

Vincent A. Masucci



The Fondation Le Corbusier in Paris (FLC) and ProLitteris (Switzerland) have not authorised the reproduction of a number of Le Corbusier works in the second edition of this volume. Accordingly, compared to the first edition, a number of those works are no longer recognisable on certain pages. Although requested by the publisher of this book, FLC in Paris did not provide any explanation as to the reasons for the refusal of publication.

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Le Corbusier

Machines for Living

Furniture:
a critical history

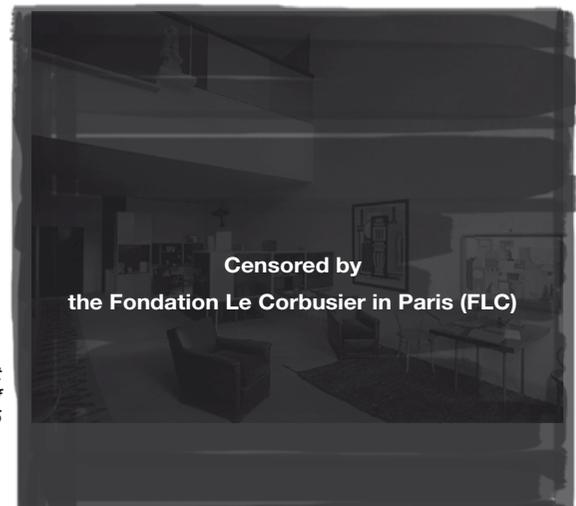
THE FORGOTTEN PROTAGONIST

Le Corbusier's four basic models in their present day form were first produced in Switzerland in 1959. This re-edition was a tribute to the energy and organizational ability of Mrs. Heidi Weber of Zurich. Nevertheless, despite the unquestionable success of her program, over the years, in inverse proportion to the growing reputation of Charlotte Perriand, the name of Heidi Weber has faded away. This is particularly noticeable in historical treatments of the furniture of Le Corbusier where, objectively speaking, her technical and stylistic solutions are more identifiable than the somewhat vaguely defined contributions of Charlotte Perriand. None the less, the story of Heidi Weber remains an unavoidable part of the real history of Le Corbusier's furniture.

Although it is hard to imagine today, these celebrated models had been almost totally forgotten when Heidi Weber first saw photographs of them in the edition of the collected Works of Le Corbusier which had just been published in her home town of Zurich in the 1950's. The simple historical truth is that if it were not for the totally unsolicited initiative of this young woman, the models of Le Corbusier would have remained faded photographs in the Collected Works of Le Corbusier along with a few rust-pitted examples left over from the past.

The models invented by Le Corbusier started off as an economic failure. They began to die as commercial products the day after their first public showing in 1929. Thonet-Paris, drawn into the business by the prospect of sponsoring an exhibition associated with the name of the famous Le Corbusier, showed an indifference to the "Domestic Equipment" as a collection and accepted for a cautiously limited production only a few models which they considered saleable. Then came the depression, followed by the Second World War, which consigned them all to oblivion.

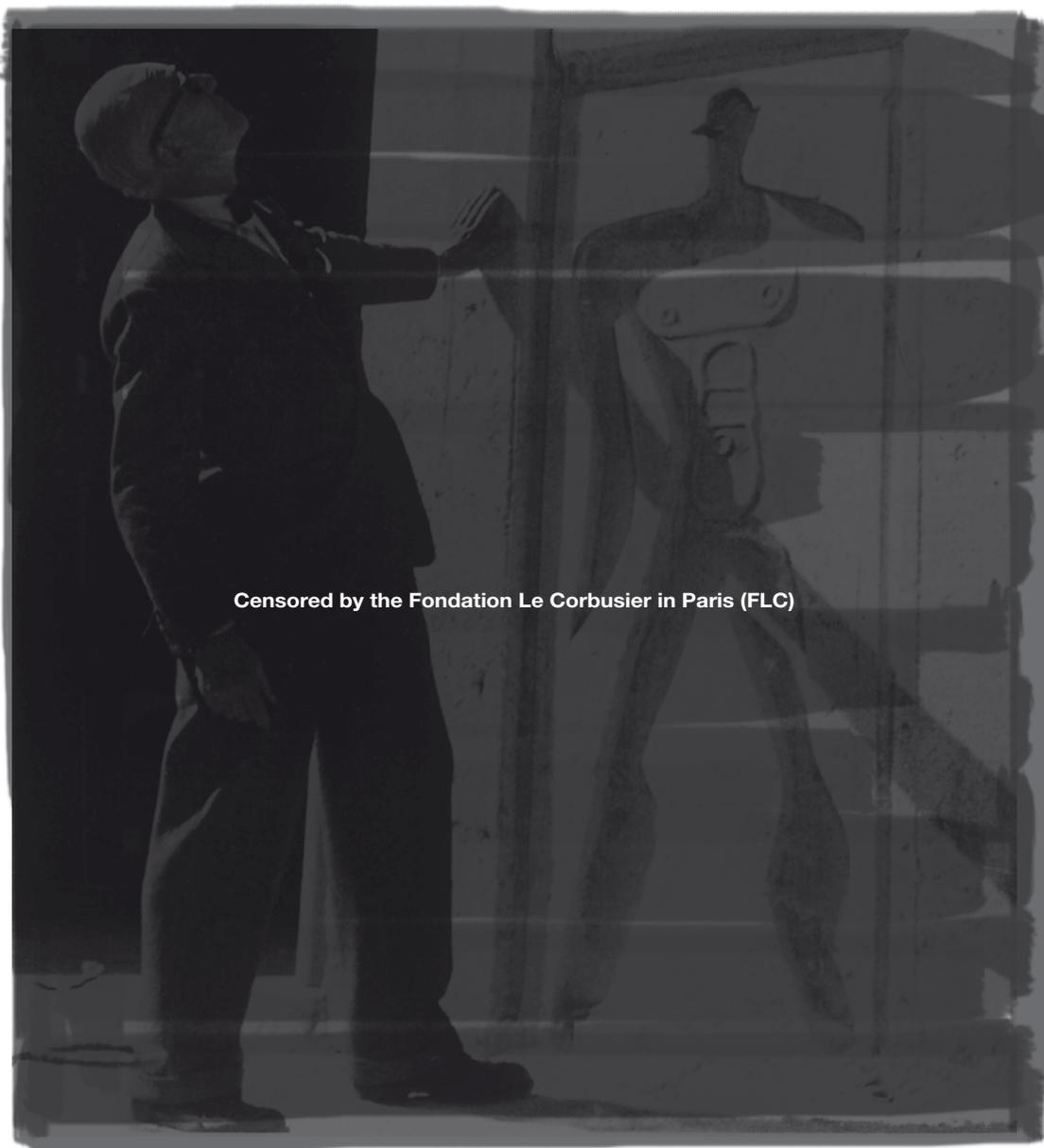
*The living room of the Pavillon d'Esprit
Nouveau, at the International Exposition of
the Decorative Arts, Paris, 1925*



During their first meeting in 1958, when Heidi Weber expressed her admiration for his furniture and his paintings, Le Corbusier seemed amazed. During the discussions that followed, she learned that no one had ever shown interest in producing his furniture and she discovered that Le Corbusier was thoroughly convinced that his paintings would not sell. She protested vehemently that this could not be true. He seemed fascinated by her interest and after speaking with her for a while, obviously impressed with her energy and her seriousness, he cautiously suggested that perhaps she would be interested in producing his furniture adding, as an aside, that, if she wished, he would certainly allow her to sell his paintings in her gallery. Without a moment of hesitation, she picked up the suggestion with enthusiasm saying that she would begin to work immediately on the project.

