, Miestakes in Phyllis Lambert (ed), *Mies in America*, (New York, Canadian Centre for Architecture, 2001), p. 727.

⁶ Josep Quetglas, *Fear of glass: Mies van der Rohe's German pavilion in Barcelona*, (Basel: Birkhauser, 2001).

⁷ Ignasi de Sola-Morales, Cristian Cirici, and Fernando Ramos, *Mies van der Rohe — Barcelona Pavilion*.

⁸ Arnold Schink, *Mies van der Rohe: Beitrage zur asthetischen Entwicklung der Wohnarchitektur*, (Stuttgart: K. Kramer, c1990), Illus. 175,176 & 177. This publication illustrates the three main plans developed for the Pavilion.

⁹ Werner Blaser, *Mies van der Rohe : The art of structure*, (London : Thames & Hudson, 1965).

¹⁰ Wolf Tegethoff, *Mies van der Rohe: the villas and country houses*; Cambridge, (Mass. MIT Press, 1985), p50. This plan was developed working with the architect Ludwig Glaeser as director of the newly established archives with the Museum of Modern Art, New York.

- ¹¹ Josep Quetglas, *Fear of glass: Mies van der Rohe's German pavilion in Barcelona*, p 116.
- ¹² Tegethoff, *Mies van der Rohe*, p71.
- ¹³ Tegethoff, *Mies van der Rohe*, p74 and Notes 24-25 state that in February, 1929, work on the project was suspended due to exorbitant increases in the cost of the building.
- ¹⁴ Interview with Cristian Cirici by author, June, 2002.
- ¹⁵ Pollens, *Barcelona Pavilion Video*.
- ¹⁶ Mies van der Rohe, 1886-1969., *The Mies van der Rohe Archive / edited by Arthur Drexler*; (New York: Garland Pub.), 1986-<1992>, Archive Drawing 14.13, p236.
- ¹⁷ Cirici explained the inefficiency of the cruciform shape comparing it with the circular hollow section as the most efficient profile. Interview June 13, 2002.
- ¹⁸ Ludwig Hilberseimer, *Mies van der Rohe*, (Chicago, Theobald, 1956), p. 20.
- ¹⁹ Franz Schulze (ed), *Mies van der Rohe : critical essays*, (Cambridge, Mass. MIT Press,1989).
- ²⁰ Franz Schulze(ed),*Mies van der Rohe : critical essays*.
- ²¹ A significant gap between the Barcelona Pavilion and later American work by Mies is the use of asymmetry. Except for the Farnsworth House, every built American design by Mies is symmetrical although site positioning is typically asymmetrical. In contrast, a link between the Pavilion and the later Farnsworth House that has not been noted is the similar eight-column format.
- ²² Tegethoff, *Mies van der Rohe: the villas and country houses*, p50.
- ²³ Adrian Gale, 'Mies van der Rohe- An appreciation', in Russell, F.,(ed), *Mies van der Rohe, European Works*, (London: Architectural Monographs, Dr Andrea Papdakis, 1986).
- ²⁴ Dr Reugenberg worked on the Pavilion as a young architect and his later section and detail interpretations have been published. Cirici, with others, visited Reugenberg prior to the reconstruction. Reugenberg had set up a curtain through the living area for this meeting. He explained that everything that was needed for the reconstruction of the Pavilion was available at a price and was waiting behind the curtains. The sum was considered too great and so the reconstruction architects continued their work without this resource.
- ²⁵ F Russell, (ed), *Mies van der Rohe, European Works*, (London: Architectural Monographs, Dr Andrea Papdakis, 1986). Observations by Sandra Honey and Adrian Gale in this book are useful additions to an understanding of Mies' European work and include interpretive drawings, particularly sections by Dr Reugenberg.
- ²⁶ Gale, 'Mies van der Rohe- An appreciation' p99. Gale analyses Mies' attitude to joints using the complicated half joint used in the frame of the Barcelona chair is a good example of Mies' attempt to eliminate the joint.
