Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Entrance hall, staircase, detail showing the travertine, the chromed and polished brass cladding of the cruciform pillar and the reconstructed stucco lustro; in the background, the reconstructed semi-translucent curved glass wall and the original metal framing painted with cream-white oil paint. © Ana Tostões, 2012.

The Re-birth of the Tugendhat House

BY ANA TOSTÕES, IVO HAMMER AND ZARA FERREIRA

Following a thorough and pioneering conservation-science study, the Tugendhat House was restored between 2010 and 2012. The house of Greta and Fritz Tugendhat, in Brno, designed by Mies van der Rohe and Lilly Reich (1928-1929), is the single example of modern architecture in the Czech Republic inscribed in the list of UNESCO World Cultural Heritage sites.
After an intense and dramatic life with different uses, the house received an outstanding restoration which brought back its original form, space and materiality, and was opened to the public as a House-Museum.
This paper aims to bring light to this fascinating story based on the book *Tugendhat House. Ludwig Mies van der Roble* by Daniela Hammer-Tugendhat, Ivo Hammer and Wolf Tegethoff (Basel, Birkhäuser Verlag GmbH, 2015), namely on Daniela Hammer-Tugendhat statements and on the experience of the members of the International Expert Advisory Commission THICOM[1].

Every reconstruction remains hypothetical. Even the most industrious attempts can only approximate the fine details of the original techniques and aesthetic. Neither the replacement of non-existent parts nor the restoration or repair of damage create conditions of which one can say more than "it might have looked like that"[2].

A Modern House for Cultivated Owners

Greta Tugendhat, born Löw-Beer (1903, Brno-1970, St. Gallen) and Fritz Tugendhat (1895, Brno-1958, St. Gallen) came from Jewish German speaking families of industrialists and traders who had lived in Brno for several generations, expressively contributing to the industrialization of the area of Czechoslovakia since the 19th century, owning and operating a number of textile, sugar and cement factories[3].

Mainly motivated by Grete, in 1928 the couple commissioned Mies van der Rohe to design their family house: "I had always wanted a spacious modern house of clear and simple forms, and my husband had been almost horrified by the interiors of his youth, stuffed with trinkets and lace"[4].

The exclusive building plot was given to Grete by her parents in March 1929, in anticipation of her inheritance, being part of a lot behind the Alfred and Marianne Löw-Beer villa, with beautiful views of the historic skyline of Brno. Mies van der Rohe, fascinated with the plot, immediately started working on the design, exploring his will to realize "the concept of opening up the interior space of the house to its natural surroundings"[5]. Impressed by the high level of Brno architecture and construction, Mies van der Rohe entrusted the construction works to a local construction company of the brothers Artur and Mořic Eisler, who finished the work in 14 months. The local company *Standard bytová společnost* of Jan Vaněk created the built-in furniture. In December 1930, the couple moved into the house, where they lived with their children for seven happy years. In fact, they left the house in March 1938, the *Anschluss* day, when, in order to survive the Holocaust, they decided to abandon Czechoslovakia[6].

Through a combination of a precise design, good construction, advanced technologies and outstanding materials, Mies van der Rohe, together with Lilly Reich, satisfied the Tugendhat family's wish for innovation, originality and truth[7], creating an exceptional way of modern life based on an open plan.

It consists of a unique global work of art – *Gesamtkunstwerk* – in terms of its placement into its natural setting, its spatial organization, construction, technical equipment and interior furnishings.

In terms of its spatial arrangement, the 2000m² house was designed on 3 levels, with each level's plan related to the variation of the slope of the terrain, providing an innovative distribution of space. The entrance is situated at the top level, together with the rooms family area on the one side and the garage and driver's apartment on the other, separated by a perspective view through to Spilberk castle on the mountain opposite. The main living and social areas of the house are disposed on the floor below along with the kitchen and servants' area. The basement below this main level integrated Fritz' photo laboratory, the "moth room"[8] and facility rooms for technical equipment such as central heating water and central air-conditioning.

Regarding construction, a steel support structure in the form of cross-shaped columns was used for the first time in the history of single residential houses. It allowed thinner walls, open spaces and larger openings in connection with the garden. The works were closely monitored and followed the highest possible requirements of the time.

01 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Mies van der Rohe (smoking) and Grete Tugendhat, sitting in the living room on the emerald green Barcelona chairs. © Fritz Tugendhat, February, 1931.

02 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Ernst and Herbert Tugendhat sitting in front of the glass wall of the living room during a heavy rain. © Fritz Tugendhat, 1935.

The technical equipment was outstanding: two of the glass walls could be retracted down into the floor while the heating system along the bottom of the glazed walls prevented the glass misting; a sophisticated air-conditioning system provided a combination of heating, ventilation and humidifier, providing filtered and thermally treated air in the main living room.

Valuable and rare materials have been used in the interiors: Italian travertine, polished chromed brass cladding to the columns in the living room contributing to its crystalline atmosphere; the semi-circular wall of ebony from Macassar (Indonesia), defining the dining space; the wall made of massive onyx marble from Morocco separating the library from the living room. The textiles were chosen in collaboration with Alen Müller-Hellwing, a textile artist from Lübeck. "Lily Reich was mainly responsible for choosing the textiles, whereas Mies initially showed little interest in such details. I would even suggest that Lilly Reich was the main force behind the colors and textiles, which shaped the impression of the Tugendhat House to such a high degree"[9]. The interior furnishings were also designed by Mies van der Rohe, together with Lilly Reich, primarily made from tubular and strip steel and noble woods (rosewood, zebra wood and Macassar ebony). Every piece of furniture was designed specifically for each place of the house.