The most fascinating part of the story is the surprising outcome. In spite of the fact that she developed and produced the first successful versions of Le Corbusier's furniture, published 50 series of more than 6000 copies of his lithographs and etchings, single-handedly managed to revalue his paintings and art works by skillful management and, last but not least, commissioned and personally financed his last architectural work, she received from the Fondation Le Corbusier of Paris in place of the recognition one would expect, what can only be described as a campaign aimed at the cancellation of her memory and the obliteration of her name from all publications regarding Le Corbusier. The almost total cancellation of her name is too obvious to be casual. In the large and otherwise complete Encyclopedia published for the centenary of the birth of Le Corbusier, there are articles about almost everyone and anything even vaguely related to Le Corbusier. The list runs from Josephine Baker to Pierre Winter. Yet there is no article dedicated to Heidi Weber and no mention is made of her even in articles dealing with the furniture, the lithography or the painting of Le Corbusier. True, her name does appear several times in connection with the museum building in Zurich. However, even here, where her name could not be avoided since she commissioned and paid for the construction of the building, she is merely named without comment nor is there even a minimum reference to her close business relationship with Le Corbusier in which she actively collaborated with him for almost eight years. In a 1974 paperback by Stephen Gardiner, then widely circulated, the section on the museum building graciously refers to Heidi Weber as:

... someone in Switzerland... determined to drag the idea, so longwithheld, out into the sunlight of the park beside the lake¹.



Censored by the Fondation Le Corbusier in Paris (FLC)



The second exhibition of Le Corbusier's works in the studio „Mezzanin“.

CONTRACT POLYTEC - WEBER

1 Dec. 1959

Contract

Polytec- Weber.

Polytec gives the rights to the 4 models to Mrs Weber for 3 years.

The contract is automatically renewed for 5 years if the sales reach or exceed 60,000 new French francs.

The royalty is 10%.

The exclusive territory is Europe and U.S.A.

Between: The Limited Responsibility Company POLYTEC, represented by its administrator Mr Alphonse DUCRET, resident in Paris, 92, rue de la Pompe, and Mrs. Heidi WEBER, resident in Zurich, Neumarkt 28 .

It is agreed as follows:

Article 1. The company POLYTEC grants to Mrs. Heidi WEBER the exclusive right to manufacture and to sell throughout the European countries and within the United States of America, four original models of "Le Corbusier" that is:

- a) chaise longue (drawing 1)
- b) small armchair (drawing 2)
- c) large armchair (drawing 3)
- d) chair with swivel back (drawing 4)

(These four models are those which are reproduced in the Oeuvres Complètes of Le Corbusier, vol II, fifth edition, pages 42 to 46 Editions Giersberger, Zurich excluding the swivel chair (siège tournant) of Mrs. Charlotte PERRIAND.)

Article 2. The company POLYTEC shall supply Mrs. Heidi WEBER with plans and designs to enable the manufacture of the furniture mentioned above. According to the agreement between Mr. Le Corbusier and the company Polytec, Mr. Le Corbusier is authorized to make at any moment those changes in the executive drawings and designs that he may judge appropriate according to what he may learn as the result of the experience acquired in the course of this present contract.

These changes shall be made in agreement with Mrs. Heidi Weber.

Article 3. Mrs Heidi WEBER agrees to pay to the POLYTEC company a royalty that will be calculated on the basis of ten (10) percent of the sales price to the private clients of Mrs. Heidi WEBER.

Article 4. Mrs. Heidi WEBER is obliged to send to POLYTEC two times per year on the dates of June 30 and December 30, an accounting of the sales made by her during the preceding semester. The royalties corresponding to these sales shall be paid to POLYTEC within ten days of the above indicated dates, that is to say not later than the 10th of January and the 10th of July of each year.

Article 5. Mrs. Heidi WEBER is free to set the sales price of the above defined furniture. In any case, she must communicate to the POLYTEC company the sales price that she has set and also every variation of this price occurring during the period of the contract.

Article 6. All of the furniture manufactured and sold by Mrs Heidi WEBER under the present contract shall be marked with a sign attesting that it constitutes a creation "Le Corbusier". This sign must bear the signature of Mr. LE CORBUSIER along with a number of series.

Article 7. The present contract is valid for a period of three years beginning on the first of January 1960 and concluding on 31 December 1962. It can be renewed for a period of three years if on 31 December 1962 the sales arrive at or exceed the sum of sixty thousand (60,000) new French francs.

Article 8. With regard to the execution of this contract, the two parties recognize the city of Zurich as the place of execution.

Made in Paris, in two copies, the first of December. 1959

Heidi WEBER (signed) for POLTEC
the administrator

PRODUCTION PHASES OF THE DOMESTIC EQUIPMENT

THE FOUR MODELS IDENTIFIED BY LE CORBUSIER AS HIS INVENTIONS

Siège à Dossier Basculant (Camp chair with a swivel back)

A re-invention in tubular steel based upon the dismountable British officer's chair in wood produced in India and distributed by Maples & Co, London.



Petite Fauteuil Grand Confort (Club chair for a man)

A re-invention of the traditional upholstered easy-chair composed of a steel frame that held cushions. This narrow version was adapted to the typical sitting position of a man with his legs spread apart.

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Grand Fauteuil Grand Confort (Club chair for a woman)

The same as above but wider to permit a woman to draw up her legs on the seat, typical of a woman wearing a skirt or dress.

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Chaise Longue (an adjustable reclining chair) A re-invention in tubular steel of the Surrepos.



PRODUCTION PHASES OF THE DOMESTIC EQUIPMENT

Being industrial products the models passed through various stages of development. Consequently, the present day models are quite different

1. The prototype stage (1928)

The prototypes of the four models appear in photographs of the Villa Church, Ville d'Avray. Prototypes of the Chaise Longue, the Basculant and the Grand Confort still exist.



