JACQUELINE MORRIN

# TUBULAR STEEL FURNITURE OF THE INTERWAR PERIOD (1925-1940)

THE NATIONAL COLLEGE OF ART AND DESIGN

MARCH 1989

B. DES. IN INDUSTRIAL DESIGN

THE NATIONAL COLLEGE OF ART AND DESIGN

# TUBULAR STEEL FURNITURE OF THE INTERWAR PERIOD (1925-1940)

A THESIS SUBMITTED TO:

THE FACULTY OF HISTORY AND DESIGN AND COMPLEMENTARY STUDIES

AND

IN CANDIDACY FOR THE DEGREE
B. DES. IN INDUSTRIAL DESIGN

BY

JACQUELINE MORRIN

DEPARTMENT OF INDUSTRIAL DESIGN
FACULTY OF DESIGN

MARCH 1989

TABLE OF CONTENTS:

## LIST OF ILLUSTRATIONS:

33 Le Corbusier, Charlotte Perrian, the 'Grand Confort', 1928
34 R.C. Coquery. Lounge chair, Model No. B251, 1929
35 René Herbst. 'Chaise Longue'. 1930.
36 Louse Sognot and Charlotte Alix. Games table. 1930-3.
37 Alberto and Diego Giacometti, Bronze chair. 1930's
38 Wolfgang Hoffmann. 'S' Chair. 1940
39 Front cover of Thonet-Mundus catalogue 1929-30.
40 Frank Lloyd Wright. 'Johnson' desk and chair 1930's.

## PREFACE

Metal furniture is nothing new. The Spanish made metal stools in the 7th Century. The campaign furniture for the Napoleonic Wars was metal. The 19th Century witnessed a foray into metal furniture. Beds of iron and brass tubing garnished with knobs and finials and stamped brass twirls, and twiddles were the essence of Victorianism[1]. As early as 1851, tubular metal chairs by Kirschelt were exhibited at the Great Exhibition held in that year.

Generations which have been brought up on a diet of stackable tubular steel chairs which smack of discomforture, institutionalisation, alienation and 'uglification'[2] find little to excite them in tubular steel furniture today.

Nevertheless, what happened with tubular metal furniture in the inter-war years was a revolution. Its significance is expressed by Charlotte Perriand in the statement: 'Metal plays the same part in furniture as cement has done in architecture'[3].

This thesis explores this insurgency, its background, its success and its various manifestations.

---

## CHAPTER 1 : ORIGINS AND BACKGROUND INFORMATION

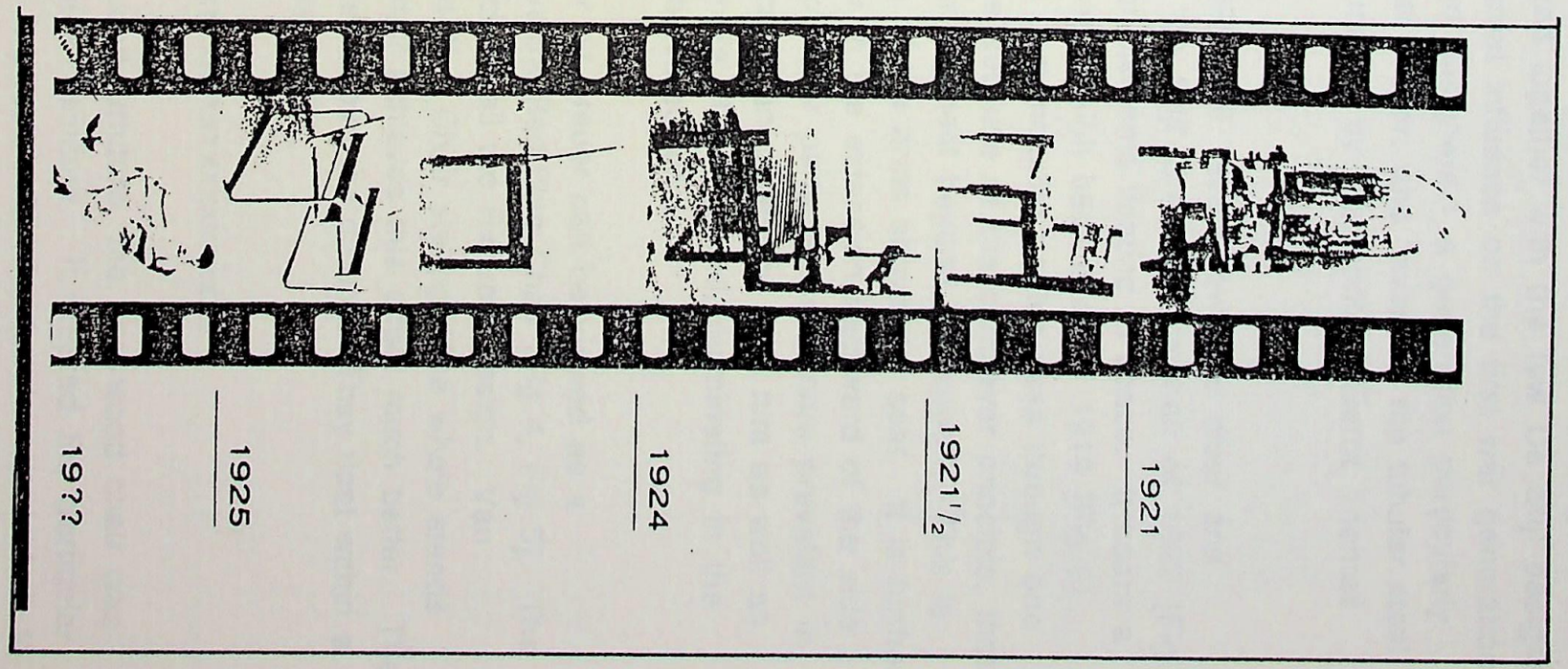
Tubular steel furniture of the 1920's didn't just happen. As Christopher Wilk explains, the furniture created during the early years of the 20th Century, had its origin neither with the traditional craftsman nor the business man, but arose within the context of early twentieth century artistic movements: Cubism, Futurism, Expressionism, De Stijl and Constructivism. The furniture that emerged during these years was part of the architectural trend known at the time by a wide variety of names - International Architecture, Neves Bauen, New Architecture, International style - which today is broadly identified by the term 'Modernism'[4].

De Stijl was a group of painters, architects and writers which came together in the Dutch city of Leidem in 1917. The goal of De Stijl was to be nothing less than, a radical renewal of art. The first manifestations of this new art were the paintings by Piet Mondrain and Theo Van Doesburg who worked out a clear geometric ordering of space that had its roots in Cubism. Theo Van Doesburg summed up the groups approach as follows:

> Instead of repeating what has already been found, we wanted to take architecture and painting to new heights scarcely imaginable before and to integrate them with one another as closely as possible. The house was taken apart, divided up into plastic elements. The static axis of the old construction was destroyed. The house was freed from the ground[5].

The concept of free flowing and interpenetration of space was made possible in architecture by the advent of reinforced concrete and in furniture by the use of tubular steel. [See fig 1]. This kinship between the New Architecture and Tubular Steel Furniture led many to view the latter as the most appropriate furniture for the new interiors.

Fig 1. "Bauhaus Film, five years long. Every day we are getting better. In the end we will sit on resilent air columns" As published in the 'Bauhaus' Magazine, July 1926



The untiring rhetoric and journalistic activity of the De Stijl architect, Theo Van Doesburg, the numberous lectures he gave and the exhibitions he organized together with the few De Stijl designs actually realised, had a great influence on the first war generation of European architects and designers - a generation particularly open to new ideas. Marcel Breuer, who 'invented' the tubular steel chair was particularly influenced by the work of Gerrit Thomas Rietveld.

Breuer's furniture from 1921 until 1925 shows the clear and unmistakable influence of 'De Stijl'. Breuer's armchair of 1922 [Fig 2] is composed of series of elements floating in space. It bears a close resemblance to Rietveld's high back chair of 1919 [Fig 3]. Pieces of the frame set at perpendicular angles pass through one another. In both chairs we see use of the cantilever principle, that is, the projection of a given element beyond its support. This is expressed in the extension of the arms above the seat. It is further developed in Breuer's chair in the extension backward of the side frame. The cantilevering of chair parts became more prevalant in Breuer's later work. It became an obsession with him as well as other architects and designers of the period, culminating in the invention of the first cantilevered chair.

The first tubular steel chair by Breuer can be viewed as a development of Gerrit Rietveld's Red-Blue Chair [Fig 4, Fig 5]. The angling of the seat and back recall the Rietveld design. Van Doesburg spoke of the Red-Blue Chair stating :'The whole stands free in space'. Breuer's chair achieves this effect much better. The seat and back are suspended above the ground. They float within a network of lines and planes.

xxxxxxxxxxxxxxxxxxxxxxx

In the field of mass produced furniture, the bent-wood chair was the precursor of tubular steel furniture. It created the particular state of mind which made it possible for the tubular steel chair to happen. These designs as they recede in time begin to look more and more like the bent-wood tradition brought up to date.

Fig 2. Marcel Breuer. Armchair, wood with upholstered seat and back rest, 1922

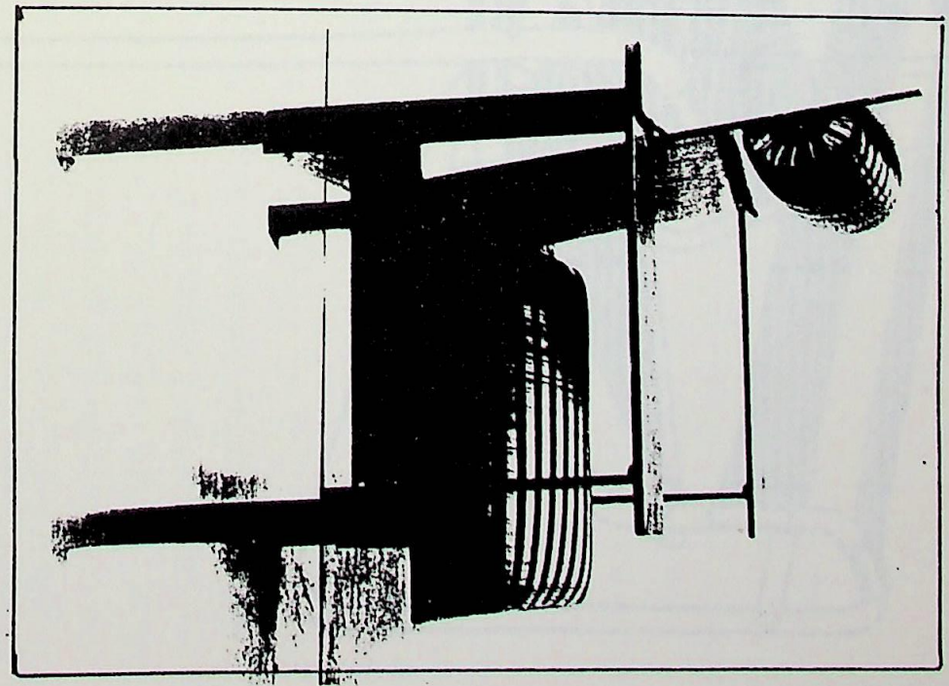


Fig 3. Gerrit Rietveld. High back chair, wood, 1919. An elaborate de Stijl construction this chair was published in 1920 and shown of the Bauhaus Exhibition in Weimar in 1923

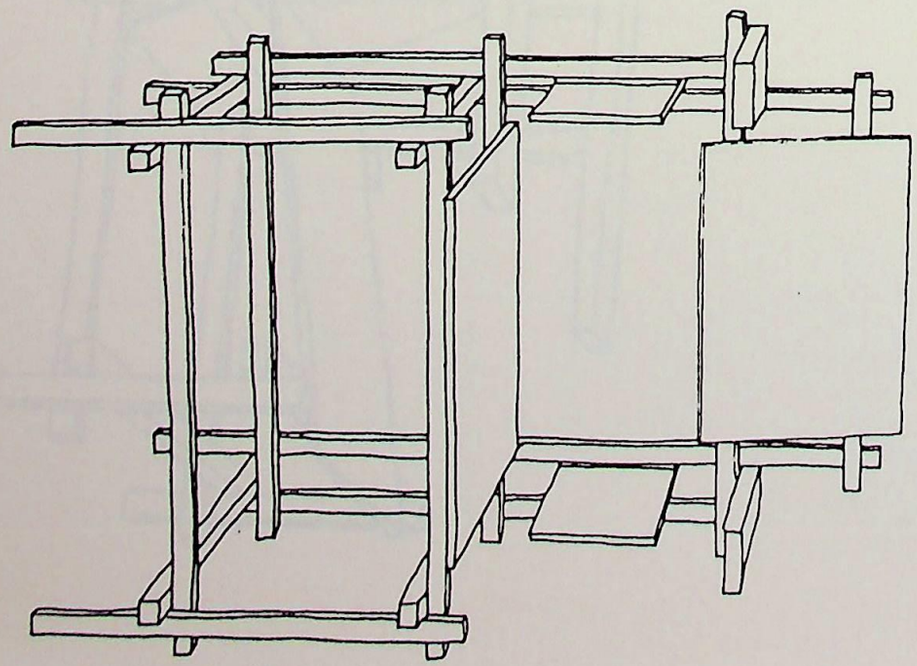
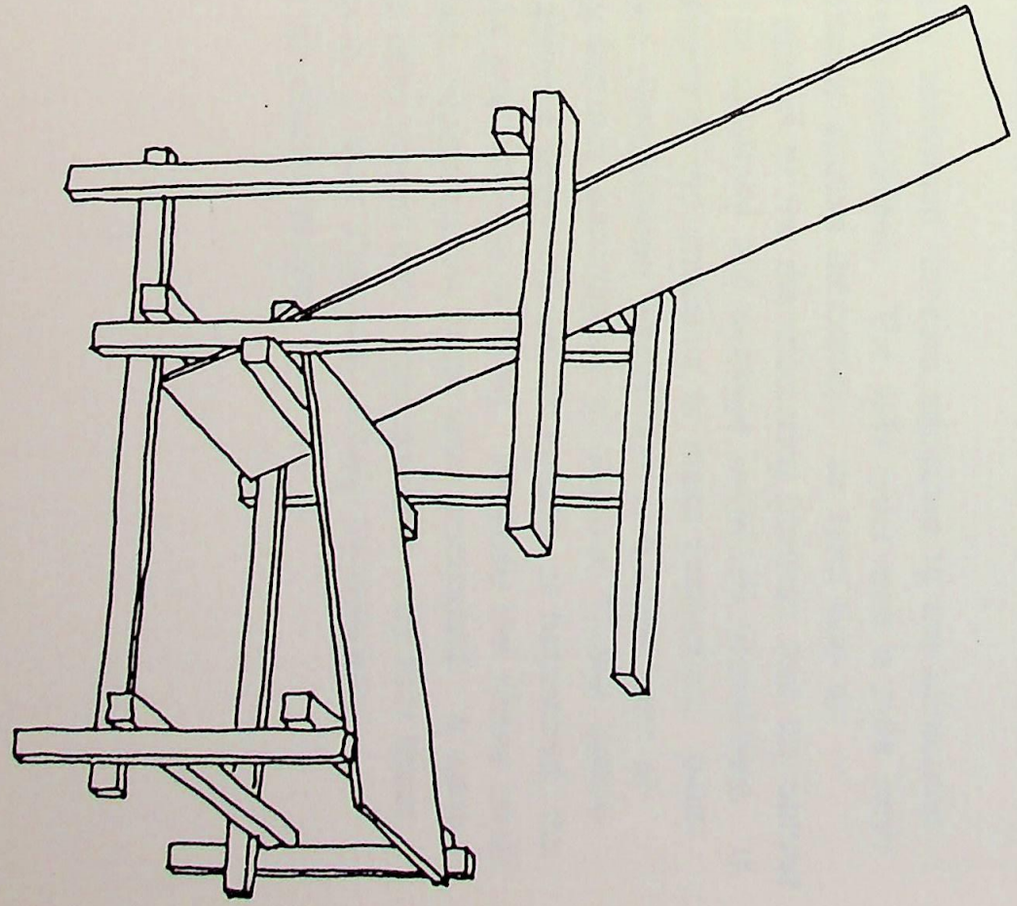


Fig 5. Gerrit Rietveld. Red-blue armchair, painted wood. Manufactured in 1918 by Van de Gronekan



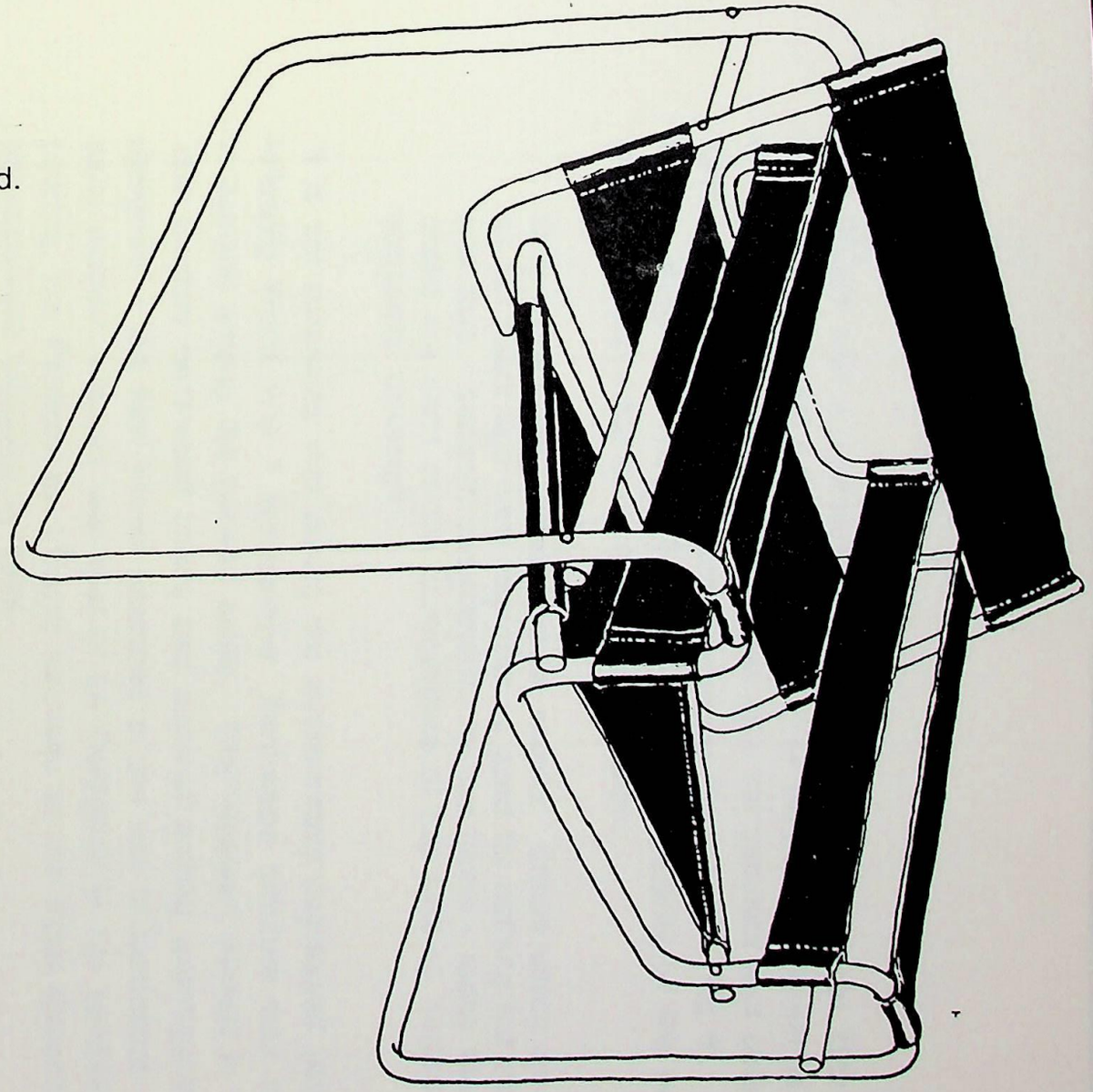


Fig 4. Marcel Breuer. 'Wassily' armchair. Chromium-plated tubing and canvas or hide, 1925. Manufactured in 1925 by Thonet

The 1920's saw a renewal in the popularity of traditional 19th Century bent-wood furniture. What is of particular interest is that the type which become most popular was the common and ubiquitous form : the simple 19th Century bent-wood 'Cafe Chair' [Fig 6]. Writing about the Thonet firm in 1929, the popularity of the bent-wood chair was cited as a recent phenomenon:

> Only today does Thonet reap its reward. Chairs which as late as ten years ago were regarded as good for nothing but cafes and bars - beneath consideration for the home - today these chairs are seen as the quintessence of this kind of industrial-economic thinking[6].