The interior space was designed as a free-flowing space, accentuated by the continuous use of cream white linoleum in the floor, allowing a fluid discovery of the space while moving through it – "My mother told me that this experience of space was an essential quality of life in the house: while providing seclusion and privacy, there was a feeling of belonging to a larger totality at the same time"[10].

The dialogue between architecture and nature is present in all scales: besides the natural surroundings having defined the structure of the house, we can find the dialogue present in the large windows that could be lowered, allowing the entry of nature into the living room, even in the winter; in the onyx wall as part of the interior structure; or even in the water-filled lamp on the desk[11].

The garden, made in collaboration with the landscape architect Grete Roder, "was a small paradise to the children, who made use of this playground all year round. The notion of freedom, which was so important to Mies, was successfully realized for this small and prosperous family"[12].

The Tugendhat House as a Symbol of the European Outbreaks: the Nazi Period, the Cold War and the Fall of the Wall

Shortly after the Tugendhat family's flight from Czechoslovakia, the house was confiscated by the Gestapo in 1939 while invading Czechoslovakia, and in 1942 became illegal property of the German Reich. Radical construction changes took place in the house during the war: the bombardments smashed all but one of the windows, furniture was stolen or used as firewood, and several modifications were undertaken – inner walls were inserted, the chimney increased height, the boiler was broken, the half cylinder from Macassar ebony went missing; "everything (was) in a desolate state, devastated, broken, fragments, rubbish, dirt, rags, various garbage, glass, etc. all over the floor"[13].

During the liberation of Czechoslovakia in 1945, the house was used for military purposes, contributing to the increase of the house's devastation with the destruction of the linoleum floors. From 1945 to 1950, a private dancing school was established in the house, by Karla Hladka, an instructor at the Brno conservatory. In 1950, the house was registered as property of the Czechoslovak Socialist state and a rehabilitation center for children with spinal defects was established there until 1979. One year after being transferred as a property of the South Moravian Health Authority, in 1963, it was classified as a National Monument as a first step leading to its preservation, as a result of main

03 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Living room, semi-circular wall consisting of Macassar ebony veneer of the dining area. © Rudolf de Sandalo, 1931.

04 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Main living room, view to the library, the onyx marble wall and the suite. © Rudolf de Sandalo, 1931.

efforts by František Kalivoda (1913-1971), an architect who was committed to promoting several initiatives dedicated to cultural monuments in Brno.

In 1980, still under "socialist" conditions, the Tugendhat House moved from the property of the state to the property of the City of Brno and, between 1981 and 1985, the first renovation attempts were undertaken, with the goal of advertising the city and hosting the accommodation of guests[14], which happened between 1986 and 1994.

During this renovation work, some removal of later additions was undertaken, but also many of the original elements were damaged rather than preserved, and partly destroyed. The lack of conservation-science study and the use of unsuitable materials led to a result differing from the original condition[15].

In 1992, the Tugendhat House gave place to the agreement for the separation of the Czechoslovak Republic into two independent states. Together with her family, Daniela Hammer-Tugendhat campaigned, for years, for the full restoration of her parents' house, so that it could be opened to the public according the wish of her mother Grete. In the following year, the Fond Vily Tugendhat (FVT) was established by Czech architects with the aim of strengthening efforts towards the reconstruction and the use of the house as an architectural center. In 1993, Brno City Council voted to open the house to the public, for cultural purposes, and continue the efforts to restore it.

Soon another association was established, "Friends of Tugendhat" (FRIENDS), with the goal to raising funds for the restoration of the house. FVT, FRIENDS and members of the Tugendhat family tried to obtain a lease over the house but it was rejected by the Brno City Council.

Nonetheless, in 1994 it was finally agreed that the Tugendhat House would be administered by the Museum of the City of Brno and would be opened to the public and further restored. The house opened as a museum finally on July 1, 1994. Since then, efforts began towards the restoration of the building envisaging the preservation of the historic fabric regarded as significant but also its adaptation to the requirements of a museum. Following these efforts in 2001, the Tugendhat House was recognized by UNESCO as World Heritage as "an outstanding example of the international style in the Modern Movement of architecture as it developed in Europe in the 1920s"[16], under the condition of conducting extensive restoration.

The Pioneering Conservation-science Study

The aim of the restoration project, in accordance with the requirements of monument conservation, was the lifetime prolongation of the monument in an original state and the reconstruction of missing original parts.

To that end, a long and careful conservation-science study was developed:

> *An important precondition to preserving the cultural values of a historic object is the investigation and documentation of materials and surfaces by conservators/restorers. (...) The entire process of conservation studies and the associated interdisciplinary historical, technical and scientific investigations is known today as conservation-science investigation*[17].

Between 2003 and 2010, the HAWK University of Applied Sciences and Arts, Hildesheim / Germany, conducted complete, careful and interdisciplinary conservation-science studies under the guidance of Ivo Hammer[18]. These studies were called the Conservation Investigation Campaign (CIC), and were a joint undertaking from different universities and scientific institutions[19]. The goal was to discover all the details about the real appearance of the Tugendhat House at the time of its construction and the various changes and repairs undertaken until the moment. To that end, all categories of materials (plasters, stone, wood, wall, metal) on its different time layers were examined, in connection with the associated techniques and the respective states of conservation. In the frame of those studies, proposals for the conservation and restoration have been developed.

The decisive criterion in restoring the building was its place in the history of architecture, understood as a work of art of universal importance. The importance of the restoration was the preservation of its value as a source of history. Therefore, the interdisciplinary cooperation between architects, structural engineers, art historians, conservator-restorers[20], material scientists, chemists, physicists, building climate control engineers, was fundamental. The building was fully studied through a transdisciplinary process including all appropriate historical, scientific, technological and empirical methods. The materials, techniques, surface materials and colors covering all the historical phases were documented and researched. The damaged and the well-preserved components were registered and analyzed. Damaging factors were identified. Methods for conservation and restoration, as well as the skills required for repair and maintenance, were developed. It was understood that the importance of heritage was also to be a source of knowledge of technical solutions[21].