2. The Thonet Stage (1929)

Thonet modifies the Basculant and the Chaise Longue. The two Grand Confort are not accepted for production and remain as prototypes. Hence, Thonet produces only two models of Le Corbusier which are mixed with models designed by Perriand. They are one of the principal sponsors of the domestic equipment show at the Salon d'Automne in 1929.



At each stage modifications were made in some of the models which changed their appearance. from those first invented by Le Corbusier.

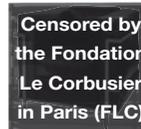
3. The Heidi Weber Stage (1958)

The Grand Conforts are put into production for the first time. Hence, for the first time, the whole collection of the 4 models is available to the public. The look of the Grand Confort is changed and the frame is available in chrome.



*Above:
Siège à Dossier Basculant,
from the catalogue of Heidi Weber
of 1958.*

*Below: Chaise
Longue, catalogue of
Heidi Weber 1958*



*Grand Confort (Petit
Modèle-for men),
from the catalogue of
Heidi Weber of 1958*

*Grand Confort (Grand Modèle
version for a woman), from the
catalogue of Heidi Weber of 1958*



4. The Cassina Stage (1964)

Initially the models are identical to those of Heidi Weber. However, after 1978 changes begin to appear.

5. The Cassina Stage (after 1978)

After the expiration of Heidi Weber's contract in 1978, Cassina began to create the curves of the Grand Confort on a bending machine. Instead of starting with straight pieces that were then flared under a press, the tube was bent practically to the breaking point (around 2.5 times the radius).

The deformed center section is then cut away and the tube ends welded together to form a curve which was much rounder and softer than that of the prototype of the approved Weber production.

This method saves time by eliminating the need to flair and finish the single parts individually, since the bending creates a similar effect. However, the curves no longer have that look of impossible sharpness that was a striking characteristic that was obviously intended by Le Corbusier. The model lost that touch of primitivism which clearly marked it as an avant garde example of tubular steel furniture of the 1920's. This change in the model elicited a strong negative reaction from Weber but, since the sub-licensing agreement had been terminated, she no longer had the power to prohibit them from taking liberties with the design of Le Corbusier.

The disagreements that eventually arose between Heidi Weber and Cassina had nothing to do with the basic quality of the product. They dealt with changes of design and the addition of new models to the collection. In 1978, despite the violent protests of Heidi Weber, Cassina quietly introduced the hitherto non-existent Grand Confort sofas, an innovation specifically rejected and categorically forbidden by Le Corbusier.

In effect, the Grand Confort was transformed into a sofa set and the original Grand Confort models became relatively unimportant (and expendable) one seat units to accompany the sofas. Moreover, 10 cm. was added to the depth of the models in order to match the depth of a standard sofa. To further enrich the program, Cassina also introduced the Siège Roulant (along with the swivel stool), the T-beam Table, the airplane tube table made of an oval shaped tube very different from the original ovoid shaped tube and the bath stool all of which were sold as "models of Le Corbusier." and accompanied by a tag guaranteeing them as authentic designs of Le Corbusier and his collaborators.

Two-seat sofa based upon the Grand Confort, Petite Modèle



Swivel stool or Tabouret



right: Siège Roulant

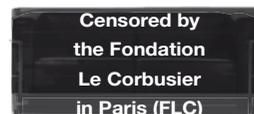


Three-seat sofa based upon the Grand Confort, Petite Modèle



Table with a structure of oval tube (rather than ovoid)

Two-seat sofa based upon the Grand Confort, Grand Modèle



T-Beam Table

Bath stool

THE FIRST PHASE: PROTOTYPES - 1928

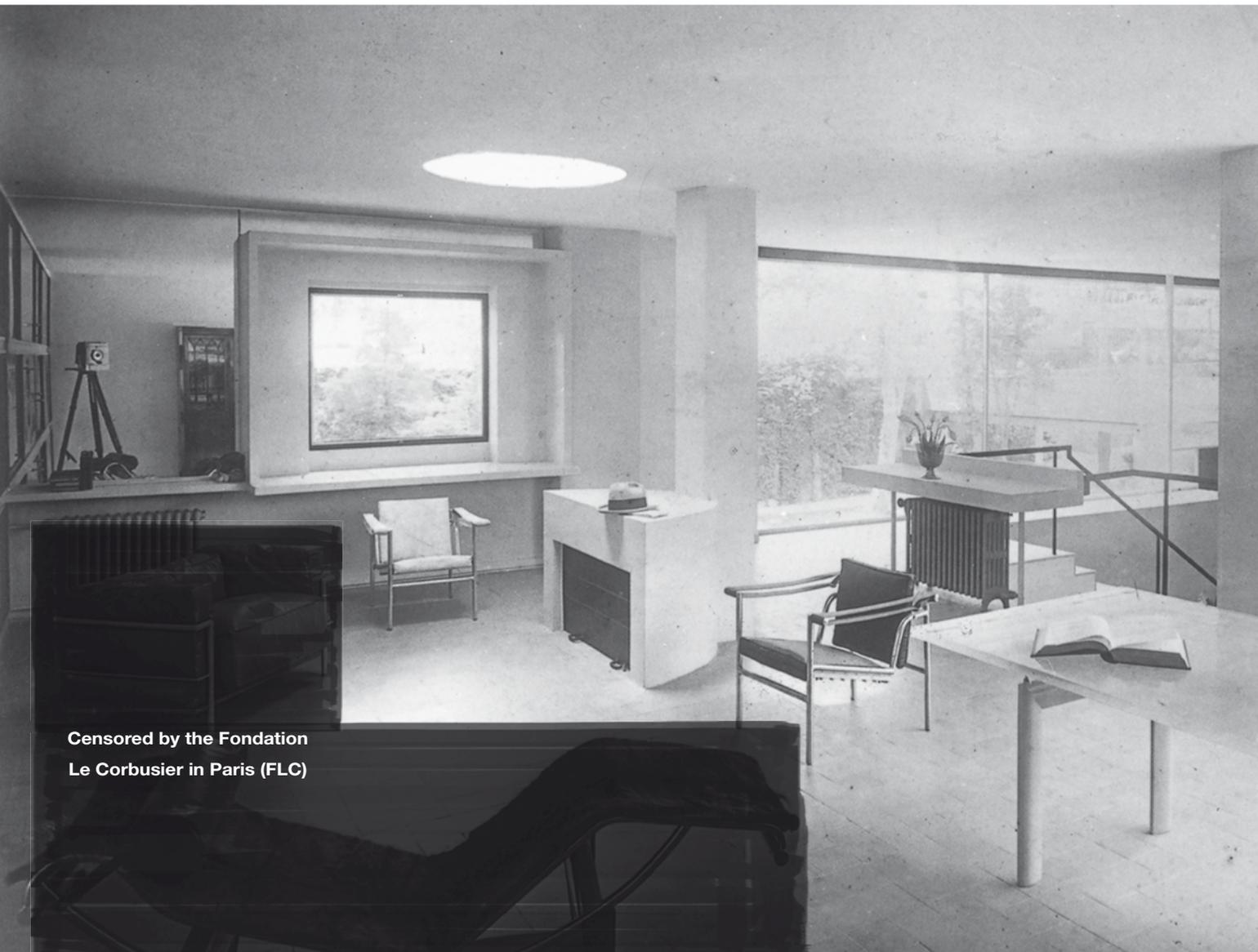
The domestic equipment made their non-official debut at the Villa Church in 1928. At least, the earliest known photographs of these objects were taken in the Villa Church in Ville-d'Avray. The models were not designed especially for Henry and Barbara Church, the American clients for whom the Villa was built and it appears certain that they had never requested them. There is no doubt that the domestic equipment was thought-up independent of any specific project. The examples in the photographs are the first prototypes of models that were obviously intended for mass production. The thrift of Le Corbusier was legendary. He made sure that his draftsmen didn't waste pencils or pa-