It is not surprising that during the economically depressed years following World War 1 inexpensive bent-wood furniture was much in demand among the general public. This renewed interest in the 19th Century bent-wood chairs also occured among avant-garde designers: - the best known examples of the use of bent-wood in early modern interiors was that of Le Corbusier in his exhibition building, the Pavillion de L'Esprit Nouveau at the Paris Exposition Internationale Moderne in 1925.

The 19th Century bent-wood furniture appealed to the Modernist designers aesthetic sensibilities. The cafe chair was a pure form devoid of superfluous applied decoration. Its form was an expression and symbol of the manufacturing process that lay behind it. Technically its simplicity and success remained unmatched. It was the embodiment of the principles of mass production. bent-wood chairs were manufactured inexpensively, a great deal of research was carried out, particulaarly by Michael Thonet before 1870, on the optimum structural use of lengths of bent-wood, the optimum sections and methods of fixing. Because the chairs could be knocked down, transportation costs were minimised. A bent-wood chair was light weight and hense portable. Its thin linear quality resulted in a chair that was virtully transparent, unencumbering to interior space[7].

Fig 6. Michael Thonet. Bent-wood 'Cafe Chair', turned in bent-wood with cane seat, 1859. Manufactured from 1859 by Thonet

In Rietveld's 'Ode' to one of his chair designs, one could be deluded into believing that he was talking about a bent-wood chair. This again reinforces the notion that the modernists were in persuit of the same aesthetic qualities in their work as was found in the modest bent-wood chair.
Rietveld's description of his chair runs as follows:

> We have attempted with this chair to make every part simple, in other words to choose a primary shape that conforms to all kind of function and the material used, and in a form that is best suited to produce harmony. The construction serves to join the single parts to one another without distorting them in the least, and in such a manner that no one part overlaps the next to any great extent, or is subordinate to the next. In this way the whole stands free in space. Form has resulted from material.[8]

World War I wrought tremendous political and social changes across the face of Europe, rivaling those of the Industrial Revolution. Germany, because it had lost the war, experienced a more pronounced radical social re-orientation than the victorious or abstentionist nations. These changes created an art community imbued with the ideals of social committment. The centre of this art community was in Weimar, a small town in Germany, where in 1919 Walter Gropius founded the Bauhaus, a design school. The group viewed furniture, houses and household products as strictly utilitarian objects of industrial production. Hannes Meyer, and other members of the Bauhaus demanded that such products be of standardized construction and form: 'The creation of standards of utilitarian objects of daily use is a social necessity. The products reproduced on the basis of Bauhaus models were to attain their moderate price solely by the exploitation of all modern, economical means of standardization and by sales volume' [9].

Bent-wood furniture fitted into the social and moral code of the Bauhaus. Not only did it fit into the functional machine aesthetic, it was also inexpensive hence available to society as a whole, not only the elite. It slotted into and may have inspired the idea of 'Typenmobel' [standardized furniture]. A limited number of models within each type would result in reduced production costs and therefore in cheaper furniture and a greater coherence of design.

This standardization of types would result in large scale assembly-line production modeled on that of the bent-wood firms. Advocates of 'Typenmobel' wanted each individual piece of furniture to be a 'typical expression of its nature'; an honest functional statement uncluttered with references to any specific styles.[10]

**********

So bent-wood furniture was mass produced; it was plain, inexpensive, lightweight and universal. For many Modernists, it didn't go far enough. It was made from wood, which immediately recalls the 19th century, where Nature was one of the symbolic sources of the languauge of Mass produced objects. The machine was the stimulus for the 20th century theory of Form[11]. As early as 1909, the Italian Futurist Marinetti proclaimed in the 'Futurist Manifesto':

> We will sing the midnight fervour of arsenals and shipyards blazing with electric moons; insatiable stations swallowing the smoking serpents of their trains, factories hung from the clouds by the twisted threads of their smoke.[12]

Blind faith of the Modernists' in the machine led Piet Mondrain to eccentric behaviour. When he travelled by train, he pulled the window blinds down so that he would not be disturbed by the chaos of the natural landscape! [13]

The hideous waste of World War I was followed by years of economic inflation, political violence and disease. When reconstruction and industrial reorganization actually began in the twenties, the promise of technology seemed to offer the one true hope for the future. A German commentator in 1935 stated that steel tubing 'has an outstanding share in the solution of the greatest problems of mankind in the last decade'[14]. In such a climate it appears only natural that the Modernists, carrying the banner of the machine aesthetic, should jump onto the tubular steel bandwagon.

As in many other respects World War I acted as a catalyst, making common-lace what had been limited developments before 1914. In the 1920's welding equipment for example was produced and marketed on a large scale, some units being transported with petrol driven generators mounted on a trailer, others being lightweight units, that could be plugged into mains electricity supplies and used with extension leads over a wide area. There was also in the immediate post war period, a further development in the production methods of tubular steel. The new method named 'the Sack Method' resulted in tubing with thinner walls than that produced by the Mannesman technique.

It was against this background of development in material and technique, both being readily available and commercially viable, that the application of tubular steel begins to emerge on a large scale in the 1920's. Tubular steel was widely used as a structural member. The qualities of tubing, strength and light weight, its smooth rounded surface, an absence of physical bulk in relation to weight gave it considerable potential. It was the stuff that aircraft frames - the first being the Spider mark 1 of 1910, car seats, building structures, ladders and scaffolding were made of.[15] [Fig. 7 and Fig. 8]

It was the use of tubular steel for car seating that inspired Mart Stam to begin work on his tubular steel cantilevered chair. Marcel Breuer, inspired by the strength, lightness and utility of his first bicycle - an Ader, invented the first Modernist tubular steel chair in 1925.

The 'invention of the tubular steel chair was the practical culmination of the Modernists preoccupation with lightness, transparency, social responsibility and technology.

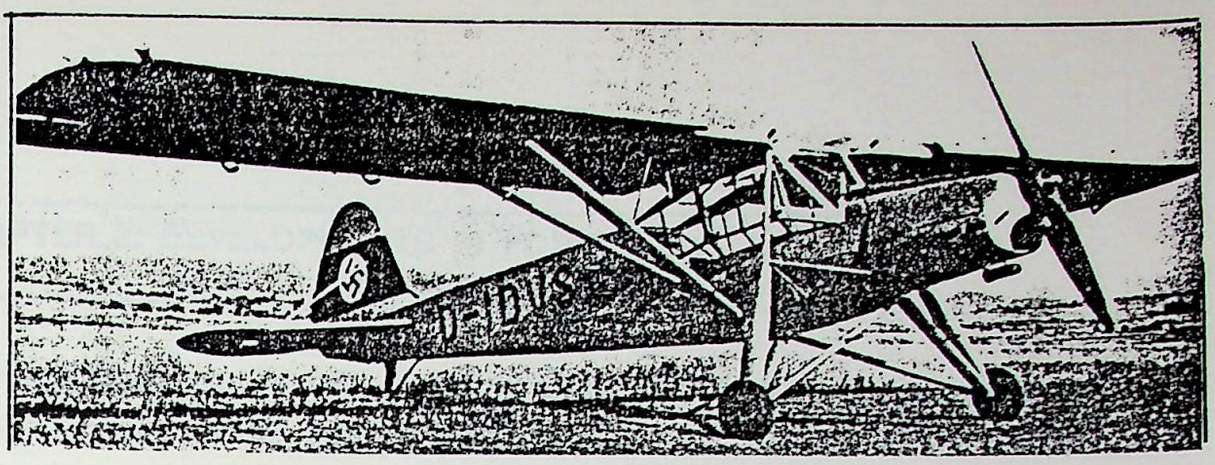


Fig 7. 1937 Fieseler Fi. 156 Storch. Fuselage and wing brace of steel tube

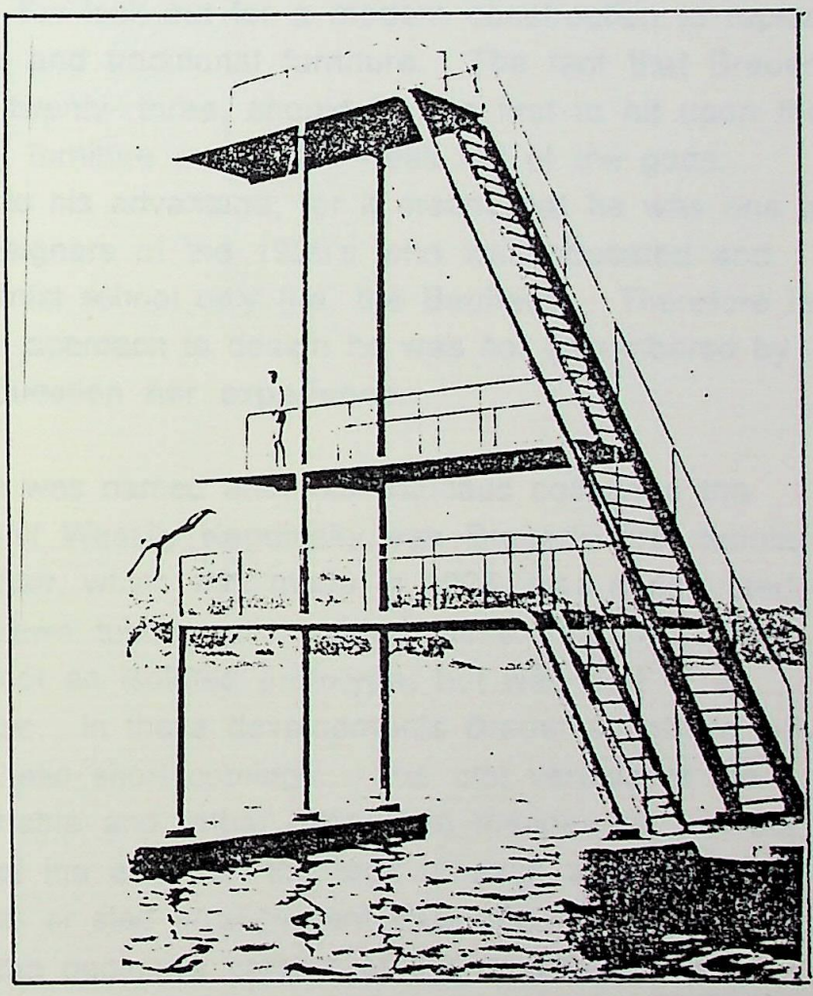


Fig 8. 1933 Diving tower using various gauges of steel tube

## CHAPTER 2: DEVELOPMENTS IN FORM

Marcel Breuer (1902-1981) initiated one of the most influential break throughs in the development of 20th century furniture: in 1925 he produced the first piece of ModernisT tubular steel furniture. Like all astounding inventions, the circumstances surrounding Breuer's development of modern furniture long ago became a legend of the Modern Movement.[16]

The idea for 'steel tube' furniture was known to everyone. The Modernists were on the look out for a modern construction to replace the bent-wood chair and traditional furniture. The fact that Breuer, who was then only twenty- three, should be the first to hit upon the idea of tubular steel furniture was not a freak act of the gods. Breuer's youth was to his advantage, for it meant that he was one of the few architect/designers of the 1920's who was educated and trained in the Modernist school only (i.e. the Bauhaus). Therefore in his search for a new approach to design he was not encumbered by either traditional education nor experience.

The 'Wassily', which was named after his Bauhaus colleague the Russian Expressionist Wassily Kandinsky, was Breuer's first tubular steel chair. This chair, which was made in 1925, was constructed of nickel-plated cold-drawn tubing with welded joints. [Fig. 4]. This club armchair was not an isolated prototype, but was part of a series of four designs. In these developments Breuer sought to solve functional and aesthetic short comings. The first version of the chair was uncomfortable and rather difficult to manoeuvre. In his first 'final' version of the armchair the legs of each side were connected in a runer or sled arrangement thus allowing for easy moving about. In the deginitive version of the armchair Breuer connected the back upright in a more continuous design [see fig. 9,10,11]

The 'Wassily' was of course the direct descendant of Rietvelds 'red-blue' chair and Breuer's wooden chairs of 1922-23. Bearing in this

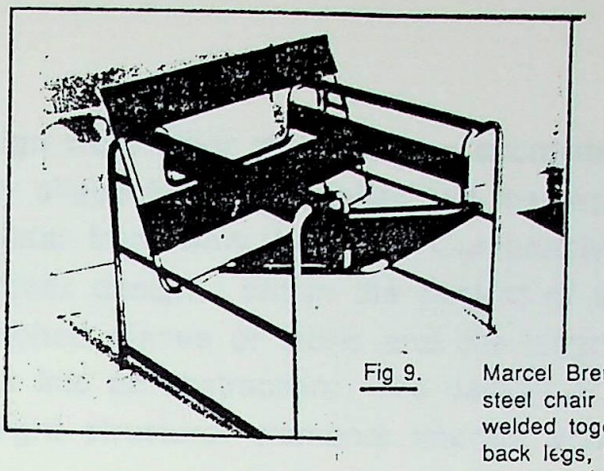


Fig 9. Marcel Breuer. 'Wassily', 1925 Breuer's first tubular steel chair was made from prebent lengths of tubing welded together; although braces joined front legs to back legs, the chair was . . conceived of as having four separate legs

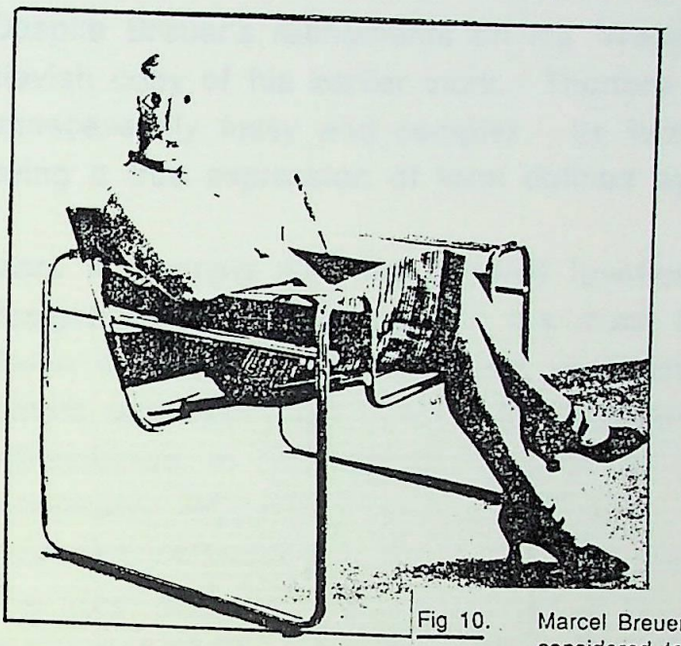


Fig 10. Marcel Breuer. 'Wassily', 1925. This chair was considered to be the first 'final' version of the armchair, which connected the legs of each side in a runner or sled arrangement


Fig 11. Marcel Breuer. 'Wassily', late 1927 or early 1928. The definitive version of the armchair, in which Breuer connected the back up rights in a more continuous design

design were other influences he encountered at the Bauhaus: The boxy shape from the Cubists and the exposed and complicated skeletal framework form the Constructivists. It was a highly complex design. Within the context of a cubic volume, the tautly stretched planes of fabric and the labyrinth of steel tubes turn the chair into an abstraction. The canvas or hide seat, back, arms and straight structural elements interact and overlap one another.

Despite Breuer's refinements on his 'Wassily' chair it remains a slavish copy of his earlier work. Therfore it appears to be unnecessarily fussy and complex. Its form is contrived rather than being a true expression of form defined by the material.

More in keeping with the avowed functionalist minimalism were designs such as those used in the much illustrated 'hauspiscator' in Berlin of 1926, the standardized, co-ordinated ranges of austerely simple seat and table designs for Standard-Mobel.[17] Breuer's nesting tables/stools of 1925-26 were extremely successful. They were remarkably light and visually unobtrusive. They could be mass produced inexpensively and could serve as stools or tables [Fig 12]. The stool also provided the illusion of an object made from a single continuous form. This idea was to become one of the most persisted and pursued notions in tubular steel and many subsequent furniture designs.

In this departure into tubular steel design Breuer established the basis for modern tubular steel furniture. The next giant step in the development process was undertaken by the architects Mart Stam and Mies Van der Rohe, who designed the first free standing cantilevered tubular steel chairs.

In Rietveld's and to a greater extentBreuer's furniture the Modernist's preoccupation with cantilevered principles is clearly demonstrated. It took the ingenuity of Mart Stam and Mies Van der Rohe to take it to its logical conclusion, which was a seat supported at one end only.