The project for the rehabilitation and restoration occurred between 2005 and 2006[22].

To advise the City of Brno regarding the implementation of the restoration of the Tugendhat House according to the principles of the preservation of a monument, an International Expert Advisory Commission (THICOM)[23] was established that actively accompanied the process.

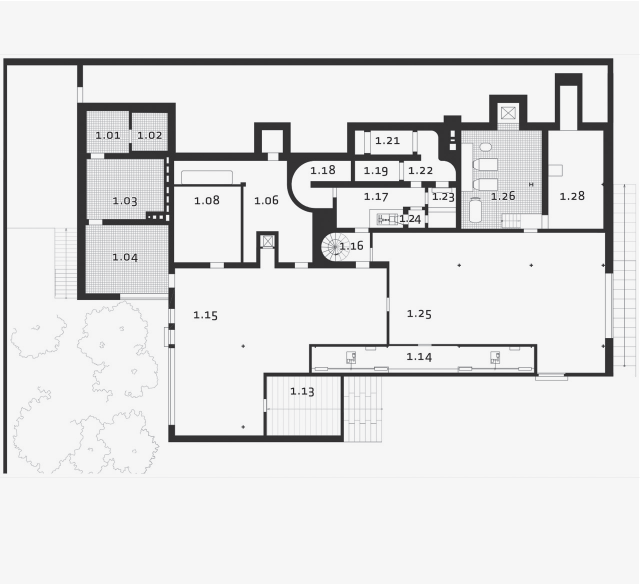
The restoration process was based on the belief that "heritage conservation as a societal practice only makes sense (...) if the material authenticity is preserved"[24].

The Restoration and the Re-open as a Museum of Modern Living following Greta's Wish

As Ivo Hammer states, *monuments are not only sources of historical testimony, commonly referred to as cultural heritage, but also a resource of technical solutions whose materiality incorporates the historical, artistic and cultural characteristics assigned to the monument. (...) Heritage conservation is the social practice of concrete, materially anchored memories. It can only maintain its socially binding and scientific character if the material source is preserved in its entire materiality*[25].

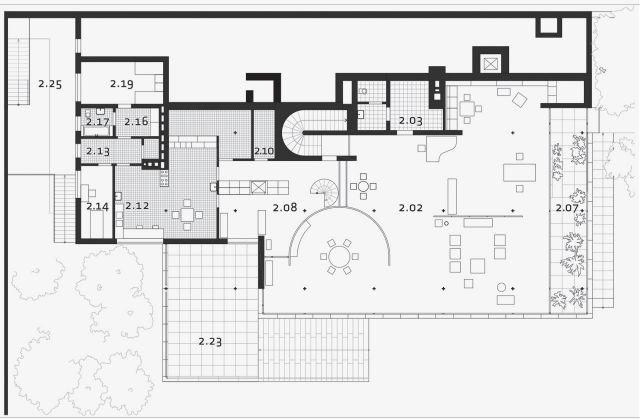
05 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Revised publication plan basement. © Atelier RAW (Tomáš Rusín and Ivan Wahla).

1:01 anteroom
1:02 moth chamber (fur safe)
1:03 darkroom
1:04 washroom
1:06 rainwater storage room
1:08 vegetables storage
1:13 room under the garden stairs
1:14 engine room of the windows
1:15 room for drying laundry and ironing
1:16 basement stairs
1:17 control of the air conditioning and motor
1:18 space under the stairs
1:19 exhaust
1:21 cooling and humidifying the air
1:22 mixing chamber
1:23 air filter
1:24 air heating
1:25 storage for garden tools and furniture
1:26 heating and ash elevator
1:28 carbon chamber



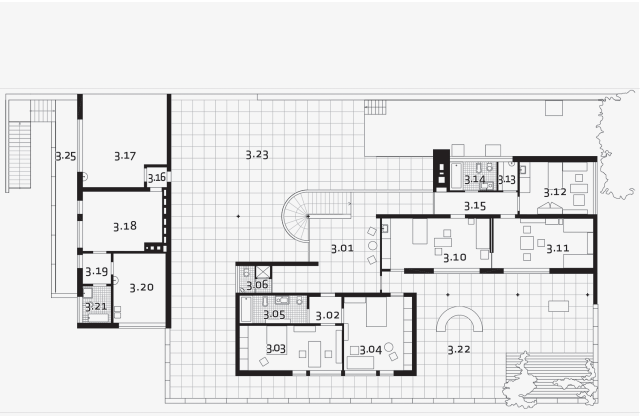
06 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Revised publication plan first floor. © Atelier RAW (Tomáš Rusín and Ivan Wahla).

2:02 main living room
2:03 screening room with toilet
2.07 conservatory
2.08 pantry
2:10 stockroom
2:12 kitchen
2:13 entrance hall of the service wing
2:14 room the lady cook
2:16 anteroom
2:17 bath and toilet
2:19 room of the chambermaids
2:23 garden terrace with staircase
2:25 gallery of drivers apartment



07 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Revised publication plan second floor. © Atelier RAW (Tomáš Rusín and Ivan Wahla).