Villa Church: dining room with the chairs (sièges roulantes) and the stool of Charlotte Perriand

per and he was certainly not willing to throw away expensive prototypes, even if they were relatively rough and had notable defects. He placed them first in the Villa Church and, when the Churches refused them, he forced them on his client and friend, Raoul La Roche. In 1930, he sold the prototype of the chaise longue to the Maharaja of Indore². The prototypes of the models of Le Corbusier are among the earliest examples of modern tubular steel furniture. Apparently, Le Corbusier began selecting of models

2. Apparently, the chaise longue was returned to Le Corbusier after the photography session at the Villa Church. It shows up again in a rarely reproduced photograph of the 1929 exhibition in a corner of the stand. Later, in the early 1930's, Le Corbusier had a visit from Eckhart Muthesius who was designing and furnishing the Palace, Manik Bagh, for Yeswant Rao Holkar Bahadur, the Maharaja of Indore. The young prince wanted to create a showplace of modern design which, of course, meant French Deco. Le Corbusier sold him the prototype of the chaise longue, which was shipped to India where it was covered with leopard skin. Photographs of the period show it in the master bedroom next to an aluminum and chrome bed designed by Louis Sognot and Charlotte Alix. The bed had a leopard-skin spread and the Chaise Longue was covered with the same material to match the bed. Unfortunately, after the death of the Maharaja, the palace was not converted into a museum and no one took the trouble of trying to keep this remarkable collection of furniture and art objects together. Virtually everything was carted off to Europe and the pieces were sold individually. Sotheby's sold the Chaise Longue at auction in Monte Carlo on May 25, 1980.



**Censored by the Fondation
Le Corbusier in Paris (FLC)**

to re-invent at the same time (1925) that Marcel Breuer in Germany produced the first version of his tubular steel club chair. With the introduction of flexible steel tubing and with the rapid succession of tubular models that followed, tubular steel became the avant garde material for modern chairs. This undoubtedly induced Le Corbusier to think in terms of tubular steel. The Germans had a head start of several years in the use of flexible steel tube since it was an invention of the Mannesmann steel works of Germany and pre-manufactured parts were available on that market to facilitate the manufacture of furniture. Naturally, tube bending equipment originated in Germany and only arrived in other countries, along with the Mannesmann tube at a later date. Moreover, in Germany the most advanced know-how filtered down directly from the manufacturer to the designers and producers of furniture.

This, of course, influenced the design of modern furniture in Germany in that designers were made conscious of the physical possibilities and characteristics of this material. In contrast, although Le Corbusier had decided to produce his models in tubular steel, his attention was focused on the function of the models in relation to the human body rather than as a means of exploiting the physical possibilities of steel tubing. He had no interest in producing state of the art furniture. As a result, the metal work of the prototypes appears primitive with respect to that of the tubular furniture being produced in Germany at the same time. The chairs of Mart Stamm, Marcel Breuer and Mies van der Rohe were conceived in terms of flexible steel tube. One might say that they spoke the formal language of tubular steel in which single parts were replaced by continuous lengths of machine bent tube³ to arrive at a desired form with a minimum of joints and practically no welding. Upholstery was avoided and seats and backs were created by stretching cloth, leather, or cane around and between the tubes. Everything was geared to reducing the time and cost of production. In sharp contrast to this Teutonic minimalism, the prototypes of Le Corbusier violated much of what were rapidly becoming the steadfast rules of modern furniture making. They required a great deal of precision welding and the curves and counter curves of the Grand Confort could not be executed by machine. They were richly upholstered and belonged more to the French tradition than to the so-called "International Style".

Consequently, the prototypes of the domestic equipment of Le Corbusier were not impressive from the technical point of view. There is no evidence that Le Corbusier was bursting with the urge to discover and experiment with new production methods.

Most certainly, the models were not the result of a search for objects that fulfilled a personal desire to demonstrate what could be done with tubular steel.

Prototypes of the Grand Confort – The narrow man’s version had springs inserted in the back legs so that it tilted back under the weight of a person. However, not being properly engineered, the simple mechanisms broke immediately and the chair remained tilted back in an awkward position. This use of a mechanism is not typical of Le Corbusier⁴. Apart from the unpleasant backward dip of the narrow chair, the frames of the Grand Confort look reasonably good in photographs of the period. However, we know from the negative reaction of Raoul Le Roche that, on close examination, one could see that they were badly made⁵. Since the curves were too tight to be produced by a bending machine, in all probability they were manually executed⁶.

The manual operations of bending, hammering and welding usually produce stress marks and defects that show through nickel or chrome plating even after lengthy hand polishing. Paint minimizes such defects and it is most probably for this reason that the frames of the Grand Confort were originally painted⁷. Certainly, this was the reason they were not accepted for production by Thonet who produced only machine-made furniture that could be economically chrome plated.

4. Le Corbusier was very proud of the fact that the Chaise longue adjusted without any mechanism. He noted this in his South American lectures given at this time (see Precisions).

5. See: Tim Benton: The Villas of Le Corbusier, pg. 72.

Despite the cleverness of the idea and its unquestionable beauty, the Grand Confort, in its original form, offers a perfect example of a design that works against the material. The sharp curves, closely followed by equally sharp counter curves, along with the fact that two different sizes of tube were welded together not only made production extremely slow and costly but also prejudiced the clean look of the final results.



From the left: Grand Confort, Petit Modèle (for a man); Grand Confort, Grand Modèle (for a woman)

Prototype of the Chaise Longue – The upper carriage finishes at the head and foot in a thicker horizontal bar to which the curved side pieces were welded. The use of the heavier bar at the head and foot of the upper carriage of

6. To bend a tube without a bending machine, an artisan would often fill the tube with sand and curve the piece by bending and hammering the heated tube into the desired shape. Better results were obtained by pouring pitch into the tube and waiting for it to cool and harden. The tube was bent cold and then heated to remove the pitch. A few years ago, Cassina widened the curves so that they could be produced on a bending machine. The tube is bent practically to the breaking point (2.5 times the radius) then cut and welded. This eliminates some of the work. This, of course, changes the look of the model. Clearly, the impossibly sharp curves were part of the dramatic illusion that Le Corbusier intended to create. This reminds one of the “illusion” of the famous joint in Mies van der Rohe’s “Barcelona Chair” that gives the false impression of the crossing of two continuous bars of steel.