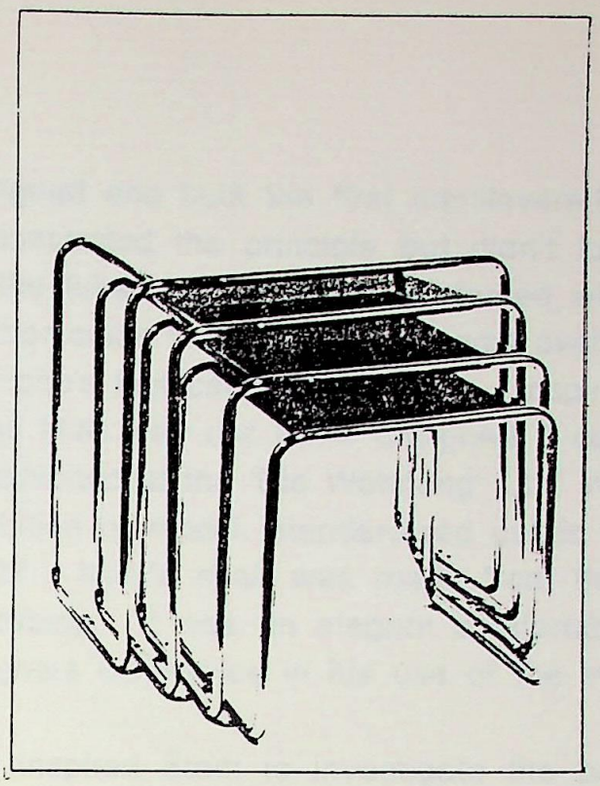


Fig 12. Marcel Breuer. Nesting stools, tubular steel and wood 1925-26. Both Standard-Mobel and Thonet manufactured the stool as a set of nesting tables, model B9

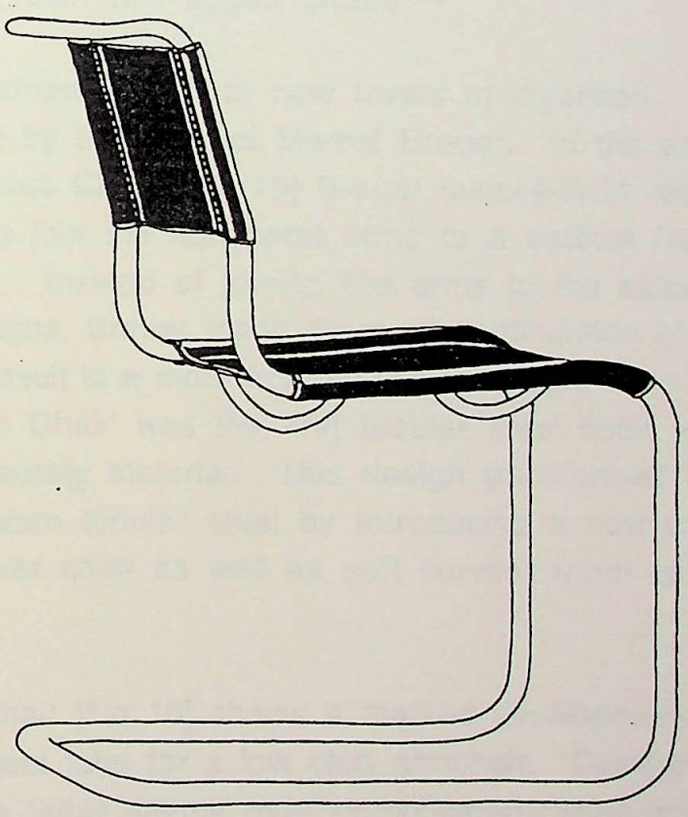


Fig 13. Mart Stam. Cantilevered side chair, chromium-plated tubing and laced canvas, 1926. Manufactured in 1926 by Thonet

Mart Stam designed and built the first cantilevered chair in 1926. This chair demonstrated the principle but didn't function properly, the interior of the tubes having to be reinforced with solid rods [Fig 13]. Stams rather crude looking invention was over shadowed by Mies Van der Rohe's first cantilevered chair. Inspired by Stams original drawings Mies Van der Rohe designed a cantilevered chair that was also exhibited at the 'Die Wohnung' CLT Wessenhofsiedlung, a massive exhibition of model, standardized public housing held in Stuttgart in 1927. Mies's chair was made from thin, resilient, precision-steel tubing. It was an elegant comfortable design and shows the designers confidence in his use of the material [Fig 14].

Just as Breuer inspired Stam to investigate the possibilities of 'Steel Tube' furniture, the canilevered chairs of Stam and Mies Van der Rohe in turn persuaded other Modernist designers to dabble with the cantilever principle. The Die Wohnung Exhibition and its publications made the concept of the cantilever chair known to the avant-garde and beyond. Soon multitudes of designers set about churning out their own two-legged chairs.[18]

At times these endeavours led to new levels of invention. This is best demonstrated by the work of Marcel Breuer. In the armchair version of the 'Cesca Chair' [Fig 15] Breuer succeeds in resolving the problem of how to join the horizontal arms to a vertical frame in a continuous design. Instead of joining the arms to the stiles as is done in other designs, Breuer made them a continuation of the frame. The end result is a more homogeneous design. The version B32 of the 'Cesca Chair' was the first tubular steel chair which uses wood and cane seating material. This design transformed the vocabulary of modern tubular steel by introducing a now continuous form on a cantilever chair as well as soft curves, warm colour and the feel of wood.

The B35 lounge chair [Fig 16] shows a marked development in Breuer's use of steel tube for a low club armchair. Compared to the 'Wassily' chair the latter seems over complicated, naive and over decorative. To the observer the most remarkable aspect of the chair is the opposing canitlevers; the seat emerging from the front of the

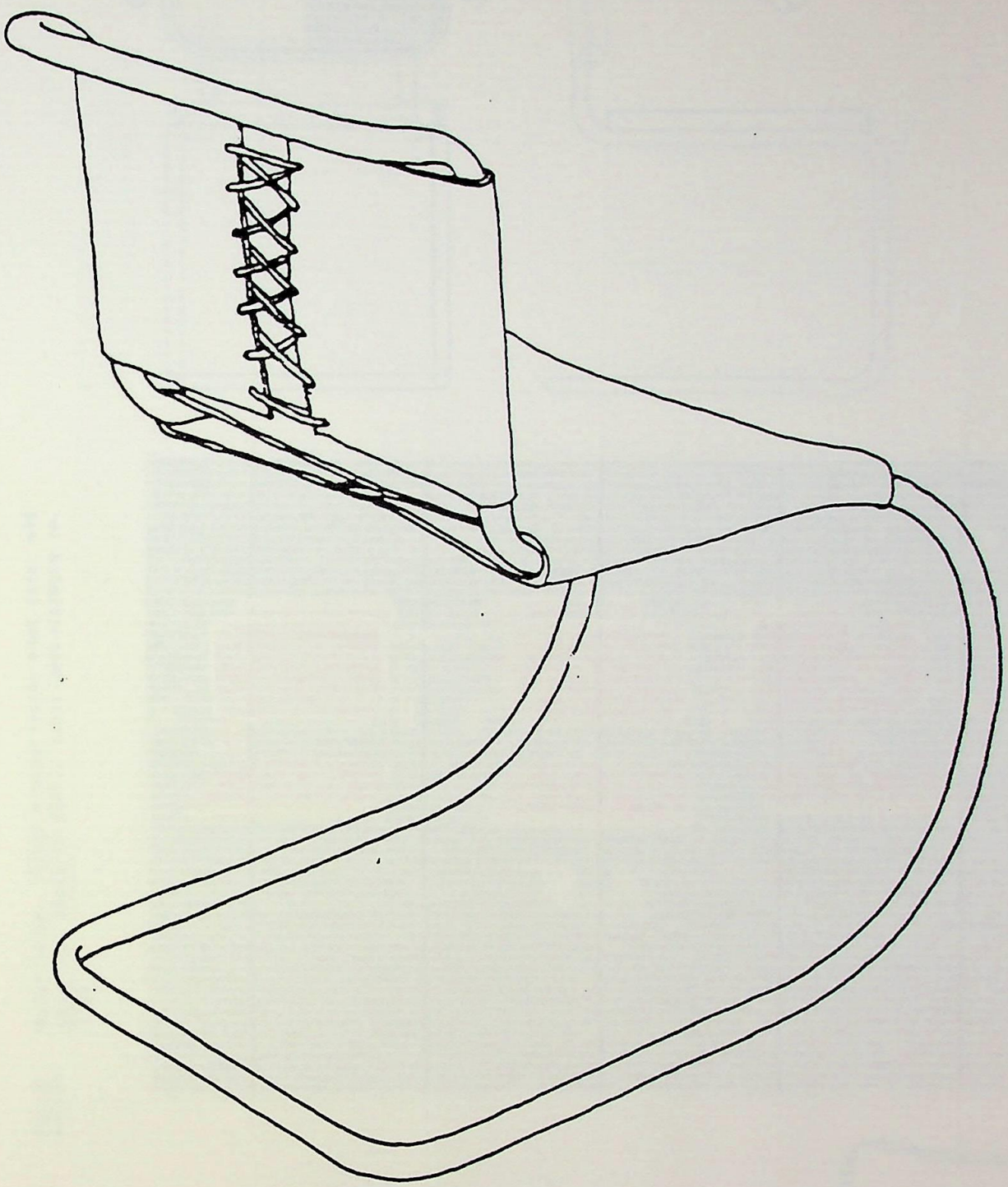


Fig 14. Ludwig Mies Van der Rohe. Cantilevered side chair/Mr chair Chromium-plated tubing and laced canvas, 1926. Reproduced in 1953 by Knoll International

Fig 15. Marcel Breuer. 'Cesca' armchair tubular steel, wood, and cane, 1928. Model No. B64 in Thonet sales catalogue, ca. 1930

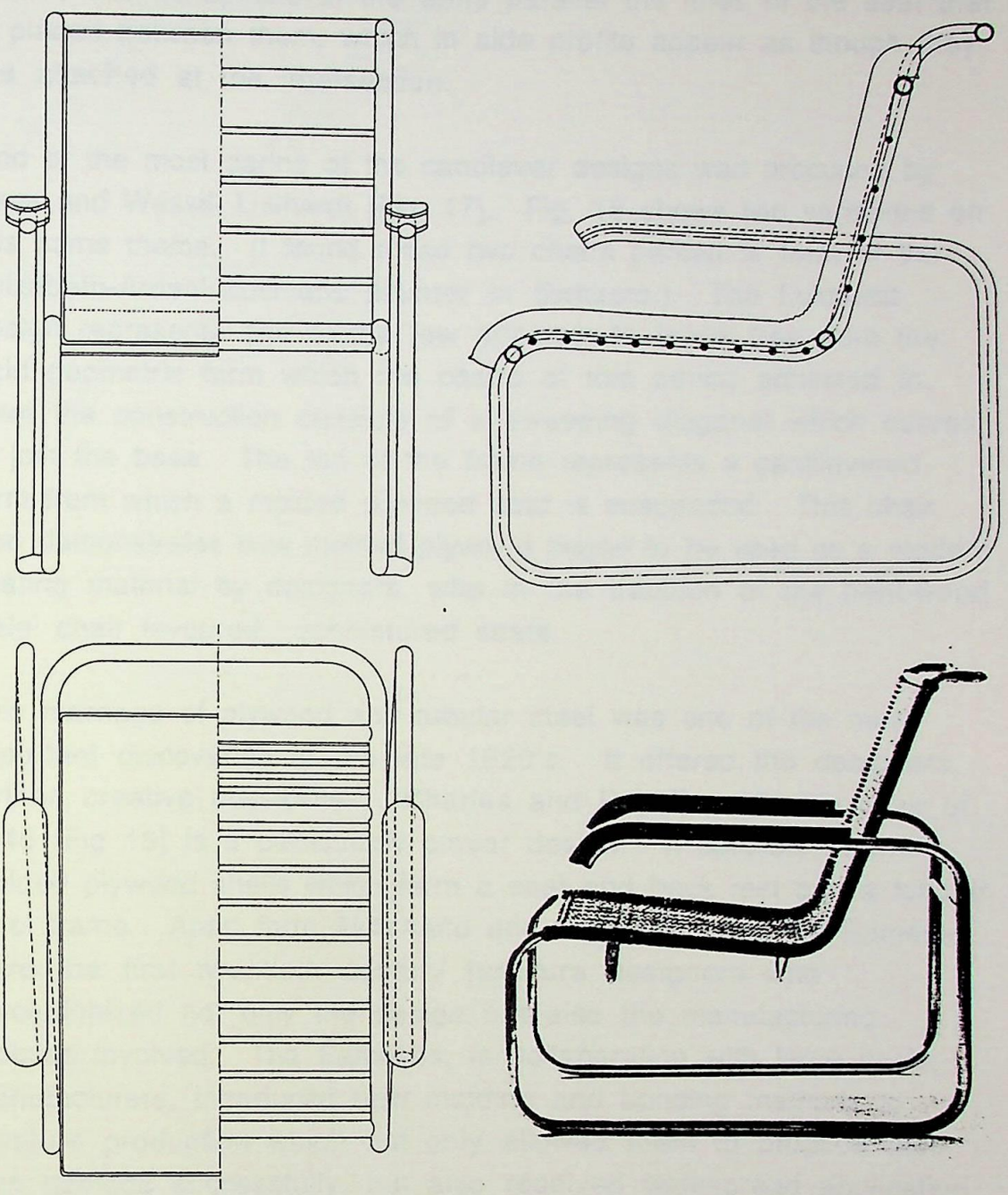


Fig 16. Marcel Breuer. Lounge chair, tubular steel, canvas and wood, 1928-29. Model No. B35 in Thonet sales catalogue, ca. 1930

chair. The horizontals of the arms parallel the lines of the seat that is placed between them, which in side profile appear as though they are attached at the intersection.

One of the most daring of the cantilever designs was procuced by Hans and Wassili Lukhardt [Fig. 17]. Fig. 18 shows two variations on this same theme. (I found these two chairs parked in front of the 'Elizabeth-Arden' cosmetic counter in Switzers.) The Lukhardt design represents one of the few attempts to break free from the rigid geometric form which the chairs of this period adherred to. Here the construction consists of a sweeping diagonal which curves to join the base. The top of the frame represents a cantilevered form from which a molded plywood seat is suspended. This chair also demonstrates how molded plywood began to be used as a modern seating material by designers, who in the tradition of the bent-wood 'cafe' chair favoured upholstered seats.

This marriage of plywood and tubular steel was one of the most important discoveries of the late 1920's. It offered the designers further, creative possibilites. Charles and Ray Eames' side chair of 1946 [Fig 19] is a particularly clever design. It consists of two molded plywood shells which form a seat and back rest and a tubular steel frame. Apart form Alvar Aalto and Otto Korhonen, the Eameses were the first twentieth century furniture designers who revolutionized not only the design but also the manufacturing process involved. The Eameses, in collaberation with large scale manufacturers, introduced new molding and bonding methods to furniture production which not only allowed them to produce their own designs successfully, but also received widespread application in the furniture manufacture industry.[19]

The cantilever was 'Bastardized' by a legion of well known designers such as Erich Dieckmann, Andre Larcat, Jean Backhalter as well as numerous anonymous company designers. The end products were over complicated forms which Mart Stam unaffectionately labeled as 'Steel Marcaroni Monsters'. It has to be conceded that all the Mondernist designers to some extent were more enraptured with the aesthetic quality of the steel rather than the pure functional

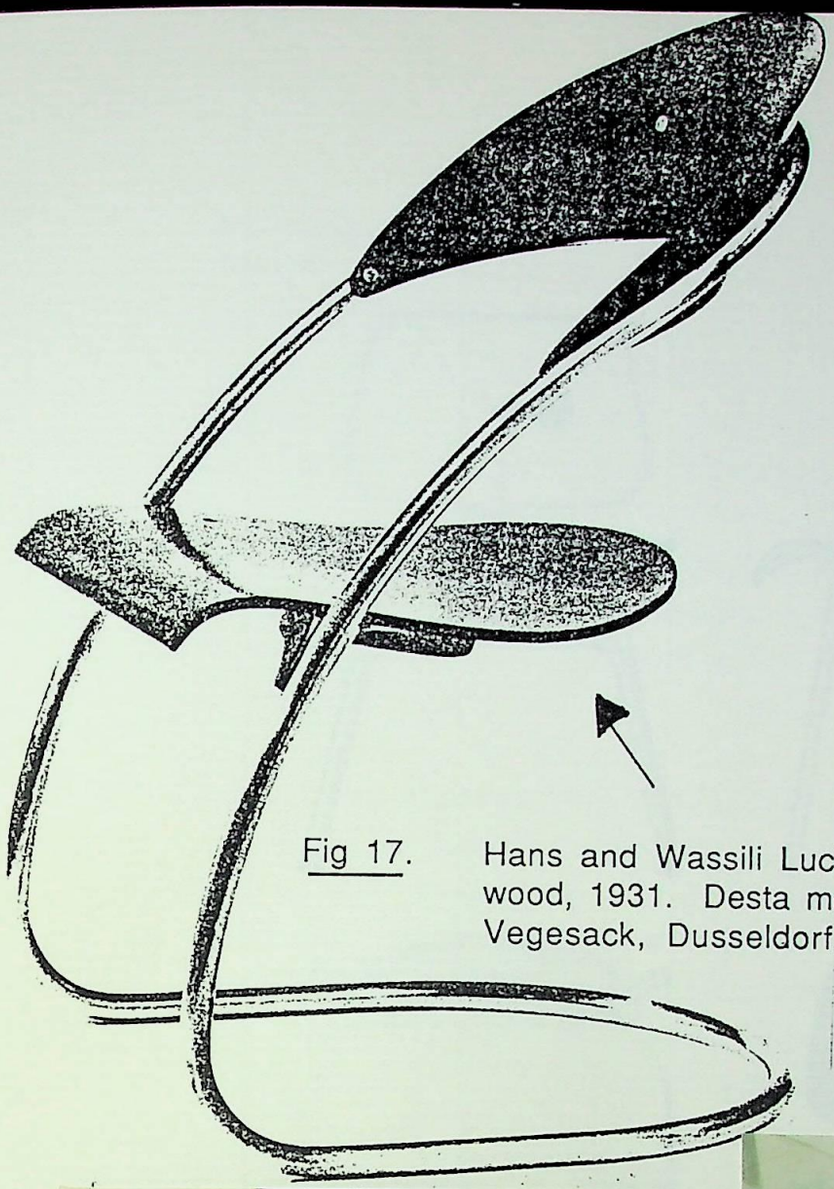


Fig 17. Hans and Wassili Luckhardt. Side chair, tubular steel and wood, 1931. Desta model ST14. Alexander Von Vegesack, Dusseldorf.