3:01 entrance hall with stairs to the main living room
3:02 anteroom
3:03 Fritz Tugendhat
3:04 bedroom Grete Tugendhat
3:05 parents bathroom
3:06 Toilet, Dumbwait- er
3:10 room of Ernst and Herbert
3:11 room of Hanna Weiss
3:12 room of Irene Kalkofen
3:13 utility room
3:14 bathroom of the children and of Irene
3:15 hallway
3:16 anteroom to the garage and driver apartment
3:17 garage
3:18 sleeping room of the drivers apartment
3:19 vestibule of the drivers apartment
3:20 cuisine of the drivers apartment
3:21 bath and toilet of the drivers apartment
3:22 play terrace
3:23 front porch (3.24 technical terrace)
3:25 gallery drivers apartment



08 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Garden stair case, before restoration: stability problems and rests of original façade plaster and later coatings, garden walls reconstructed in 1970 using carved stones. © Ana Tostões, 2009.

09 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Main living room, view towards west, before restoration: PVC-flooring, semicircular wall not matching the original one, distemper paint on the ceiling, plastic curtains, commercial copies of the furniture. © Ana Tostões, 2009.

In the face of this conceptual context and the importance of ensuring the original materiality, this recovery has been made as close to the original as possible, and when necessary, by replacing the material for the original ones, with the intent of preserving the authenticity of the original structural materials.

Beyond the physical aspects of the restoration, some structural problems have been resolved while the spaces and the lighting quality have been carefully restored. The house has been discreetly adapted to a museum, to accommodate many visitors, involving the house's temperature, security and fire detection control. The toilets were installed in the basement, which also houses an exhibition of original photographs and a book shop.

Legislation was applied with good common sense regarding the security and comfort regulations without putting in danger the spatial and constructional detailing value of the building.

The fundamental structural issues that the Tugendhat House was facing before the renovation and restoration process referred to the drainage system, the deformation of the garden terrace, the waterproofing of the coverages and the corrosion of steel structures.

The original plaster of the exterior terrace walls was detached by a conservator-restorer and re-attached to the brick wall rebuilt on the correct original place, and the pavement of the floor and stairs, made of Slovakian travertine introduced in the 1980s' renovation, was replaced with the original Italian Tivoli travertine. Both, the garden terrace and the upper terrace received a new waterproofing system. After the removal of insulation layers introduced in the 1980s and the lowering of the parapet to its original height, a new roof covering was developed using contemporary materials and technology: cellular glass roof insulation, modified-bitumen sheet, POCB membrane; the roof parapet was covered by an adhesive bitumen on the underside and the rainwater gutter outlets and downpipes were covered with pre-weathered titanium zinc[26].
Within the renovation of the drainage system, the original pipelines were respected to the maximum. When the renovation of the drainage pipes would imply the damage of authentic finishes, a method of relining the historical piping was chosen. The water supply of the whole building – made of stainless steel – was renewed.

The restoration of all the structural steel components and metal fittings was of crucial importance. The original technology of oil-based paints was applied to all metal coatings, following the original technology.

Also, almost all the technical artifacts and building services engineering components were restored and made fully-working again: the whole ventilation system, including humidifier, cooling, fan, filter for oil and wood shavings with mechanical controls, has been preserved in its original state and is fully functional; the heating unit was reconstructed as a technical monument; the engine room for the retractable windows and the boiler room was restored with great attention to detail, as were the tubular heating elements, the rainwater tank and the ventilation equipment. The equipment substitutions made during the 1980s' renovation or the equipment that hadn't survived, were replaced by the most similar equipment to the original ones: the historical equipment of the boiler room was rebuilt using overhauled historical Strebel boilers taken from other buildings, the cast-iron radiators were replaced by fully working replicas, the 1980s' central heating pipes were replaced with stainless steel tubing. The lights and sanitation facilities were reconstructed in detail based on historical photos.

All the plasters were preserved in their entirety after removal of secondary coatings from the surfaces. The original exterior plaster was smoothed traditionally with a wooden board and correspondingly having some roughness caused by the sand grains. The original thin layer of whitewash

10 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Ivo Hammer cleaning of the original façade plaster using pneumatic micro chisel. © Dieter Reifarth, 2011.

11 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Garden façade, after restoration. © Alex Dill, 2012.

of slaked lime pigmented with fine grains of Bratčice sand hardly covered the roughness of the surface thus producing a somewhat impressionistic polychrome effect of its original yellowish exterior tone. The conservators treated the wall surface to reconvert the gypsum caused by pollution. The actual final coating of the façade follows the traditional way of maintenance using the original coating material: a wash of slaked lime pigmented with sand. Crumbly layers were injected and reinforced. Because of its poor state of conservation, the original stucco lustro of the interior wall was newly coated with a thin layer using nearly identical material: limestone and marble dust, some linseed oil and cellulose-ether as the binding medium. Again, as with the façade coating, it was pigmented with fine silt size grains of Bratčice sand and was finely sanded creating the illusion of a polished marble surface.

Good luck played its role in the restoration process too: the original bathtub, missing since the 1940s, was found in a nearby house; a part of the original Macassar panels was found in the former headquarters of the Gestapo at the University of Law in Brno in 2011. Through the analysis of old photographs, the restorers were able to align the authentic material to its original position and restored the inner face to the original state. Partial missing parts were covered with new Macassar veneer. Original white and black RAKO Czechoslovakia ceramic floor tiles were discovered during the construction works, under later-added layers. Also, while removing the PVC flooring that, during the 1980s' renovation, had replaced the original DLW (*Deutsche Linoleum Werke*) linoleum, an authentic floor screed, made with Sorel cement, was discovered. This cement was made from a mixture of magnesium oxide (burnt magnesia) with magnesium chloride and wooden filler materials. After this discover, the experts decided to produce this material, to be used as the substrate of the linoleum, in accordance with the original formula. Also, the same manufacturer DLW linoleum who had supplied the original one for the house in 1930 produced the linoleum.
The garden was also renovated and its land drains were provided with a new irrigation system.