7. The claim that the frames were deliberately painted rather than chromed for aesthetic reasons is hardly convincing since the other two models were both chromed. The width of the Grand Confort which could not be dismantled may have also created an obstacle since galvanic tanks are normally long and narrow and it is most unlikely that wide tanks were available in Paris at the time.

the prototype was a temporary solution forced upon Le Corbusier by the limited equipment available to the artisan who executed the piece. In fact, his sketches show that he had imagined a continuous curved tube from the very beginning.

Bending machines for flexible steel tube were not easily available to all in those days and the prototype of the chaise longue, as that of the Grand Confort, appears to have been made manually, using very simple equipment.

The thicker bar, welded at the top and the bottom, eliminated the right hand and left hand curves at the top and bottom, which would have been extraordinarily difficult to execute by hand⁸. The fact that this version was dropped almost immediately in favor of the later continuous tube version confirms that this detail of the prototype was dictated by practical necessity rather than stylistic considerations.

From the left: Ovoid tube of the base of the Chaise Longue, in the prototype version

Chaise Longue. Prototype of the Villa Church sold to the Maharaja of Indore and then, recovered with a leopard's skin



The Second Phase: the Thonet Production – 1929-1932

Very little has surfaced in the way of documentation regarding the business relationship between Thonet and Le Corbusier. After the Second World War, Le Corbusier wrote a letter to Pierre Jeanneret (March 31, 1949) asking if he had information regarding the Thonet contract. Apparently, he had no copies of correspondence or records of any kind and his memory of the whole affair was rather vague. We know from Charlotte Perriand's autobiography that the contract between Thonet and the studio Le Corbusier had been negotiated but was never signed because Le Corbusier was away from France during the whole period⁹.

8. If the curves were not precise and the welding templates did not correctly take into consideration the expansion and retraction of materials subjected to the heat of welding, the carriage would not have rested correctly upon the base. The solution of the thicker tube at the head and foot made it much easier to achieve proper alignment.

The modern furniture venture of Thonet-Paris was brief and totally unsuccessful. They opened their operation shortly before the 1929 Salon d'Automne. Since it is highly unlikely that they were able to set up an elaborately equipped factory in such a brief period after their arrival in France, we do not know to what extent they actually produced the furniture or if they simply mounted parts from other workshops or from their factory in Germany¹⁰. In 1932, they were forced to shut down their modern tubular furniture venture in France, transferring the production of those few models they had acquired to their headquarters in Frankenburg, Germany.



*Salon d'Automne of 1929.
The exhibition space where the models invented by
Le Corbusier were first presented to the public.
In the photo we see three of the models of Le Cor-
busier*

9. "We had worked well and we ourselves had prepared with Mr. Weill, the director of Thonet Freres France the draft of a contract for the production of our furniture. The only thing we lacked to conclude was the principal person; Corbu, Holy Corbu!" "Nous avons bien travaillé et avons même préparé avec M. Weill, directeur de Thonet France, un projet de contrat d'édition pour nos meubles. Il ne manquait plus que le principal pour conclure; Corbu. Sacré Corbu!" *Une vie de création, Charlotte Perriand, pg 38.*

10. In museum collections one finds a number of examples of the *Basculant* attributed to Thonet Freres France which are different in construction one from another. For the most part they are dismountable. However, some have a bolt in the side of the legs which pull the front and back stretchers against the legs. Others have short lengths of tube welded to the inner sides of the legs into which the cross stretchers are inserted and fastened with screws underneath. However, it is unlikely that in the short and troubled period of its existence Thonet France would make such a modification of a model which was not being sold in great quantities. It is more likely that different versions were produced in different factories at different times. Moreover, the chair continued to be produced in Switzerland, officially and unofficially, up until the late 1970's. Stendig, Inc. began importing into the USA a version in 1958 (before the Weber production). This version was similar to the versions attributed to Thonet France.

The reasons for the failure can be imagined. The international economy had entered into a period of deep economic depression and France, even under the best of economic conditions, has always been a very weak market for modern design. Despite the fact that France has produced a number of extremely important modern designers, their work has always appealed to a very limited segment of the population.

The fact that Le Corbusier seemed to be in the dark about the financial arrangements leads us to suspect that he had no recollection of having received royalty checks from Thonet. Even the most modest of checks from Thonet would have been remembered by Le Corbusier who had promised to divide all earnings with his collaborators.

*Below: the Siège à Dossier Basculant;
Center: the oval tube of the base of the
Chaise Longue, in the Thonet version
Right: the Chaise Longue in a version produced by Thonet*



At any rate, Thonet had an option on the rights to the domestic equipment in exchange for having picked up part of the expenses of the very impressive exhibition at the Salon d'Automne. Perhaps no additional royalties were expected or due.

In 1929, Thonet put into production the Chaise Longue (model 306) and the Siège a Dossier Basculant (model B 301) of Le Corbusier. They also accepted for production, the Siège Tournant (model B 302) and the Bath Stool (model B 305) of doubtful origin. The Siège Tournant was offered not only in the well-known version with the continuous sausage shaped arm-backrest still produced today but also in a backless stool version (model B 304) and in an armless office version. Finally, they produced a T-beam table with a glass top (model B 307).

The Airplane Tube Table was not accepted for production by Thonet and therefore never went beyond the prototype stage. The reasons behind their refusal seem obvious. Apart from the fact that the table was probably considered too advanced for the times, with a potential appeal only to a very limited public, it also departed radically from the light Thonet style. Moreover, the cutting, welding and polishing of the ovoid material would have required highly skilled and closely supervised labor.

Certainly, a company specializing in robust easy-to-produce, knockdown furniture would have severe reservations about marketing a table frame that was so cumbersome and at the same time delicate. Given the length of the welded joints, any severe jolt, blow or sustained lateral pressure could easily throw the frame out of line or deform the wide surface of the tube. Finally, the table presented logistical problems with regard to handling and shipping. In fact, the cost of packing and shipping would have undoubtedly exceeded the cost of production (as it does today).

In accordance with the general misconception that furniture manufacturers simply follow the directions of the designer in a more or less servile manner, practically no attention has been given to Thonet's contributions during the process of industrialization. The differences between the prototypes of the Chaise Longue and Basculant and those same models as produced by Thonet prove that their contribution was substantial.