Fig 18. Chairs-photographed in Switzer's, Dublin 1989

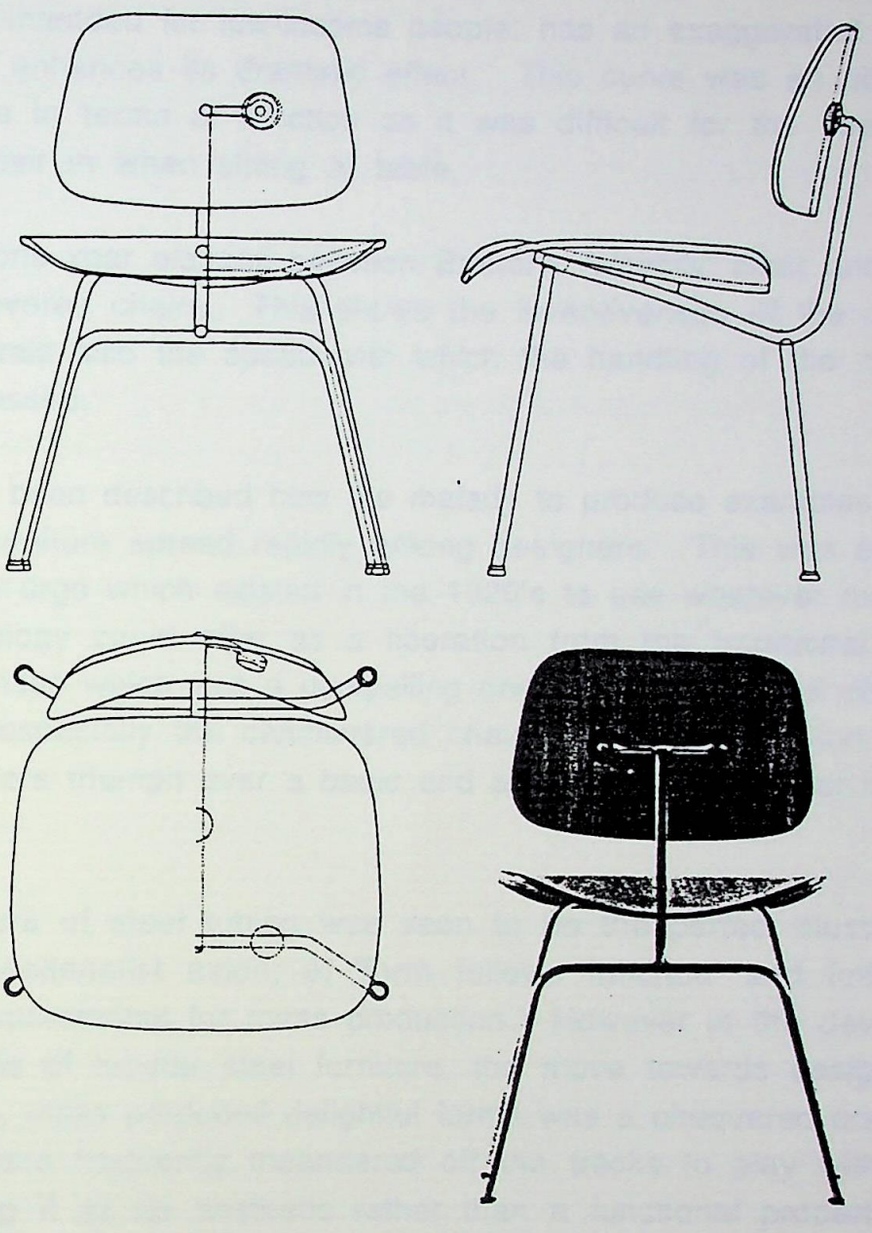


Fig 19. Charles and Ray Eames. Side chair, model DCM. Molded ash plywood, bent steel rod, rubber, metal, 1940-46 Manufactured after 1946 by the Herman Miller Furniture Company, Grand Rapids, Michigan.

requirements of the chair/furniture. Mies Van der Rohe's side chair [Fig 14] for example, was intented for use in the minimal living areas intended for low-income people; has an exaggerated curve which enhances its dramatic effect. This curve was an obtrusive feature in terms of function as it was difficult for the user to pull the chair in when sitting at table.

Only one year elapsed between Breuer's 'Wassily' chair and the first cantilevered chairs. This shows the inventiveness of the designers. It reveals also the speed with which the handling of the material progressed.

It has been described how the malady to produce examples of this new furniture spread rapidly among designers. This was explained by the urge which existed in the 1920's to use whatever modern technology could offer as a liberation from the traditional convention which was a compelling one. The 'steel tube' chair and more especially the cantilevered chair was a proclamation of the designers triumph over a basic and ancient form: the four legged chair.

Furniture of steel tubing was seen to be the perfect illustration of the functionalist axion; of 'form follows funciton' and fulfilled all the requirements for mass production. However in the development process of tubular steel furniture, the move towards designing simple, mass produced delightful forms was a chequered one. The designers frequently meandered off the tracks to play with form, treating it as an aesthetic rather than a functional property.

## CHAPTER 3: THE PROLIFERATION AND BUSINESS OF TUBULAR STEEL FURNITURE.

In 1925 Groupius wrote in his 'Principles of Bauhaus Production'

> Whether it is a vase, a chair or a house ... it shall have to serve its purpose absolutely, in other words its practical functions: Be durable, cheap and "beautiful"...
> .... taking into account all manufacturing methods, constructions and materials.[20]

Gropius's propagandic statement shows how the Modern designers had aspirations towards producing anonymous mass produced tubular steel furniture. Many of the Modernists extrolled the virtue of designing furniture which was not 'beyond the means of 99 per cent of the population'[21]. These same designers then preceeded to design furniture affordable only to the middle and upper classes.

Marcel Breuer, was one of the few avant-garde designers who made a valiant attempt to design products suited to mass production. To this end he set up the firm Standard-Mobel with the Hungarian architect Kalman Lengel. Breuer also remains a key contributor to the development of cheap steel furniture. His familiar model for Standard-Mobel is one such example [Fig 20]. In Mart Stams extension of Breuer's chair to the cantilever principal, he employs a greater simplification and economcy of means in material and method of producion [Fig 21]. Under the supervision of Josef Albers, the Bauhaus 'finishing shop' produced furniture prototypes that had minimal constructions and were affordable in price. Work there concentrated on experiments with bent-wood and folding chairs of steel tubing. Under Alfred Arnst who headed the workshop until 1931, these experiments were brought further in the direction of design anonymity. In consideration of the economic troubles of the years, Arnst believed that the primary task of the shop was to develop inexpensive furniture for manufacture by automated

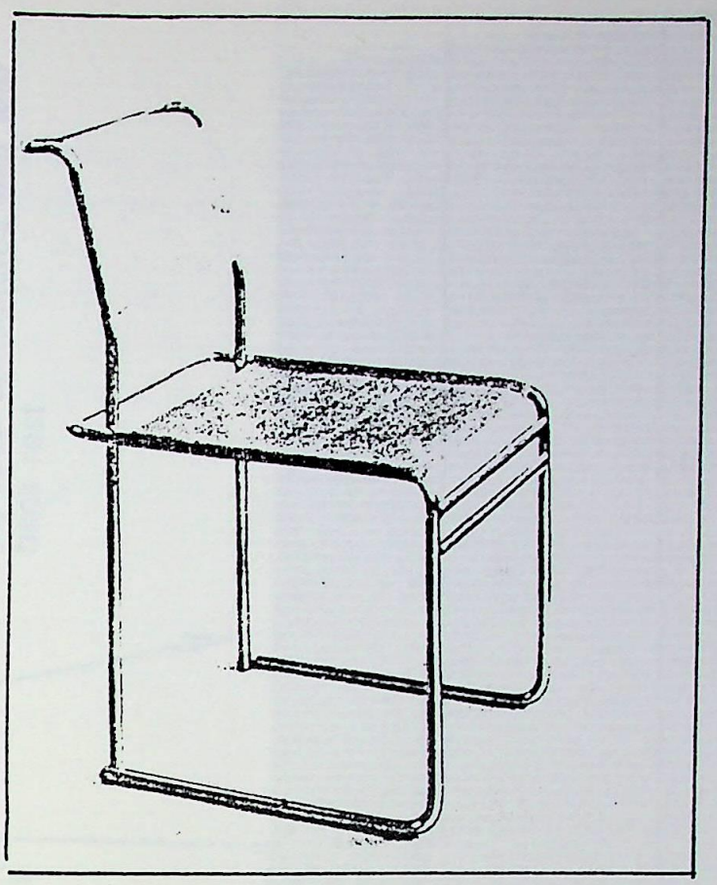


Fig 20. Marcel Breuer. chair, 1925. Manufactured by Standard-Model 1926. later sold by Thonet

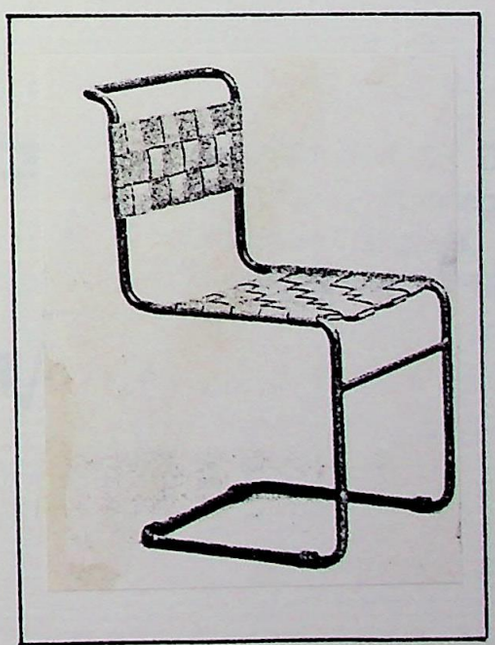


Fig 21. Mart Stam. Side chair, tubular steel and canvas, 1927 Manufactured by L&C Arnold, 1927

Fig 22. Photograph of a stacking chair in U.C.D Dublin. Tubular steel frame with plywood upholstered seat and back rest

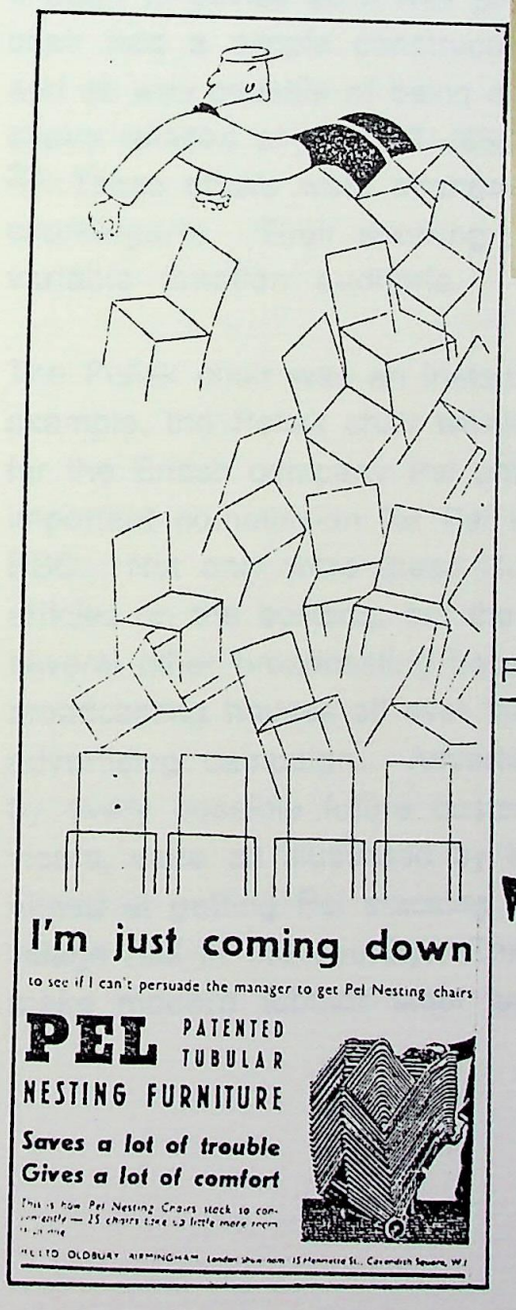



Fig 23. Advertisement for Pel stacking chairs with drawings by cartoonist Langdon. (Punch November 1937)

methods. He and his students worked with standardized parts and studied mass production methods and ways to improve them.

One obstacle twarted the efforts of Breuer and the Bauhaus designers. The problem was that wood was the cheapest material to make furniture. It is significant that when Hannes Meyer attempted to take the Bauhaus onto a new level of practical efficiency between 1928-1930, he turned his designers away from tubular steel and back to wood.[22]

All the ambitious attempts by Breuer and company were not nullified, for an Austrian designer, Bruno Pollak, with his patent 344159 registered in 1929, succeeded in producing a stackable tubular steel chair [Fig. 22]. The stacking principle was simple enough to devise as it was prefigured in wooden furniture. This chair had a simple construction which greatly simplified production and so was capable of being mass produced extremely cheaply. These chairs retailed at only 13/-(65p) each during the 1930's in England.[23] These chairs were stronger and ligher than their wooden counterparts. Their stacking potential revolutionized the use of variable function auditoria.

The Pollak chair was an instant commercial success. In England for example, the Pollak chair which was renamed the RP6, made fortunes for the British company Pel until the second world war. An important commission for Pel was a commission received from the BBC. Not only were these illustrated in innumerable and influential articles on the building, but the BBC decided to use Pel chairs in several other broadcasting houses. By 1936 there were RP6's in broadcasting houses all over the world. Pel also had a very novel advertising campaign. Advertisements, particularly in Punch, read by every possible future customer from managing directors to vicars, were all illustrated by the cartoonist Langdon [Fig 23], and aimed at getting Pel stacking chairs into every canteen, church and village hall in the country. The success of the Pollak chair helped make modern tubular steel furniture universal.

The global conversion 'to this alternative religion' was in part attributable to the invention of the stacking chair. There were other factors involved also. The impact of exhibitions on the dissemination of the concept of tubular steel furniture cannot be underestiminated. It was at a meeting, on the 22nd November 1926, held in preparation for the Weissenhof Exhibition, that Mies Van der Rohe saw Stams sketches for a cantilevered chair. Numerous other exhibitions from 1929 onwards lent themselves to spread the cool, rational Bauhaus style all over the world. The Werkbund exhibition in Stuttgart was followed by the International Exhibition in Paris (1930) and the Bauhaus Exhibition in New York. The outcome of these exhibitions was that an ever increasing number of designs and maunfacturers experimented and imitated this new furniture.

It rather seems like poetic justice that the Thonet company should play a major role in the popularisation of tubular steel furniture. It was afterall the bent-wood chair which gave the Modern designers their example and predisposed the public to support steel. Thonet, was the first large scale manufacturer to move into the market after the first few years of experimentation with tubular steel furniture. Due to the interest the avant-garde architects all over Europe had in the Thonet chairs they were exhibited in all the housing exhibions of the period such as Weissenhof (1927) and Breslau (1929). An important consequence of this was that Thonet had developed its contacts with the avant-garde just when the interest in tubular steel furniture was beginning. Thonet was thus enabled to secure patents to manufacture furniture by leading designers such as Marcel Breuer, Mart Stam, Mies Van der Rohe, Le Corbusier and Charlotte Perriand. Under the patronage of Thonet, really cheap mass produced chairs became a practicality as the volumes sold off set the high cost of the raw material. The international nature of this conglomerate also effected the development of tubular steel furniture. In the case of Britain Barbie Campell-Cole stated how that; 'the Thonet designs formed the basis of all English tubular steel furniture, an influence which varied from initial inspiration to blatant plagiarism'.[24]

Another factor influential in the spreading of this 'contagion' of tubular steel furniture, was the economic crisis of the late 1920's. The reverberations of this crisis were felt right across Europe and America. The peculiar phenonenon of attention being lavished on the problems of design for industry came into play.

In Britain the resistance and derision of tubular steel furniture was the most entrenched of the European countries. Througout the 1920's the Britian preferred to ignore the changing attitudes to design and materials that were taking place on the continent. The depression brought about a revived energy to experiement with new materials particularly the techniques of mass production. This movement was given an added impetus by the influx of designers and architects who started to work in Britain in the 1930's. These designers were mainly refugees from Nazi Germany and included such prominent luminaries as Walter Gropius, Wells Coates and Marcel Breuer.[25]

Crippling economic circumstances coerced British manufacturers into exploiting this new industry. The firm Cox and Co., for instance manufactured motor car components before diversifying into tubular steel furniture. Accles and Pollack who also manufactured tubular steel furniture formed part of tube investments; the latter was a group of companies in the English Steel Tube Industry, who had joined together to protect their business interests after World War 1. Like Cox and Co. Pollocks were forced by degerating economic conditons to seek new trade outlets, and in 1929 the company formed a department to manufacture tubular steel chairs. Tube investments registered a new company under the name practical equipment limited, subsequently changed to Pel in 1932. Pel and Cox and Co. became the major maufacturers of tubular steel furniture in Britian before the Second World War.

xxxxxxxxxxxxxxxxxxxxx

As the tubular steel furniture industry grew at a phenomenal place in the 1930's, plagarism came to rule supreme. It was a time of company takeovers. The giant conglomerate Thonet swallowed up smaller companies such a Standard-Mobel and Desta. It was a time

of doubtful design attribution. In such an atmosphere there was a reason, cther than egocentricity, which propelled designers to forfeit their anonymity. Mies Van der Rohe and le Corbusier were a few of the designers with financial acumen, who were very quick to patent anything which could be described as a technical principle, and ensured tht their designs were prominently identified in the advertisements. Most manufacturers, at some stage of other; were implicated for breach of patent or filed suit for breach of patent or both. Pel was sued by the British agent of the Austrian designer Bruno Pollak, who claimed the design principle of stacking furniture to be his. The dispute was settled when Pel brought Pollok's patent no. 344159. Cox and Co continued to manufacture the chair without Pel's permision. After a legal battle, Cox agreed to manufacture the chair under licence, paying Pel 6d (2 1/2p) per chair sold.[26]

The shady character of Anton Lorenz, a former history and geography teacher trom Budapest, was a central character in this legal wrangling. He purchased the rights and designed tubular steel furnituere. From 1929 onwards, and during the 1930's and 1940's Lorenz was plaintiff in lawsuits against virtually all the large manufacturers of tubular steel furniture; he charged them for plaziarizing his furniture designs. It was claimed that he became so mired in court cases that finding time for other work became an impossiblility.[27]

Besides providing bedtime reading for future generations of law students; these court cases throw up important items of informaion concerning design attributions. Breuer for example, collected royalties from Thonet on certain chairs such as the B30, B33 and B34 which infringed Stams copyright on the rectilinear, tubular-steel cantilevered chair [fig. 13]. Beginning in 1930 the Thonet company produced a number of tubular-steel furniture models that carried a designer credit for Marcel Breuer. Breuer didn't design any of these products save two. Here Thonet used the cretits as a selling device to enhance the prestige of a design that was being directed at fairly sophisticated market well aware of the various architect designers.

Such products as the B65 desks [Fig 24], the B34 table [Fig 25] were wrongly attributed to Breuer. The B114 bar stool [Fig 26] was credited to Breuer in the first Thonet catalogues, but later the attribution was given to the French designer Emile Guillot.[28]

This business of law suits shows the competitive cut - throat nature of the tubular steel furniture industry of the inter - war period. Loren'z endeavours also had a positive impact; designs came to be attributed to the correct ' Artist - technicians' / designers.