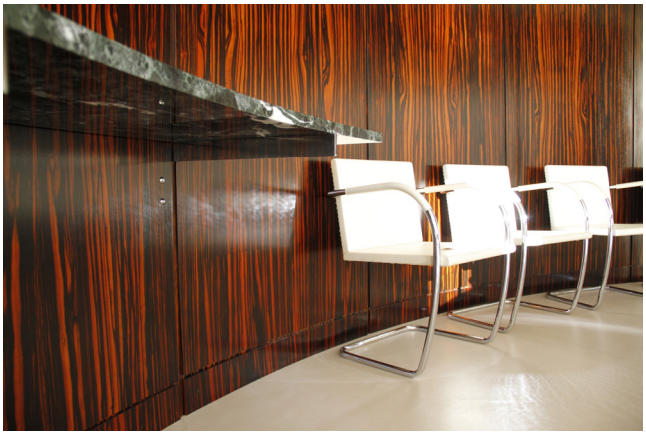
In the interiors, the curtains and the carpets were selected on the basis of historical black and white photo-documentation[27]. The restoration of the wooden furniture required restoring original and preserved elements and replacing all the missing furniture pieces with exact replicas recreated through research on surviving original pieces and archive photographs[28]. (The sliding doors and drawers of the original wooden furniture were, however, still perfectly fitting, after all the multiple relocations and climate changes, proving the high quality of the furniture originally produced for the house).

Within the new functional requirements of the building, inaugurated as a monument of modern architecture, the house's security had to also be an important component of the restoration project: fire protection and security was achieved through modern technical equipment and the minimum of visible changes. Furthermore, new spaces had to be introduced: the director's office, the documentation center, guides' facilities, cash desk, bookshop and toilet facilities. These new spaces were designed to be legible and work as removable structures.

The search for maintaining the character and the materiality was decisive in achieving the outstanding results. As Mies had explained to his clients "how it is important, especially in a modern building which is almost free of decoration and ornament, to use precious materials"[29] that's why "materials are not merely carriers of meaning; they also produce meaning. (...) Materiality incorporates the historical, artistic and cultural characteristics assigned to the (architectural) monument"[30].

After two years of restoration works, the Tugendhat House opened its doors to the public on February 29, 2012 – "the house that was planned as a private residence for a

12 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Main living room, suite in front of the onyx marble wall and dining area, view towards north-west; after restoration. © Ana Tostes, 2012.



13 Mies van der Rohe and Lilly Reich, Tugendhat House, Brno, Czech Republic, 1929-30. Main living room, dining area, the curved inner wall made of Macassar ebony, after restoration. © Ana Tostões, 2012.

family with children has become a work of art that is now given to a global community"[31].
In addition to guided tours through the house, presented as a living museum exhibition, a formal exhibition about the house is located on the technical floor, followed by a shop selling publications and souvenirs. The exhibition includes a 1:100 model of the house and is centered on the time the Tugendhat family lived there, between 1930 and 1938.

Thanks to the exceptional renovation works conducted and the symbiosis that has been achieved between its uses as a museum and as a fully functional living organism, the Tugendhat House is nowadays an authentic Modern Movement monument.

The quality of the materiality of the Tugendhat House can be used as an international guideline for future restoration and adaptation projects involving architects of the Modern Movement. The conservation-science studies conducted prior to the works and the dedicated effort of the THICOM members have certainly contributed to a considerable degree. The work of the experts may serve as a model for international cooperation in the context of heritage preservation[32].

This unique restoration confirmed the awareness of the necessity of such conservation-science studies, accompanied by an active international advisory board.

Notes

1 THICOM - acronym of Tugendhat House International Expert Commission.
2 Ivo Hammer, "Surface is Interface. History of the Tugendhat House 1938-1997. Criteria for the Preservation", in Daniela Hammer-Tugendhat, Ivo Hammer and Wolf Tegethoff, *Tugendbat House. Ludwig Mies van der Roble*, Basel, Birkhäuser Verlag, 2015, 161.
3 Hanák, Jaromír (ed.), *Rodinné domy Löw-Beerů. Brněnec – Brno – Půlpecen – Svitávka*, Brno, Muzeum Brněnska, 2016. See also: http://www.vilalowbeer.cz/en/villa2/the-l-w-beers.
4 Grete Tugendhat, lecture held in the Brno House of Arts in the Czech language on 17th January 1969, in Daniela Hammer-Tugendhat, *et al., op. cit.*, 21.
5 Daniela Hammer-Tugendhat *et al.*, *op. cit.*, 30.
6 "In 1938, my family emigrated to Switzerland and in January 1941, to Venezuela. Many members of our family only recognized the danger they were in when it was too late, like my father's mother and sister with her husband Richard Schwarz and their two children who were sent to Theresienstadt and later to an extermination camp, where they died. My mother's father died under unknown circumstances when he tried to escape", Daniela Hammer-Tugendhat *et al., op. cit.*, 52.
7 Fritz Tugendhat, in *Die Form*, 6. Jahr, Heft 11, 15. Nov. 1931, 438. "...whenever I let these rooms and all they contain take their effect, I am overcome by the feeling that this is beauty, this is truth". See Daniela Hammer-Tugendhat *et al, op. cit.*, 77.
8 Preserved entirely in its original state: mat greyish white floor tiles, glazed cream white tiles on walls and ceiling, and the brass bars to hang the clothes and furs (Grete Tugendhat had only one fur coat and one fur jacket, she did not show her richness in an ostentatious way).
9 Daniela Hammer-Tugendhat *et al, op. cit.*, 43.
10 *Id.*, 41.
11 Most probably an arrangement of Grete or Fritz Tugendhat, see Daniela Hammer-Tugendhat *et al., op. cit.*, 39–41, 195.
12 *Id.*, 30.
13 http://www.tugendhat.eu/en/after-the-departure-of-the-family.html.
14 The investor was the department of internal affairs of the National Committee of the City of Brno; the project was developed by the State Institute for Reconstruction of Historical Towns and Buildings in Brno and the designing team consisted of Ing. arch. Jarmila Kutějová, Ing. Josef Janeček, Ing. arch. Adéla Jeřábková and was directed by Ing. arch. Kamil Fuchs, CSc., see Ivo Hammer, "Surface is Interface. History of the Tugendhat House 1938–1997. Criteria for the Preservation", in Daniela Hammer-Tugendhat *et al, op. cit.*, 149-154.
15 The procedures involved to adapt electricity and plumbing systems to the ones required by a hotel were not gentle: the introduction of new electrical lines and new water and heating pipes promoted the destruction and replacement of the original tiles in the kitchen, in the basement and in the bathroom. The original floor linoleum was replaced by PVC; the curved inner wall made of Macassar ebony received an inappropriate longitudinal veneer work; the broken large window was substituted with two glass pieces connected with a silicon joint; the only preserved window ended up being destroyed because its color and absence of a joint was not "in line" with the new glazing; some of the windows and doors steel frames showing back then evidence of corrosion caused by thermal bridges and condensation, were only cleaned and coated with a readily available paint; the plastering was repaired and treated with