Photo of the Salon d'Automne (Paris, 1929)

The art director of Thonet-France was Bruno Weill, an Austrian designer and pioneer of tubular steel furniture, professionally known as Bév . Given his professional competence, it seems obvious that B v  must have made an active contribution to the industrialization and was in some way responsible for the noticeable improvement of the two Le Corbusier models produced under his supervision. This is not to imply that the changes in the models can be attributed to his inventiveness. Rather, it is most probable that he was responsible for proposing or insisting upon those modifications which had become part of the standard technical repertory of such furniture.

In the Thonet version of the Chaise Longue, the structure of the upper carriage was modified. The thicker tube, welded at the head and foot, was eliminated and the total structure became a continuous tube to which were welded (as in the prototype) a pair of supporting arcs which rested upon the base. These provided a simple means of adjusting the sitting and resting positions by shifting their position on the base.

Since the galvanic baths used for nickel and chrome plating are normally limited in size (tending to be long and narrow rather than square), it was necessary to produce frames that were dismountable. Moreover, the divided frame facilitated the polishing of the welded joints and permitted faster drainage which limited the waste of the costly materials used in the galvanic process.

Therefore, in the Thonet version, the right and left-hand sides were separate and mounted together with sections of tube fitted in the center.

Thonet's simple but elegant practice of using slings for seats and backs when combined with Le Corbusier's suggestion of making them in pony skin resulted in the distinctive version that is still popular today. The Thonet version of the Basculant eliminated the cushions and the elaborate structure that supported the seat. These were replaced with simple slings held in tension by a series of springs.

Nevertheless, despite the obviousness of the solution, the use of such a method with steel tube only seems to have been used from 1925 for the Breuer chair produced by Standard-Möbel, the company that was later absorbed by Thonet. In 1926 and 1927, the cantilevers of Breuer and Mies van der Rohe were produced with leather and canvas slings¹¹.

When the old Thonet Furniture Company went into the modern furniture business in 1929, the sling was their preferred upholstery solution for tubular steel seating. It was a clean, minimalist, avant-garde feature. However, it wasn't until 1930 that slings became the normal way of upholstering tubular steel and the *Siège a Dossier basculant* with pony skin sling seat and back certainly appeared very advanced at the 1929 Salon d'Automne in Paris.

The use of steel springs to maintain the tightness of the slings was a happy solution introduced by Thonet. In the first Thonet production run of the basculant, the swivel seat did not have a top crossbar. This element was not present in the plans supplied by Le Corbusier's studio since the prototype had an upholstered back and in the transformation to the sling they reverted to the wooden original upon which it was based which was open on the top¹².

11. A strong canvas treated with paraffin called "Eisengarn".

Evidently, the force of the springs made it necessary to have lateral support to prevent the swivel back from collapsing inward at the top. In the case of the Basculant, this meant adding a curved crossbar at the top of the swivel back. This made the steel frame of the back into a closed square. The use of cross-stretchers in tubular furniture was the standard solution to maintain a lateral separation of vertical elements. There is no reason to doubt that Thonet, as the manufacturer, was responsible for the introduction of the structural differences between the prototypes and their mass produced versions. Such a doubt would be unreasonable since the modifications in the Chaise Longue and Basculant consisted in the addition of features already present in other models being produced by Thonet. From the industrial point of view, their intervention represented a step in the direction of economy and greater productivity. Before the publication of its 1932 catalogue, Thonet had eliminated both the Chaise Longue and the Basculant. The Siège Tournant of Perriand was kept in production but attributed to Le Corbusier alone. The beam table was the only piece still attributed to the three names of Le Corbusier, Jeanneret and Perriand in the photographic section of the catalogue. This was due to the fact that they had re-used an earlier photograph that had all three names at the bottom. However, in last section of the catalogue in which each model was presented in a small drawing with dimensions, this same table was shown without attribution. By the time the 1935 catalogue was issued, the only model still in production was the Siège Tournant (and the backless stool of the same model) still incorrectly attributed to Le Corbusier.

Thonet evidently felt that they were free to do what they wished with the designs. In 1932, they replaced the original Chaise Longue with a rocking chair version made by resting the upper chassis on an oval metal structure. This strange object appeared in the 1932 German catalogue as model B 306/0 without the name of Le Corbusier. Obviously, he had not been consulted. While Thonet refused to put Le Corbusier's Grand Confort into production, the general idea served Bévé as an inspiration for a type of sofa that Thonet put into production in 1932. It had a continuous chromed-steel tubular structure but without all the difficult cutting, welding and bending required for the production of the Grand Confort.

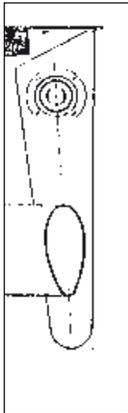
The Third Phase: The Heidi Weber Production – 1958-1964

The Le Corbusier furniture collection as re-introduced by Heidi Weber in 1958 became the version which served as the official standard for production up until 1978. The four models were chosen by Le Corbusier who approved of the changes made by Heidi Weber. As a manufacturer, Heidi Weber was more concerned with authenticity and quality

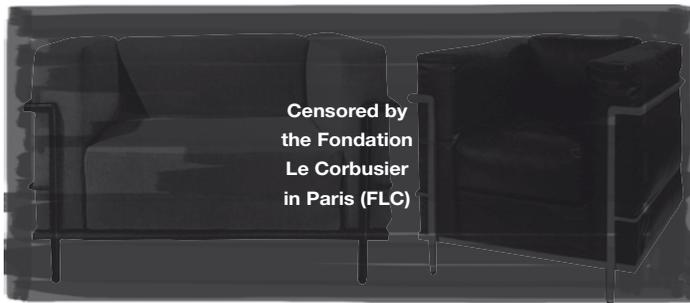
Below: oval tube of the base of the Chaise Longue in the Weber version

Center and right: Siège à Dossier Basculant and the

Chaise Longue as illustrated in the Heidi Weber catalogue of 1958)



rather than with labor-saving, cost-cutting solutions. She produced the upper carriage of the Chaise Longue in one piece even though this was significantly more costly than the previous dismountable version of Thonet. Because she had been unable to locate a source for the ovoid airplane tube originally used in the base of the chaise longue, she was forced to utilize a flatter oval tube for the first production-run of ten pieces. However, as soon as she discovered that the ideal tube in exquisite quality could be obtained from an airplane factory in nearby Constance (Flugzeugwerke Altenrhein Ag.) she continued her production using this more authentic material. As for the Basculant, the tapered armstraps held in tension by springs – a feature of the earlier versions – were replaced by continuous straight leather straps. The swivel back of the very first ten examples of the Basculant lacked the upper cross-stretcher. The presence of this feature was not clear in one of the plans of Le Corbusier which Heidi Weber used¹³ and, in this, she reverted to the earliest Thonet version. She added the upper stretcher in subsequent production runs. At present, Mrs. Weber does not remember the details as to when and why this change was made¹⁴.