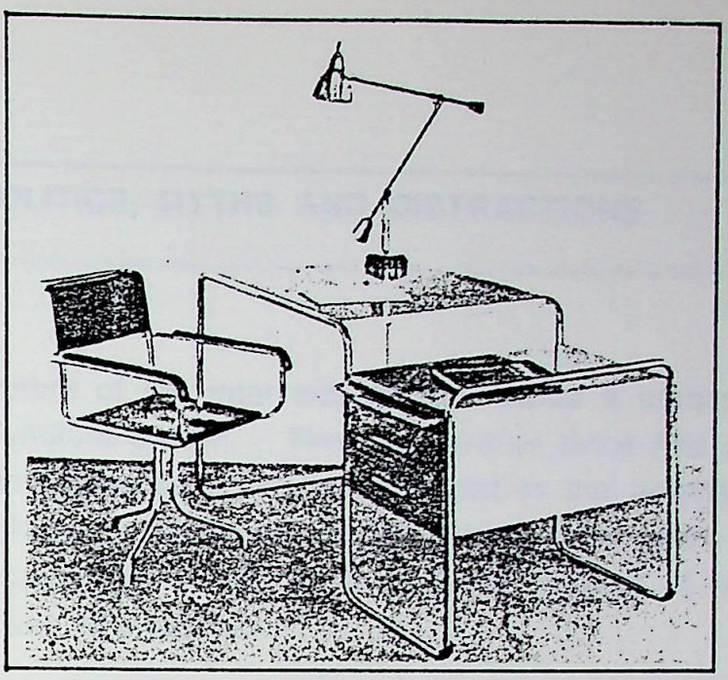


Fig 24. Desk B65, ilustrated with an armchair version of Breuer's B7a and E.W. Buguest's B7a and E.W. buguet's adjustable architect's lamp. B65 desk was wrongly attributed to Breuer in Thonet catalogue of 1930

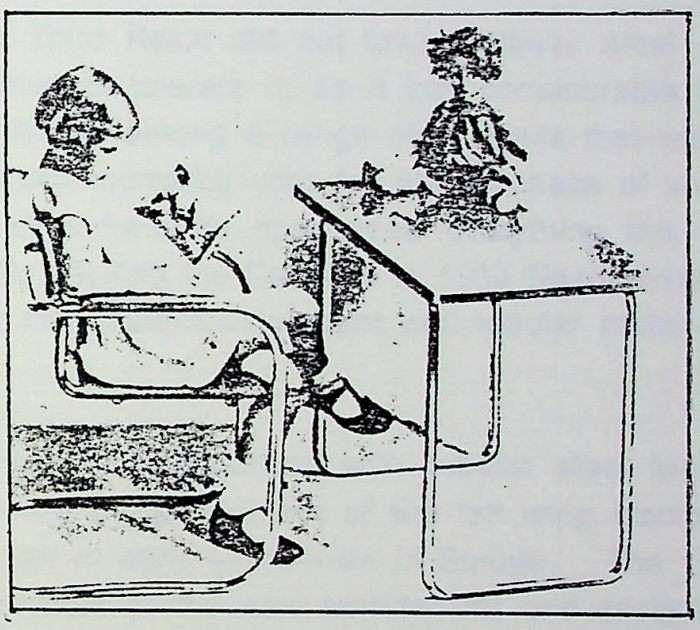


Fig 25. Anton Lorenz. A childs version of the B34 as sold by Thonet (and attributed to Breuer in the first catalogue), Ca. 1930

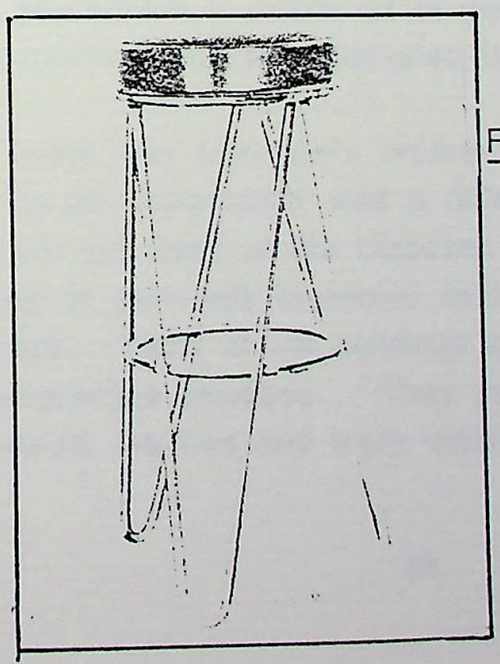


Fig 26. Emile Guillot. Bar stool B114 sold by Thonet (and attributec to Breuer in the first catalogue), ca. 1930

## CHAPTER 4: POLITICS, MYTHS AND DISTRACTIONS

Tubular Steel furniture of the inter war period holds a unique place in the history of furniture design. Never before or since has a furniture type been embroiled to such an extent in the aesthetic, social and political issues of its day. Resultingly this new furniture was a controversial entity. It was the subject of heated emotions, argument and ridicule.

The authorities of the Third Reich did not favour tubular steel furniture. It was forced to tolerate it, as it had considerable export potential. Therefore it was among a range of products that were capable of earning foreign currency vital for the purchase of war materials. Tubular steel furniture epitomized everything the Bauhaus stood for. By shutting the Bauhaus in 1933 Nazi Germany showed its disdain for the Modern movement and tubular metal furniture.

The reason for the Nazis' discomforture with tubular steel furniture was that it was perceived as an element of the left wing ideology that ws an important part of early Modernism in Europe. The exponents and sympathizers of the new architecture and design hoped that it would alter the domestic landscape as profoundly as revolutionary politics would change the political arena.[29] Thus the aesthetic image of gleaming metal merged with the dreams of Utopian Modernism in which all of society would live idyllic lives in homes furnished with well designed bold new furniture.

In Italy which was Germany's brother Fascist state, Modernism, referred to as 'Rationalism' was a different experience. Here Rationalism put itself at the disposal of the Fascist regime, attempting to persuade Mussolini that it was the right style for its government. Many of the buildings constructed for this the regime were compromise solutions. They incorporated both Rationalist and Neo-Classical features and were classified as 'Novocento' [30].

Rationalist architects - Mucchi, Levi-Montalcini, Pagano and Terragni all worked on tubular steel furniture during this period. This furniture was put at the disposal of the right wing dictatorship for as Paolo Fossari declared; The Italian designer had a reputation but no role! [31].

In Britain socialist principles were embraced by architects and designers like Wells Coates, Serge Chermayeff, Raymond McGrath and Berthold Ludeckin[32]. Due to the political stability of Britain, socialism or more importantly communism were not a real threat. Therefore tubular steel was devoid of political connotation. It was rather the conservative attitudes of the British, particularly their love of the well upholstered armchair, made them slow to acccept tubular steel into their own homes. Referred to as 'too austere for the British', it was regarded as the first fimmick of Modernism. it was constantly used throughout the 1930's to portray all that was ridiculous about Modern design (Fig. 27).

At times tubular steel furniture of this period did verge on the ridiculous. Its protagonists believed that it was the stuff most suited for the proletariats homes. If this were so, then the working class had expensive taste. Tubular steel in terms of cheapness could never supplant low-cost wood furniture.

Grandiose claims were made for the durability of this new furniture. Charlotte Perriano preached that for the same solidity a wood construction would have to be 14 times as thick as a metal one, and that metal combined maximum strength with minimum weight.[33] An indeterminable amount of such like claims were made in order to justify or camoflage the fact that tubular steel was not always the most cost effective furniture material.

The Modernists claimed that this furniture was an expression of function; not the expression of a self justifying aesthetic. Herein lies the essence of another myth. Mart Stam reiterated this shallow claim; stating that what was important were the functions of the product and these should dictate the form.

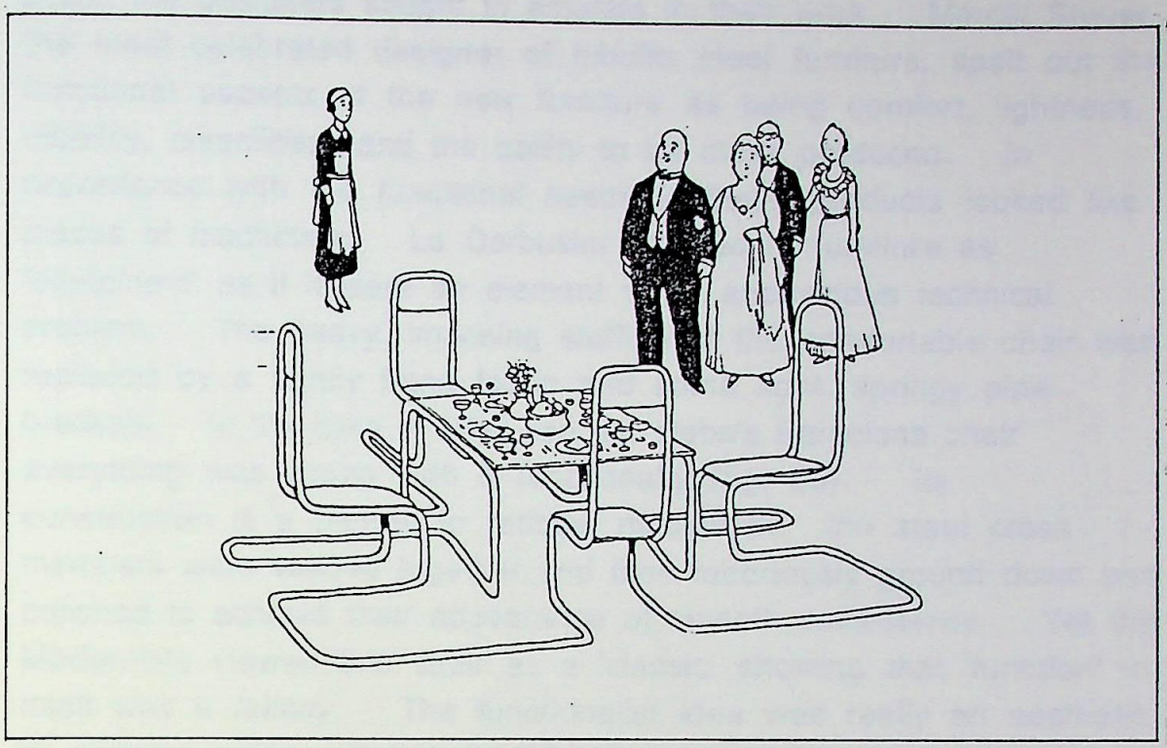


Fig 27. A satirical English view of tubular steel furniture was provided in Robinson and Browne's 'How to Live in a Flat' (1936), which explained to its readers that "Whereas formerly the best furniture was made by carpenters, cabinet-makers and similar skilled craftsmen ... Nowadays the trade is almost entirely in the hands of plumers, riveters, blow-pipers, and metal-workers of all sorts

The truth was, that 'function' became the self justifying aesthetic which the designers sought to emulate in their work. Marcel Breuer, the most celebrated designer of tubular steel furniture, spelt out the functional aspects of the new furniture as being comfort, lightness, mobility, cleanliness and the ability to be mass produced. In accordance with the functional aesthetic these products looked like pieces of machinery. Le Corbusier referred to furniture as 'equipment' as if it were an element in an anonymous technical problem. The heavy, imposing stuffing of the comfortable chair was replaced by a tightly fitted fabric and some light, springy pipe brackets. In the case of Mies van der Robe's Barcelona chair everything was wrong with it functionally (fig. 28). Its construction is a parody to rational metalwork; the steel cross members were welded together and then laboriously ground down and polished to achieve their appearance of smooth consistency. Yet the Modernists viewed this chair as a 'classic' showing that 'function' in itself was a fallacy. The functionalist idea was really an aesthetic or stylistic option; it was another form of 'decoration'.

This intoxication with the functionalist aesthetic meant that this new furniture often violated the users psychological needs. The stark chromium plated skeletal forms, the glass table tops, all had a basic inhumanity about them. This led to a vitriolic outcry against tubular steel furniture from many quarters.

John Gloag was a knowledgeable observer of furniture design. He vociferously disapproved of this new metal furniture. In his opinion the designs were as efficient and as interesting as modern sanitary fittings. Aldous Huxley also viewed this furniture with derision:

> 'Metal furniture' will be modern with a vengeance. Personally I very much dislike the aseptic hospital style of furniture. To dine off an operating table, to loll in a dentists chair - this is not my idea of domestic bliss ..... the time, I am sure, is not far off when we shall go to go for our furntirue to the nearest Ford or Morris agent.[34]

Le Corbusier, in his article - 'The Furniture Adventure' of 1929 boasted that this furniture met 'standard functions, standard needs,

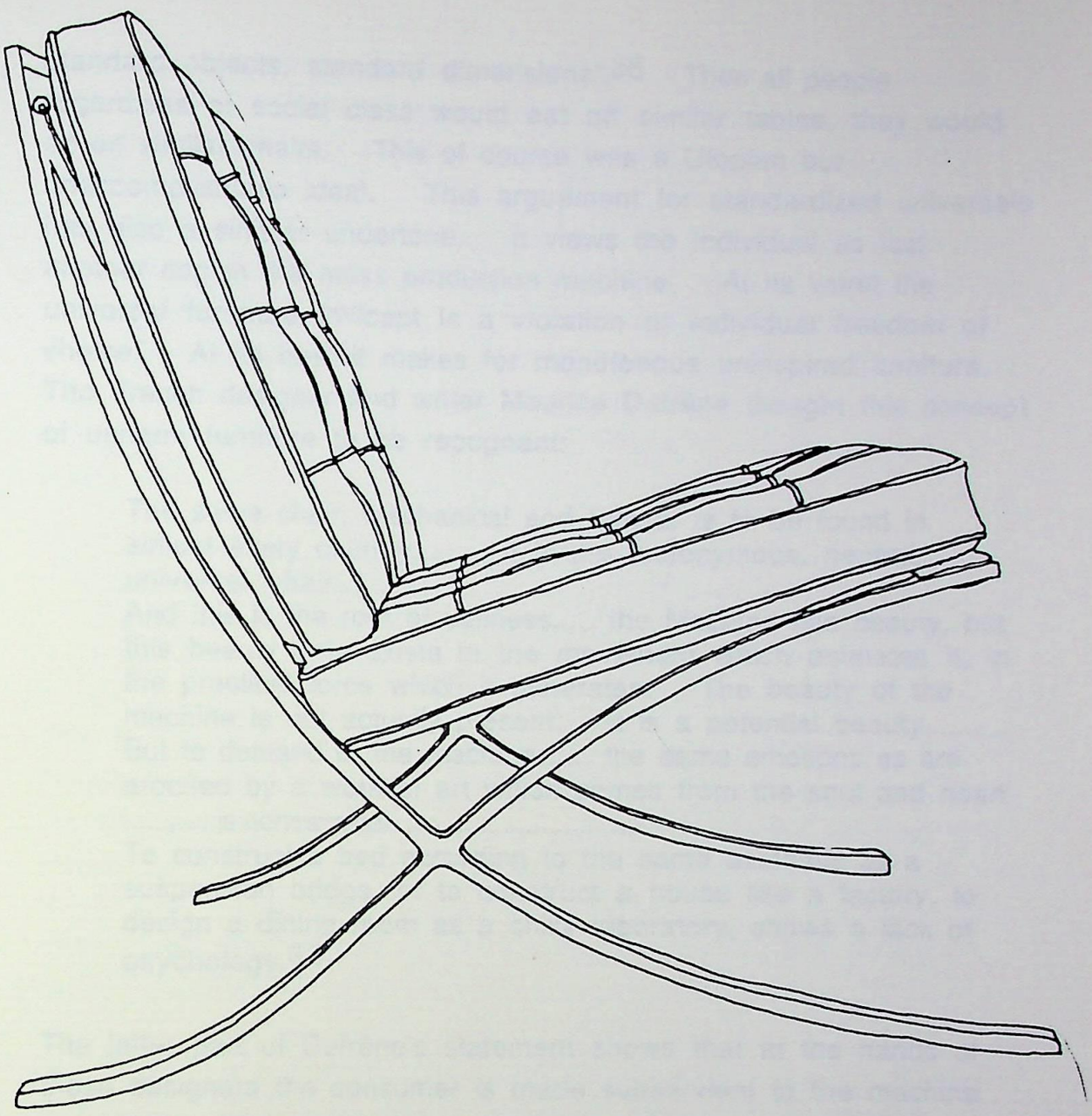


Fig 28. Ludwig Mies Van der Rohe. 'Barcelona' chair plated metal, leather-covered cushions resting on leather straps, 1929. Created for the German Pavi llion at the World Exhibition, 1929. Reproduced in 1953 by Knoll International

standard objects, standard dimensions'.[35] Then all people regardless of social class would eat off similar tables, they would sit on similar chairs. This of course was a Utopian but unaccomplishable ideal. This arguement for standardized universals has also a sinister undertone. It views the individual as just another cog in the mass production machine. At its worst the universal furniture concept is a violation of individual freedom of choice. At its best it makes for monotonous uninspired furniture. The French designer and writer Maurice Dufrêne thought this concept of uniform furniture to be repugnant:

> The same chair, mechanical and tubular is to be found in almost every country..... it is the anonymous, neutral, universal chair...
> And this is the root of dullness..... the Machine has beauty, but this beauty only exists in the movement which animates it, in the practical force which it generates. The beauty of the machine is not actually present. It is a potential beauty.....
> But to demand of the machine ..... the same emotions as are aroused by a work of art which comes from the soul and heart ..... is nonsensical ..... .....
> To construct a bed according to the same aesthetic as a suspension bridge, or to construct a house like a factory, to design a dining room as a chilly laboratory, shows a lack of psychology.[36]

The latter part of Dufrêne's statement shows that at the hands of these designers the consumer is made subservient to the machine aesthetic. These artifacts existed in order to symbolize the world of science and technology, of speed and danger, of hard struggles and no personal security. The designers were not interested in the actual needs, ideals and aspirations of ordinary people. The chair designs by the first generation of designers don't even invite the person to sit down. This is especially true of the cantilever spring chair in the canonical form invented by Mart Stam. Reyner Banhan explains how that it was a " 'Machine à s'asseoir' of a fit generation poised for action. It was comfortable; but did not invite one to lounge or slouch. Most of the attempts at 'fauteils grand-comfort' of the inter-war period are anything but; they abound in anthropometric and ergonomic faults: the only one that works is Charlotte Perriand's famous 'cowboy' chair made for Le Corbusier and

its very name reminds us that the posture it offered is the memory of a poised, not relaxed, sitting position - that of the cowboy with his boots on the table and his chair balanced on its back legs".[37]

A quality over which the Modernists had no control was that Metal looks and feels cold. This intrinsic quality gives all metal furniture a harsh impersonal quality. The Modernists themselves found this to be desirable as it further enhanced the sense of annonymity which they were so taken with. The 'giddy multitudes' didn't share their ecstaticism. John Gloay in his article 'Wood or Metal' of 1929 states that:

> Metal is cold and brutally hard and whether it is used for a Mid-Victorian bedstead or a chair that is formed by simple loops of polished steel tubing ..... it gives no comfort to the eye.[38]

This fact served to further alienate tubular steel furniture. Many people believed that office equipment was the legitimate field for the employment of metal furniture. Metal equipment satisfied the standards of commercial life, adequately resisting the wear and tear of an office. This belief proved to be prophetic. To this day institutions, educational establishments, factories and offices remain the biggest consumers of tubular steel furniture.

What emerges is that an elite group of designers, who are oblivious of peoples true needs, cannot dictate the tastes of the masses. Figure 29 is a tubular steel chair whose form apes a bent-wood 'café chair'. This chair is just one of a multitude of similar products. They stand as a testimony to the fact that even in 1989 Modern tubular steel furniture still gives many people 'indigestion'!