new layers of paint containing cement mortar and synthetic resin. Even if these materials were consistent with international practice back then, even for historical buildings, they had a destructive effect on the historic substance, damaging the materials, *idem*.

16 http://whc.unesco.org/en/list/1052.

17 Ivo Hammer, "Materiality. History of the Tugendhat House 1997-2012. Conservation-science Study and Restoration", in Daniela Hammer-Tugendhat *et al., op. cit*., 164.

18 Being a conservator/restorer and dean of the Faculty of Conservation of HAWK, he coordinated from 2003 the international conservation investigation campaign (CIC). In 2010, he was appointed as the chairman of the Tugendhat House International Advisory Commission for the restoration of the Tugendhat House (THICOM).

19 Hildesheim (Ivo Hammer, Gerdi Maierbacher-Legl); Vienna (Martina Griesser-Stermscheg, Tanja Bayerová); Pardubice and Litomysl (Karol Bayer); Bratislava (Peter Szalay); Brno (Josef Chybík); Dresden (Thomas Danzl) and Cologne (Friederike Waentig); with the support of the Brno City Museum (Iveta Černá) and the National Heritage Institute (Karel Ksandr).

20 We use that double term "conservation-restoration" according to the decision of the Copenhagen conference of ICOM CC in 1984 to keep clear the specific professional image of "conservators-restorers" and the difference to the more general use of the term "conservation" e.g. "architecture conservation" which includes the work of architects also. See Ivo Hammer, *op. cit*., 248.

21 *Id*., 165.

22 For that an association was formed combining three architectural offices from Brno: Omnia projekt, Archteam and RAW. However, the proposals originating from the conservation-science study had not been fully integrated in that project by the architects, justified by the argument that the architects would not be able to take responsibility for the conservation methods applied and this information was not necessary for obtaining a building permit. See Ivo Hammer, *op. cit*., 178.

23 Members: Daniela Hammer-Tugendhat (Vienna), honorary chairperson; Ivo Hammer (Vienna), chairman; Wessel de Jonge (Rotterdam), deputy chairman; Iveta Černá (Brno), secretary; Alex Dill (Karlsruhe), Ana Tostões (Lisbon), Arthur Rüegg (Zurich), Helmut Reichwald (Stuttgart), Ruggero Tropeano (Zurich), Thomas Danzl (Dresden), Vladimír Šlapeta (Brno). Karel Ksandr (Prague), Petr Kroupa (Brno), Milos Solař (Prague), Josef Štulc (Prague), Martin Zednícek (Brno).

24 Ivo Hammer, *op. cit*., 165.

25 *Id*., 166. A Technical-Economic Brief (TEB) regarding the preservation of the building and its interior and furnishings as well as the restoration of the garden, issued by the Cultural Department of the City of Brno in October 2002 remarkably states that "the restoration of the villa will be awarded, based on the results of the tender, to a restoration company with the construction work being subcontracted, and not vice versa." Due to problems of legal battles finally the works were awarded to the Brno-based construction company UNISTAV, *id*., 170-172, 178.

26 The insulation of the upper terrace executed in 2011 is too thick and thereby the levels are partly incorrect: the travertine thresholds of the parents and childrens rooms appear lowered nearly to the level of the terrazzo slabs and the slabs are partly inclined to the house walls. Consequently, water has infiltrated into the ceiling of the living room since 2012. In late 2016, following an expert opinion of Thomas Danzl, Ivo Hammer and Arthur Rüegg, the cause of the infiltration was analyzed and repair measures planned to be executed in April 2017.

27 The actual oriental carpets are selected from the market according to a general resemblance of their design to the original ones in black and white photos, whereas the carpet in front of the onyx marble wall has apparently nothing to do with the original carpet woven by Alen Müller-Hellwig. The actual black and cream white velvet is in comparison with the historic photographs not matching the original material quality. The critique has been formulated in the frame of THICOM (2012), see Ivo Hammer, *op. cit.,* 219.

28 The authorities in 2011 refrained from acquiring the available original furniture although they would have been hardly more expensive than the copies. The astonishing argument was mainly that the damage to the old furniture would blur the "aesthetic integrity" of the newly restored building. With the same argument, all original refined wood surfaces have been sanded down in a craft manner. The conservation argument regarding the climate refers also to the original fixtures, e.g. of the library, see Ivo Hammer, *op. cit.,* 216.

29 Grete Tugendhat, lecture held in the Brno House of Arts in the Czech language on 17th January 1969, in Daniela Hammer-Tugendhat *et al., op. cit.,* 20.