*Left: Grand Confort (Grand Modèle)
Right: Grand Confort (Petit Modèle),
in the Heidi Weber catalogue of 1958*

13. Upon instruction from Le Corbusier, Willy Boesiger supplied copies of the plans taken from among the documents in his possession for the Oeuvre Complète. The plans were from different periods and were not the very first designs that were used to make the prototypes. As is usually the case, the very first designs were probably damaged, dirtied or lost when in the hands of the artisans who made the prototypes. Hence, the good copies that were made after the production included those modifications that entered during the work on the prototype. Most of the drawings, which exist today, were made after the Thonet production. The archives of the Fondation Le Corbusier up until the fall of 1998 did not have any furniture plans. In 1998, Mrs. Weber sent them copies of the plans she had used. Charlotte Perriand who had refused to give hers to the Fondation had a complete set of plans in her office. She allowed me to examine them in the mid-1970's. They were certainly not the "originals." They were in mint condition, unfolded, and, unlike those of Mrs. Weber, showed no signs of having been used. However, she had the designs of the prototype and Thonet sling version of the basculant (i.e. back without the upper crossbar).

The most important innovation of the Weber Edition was the introduction of mass-produced versions of the two models of the Grand Confort. These were made available to the public for the first time in 1959. This was also the first time that these models were produced with chrome plated frames. Chroming had become feasible because the sharp curves, unlike those of the prototypes, were not hand bent or hammered into shape but were constructed out of cut parts pieced together by welding to give the appearance of being bent.

The tube was pre-polished before welding and the welds were then polished to a smooth finish before chroming. Careful workmanship produced a perfect, mirror polished, chrome finish. The upholstery of the Grand Confort, as conceived by Heidi Weber, represented a major departure, not only in execution but also in spirit, from the prototype. The Grand Confort, in its earliest version, had been called a frame to hold cushions.

The goose down cushions of the prototype were rather unstructured affairs that rested in a loose manner in the contrastingly rigid steel frame.

While the insides of the cushions were divided in the traditional manner into fabric compartments that kept the down more or less evenly distributed throughout the cushion, the total effect was floppy. A well-known photograph of the prototype of the wide female model shows that there was practically no stiffening material in the cushions: they are collapsed and hang over the steel frame. In photographs of the narrow male chair, the cushions appear more rigid, probably because the narrower width of the frame gave more support to the cushions.

At any rate, the soft cushions of the prototype contrasted strongly with the rigid geometry of the frame. Weber radically changed the appearance of the model by giving the cushions a rigid internal structure of horsehair and wool, confining the softer materials to a thin outer layer composed of small compartments filled with fine down. Moreover, the seat cushion contained coiled springs.

Finally, the covering material was hand sewn to reinforce a very precise, geometrical look. There was nothing informal or easy-going about Heidi Weber's Grand Confort. It was carefully tailored to be rigorously formal – crisp, solid-looking, geometrically clean leather cushions, neatly framed in an equally geometric shiny steel frame. The frame and cushions work so closely together that the impression of the frame as a mere basket to hold cushions totally disappeared.

In order to underline the fact that the narrow Grand Confort was intended for a man, Mrs. Weber produced it only in black leather thereby carefully distinguishing it from the wide woman's chair which she made available only in a selection of fabrics in solid colors chosen by Le Corbusier.

14. Charlotte Perriand, when questioned by the author also did not remember the details of the addition of the upper crossbar of the swivel back by Thonet.

THE FOURTH PHASE: 1965 TO 1978

THE FIRST CASSINA PRODUCTION

In 1965, when Heidi Weber engaged Cassina as a sub-licensee to undertake the more large-scale production Le Corbusier had requested, she gave them an example of each model to serve as a prototype. As a result, the first production of Cassina, as far as dimensions and general standards were concerned, corresponded to Heidi Weber's. Moreover, by visiting the factory regularly, Heidi Weber maintained standards, following the operation with care, offering suggestions and controlling the results.

Nevertheless, since the Cassina production was intended for the general market as a less expensive alternative to her Swiss production, Heidi Weber was forced to make concessions with regard to workmanship and the quality of some materials. The upper carriage of the chaise longue was dismountable in two parts to reduce the cost of chroming and the expensive oval airplane tube was replaced with a much less expensive flat oval tube.

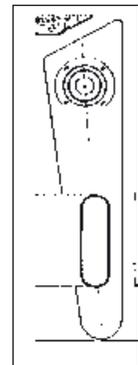
Natural materials (horse hair, wool, down) and steel springs were eliminated from the upholstery in place of more modern – but less durable – foam rubber and Dacron.

Apart from this, it goes without saying, that the transferal of the production from one factory to another unavoidably introduced changes. In this, a furniture factory resembles a restaurant, where changes of personnel are reflected in changes of quality and ambiance.

Moving production from one country to another means changing the equipment and the suppliers of raw materials. Each production develops its own tooling, cutting dies, milling equipment, bending heads, etc. With regard to the classic models of Le Corbusier, the jigs or iron frames used to hold the parts in position while they are being welded are critically important. Given the fact that there is an expansion and shrinkage during welding, the jigs must be carefully deformed so that, when the piece cools, it shrinks into the proper shape.

In the last analysis, in a semi-industrial production where so much skilled human intervention is involved, constancy is simply an illusion. Not only are there unavoidable differences in the same model produced by different factories but, with the passage of time, changes inevitably enter into the production within the same factory.

In the 1960's, Italy had assumed a position of leadership not only in design but also in the production of modern furniture. This was particularly true of upholstery techniques where cold molded polyurethane foam was revolutionizing the industry. In 1965, Cassina and Busnelli had formed C&B which became, at the time, one of the most advanced



Oval tube of the base of the Chaise Longue in the Cassina version

producers of upholstery in the world¹⁵. While the insides of the Grand Confort cushions did not call for a spectacular use of advanced methods and materials, nevertheless, the choice of fillings, their characteristics and density, as well as the work methods available in Italy, were undoubtedly more up to date than in Switzerland.

Cassina was primarily a producer of upholstery and wooden furniture. Hence, they used another company's facilities for the production of the steel frames. This is a normal procedure of relative importance. In Italy, the quality level of chromed tubular steel furniture was unusually high with respect to cost. However, the curves of the Italian version of the Grand Confort, although artificially produced by cutting and welding with a method similar to that of Mrs. Weber, had a slightly different appearance from hers. The curves appeared slightly more rounded because, to simplify the welding and polishing, the tubes were slightly flared in the direction of the curve by a mechanical press.

Therefore, putting the unwelded ends together practically formed the finished curve. It was then a simple matter to weld the parts together and to polish away the excessive material leaving a clean curve ready for chroming.