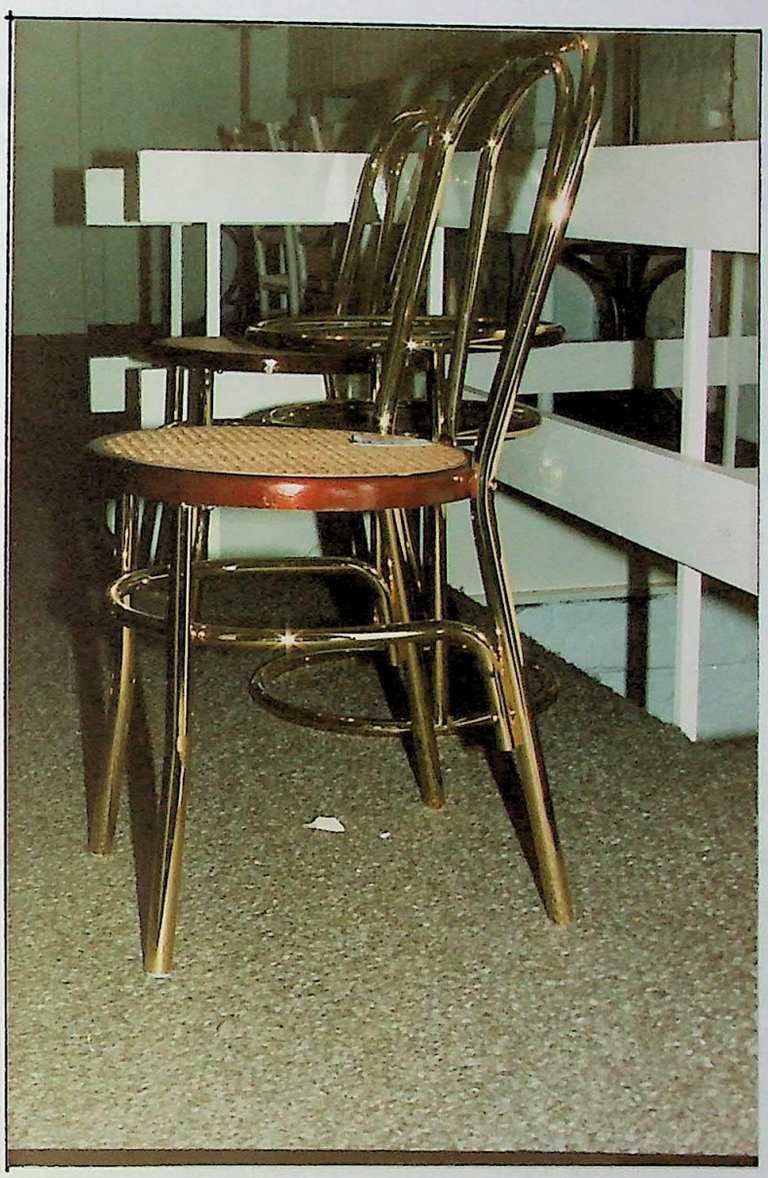


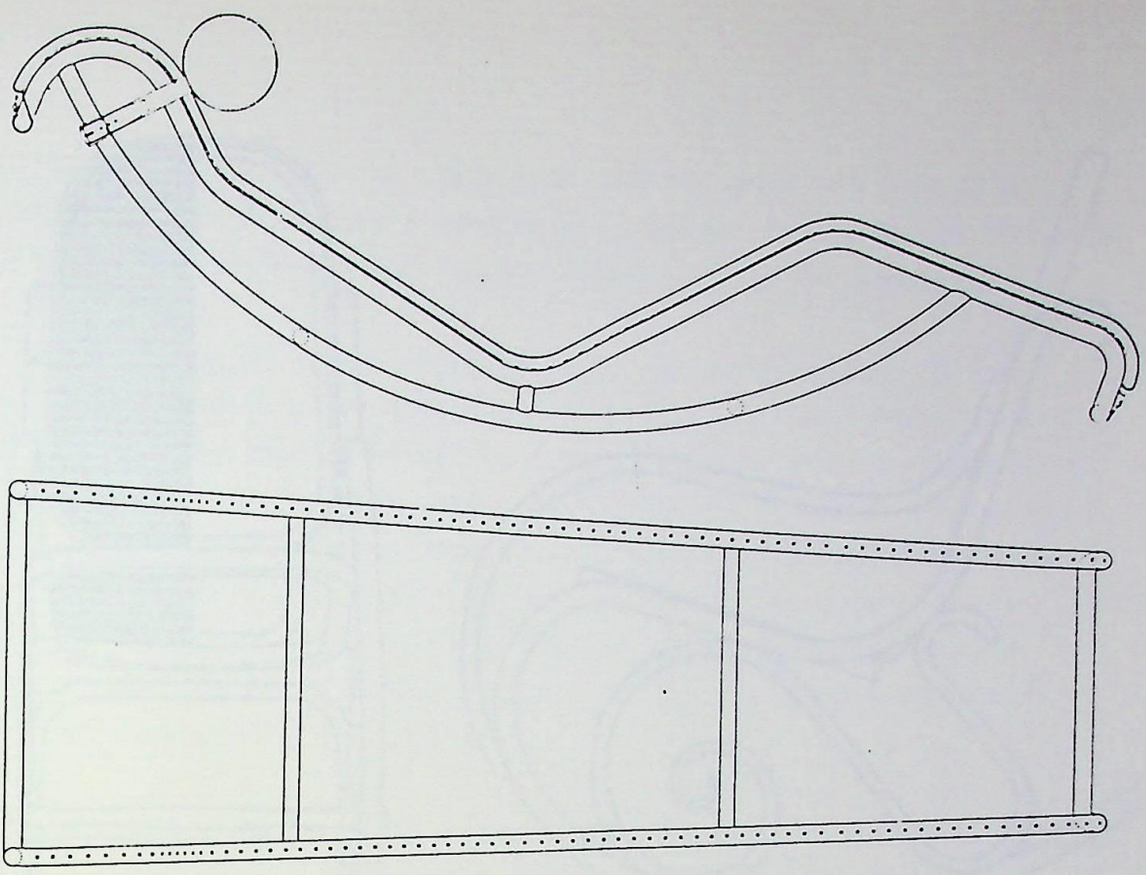
Fig 29. Photograph of an imitation of the bent-wood 'Cafe chair', in tubular steel; chair from O'Hagan Design, Mary Street, Dublin, 1989

## CHAPTER 5: FRANCE AND AMERICA

In France the advocates of Moderism, apart from Le Corbusier and a few other individuals, were interested neither in inciting revolution nor in dictating what was the only appropiate furniture for modern life. Instead, they designed for the chic and design-conscious elite. However, the most important French bent-metal designs of the period were created by designers who were concerned with ideology. These designers were namely Le Corbusier and Charlotte Perriand.

Le Corbusier was reputedly the most important architect and theorist of Modern design. It was Le Corbusier who vociferously advocated 'Standard functions, standard needs, standard dimensions'[39]. For Le Corbusier and his colleagues, 'A chair is in no way a work of art; it is a machine for sitting in'.[40] Accordingly, the mechanistic imagery of shiny metal and geometric forms predominated in the furniture design of the inter War period. What is remarkable about the work done by them, that is was the antithesis of all their theories. Their work did not combine an interest in aesthetics with social questions or even with the problems of mass production. In his architecture, Le Corbusier did attempt to tackle these problems by promoting the notion of mass produced concrete housing. In his furniture design he eschewed the notion of inexpensive design. All the le Corbusier - Charlotte Perriand furniture was extremely costly to produce. Although their furniture was at variance with Le Corbusier's rhetoric their work was highly inventive, subsequently passing into the 'pantheon of design classics'[41].

The most impressive of their collaborations was the 'Chaise Longue' [Fig 30]. Although, it was a highly original design it was not entirely without precedant and resembled an updated version of Thonets' 'rocking Chaise' [Fig 31]. The seat rests on a stationary base, unlike its 19th Century predecessor, which was a true rocking chair. The 'Chaisse Longue' is machine like in appearance. The H-shape metal stretches of the 'chaise longue' recall the aerodynamic design of an



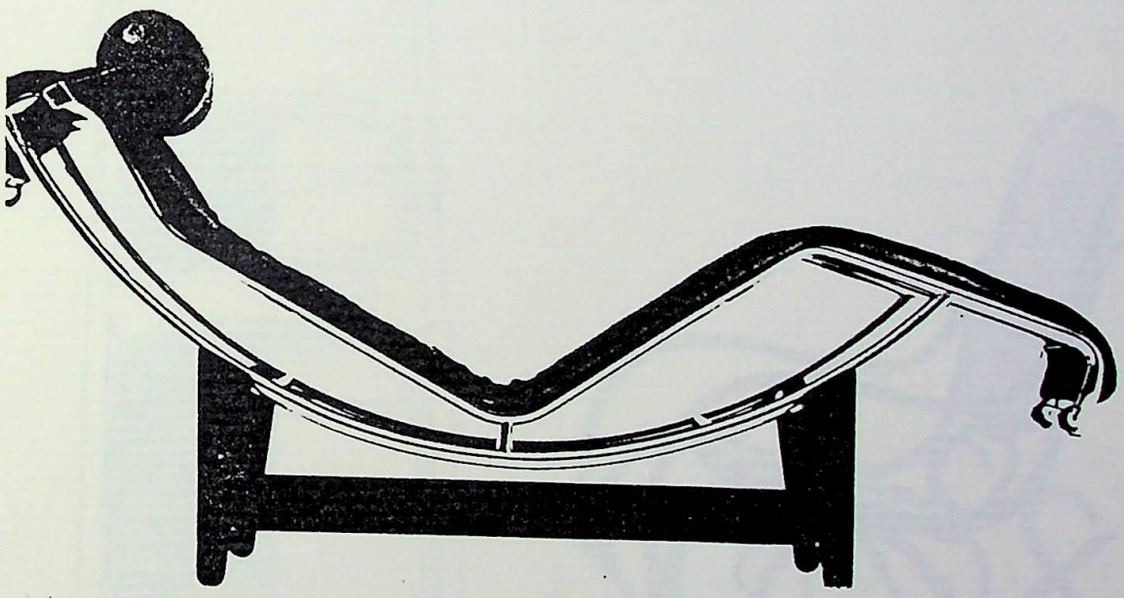


Fig 30. Le Corbusier and Charlotte Perriand. 'Chaise Longue' 1929. At the time of its first public showing in the 1929 Salon d'Automme, Le Corbusier presented this explanation of his Chairg Longue in a lecture he gave in Buenos Aires:

> 'We have built it with bicycle frame tubes and we have covered it with a magnificent pony skin ... I thought of the cowboy from the Wild West, smoking his pipe, his feet in the air higher than his head, against th e chimney piece: complete rest'

Manufactured in 1927 by Thonet, Reproduced in 1966 by Cassina

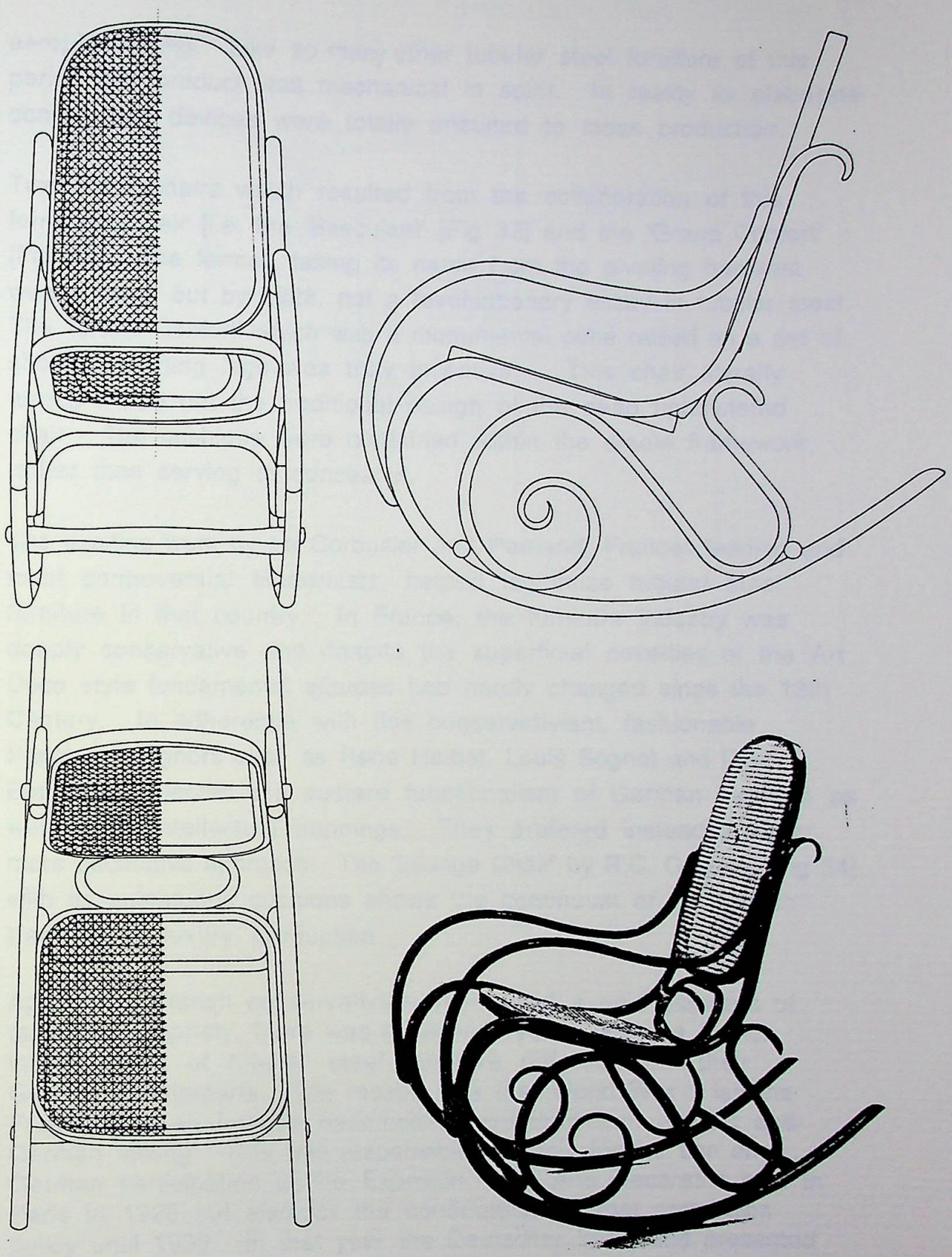


Fig 31. Bent-wood Rocker 1860
Manufactured by Thonet

aeroplane wing. Like so many other tubular steel furniture of this period this product was mechanical in spirit. In reality its elaborate construction devices were totally unsuited to mass production.

Two other chairs which resulted from the collaboration of this formidable pair [i.e. the 'Basculant' [Fig 32] and the 'Grand Confort' [Fig 32]. The former, taking its name from the pivoting backrest, was a noble but by 1928, not a revoluntionary essay in tubular steel. The 'Grand Confort' which was a monumental cube raised on a set of short supporting legs was truly inventive. This chair literally turned inside out the traditional design of the deep upholstered chair. The cushions were contained within the cradle framework, rather than serving to conceal it.

The exciting work by Le Corbusier and Perriand, Frances leading and most controversial Modernists, helped legitimize tubular steel furniture in that country. In France, the furniutre industry was deeply conservative and despite the superficial novelties of the Art Deco style fundamental atitudes had hardly changed since the 18th Century. In adherence with this conservativism, fashionable Parisian designers such as Rene Herbst, Louis Sognot and Djo Bourgeois rejected the austere functionalism of German furniture as well as its intellectual trappings. They prefered instead a richer more decorative approach. The 'Lounge Chair' by R.C. Coquery [Fig 34] with its sumptuous cushions shows the continuum of the French tradition of luxury production.

Apart from French conservativism which had a rigid standard of taste and propriety, there was a second reason why the French interpretation of tubular steel furniture differed from their German counterparts. The reason was that World War 1 left the French with an intense nationalism combined with distinct anti-German feeling. This was responsible not only for the ban on German participation in the Exposition des Arts Decoratifs held in Paris in 1925 but also for the continuation of that prohibition policy until 1930. In that year the Deutscher Werkbund presented a pavilion at the Salon Des Artistes Decorateurs in Paris that included the bent-wood and metal furniture of Breuer, Mies Van der Rohe, Adolf Schneck and other designers. Simultaneously, Thonet Freres, the French branch of the Thonet firm expanded it operations, the products becoming virtually mass produced.

Fig 32. Le Corbusier and Charlotte Perriand. The 'Basaulant' armchair. In tubular steel, and hide 1928-29. Manufactured in 1929 by Thonet. Reproduced in 1965 by Figi Amedeo Cassina

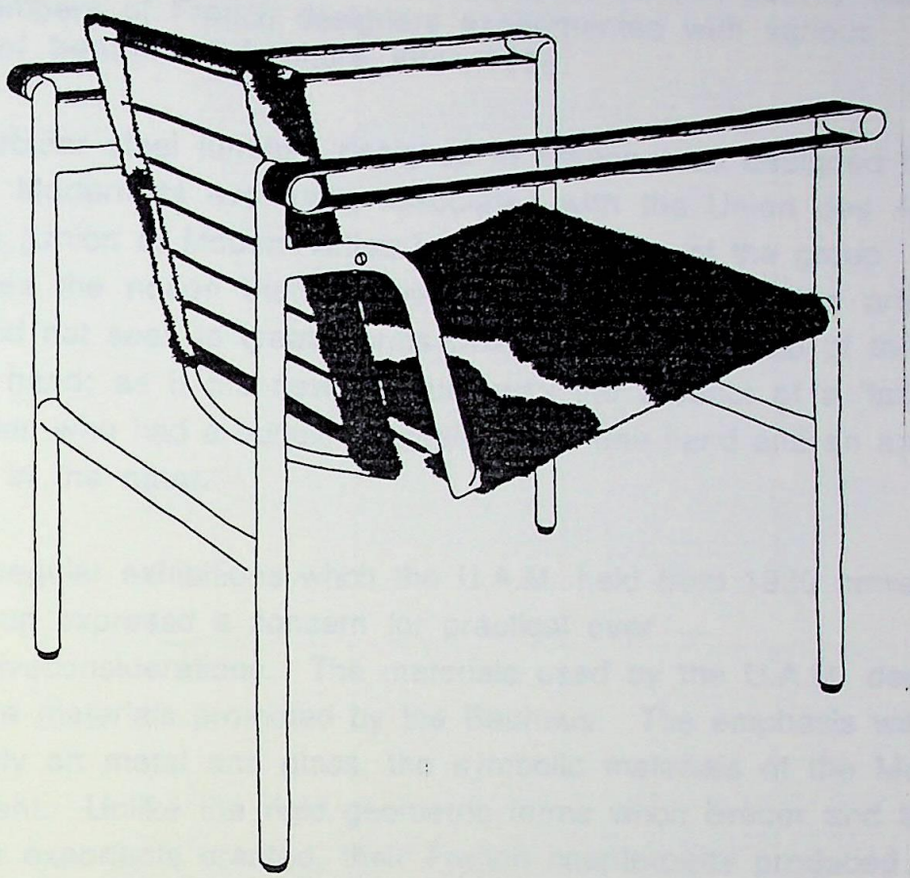
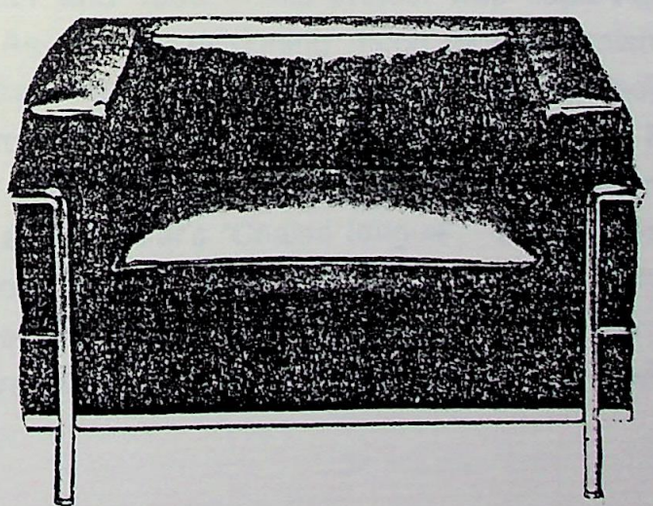


Fig 33. Le Corbusier and Charlotte Perriand. The 'Grand Confort'. Leather-covered cushions contained within a frame of tubular steel. 1928-29



Thonet commisioned and manufactured tubular steel furniture created by French designers. The result of all this activity was that numbers of French designers experimented with various types of bent-metal furniture after 1928.