30 Ivo Hammer, *op. cit*., 164-65.

31 Daniela Hammer-Tugendhat, "Speech on the Occasion of the Opening of the Tugendhat House in Brno on February 29, 2012, in Daniela Hammer-Tugendhat *et al., op. cit*., 226.

32 Ivo Hammer, *op. cit*., 222.

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Ana Tostões

(b. Portugal, 1959). PhD, architect, architectural critic and historian, Chair of **docomomo** International and editor of **docomomo** Journal. Full Professor at Técnico - University of Lisbon, where she is in charge of the architectural PhD program. Her research field is the theory and history of architecture and construction of the 20th century, focusing on the worldwide cultural transfers. She was awarded with the title of Commander of the Order of Infante Dom Henrique (2006), with the Gulbenkian Prize (2014) and with the BIAU Prize (2016). She was a member of THICOM (2010–2012).

Ivo Hammer

(b. Ulm/Germany, 18.5.1944). Trained as a conservator/restorer. Studied art history and archaeology in Freiburg/Br and Vienna. Doctoral dissertation on early bourgeois realism. Chief conservator/restorer of the Austrian Heritage Authorities (1976–1997). Full Professor at HAWK, Hildesheim (1997–2008). He established the first international university course for the conservation/restoration of architectural surfaces. He was the chairman of THICOM (2010–2012).

Zara Ferreira

(b. Portugal, 1988). MSc in Architecture (2012, Técnico – University of Lisbon, thesis: *The Modern and the Climate in the Lusophone Africa. School Buildings in Mozambique: The Fernando Mesquita Concept (1955–1975)*). She is the secretary general of **docomomo** International and co-editor of ***docomomo*** *Journal* editor. She is currently doing a PhD on the preservation of post-WWII European housing estates (Técnico – University of Lisbon/*École Polytechnique Fédérale de Lausanne*).






Tugendhat House International Expert Commission (THICOM)

Some Testimonies

THICOM Members: Daniela Hammer-Tugendhat (Vienna), honorary chairperson; Ivo Hammer (Vienna), chairman; Wessel de Jonge (Rotterdam), deputy chairman; Iveta Černá (Brno), secretary; Alex Dill (Karlsruhe), Ana Tostões (Lisbon), Arthur Rüegg (Zurich), Helmut Reichwald (Stuttgart), Ruggero Tropeano (Zurich), Thomas Danzl (Dresden), Vladimír Šlapeta (Brno). Karel Ksandr (Prague), Petr Kroupa (Brno), Milos Solař (Prague), Josef Štulc (Prague), Martin Zednícek (Brno).

Since the significant international symposium held in Brno in April 2006, "materiality" had become the motto for the restoration of the Tugendhat House. But what to do when important original parts had disappeared? If they need to be reconstructed, the eye wants to compare the new shine with traces of historical evidence. Unfortunately, all the bathroom tiles and appliances as well as all the moveable furniture (!) had to be redone from scratch. But when it came to the re-rebuilding of the outstanding half-round dining-room screen, an incredible miracle happened and art historian Miroslav Ambrosz presented us with part of the extra-long original Macassar veneers that had been reused for the paneling of an underground SS bar in the Gestapo Headquarters, now a canteen of Masaryk University. 10 of the former 22 panels could be restituted and carefully integrated into the inner surface of the new screen. The result is stunning and adds decisively to the credibility of the iconic furnishings.

Arthur Rüegg
Arch. ETH SIA BSA; Prof. Em. ETH Zurich;
Arthur Rüegg Architektur (Zurich)
THICOM Member

The Villa Tugendhat was inscribed on the World Heritage List on 16 December 2001. Almost 8 years of preparations have been filled by above-standard multi-professional surveys and project documentation. The establishment of THICOM by the Council of the City of Brno then turned out to be an enlightened and unique opportunity to capitalize on the experience of an international team of specialists and docomomo members. The limit of the legislative framework of monument care in the Czech Republic or the financing conditions attached to EU funds introduced a regulated spectrum of changes; however, enthusiasm, expert erudition and argumentation was reflected in a total of 27 changes to the project. THICOM has created an exemplary model situation. In addition to the primary assistance in the most significant intervention in the building's history, there is also the highly appreciated foreign reflection and popularization of the restoration process. I personally appreciate the dedication and commitment of all members who have been able to respond flexibly to the progress of the building and conservation. For me personally, the involvement in THICOM has become an unforgettable professional experience.

Iveta Černá
Director of Villa Tugendhat
THICOM Secretary

"There is still little awareness concerning the restoration of architecture, especially of modern architecture. Architects and art historians believe themselves to be competent enough on their own. For the restoration of modern architecture, it is absolutely necessary to develop awareness of the very specific problems regarding the restoration process, which means conservators/restorers need to be consulted as well".
"My parents identified with Mies van der Rohe's architecture. It was one of those rare occasions of a happy co-operation between an architect and his client and their individual ideas".
"From my perspective, the Tugendhat House is an ideal architectural expression of my parents, at least how I see and experienced them, also in their ambivalence: on the one hand, there was the admirable striving towards 'spirituality' and 'truth', which on the other hand implied an attitude of excessive strictness and demands. The question of Justus Bier concerning whether or not the Tugendhat House was habitable might thus perhaps be answered this way: for my parents, it was".