THE SECOND CASSINA PRODUCTION – AFTER 1978

After the expiration of Heidi Weber's contract in 1978, Cassina began to create the curves of the Grand Confort on a bending machine. Instead of starting with straight pieces that were then flared under a press, the tube was bent practically to the breaking point (around 2.5 times the radius).

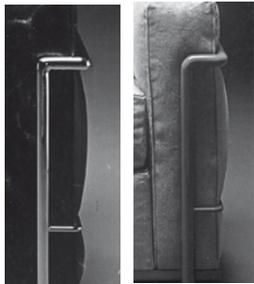
The deformed center section is then cut away and the tube ends welded together to form a curve which was much rounder and softer than that of the prototype of the approved Weber production.

This method saves time by eliminating the need to flair and finish the single parts individually, since the bending creates a similar effect. However, the curves no longer have that look of impossible sharpness that was a striking characteristic that was obviously intended by Le Corbusier. The model lost that touch of primitivism which clearly marked it as an avant garde example of tubular steel furniture of the 1920's. This change in the model elicited a strong negative reaction from Weber but, since the sub-licensing agreement had been terminated, she no longer had the power to prohibit them from taking liberties with the design of Le Corbusier.

15. Piero Busnelli was a pioneer in the use of cold molded foam.

The disagreements that eventually arose between Heidi Weber and Cassina had nothing to do with the basic quality of the product. They dealt with changes of design and the addition of new models to the collection. In 1978, despite the violent protests of Heidi Weber, Cassina quietly introduced the hitherto non-existent Grand Confort sofas, an innovation specifically rejected and categorically forbidden by Le Corbusier.

In effect, the Grand Confort was transformed into a sofa set and the original Grand Confort models became relatively unimportant (and expendable) one seat units to accompany the sofas. Moreover, 10 cm. was added to the depth of the models in order to match the depth of a standard sofa. To further enrich the program, Cassina also introduced the Siège Roulant (along with the swivel stool), the T-beam Table, the airplane tube table made of an oval shaped tube very different from the original ovoid shaped tube and the bath stool all of which were sold as “models of Le Corbusier.” and accompanied by a tag guaranteeing them as authentic designs of Le Corbusier and his collaborators.



*Left: (before 1978)
the curve of the tube of the
Grand Confort in the
original version approved
by Le Corbusier
(after 1978)
the same detail
with rounded curves*

*Right: Sofa
based upon the Grand
Confort
introduced in 1978
despite
Le Corbusier's
prohibition of such a
transformation of his
original model*



MODELS ASSOCIATED WITH THE DOMESTIC EQUIPMENT

NOT DESIGNED BY LE CORBUSIER

Charlotte Perriand designed the Siège Roulant (Tournant) in 1927. The following year, it was exhibited for the first time at the 1928 Salon des Artistes Décorateurs at the stand of an ad hoc group of three designers who called themselves L'Unité de Choc. Each designer had a section of the stand. In her area, Charlotte Perriand showed the Siège Roulant with a dining table. In another section, Rene Herbst showed furniture for a smoking room and, in a third section, Djo-Bourgeois displayed a living room. There was no doubt that each of the designers had worked independently and it was understood Charlotte Perriand had designed the Siège Roulant without the collaboration of the others. Then, in

1929, it was exhibited as part of the domestic equipment at the Salon d'Automne together with the furniture of Le Corbusier. Thonet put the Siège Roulant into production together with the Chaise Longue and the Siège a Dossier Basculant as part of a single collection. The catalogue of this collection referred to all of the furniture together as "the models of Le Corbusier, Pierre Jeanneret and Charlotte Perriand" without specifying the author of each model. The Siège Roulant then appeared in the Collected Works of Le Corbusier as part of the domestic equipment without any indication that Charlotte Perriand had designed the model. Nevertheless, it seems to have been no secret that Charlotte Perriand had designed this chair before she met Le Corbusier and that Le Corbusier had in no way contributed to this design. None the less, as has already been noted, the Thonet Catalogues from 1932 eliminated the name of Perriand attributing the design of the chair to Le Corbusier. In 1958, when Le Corbusier authorized Heidi Weber to produce his furniture, he was aware that some confusion had developed as to the authorship of the various models. Consequently, he made it unequivocally clear in the contract that the Siège Roulant was to be excluded from the collection of his furniture since it had been designed by Charlotte Perriand. We have not been able to find any information regarding the production of the prototype of the Siège Roulant. A photograph exists of an early version that may have been the prototype. The swivel mechanism is a large and heavy mechanism with ball bearings.

The chair appears in the photographs of the Thonet sponsored stand at the 1929 Salon d'Automne. Whether these are the original six pieces or versions by Thonet is a moot question since the stand was a mixture of the new with the old. Although it is difficult to judge, the model in the photos appears a bit slicker than the earlier versions and the complicated swivel mechanism seems to have been replaced by a simpler mechanism. A drawing, allegedly from the



Da sinistra: the stools and swivel chair designed by Charlotte Perriand in 1927, and still in production (now incorrectly attributed to Le Corbusier)

period, confirms this. Thonet produced the chair and the stool version until 1935 when they both ceased to be produced. The Czechoslovakian licensee of Thonet, Mücke-Melder at Frystat, also produced the chair during more or less the same period. By the time of the Second World War, the chair was no longer in production. Le Corbusier specifically excluded the Siège Roulant from the Weber production. To our knowledge, its first appearance after the War was unauthorized. In 1967, a group of Florentine architects who had turned their professional attention to the manufacture of furniture produced this chair along with the oval tube table both of which they attributed to Le Corbusier. These were shown at furniture markets in Florence and the United States as a curiosity but were apparently never produced in quantity. The Cassina production of the Siège Roulant began in 1978. It is sold as a design of Le Corbusier under the three co-author formula (Le Corbusier, Pierre Jeanneret, Perriand). On the publicity material, the date of the design is given as 1928, the date of the other models of the domestic equipment. This inaccuracy, of course, serves to reinforce the impression that they were all designed together as a collection.

The T-Beam Table is very visible in the stand at 1929 Salon d'Automne. It is most certainly the work of Charlotte Perriand.

Machines for Living: a search for the truth is a critical history of the furniture of Le Corbusier based on documentary evidence and verified fact rather than upon hearsay and supposition. Machines for Living deals with the following themes: chapter one: Le Corbusier inventor, his mind and and character. chapter two: industrial development of the models from the prototypes to the present day. chapter three: problem of authorship. chapter four: the 1959, Heidi Weber production, the first complete production of all four models and the only one personally supervised and approved by Le Corbusier. chapter five: the battles and harassment of the author. chapter six: the author's hitherto unpublished drawings and models. chapter seven: the author's letters to the publisher, the Fondation Le Corbusier in Paris (FLC) and ProLitteris (Switzerland) are not willing to provide any explanation as to the reasons for the refusal of publication for „Machine for Living by Masucci“.

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