Most tubular steel furniture designed in France, was designed by French Modernists eventually associated with the Union des Artistes Modern [Union of Modern Artists.]. The very title of the group reiterates the notion that its devotees saw themselves as artists. They did not seek to create forms which appeared devoid of the artist's hand; as if the new furniture was the product of a 'face-less' technician who had a bundle of steel rods in one hand and an arc welder in the other.

In the regular exhibitions which the U.A.M. held from 1930 onwards the group expressd a concern for practical over — decorativeconsiderations. The materials used by the U.A.M. designers were the materials promoted by the Bauhaus. The emphasis was inevitably on metal and glass, the symbolic materials of the Modern Movement. Unlike the rigid geometric forms which Breuer and the German exponents created, their French counterparts produced more free flowing designs. The skeletal structure and cantilevered arrangement of Rene Herbsts 'Chaise Longue' [Fig 35] is totally evocative of the machine aesthetic. Here Herbst took the industrial aesthetic of tubular steel and created a design which emphasized elegance and decorative possiblilities.

The most exciting scheme that the artists of the U.A.M. were involved in, was the decoration of the place of th Maharaja of Indore between 1931 and 1933. This project was supervised by Eckart Muthesis. As well as designing much of the furnishings for the palace himself he enlisted the collaboration of leading designers and craftsmen from France, England and Germany. The French contribution included such classic designs as Eileen Grays' 'Transat' chair and Le Corbusier's 'Chaise longue'. Emile-Jacques Ruhlmann supplied more conservative furnishings. Other contibutors included Louis Sognet, Charlotte Alix and Rene Herbst. The designers in this venture were given the opportunity to be Modern without any

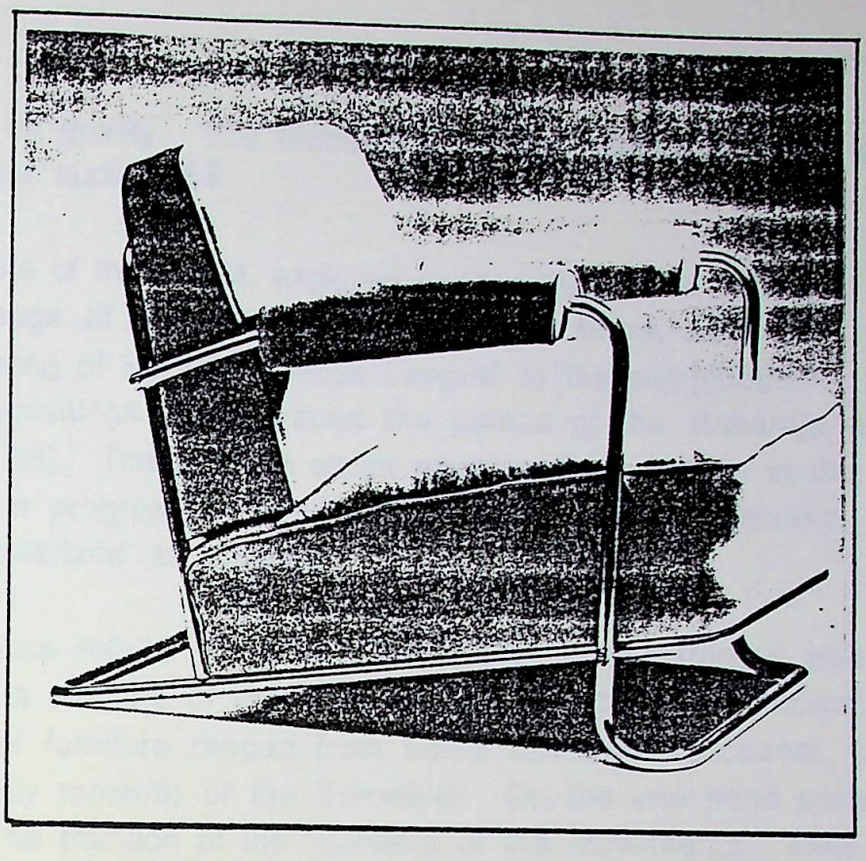


Fig 34. R.C. Coquery. Lounge chair, model No. B251 bent chromed tubular steel, flat steel, upholstery (Later). 1929. Manufactured after 1929 by Gebrualer Thonet, Frankenberg, Germany

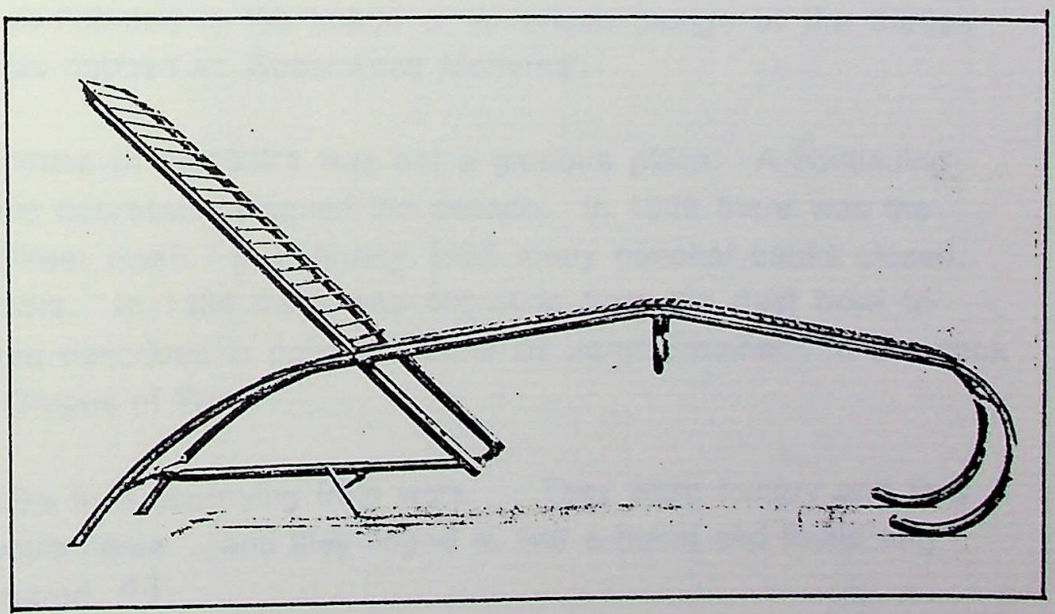


Fig 35. Rene Herbot. 'Chaise Longue', in tubular steel, 1930

compromise of quality. 'The Maharaja's palace became a shrine to the Modernist fashion.'[42]

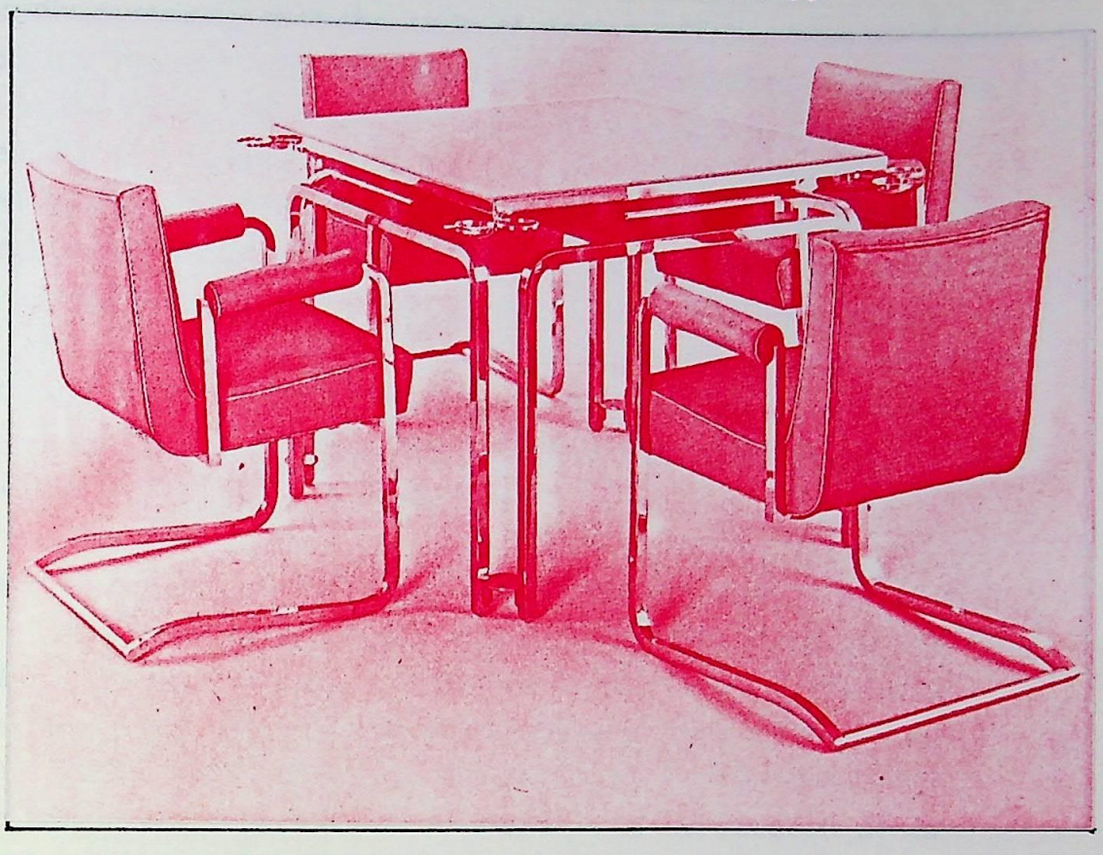
The designers of the U.A.M. explored every conceivable variant on the visual language of Modernist tubular metal furniture, from the Bauhaus styling of Herbst's 'Chaise Longue' to the sumptuous theatrical furnishings which graced the palace of the Maharaja of Ingore. [Fig 36]. The furniture which emerged from France in the 1930's was a progression from the rigidity of Bauhaus idealism whch characterized its inception.

Outside France tubular steel furniture design of the thirties also represented a plethora of styles. It was a decade of eclecticism. Tubular steel furniture ranged from being austerely functional, to the indulgently romantic or the Surrealist. On the one hand purists maintained the tradition of the founders of the movements. Mies van der Rohe continued to add to his collection of sophisticated austere designs. The bronze chair by Alberto and Diego Giacometti is Surrealist in conception. [see Fig. 37]. This chair is unashamably retrospective. It served as a reaction against what became the stifling self consciousness of Modernism. In America Modernism was taken as the basis for a new approach to furniture design with style and mass sales as the goal. The tubular steel furniture of this period contributed to the image of American design of the thirties whch was dubbed as 'Streamlined Moderne'.

The America of the1930's was not a glorious place. A continuing economic depression plagued the decade. In 1929 there was the Walls Street crash. In February 1933 many national banks closed their doors. In 1934 there was migration from the dust bowl to California described in poignant terms by John Steinbeck in the book - 'The Grapes of Wrath'.

> Like ants scurrrying from work .... They were hungry and they were fierce ... and they hoped to find a home and found only hatred. [43]

Fig 36. Louis Sognot and Charlotte Alix. Games table and four armchairs designed for the Maharajah of Indore. Tubular steel frames with the arms, backs and seats of the chairs are in a synthetic material. 1930-33



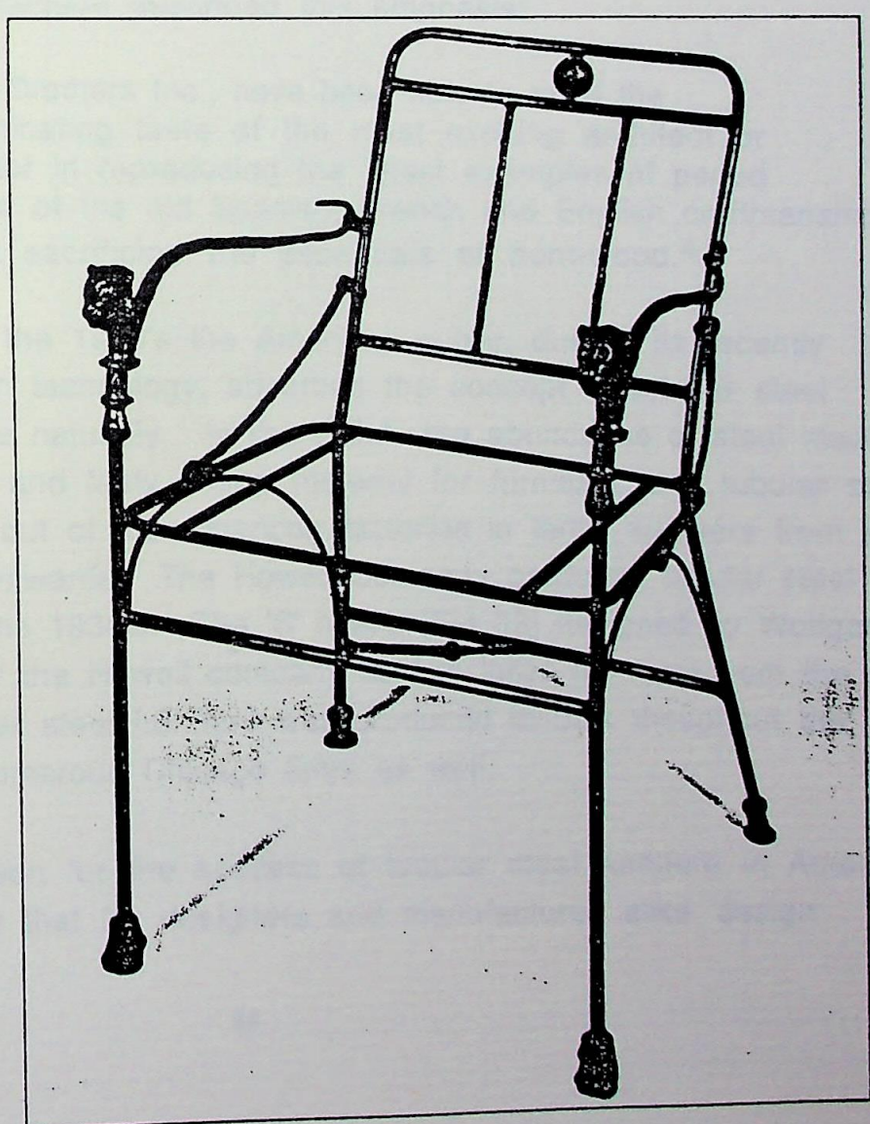


Fig 37. Alberto and Diego Giacometti. Bronze chair designed for Jean-Michel Frank, Mid-thirties

It is hardly surprising that the style of design which emerged should jettisson the present. As one exponent of Streamlining stated- 'We are all in the gutter but some of us are looking to the stars.'[44] Streamlining was a style based on a fantasy vision of a world of easy travel and mechanized living, unclutered with references to the past and in itself a dream for the future. Tubular steel was seen to be an appropriate material for furniture of this style. Raymond Loewy, the most vocal of the 'Streamline' designers saw fit to use tubular steel furniture in the mock up of his 'Designers office and studio' at the 1934 contemporary industrial art exhibition at the Metropoliton Museum of Art, New York.

This faith in technology percolated down into the rest of American society. Proof of this is the fact that in the 1900's America was considered, by the European companies who exported furniture to America, to be an exceptionally conservative market. The Thonet company had to produce special furniture lines just for the U.S.A., most of which had a period feel to them. The introduction of its American catalogue described this emphasis:

> Thonet Brothers Inc., have been able to meet the descriminating taste of the most exciting architect or decorator in reproducing the finest examples of period furniture of the old Spanish, French and English craftmanship without sacrificing the essentials of bent-wood.[45]

However, in the 1930's the American public, due to its recently found faith in technology, absorbed the concept of tubular steel furniture quite naturally. In the U.S.A. the abundance of steel made it a popular and fairly cheap material for furniture, and tubular steel items came out of the American factories in large numbers from the mid 1930's onwards. The Howell Company produced tubular steel furniture in the 1930's. The 'S' chairs [Fig 38] designed by Wolfgang Hoffmann for the Howell company sold in large numbers from the mid 30's. Tubular steel furniture was produced in bulk thoughout the 1930's by numerous Chicago firms as well.