Quotes from the book Daniela Hammer-Tugendhat, Ivo Hammer and Wolf Tegethoff, *Tugendhat House. Ludwig Mies van der Roble*, Basel, Birkhäuser Verlag, 2015, 39, 72, 73

Daniela Hammer-Tugendhat
Hon. Prof. Dr. Phil. University of Applied Arts in Vienna
THICOM Honorary Chairperson

When reflecting on **docomomo**'s wish for a statement about THICOM I realized that I had an incredible chance to follow the destiny and the development of the renovation of the Tugendhat House in the years between 1983 and 2012. As a young architect visiting the building site of the first renovation campaign directed by Kamil Fuchs I met Jan Otava, Jan Sapak, Vladímir Šlapeta and, later on at the beginning of Docomomo, Iveta Černá, then the opportunity to be invited by Pavel Liska on occasion of the inscription of the house on the World Heritage List. The "materiality" meeting presented the groundwork done by Ivo Hammer and the researchers setting the basis for the renovations to come and a signal for THICOM. The commission had the task to evaluate the renovation in the planning and in the realization process. Out of the enormous number of discussions and surprises came a due consideration: The first renovation period of the 1980s presented, in some cases, a surprising reversibility, for example the Xylolite underflooring was preserved under the layer of the synthetic floor, the same resulted by the original stuccos inside and outside under the acrilic coating. While in the final full reconstructive minded renovation there are some informative references, the renovation history of the first period lacks of the presence of material testimonies.

Ruggero Tropeano
Dipl. Architect ETH BSA SIA; Professor at Accademia di Architettura di Mendrisio – USI Universita della Svizzera Italiana;
Ruggero Tropeano Architekten (Zurich)
THICOM Member

The appointment of the THICOM was an important prerequisite for the successful outcome of the "surgical intervention" made to the body and spirit of the Villa Tugendhat.
This international commission of experienced experts soon gained confidence, authority and respect of the City administration, the monument management and the professional public.
Various conceptual, technical and economic problems arose during the process of reconstruction and these were discussed very openly and critically with the authors of the project and the companies involved. 27 recommendations of THICOM were converted into reality, such as decisions relating to the use of glass, oil paints and floor coverings, as well as the installation of a small exhibition in the basement. Without the active participation of THICOM, the quality of the restoration work would not have attained such high level.

Vladimír Šlapeta
Prof. Ing. Arch. DrSc. Faculty of Architecture – Brno University of Technology
THICOM Member

In 2004, I joined CIC directed by Ivo Hammer before I became a THICOM member.

I traveled several times to Brno and I could very closely assist the crucial decision-making processes and the politics of cultural heritage in the Czech Republic and in the City of Brno.

Our optimism ruled then, since it would have been the first time that conservation sciences were given plenty of time for necessary preparatory research work.

In 2010, before conservation works started, I spent 3 days and nights in the half empty house sleeping on a cot in Grete Tugendhat's room. The daydream I had was a dream of the return of all the remaining original furniture to their original places, but in their current state of conservation – as for instance the Grete Tugendhat's bed still in possession of the Tugendhat-Hammer family in Vienna in which I slept days before. Nothing else in the house but these authentic pieces of furniture! A dream?

For sure it could have served as a symbol of the family's history after emigration and for reconciliation today.

A unique chance to realize this idea was given by the sensational return of the semicircular wall in 2011. The THICOM experts discussed the concept seriously on this occasion.

Much to my surprise at the reopening of the house, in February 29, 2012, I met a nightmare: not only that the partly original varnishes of the "restored" Macassar wall and of the bookshelves were cleaned and gone, but the house was completely filled instead with "reconstructed" replica furniture as in a 1:1 model. The so-called museum's concept, established in 2002, has been realized as if all the discussions about history and patina since then hadn't taken place – and no one could have prevented it!

A bluff?

Thomas Danzl
Prof. Dr. phil. Dott., Hochschule für Bildende Künste Dresden
THICOM Member

Materiality is essential to Mies van de Rohe's architecture. The composition, texture, color and finish of the surface materials are crucial to the perception of his masterfully designed forms and spaces. This applies to glass just as it does to other materials: although transparent, glass is never "invisible".

Mies van der Rohe was fortunate to be acquainted with the top-quality window glass production in the Czech Republic when designing the Tugendhat House. The 3x4.8m clear glass panels for the legendary living room windows were almost certainly produced in the Chudeřice Glass Works, one of the very few factories worldwide where plate glass in these sizes could be polished to perfection – as required by Mies van der Rohe. But the glass panels had all been lost and are no longer produced.

Our concern that the typical green hue of today's standard glass would compromise the original architecture, particularly in case of the etched panels at the entrance, was finally responded by restoring the glazing with "extra clear" low-iron glass from Saint Gobain.

Wessel de Jonge
Prof. Ir. Delft University of Technology; Wessel de Jonge Architecten BNA BV (Rotterdam)
THICOM Deputy Chairman

"Every famous house has it's secret..." (Iveta Černá, 2012)

Having been listed as World Cultural Heritage in 2001, it was evident that all the material and immaterial values of the Tugendhat House should be treated with the greatest possible care.

A sequence of breathtaking events started with the passionate and adventurous renovation work undertaken in 2010-2012. At regular meetings involving a constant exchange of ideas, THICOM members discussed and meticulously decided upon every detail. The process involved a lot of adrenalin, passion and personal commitment, with great tension and a propelling strength always perceptible. Political and cultural differences marked the whole process of this special collaboration, with different interests being displayed by local and international actors – the Brno council, companies, craftsmen, curators, the general public, the press and the family.

Visitors will never know which judicial discussions walked ahead of the renovation work, nor the violent discussions and personal insults originated in the course of time. However, professionalism prevailed, enabling the work to be done with the highest possible quality, and the house was opened on time and within the budget.

Secrets will remain, but the Tugendhat house, outstanding architectural piece of art, has fortunately withstood the tests of time and will carry it in itself, maybe as a secret to be experienced now and in the future.

Alex Dill
Akad. Oberrat. Dipl.-Ing., Faculty of Architecture – University Karlsruhe - KIT
THICOM Member