- ²⁷ Mies van der Rohe, 1886-1969., *The Mies van der Rohe Archive*. In first preliminary scheme, Drawing14.3, no columns are shown and three sculpture plinths are located at the ends of viewing axes. In Plan 14.2 which is called the second preliminary scheme, the plan seems to be reduced in size and six columns rather than eight are located. Just two sketches shown on 14.28 are irrefutably by Mies van der Rohe. The first preempts the plan of the later Resor House but has none of the sliding and interconnected spaces apparent in the second sketch and in the final scheme. It is also worth noting that Plan 14.22 is a shop drawing showing the layout of the irregularly shaped travertine slabs indicating that it is unlikely that Mies used the modular system suggested in the 1965 Blaser plan developed with the office of Mies van der Rohe. This plan along with Plan 14.7 indicates a large rectilinear landing to the rear of the Pavilion and no travertine behind the bench wall.
- ²⁸ Mies van der Rohe, 1886-1969., *The Mies van der Rohe Archive*. 14.3 is titled as the first preliminary scheme.
- ²⁹ Quetglas, *Fear of glass*, p 182
- ³⁰ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*, p. 11
- ³¹ Chicago Architects' Oral History Project, *Impressions of Mies — an interview on Mies ven der Rohe With former students and associates*. Edward A Duckett and Joseph Fujikawa. Interview by William Shell (Nov 1 1988. The Ernest Graham Study Center for Architectural Drawings, The Art Institute of Chicago), p 20.
- ³² Tegethoff, *Mies van der Rohe: the villas and country houses*, p82.
- ³³ Mies van der Rohe, 1886-1969., *The Mies van der Rohe Archive*, p220 notes that the cruciform column section drawn in 1964 by the Mies van der Rohe Chicago office as the incorrect version. (Archive number 1000.65)
- ³⁴ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*, p. 37.
- ³⁵ Quetglas, *Fear of glass*, p146.
- ³⁶ Mies van der Rohe, 1886-1969. *The Mies van der Rohe Archive*, p216.
- ³⁷ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*, p.17. Sola-Morales states that it was only after its inauguration that Mies designed doors for his building, whose incorporation has an evident air of being something additional.
- ³⁸ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*, p. 16.
- ³⁹ Russell, (ed), *Mies van der Rohe, European Works*. Refer to observations by Sandra Honey on later work by Dr Reugenberg, p62.
- ⁴⁰ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*.
- ⁴¹ Using sketches Cirici explained that this remnant of column showed that angles fixed to a sleeper section in the footings.
- ⁴² Tegethoff, *Mies van der Rohe: the villas and country houses*. Tegethoff explains the original dark green glass was unavailable in 1986 and that the resultant transparency destroyed the integrity of the central space. Cristian Cirici explained in interview that they found a Czechoslovakian glassmaker that could replicate the original plate glass process but that the cost was prohibitive.
- ⁴³ Bonta, *Architecture and its interpretation*, p201, Illus 110.
- ⁴⁴ de Sola-Morales, Cirici, and Ramos, *Mies van der Rohe - Barcelona Pavilion*, p. 8.
- ⁴⁵ Cirici in an interview with the author, said that the columns still exist and he saw them lying in a storage area at the Barcelona Botanical Gardens.
- ⁴⁶ Robin Evans, *Translations from drawing to building and other essays*, (London : Architectural Association, 1997). In his essay on Mies van der Rohe's Paradoxical Symmetries, Evans confirms his observations after attempting to sort slides from a visit to the rebuilt pavilion and having trouble working out their orientation.
- ⁴⁷ Chicago Architects' Oral History Project, *Oral History of George Edson Danforth, FAIA*, Interviewed by Pauline Saliga, (August 1986, The Ernest Graham Study Center for Architectural Drawings, The Art Institute of Chicago). In this oral history, George Danforth, an employee of Mies noted that the reconstruction process and outcome were going to be highly successful. Likewise, Franz Schulze states in his introductory notes to the *Mies van der Rohe Archive* that the reconstructed building is now as close to its original form as new materials would allow.