Another reason for the success of tubular steel furniture in America, was the fact that for designers and manufactures alike 'design

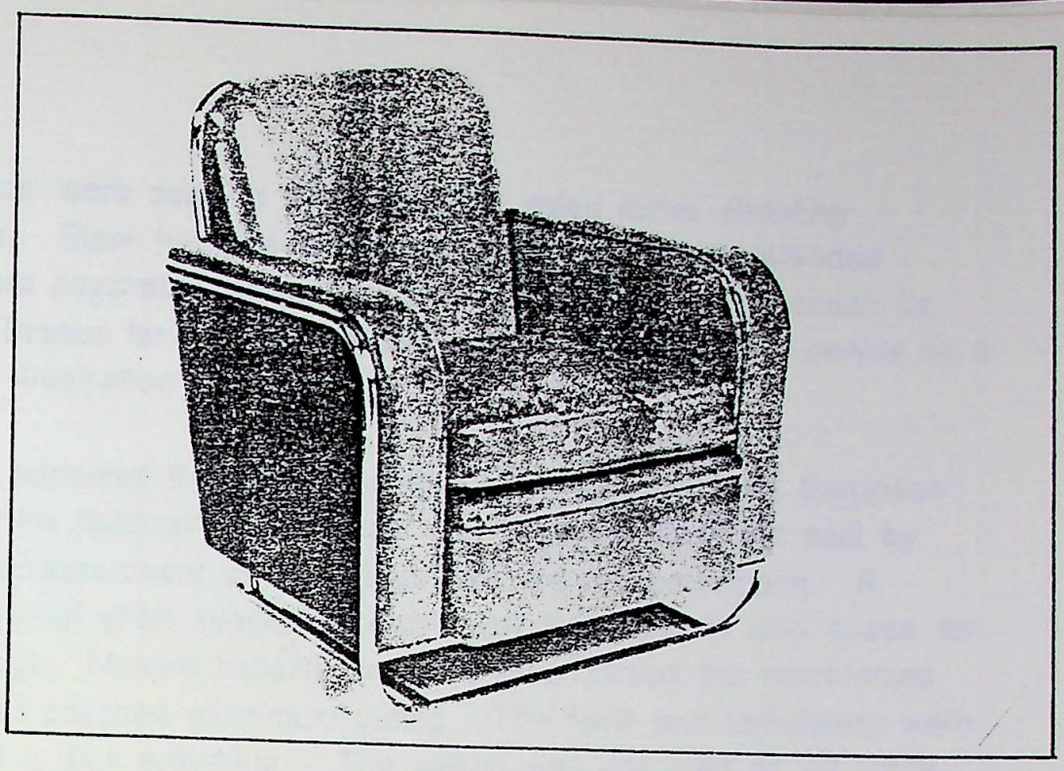


Fig 38. Wolfgang Hoffmann. A tublular-steel framed upholstered armchair. Also called 'S' chair. 1930's Manuafactured by Howell Company in the USA in mid 1930's

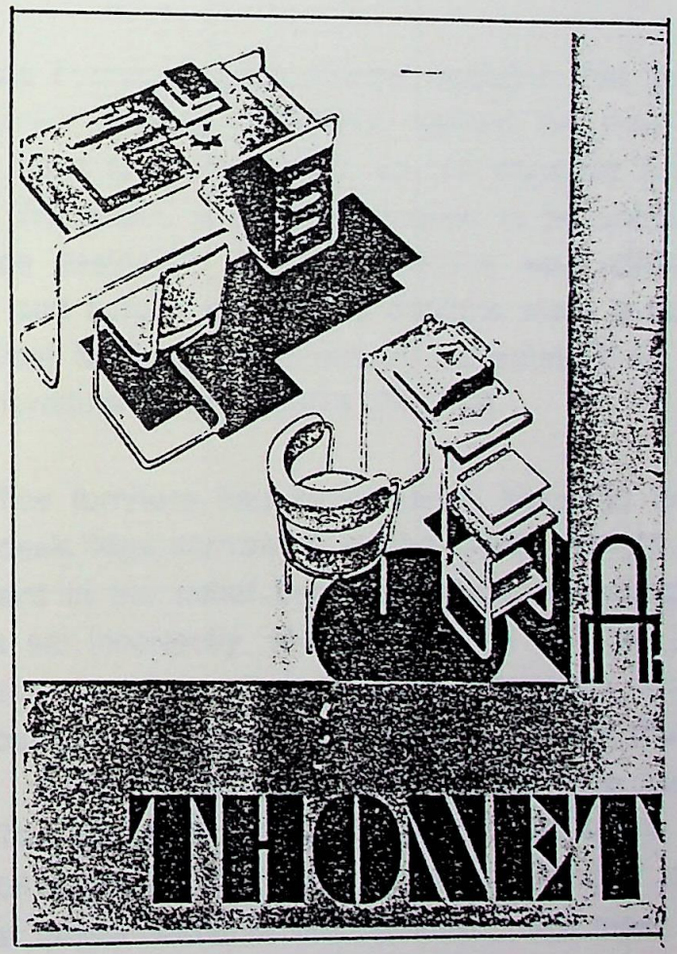



Fig 39. Front cover of Thonet-Mundus catalogue 1929-30 range of office furniture by Breuer, Le Corbusier and Charlotte Perriand.

aesthetics' were seen to be a beautiful sales curve shooting upwards. Steel furniture was designed to satisfy its intended customers psychological needs. The interior design of a coach by Dorwin Teague for the New Haven coach company in 1934 serves as a perfect illustration of this fact.

Teague borrowed the idea of using tubular aluminium for European design. He determined the proper slant and height of the seat by having an assortment of individuals test several prototypes. A circular steel shaft supporting each seat left legroom and space for belongings. Molded bakelite armrests emphasised the machinized beauty of polished aluminium tubing. The floor and upholstery were coloured a dark gray-blue . The ceiling was coloured an off white. These colours had an icy appearance. In order to counteract any effect of coldness, he added in three parallel bands of brilliant vermillion near the top of each wall. Attributing increased revenues to Teagues work New Haven officials ordered fifty more identical cars a year after delivery of the initial lot. [46]

In the book 'Office Furnitue' Lance Knobel explains that 'just as Frank Lloyd Wright's Larkin building in Buffolo marked the true beginnings of 20th Century office furniture design, so his work for S.C. Johnson, & Son in racine, Wisconsin, in the '30's proved to be another landmark in office design.[47] Wright's furniture was made from, sheet aluminium and tubular steel. His designs were a departure from the puritanical Modernist convention; as established by Thonets range of office furniture in the 1930's. [Fig 39]

While typical office furniture had large bases covering the floor, Wright had the desk, legs narrrowing at the base. Wright designed three-legged chairs in the belief that they would encourage good posture; if users sat incorrectly, the chair would tip over [Fig 40]. a fourth leg was later added to all these chairs because first time users were embarrassed when they invariably fell off the three legged versions. Both, the chair seats and backs were padded with foam-rubbber. The pivoted back had fabric on both sides; being designed both for added comfort and for decreased wear on the fabric. The seat fabrics came in four colours. The steel frames of

Fig 40. Frank Lloyd Wright. 'Johnson' desk and chair, 1930's made by Steelcase.

the furniture throughout the building were painted Cherokee red. Wright's tub desks were also impressive. They had deep and wide openings for files with a sliding wood insert to provide a small working surface over the files. The most spectacular was the informaton desk, located at the junction between the lobby and the Great Workroom. This tubular steel table was 28 feet long and had a maple surface.

Wright's furniture has been identified as the fore runner of the open plan office furniture of the 60's. It also serves as an example that high lights one of the decisive ironics of Modern tubular steel furniture; that a style born out of a desire to improve working class furniture design, was transformed into the perfect encapsulation of corporate style. Wrights use of bright colours soft fabrics, and his concern for ergonomics highlights the difference between the European and American approach to tubular steel furniture design during the inter - war period.

The Bauhaus tubular metal furniture offered cerebral pleasure. The French translation was an elitist affair. The American version could be understood by everyone. Under the guiding influence of Charles Eames, Eero Saarinen and Harry Bertoia, it would prove to be the way forward for the post World War II furniture developments.

## CONCLUSION:

It can be concluded that tubular steel furniture design of the 1920's and 30's was an assemblage of contradictions:

> It had its genesis in left wing idealogy but graced the homes of the wealthy.
> It was the bulwark against the past. The cantilevered chair offered no personal security.
> It was supposed to appeal to the masses. Too often its cold aesthetic alienated them.
> It was the product of left wing idealogy. It became the encapulation of the corporate style.
> It was a mass produced anonymous product. It was an elitist affair.
> It was the universal style. It was interpreted differently in various countries.
> It led to new levels of invention. Plagiarism was rife.
> It was a bulwark against the past. The cantilever chair offered no personal security.
> It exploited the technology of the day. Its next generations of designers would exploit the plastics technology.

Modern tubular steel furniture was a brilliant and appropriate invention. It remains one of most potent symbols of the twentieth century; to this effect Reyner Banham added:

> Through all these reversals of fortune and reputation the tubular steel chair remains; physically it remains one of the artifacts by which remote future archaelogists will recognise the twentieth century symbolically it remains as the most nearly perfect embodiment of the platonic ideal of modernity.[48]

NOTES:

1. Pile, John F. Modern Furniture, A Wiley Interscience publication, New York, 1979, p.41

2. Banham, Reyner. 'Introduction' in Barbie Campbell-Cole and Tim Benton. Tubular Steel Furniture. The Art Book Company, London, 1979, p. 9.

3. Perriand, Charlotte. 'Wood or Metal, a Reply?', 1927. In Tim and Charlotte Benton with Dennis Sharp, Form and Function. Lockwood Staples in association with the Open University Press, 1975, p.232

4. Wilk, Christopher. 'Bent Wood and metal furniture 1925-1946. In Ostergard, Derek E. Bent Wood and Metal Furniture 1850-1945. American Federation of Arts, New York, 1987, p.121-122.

5. Lucie-Smith, Edward, A History of Industrial Design. Phaidon Press Limited, Oxford. 1980, p. 102

6. Benton, Tim, 'German Origins - Thonet Mundus and its Influence'. In Tim Benton and Barbie Campbell-Cole. Tubular Steel Furniture. The Art Book Company, London, 1979, p.12

7. Wilk, Christopher. 'Furnishing the Future: Bentwood and Metal Furniture 1925-1946'. In Ostergard, Derek E. Bent Wood and Metal Furniture 1850-1946. American Federation of Arts, New York, 1981. p. 122-125

8. Lucie-Smith, Edward, A History of Industrial Design, Phaidon Press Limited, Oxford, 1980, p. 104

9. Keil, Robert. 'The social and cultural context of Bentwood and Metal Furniture'. In Ostergard, Derek E. Bent Wood and Metal Furniture 1850-1946. The Art Book Company, London, 1979, p. 190

10. Wilk, Christopher. 'Furnishing the Future: Bent Wood and Metal Furniture 1925-1946' in Ostergard, Derek E. Bentwood and Metal Furniture. The Art Book Company, London, 1979, p.138-139.

11. Barry, Peter. Chairs. Barbie and Jenkins, London, 1972, p. 104.

12. Hulten, Pontus. Futurism and Futurisms. Thames and Hudson, London, 1986, p. 40.

13. Shorts, Penny. An Introduction to Design and Culture in the Twentieth Century. Allen and Unwin, London, 1986, p.50.

14. Heskett, John. 'German': The Industrial Application of tubular Steel. In. Barbie Cambell-Cole and Tim Benton. Tubular Steel Furniture. The Art Book Company, London, 1979 p. 24.

15. Heskett, John. 'Germany: The Industrial Application of Tubular Steel. In Barbie Cambell-Cole and Tm Benton. Tubular Steel Furniture. The Art Book Company, London, 1979, p. 22-24.

16. Wilk, Christopher. Marcel Breuer: Furniture and Interiors. The Museum of Modern Art, New York, 1981, p. 37.

17. Garner, Philippe. Twentieth-Century Furniture Phaidon, Oxford, 1980, p.99.

18. Wilk, Christopher. 'Furnishing the Future: Bent-wood and metal furniture. In Ostergard, Derek E. Bent-wood and Metal Furniture. The Art Book Company, London, 1979, p. 128-132.

19. Ganby, Charles D. Zimmerman and Stidham, Susan, Contemporary Classics. Mc Graw Hill Book Company, New York, 1980, p.36.

20. Lucie-Smith, Edward. A History of Industrial Design. Phaidon Press Limited, Oxford, 1980 p. 108.

21. Stam, Mart. 'Away with the furniture Artists', 1927. In Tim and Charlotte Benton with Dennis Sharp. Form and Function Crosby Lockwood Stapples in Association with the Open University Press, London, 1975, p. 227.

22. Benton, Tim. 'Back ground to the Bauhaus'. In Faulkner, T. Design 1900-1960/Studies in Design and Popular Culture of the 20th Century. Newcastle upon Tyne Polytechnic, 1976, p.30.

23. Campbell-Cole Barbie. 'The Arrival of Tubular Steel Furniture in Britain' in Barbie Campbell-Cole and Tim Benton. Tubular Steel Furniture. The Art Book Company, London, 1979, p. 56.

24. Campbell-Cole, Barbie. 'The Arrival of Tubular Furniture in Britain. In Barbie Campbell-Cole and Tim Bention. Tubular Steel Furniture. The Art Book Company, London, 1979. p. 53.

25. Mac Carthy, Fiona. British Design Since 1880. Lund Humpharies, London, 1982, p. 108.

26. Campbell-Cole, Barbie. 'The Arrival of Tubular Steel Furniture in Britain. In Barbie Campbell-Cole and Tim Benton'. Tubular Steel Furniture. The Art Book Company, London, 1979, p.56.

27. Wilk, Christopher. Marcel Breuer: Furniture and Interiors. The Museum of Modern Art, New York, 1981, p.73

28. Wilk, Christopher. Marcel Breuer: Furnituer and Interiors. The Museum of Modern Art, New York, 1981, p. 184.

29. Wilk, Christopher. 'Furnishing the Future: Bent-wood and Metal Furniture 1925-1946 in Ostergard, Derek E. BentWood and Metal Furniture 1850-1946. American Federation of Arts, New York, 1987 p.

30. Sparke, Penny, An Introduction to Design and Culture in the Twentieth Century. Allen and Unwin, London, 1985, p. 91.

31. del Renzio, Toni. 'Italy-The Italian Experience'. in. Barbie Campbell-Cole and Tim Benton. Tubular Steel Furniture. The Art Book Company, London, 1979, p. 47.

32. Sparke, Penny. An Introduction to Design and Culture in the Twentieth Century. Allen and Unwin, London, 1985, p. 83.

33. Perriand, Charlotte. 'Wood or Metal, A reply?', 1927. in. Tim and Charlotte Benton with Dennis Sharp. Form and Function Crosby Lockwood Staples in association with the Open University Press, 1975, p. 232.

34. Wilk, Christopher. Marcel Breuer: Furniture and interiors. The Museum of Modern Art, New York, 1981, p. 67.

35. Le Corbusier, 'The Furniture Adventure', 1929. In Tim and Charlotte Benton with Dennis Sharp. Form and Function Crosby Lockwood Staples in Association with the Open University Press, 1975, p. 234.

36. Wilk, Christopher. Marcel Breuer, Furniture and Interiors. The Museum of Modern Art, New York, 1981, p. 182.

37. Banham, Reyner. 'Introduction', in Barbie Camblell-Cole and Tim Benton. Tubular Steel Furniture. The Art Book Company, London, 1979, p.9.

38. Gloag, John. 'Wood or Metal', 1929. in. Tim and Charlotte Benton with Dennis Sharp. Form and Function. The Art Book Company, London, 1979, p. 231.

39. Le Corbusier. 'The Furniture Adventure', 1929 in. Tim and Charlotte Benton with Dennis Sharp. Form and Funtion. The Art Book Company, London, 1979. p. 234.

40. Wilk, Christopher. 'Furnishing the Future: Bent-wood and metal furniture in Ostergard, Derek E. Bentwood and Metal Furniture 1850-1946. American Federation of Arts, New York, 1981, p. 146.

41. Larrabee, Eric. Vignetti, Massimo. Knoll Design. Harry N. Abrams, Inc., New York, p. 26.

42. Garner, Philippe. Twentieth-Century Furniture. Phaidon, Oxford, 1980, p. 117.

43. Pulos, Arthus J. The American Design Adventure. M. I. t. press, Massachusets, 1985, p. 30.

44. Pulos, Arthur J. American Design Ethic M.I.T. press, Massachusetts p.44.

45. Sparke, Penny, Furniture. Bell and Hyman, London, 1986, p. 38.

46. Merkle, Jeffrey L. Industrial Design in America 1925-39, Temple University Press, Philadelphia, p. 113.

47. Knobel, Lance, Office Equipment Unwin and Hyman, London 1987, p. 39.

48. Bunham, Reyner. 'Introduction' in. Tim and Charlotte Benton with Dennis Sharp. Tubular Steel Furniture. The Art Book Company, London, 1979, p.9

## BIBLIOGRAPHY

BOOKS:


Barry, Peter. Chairs. Barbie and Jenkins, London 1972.

Benton, Tim and Charlotte. Sharp, Dennis. Form and Function. Lockwood Staples in associatin with teh Open University Press, 1975.

Campbell-Cole, Barbie. Benton, Tim. Tubular Steel Furniture. The Art Book Company, London, 1979.

Faulkner, T. Design 1900-1960/Studies in Design and Popular Culture of the 20th Century. Newcastle upon tyne Polytechnic, 1976

Fuller, Buckminster. Ideas and Integreties of Kuckminster Fuller. Collier Books, New York 1963.

Ganby, Charles D. Zimmerman. Stidham, Susan. Contemporary classsics. Mc Graw Hill Book Company, New York, 1980.

Garner, Philippe, Twentieth-Century Furniture. Phaidon. Oxford, 1980, p. 99.

Knobel, Lance. Office Furniture Unwin Hyman, London, 1987.

Kron, John. Sleisin. High-Tech. Penguin Books Ltd., London. 1979.

Lucie-Smith, Edward. A History of Industrial Design Phaidon Press Limited, Oxford, 1980

Larrabee, Eric. Vignettti, Massimo. Knoll Design. Harry N. Abrams Inc., New York, 1900.

Mac Carthy, Fiona. British Design since 1880 Lund Humpharies, London, 1982

Mang, Karl. History of Modern Furniture. Academy Editons, London, 1979.

Meikle, Jefferey L., Industrial Design in America 1925-39. Temple University Press Philadelphia, 1986.

Ostergard, Derek E. Bent-wood and Metal Furniture 1850-1945. American Federation of Arts, New York, 1987.

Pile, John F. Modern Furniture A. Wiley Interscience Publiction, New York, 1979.

Pulos, Arthur J. American Design Ethic Massachusetts Institute of Technology, Massachusetts 1905.

Pulos, Arthus J. The American Design Adventure Massachusetts Institute of Technology Massachusetts, 1985.

Sparke, Penny. And Introduction to Design and Culture in the Twentieth Century. Allen and Unwin, London, 1986.

Wilk, Christopher. Marcel Breuer: Furniture and Interiors. The Museum of modern Art, New York, 1981, p. 37.

MAGAZINE ARTICLES:

Sunjac, Deyan. 'Rogers Conversion'.
in Elizabeth Tiberis, VOGUE
The Conde Nast Publications Ltd. London
February 1988 p.

COMPANY CATALOGUES AND RELATED PUBLICATIONS:

Hospital Metal Craft Limited. catalogues 1950 and 1989. Address: 44 Ashton Vale Road. Bristol.

Pel Limited. catalogue 1989
Address: Oldbury, Warley West Midlands.

Scan-Q Limited. catalogue 1989.
Address: Norwester hosue, 12 Fairway drive Greenford, Middlx

## ACKNOWLEDGEMENTS:

LIBRARIES: Trinity College, Dublin; Bolton Street College; N.C.A.D.; Ilac Centre. COMPANIES: Pel; Royal Master Peace; Scan - Q Ltd., Middlx; Bristol Maid, Dorset. These companies provided brochures and leaflets of their product ranges. TUTOR: Dr. Turpin. TYPING: Sarah. PHOTOGRAPHS: Thanks to the following for allowing me take photographs on their premises: U.C.D. Eng. Library; Ilac Centre Library; O'Hagan Design, Mary Street; Switzers, Grafton Street; Anglo-Irish Bank, St. Stephens Green. THANKS TO Mr. Richard Farrelly of Royal Master Peace, Navan for providing me with a 'summerful' of tubular steel orthopaedic beds and stacking chairs to assemble, in 1988!